

## **Contemporary Uses of Design Thinking Across Society, Work, and The Individual**

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### **Why Design Thinking for Society, Work, and the Individual?**

Historically, design has been viewed as an activity for professionals. The customary form of participation for design and other professions is the long-term development of expertise within a specific design discipline. While society values and depends on professionals, twenty-first century realities call for increased participation of everyone to improve their world. Part of this participation is ethical, involving people directly in decision-making, rather than delegating to professionals and governments. Participation is also pragmatic in that informed people are motivated to reassume responsibility. Design is a human activity that all humans can participate in. The ideas of design have moved to the business world where design is touted as a mindset that should be incorporated across the organization.

A term that has been increasingly used is design thinking, although no agreed-upon definition exists for the term. This paper examines design thinking through current literature comparing different views and identifying their implications. Looking at design education and design practice we discuss ways to help designers understand what design thinking is and how such thinking helps designers respond to human needs. One of the common features in the design thinking literature is bringing customers and clients into the design process. An inherent possibility in that mutual engagement is that all constituents in the design process come to understand and use design thinking. Designers need to be able to verbalize what design thinking is and what it means for people, so that all citizens can make the connection between their needs in the 21<sup>st</sup> century and our abilities as both informed citizens and responsive designers.

### **Views of Design Thinking**

The contemporary views on design thinking have been organized in four levels of concern; namely, that of design and society, organizations, education, and the designer. Figure 1 visually summarizes the differences in how design thinking relates to society, to the world of work, and to the individual.

#### ***Design and Society***

We tend to hold a narrow view of what “being human” means. Despite having been nudged into the era of cultural awareness, the result is still a lack of understanding and resistance

to other cultures. Other peoples can be better understood *through* their culture, one aspect of which is their designed world. The benefit to such a stance can develop a true cultural appreciation by laypersons, but also an awareness of the role of design in creating this designed world. Designers and informed individuals have a role in sustainment. An unsustainable world, says Fry (2003), is a “failure of design” (p. 78). He cites a new kind of design knowledge that will be needed to inform education, practice, and economics. Design thinking, he says, “is not natural. It is learned in that unnaturalness we call culture” (p. 73). What is needed by designers and informed individuals will be the ability to see the nature of things differently, carry on a global conversation among all peoples, and develop a stronger reflective capability. “What arrives last is a retreat into conventional design practice and the design of things” (p. 81). Some businesses are beginning to realize that the success of their products or services will depend on understanding the human experience, rather than manipulating the culture with products (Riley, 2003).

Daniel Pink’s (2006) popular book, *A Whole New Mind*, has given the general public a view of the importance of design in everyday life. He discusses the coming of the “Conceptual Age” as a response to the Information Age of the early 21<sup>st</sup> century. Pink identifies different skills and abilities that will be required for this new Conceptual Age, including “inventive, empathetic, and big-picture capabilities..” (p. 2). These skills are typically associated with right-brain thinking, and Pink believes that they will be critical for survival and success. The “Whole New Mind” refers to the ability to creatively and innovatively respond to those questions. Finally, he believes that success will go to people who can move quickly and master these high-concept, high-touch abilities and apply them appropriately in today’s culture.

Richard Farson (2008) discusses the idea that the use of design and design thinking provides people with the ability to begin to address some of the complex social and economic problems we currently face. In *The Power of Design*, he discusses the concept of metadesign, or “the design of design.” According to Farson, metadesigners have the ability to re-vision major systems such as healthcare, education, and criminal justice since they are capable of moving beyond the traditional design disciplines and see a more holistic system of solutions. Farson believes that metadesigners have a responsibility to use systems thinking to move innovation to the forefront, and to become leaders in 21<sup>st</sup> century creativity and innovation practices. He does not, however, offer a definition of design, nor does he identify working principles for design or design thinking. *The Power of Design* takes a broad view as it explores the idea that individuals as well as professionals need to accept a larger role in addressing socially responsible issues.

### ***Design and Organizations***

The terms design and design thinking have found their way into many business firms, resulting in numerous books touting their value to their success. David Burney of Red Hat, an open source computing company adopted design thinking because its ideas mirror the idea behind open source software. Burney says that design thinking involves everyone in design “because it makes it easier for those outside the design industry to focus the idea of design as a way of thinking about solving problems, a way of creating strategy by experiencing it rather than keeping it an intellectual exercise, and a way of creating and capturing value” (Hyer, 2009). The growing attraction of design thinking, according to Burney, is that it focuses on innovation rather than on traditional business processes such as small-scale product improvement, efficiency, and

top-down view of people, “need to know” attitudes and hidden agendas. Design thinking, according to Burney, is not a methodology, but a cultural way of thinking.

A key feature that cuts across most of these books on design and design thinking is customer involvement in the design. One example with a typical business title is *Do you matter? How great design will make people love your company* (Brunner & Emery, 2006). The main idea here is that “Design establishes a *relationship* between your company and your customers” (p. 43). The authors discuss the importance of designing a successful total customer experience, or risking total failure of the business. They identify strategies for becoming a successfully design-driven business through (a) awareness, (b) commitment, (c) implementation, and (d) vigilance. An organization can only be successfully design driven, according to Brunner & Emery, if the design culture occurs from both the top down (supported by upper management) and bottom up (embraced by workers from entry level upwards). A design culture will not be successful as an add-on to existing products, spaces, or work systems. The focus of the book is product design, however the message is universal across all business contexts, and clearly supports design as a critical element for today’s culture.

IDEO is a consulting and design firm that is widely recognized as a firm on the leading edge of innovation. Tom Kelley, founder of IDEO and author of *The Ten Faces of Innovation* (Kelley & Littman, 2005), has developed a set of “human personas” that have been tested continually in IDEO’s innovation work. The “devil’s advocate” is the first persona identified, and is defined as the most destructive role to innovