Abstract

In this paper, we describe design and popularized descriptions of *design thinking*. We claim that design thinking is often presented in a way that oversimplifies design and devalues expertise. The result is an incomplete model that, although valuable, should be considered just one way of thinking of design.

Keywords: design, design thinking

Why Design Thinking Sucks (in Education)

> *On one level, design is a general human process that we use to understand and to shape our world. Nevertheless, we cannot address this process or the world in its general, abstract form. Rather, we meet the challenges of design in specific challenges, addressing problems or ideas in a situated context.* -(Friedman & Stolterman, 2017, p. xiii)

"Design thinking" (at least one model of design thinking) has become somewhat of a buzzword in education and beyond (Kimbell, 2011; Korn & Emma, 2012; Lahey, 2017; Razzouk & Shute, 2012). Proponents argue that design thinking is a tried and tested process for fostering innovation while critics suggest that it is the latest fad to sweep through, and will, like others before it, fade away (Hernández-Ramírez, 2018). Our experiences engaging in design work with schools and educators has suggested a bit more nuance is needed. We argue that the prevalent model of design thinking has significant limitations—particularly in the manner in which it misrepresents the richness of the design process and devalues expertise. That said, it can offer an initial perspective of design that can be enriched through consideration of other models of design. In this paper, we describe design, explain what we mean by design thinking, present challenges to the popular design thinking discourse, and suggest the need for epistemic variety in how we incorporate designerly ways of being, thinking and acting into educational discourses.

What is Design?

Simon (1969) contrasted design with the natural sciences, suggesting that the natural sciences study what *is,* while design seeks to find what *could be*. Nelson and Stolterman (2012) described design as "a compound form of inquiry, composed of true, ideal, and real approaches to gaining knowledge" (p. 34). Whereas scientific understanding focuses primarily on the true, design is ultimately concerned with the real (the particular)—that which is created in and for a context. Thus, as Perkins (1986) described, a design is a "structure adapted to a purpose" (p. 2). It is something created to work in a particular context.

We highlight two elements of design critical to our argument. First, design embraces complexity and resists reduction. Designers "make things out of the materials of a situation under conditions of *complexity and uncertainty*" (Schön, 1992, p. 127, emphasis added). Redström (2017) highlighted complexity as what makes design powerful; he described the importance of difference, alternatives, and fluidity when designing the complex particular. The

ability to embrace complexity is important, as working in the complex particular requires making adaptations in fluid ways. Second, designers develop a type of knowing and expertise that enables them to work in this complexity in an effective way. This expertise includes not only domain knowledge, but also design judgment. Design judgment is built from experience as well as precedent knowledge (see Boling et al., 2017). It is what allows designers to be successful in the complex particular.

What is Design Thinking?

The term *design thinking* itself was used by Peter Rowe (1991) to describe the inquiry patterns of professional designers such as architects and urban planners. The notion of *design thinking* we explore here (and that our use of the term design thinking refers to) became popular in the early 2000's when Todd Kelly and Tim Brown, owners of a design consultancy agency, began promoting a 5-stage design process (Brown, 2008). Brown (2008) described design thinking as:

> a discipline that uses the designer's sensibilities and methods to match people's needs with what is technologically feasible and what a viable business strategy can convert into customer value and market opportunity. (p. 86)

Design thinking focused explicitly on applying design in an disciplinary-free way to business and, later, other fields such as education (Kimbell, 2011; Razzouk & Shute, 2012). It is often represented as a model with five stages, similar to Figure 1.

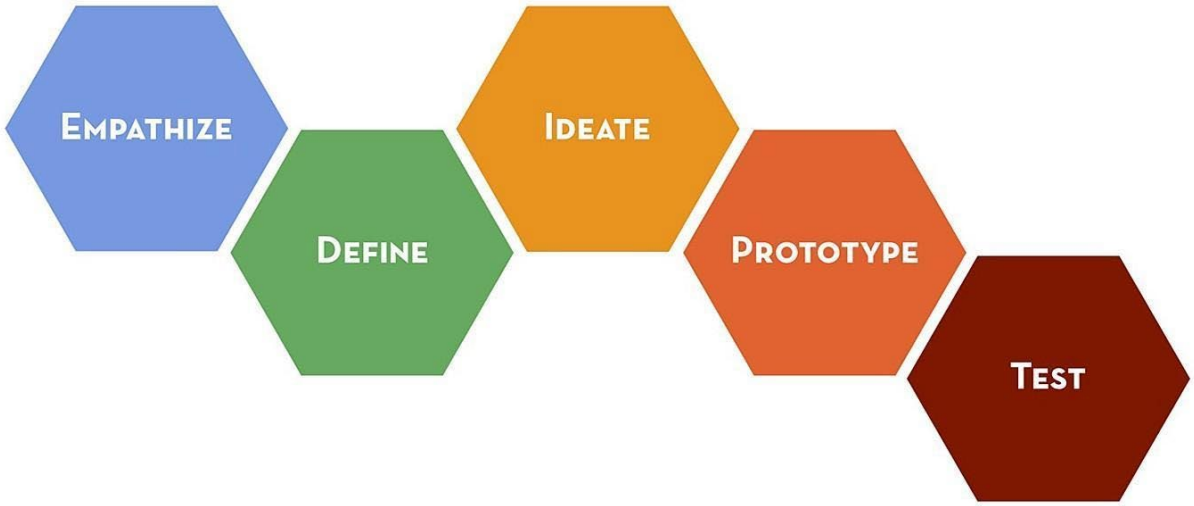

Figure 1. Stanford d.school Design Thinking Process Model

Design thinking models suggest a *process* to designing innovative solutions. The process begins through an empathy or research step, where design thinkers gather information about the situation. Then, they define the problem and come up with potential solutions for that problem. Next, they go through cycles of prototyping and testing, gradually refining their design. It is important to note that recent efforts have been made to describe design thinking in

a less linear and more flexible way (see, for example, Carter & Stariha, 2019). However, the general concept of design thinking as a disciplinary-free path to innovation can still be seen in most current models.

It is important to note that this 5-hexagon model is not the only representation of design thinking, and a variety of alternative forms have been presented as well. What is common to them are that they are typically process models, providing a sequential series of steps, typically starting with empathy and working their way towards prototyping and testing.

Challenging Design Thinking

Although design thinking has been lauded by some as a revolutionary approach to creating innovation, many designers and design scholars have been critical of the model. They claim design thinking trivializes the role of critique, expertise, and design craft (Hernández-Ramírez, 2018; Jen, 2017; Kolko, 2018); assumes outputs will be appropriate and effective (Hernández-Ramírez, 2018; Jen, 2017; Vinsel, 2017); takes a naive perspective on empathy (Kolko, 2018); and over-simplifies design (Hernández-Ramírez, 2018; Jen, 2017; Kolko, 2018; Nussbaum, 2011). Our own experiences engaging in design processes in education affirms the relevance many of these criticisms. In particular, our work has highlighted the challenges in how design thinking misrepresents the richness of design and undermines expertise.

First, design thinking process models attempt to simplify the process of design. Doing so is not without value, as it can help non-designers begin to work in a more designerly way. However, design also needs to be recognized for what it is: *creation in the complex particular*. Presenting design as steps to take in order to achieve "innovation" diminishes the complexity that is the soul of design. It encourages a discrete process that progresses step-by-step rather than supporting the fluid and opportunistic nature of design.

The attempt to simplify design brings with it our other major challenge to design thinking: design thinking undervalues expertise. Often design thinkers attempt to address a problem in an area where they have limited expertise. Some claim this is advantageous, as expertise can lead to blinders, limiting creativity. However, unmoored novelty misses out on the rich insights experts can offer as they draw upon their disciplined judgment. Norman (2010) explained, "Fresh eyes can indeed produce insightful results, but the eyes must also be educated and knowledgeable."

Developing design judgment requires more than following a process. It entails both the development of domain knowledge and a refined understanding of how to apply that knowledge in the particular. This leads to a unique way of seeing that enables designers to work effectively in complexity (Razzouk & Shute, 2012). Design educators use critique to develop this judgment. When design products are critiqued, either by the designers themselves or outside consultants, the unique judgment and expertise of the critic can be used to significantly refine the designer's knowledge and skill as well as the design itself. Surprisingly, the "critique" that is key to any design studio experience finds no place in the 5-stage model.

Our work has highlighted a related issue specific to working with educators and the expertise they bring to design. Most design thinking process models begin with empathy; however, we have found that empathy is not necessarily the best place to start when working with educators. Teachers are naturally empathetic individuals; most teach because of how much they care about their students. They spend a large amount of time with students and

likely know more about students than most others do. This does not mean that educators cannot benefit from empathy-centered activities that help them understand their students in new ways. However, *beginning* the design process with empathy can be regarded as insulting to their way of working and expertise with students. It devalues the very expertise that make them effective designers. We have found, in our work, that bringing in processes that help them understand where their learners *are,* and the nature of their learners' experiences (i.e., develop empathy) makes more sense deeper into the design process.

Design thinking models attempt to accommodate these two problems—lack of attention to complexity and designers without expertise—through the process itself. For example, design thinking begins with empathy or a similar research stage with the hope that the design thinkers can gather enough information to define the problem effectively, despite the designer thinkers' lack of expertise. Additionally, the cycle of prototyping and testing attempts to replace the need for design judgment; the testing itself can provide the feedback an expert might have offered. Gathering information, defining a problem, prototyping, and testing are important and are part of what professional designers do. However, focusing exclusively on these processes might result in wasted time and ultimately less-effective solutions.

Design Thinking as One Perspective

Despite these critiques of design thinking (and a bit of hyperbole in our title), we do not think design thinking is useless. Design thinking has helped many educators consider their practice in new ways and find more creative solutions to problems. Despite oversimplifying design and devaluing expertise, it does support designerly traits such as combining inquiry (through research and analysis) with action (through prototyping and testing). However, it is only one perspective on design.

We have found that combining process models with other ways of viewing design—for example "domain models" that explore not only *how* to design but *what* is designed—can enrich our understanding of design in education (Authors, in press), including a deeper consideration of the complexities of design. Examples of domain models include Buchanan's (2019) five orders of design, Golsby-Smith's (1996) four domains of design, and the five spaces for design in education (Authors, 2019, 2020). Each of these models seeks to identify "places of invention . . . where one discovers the dimensions of design thinking by a reconsideration of problems and solutions" (Buchanan, 1992, p. 10) thus "widening designerly ways of thinking" (Golsby-Smith, 1996, p. 5). They offer a framework for considering expertise in design as well as the complex role design plays in the artificial world.

In summary, design thinking is just one way of considering design, whether in education or elsewhere. By itself, it discounts the complexity of design and expertise of the designer. However, if combined with other perspectives of design, such as design domain models, it can offer tools to support design. Ultimately, design in education should anchor itself in the particularities of educational contexts and support educators in using their expertise to make sense of the present and shape the future.

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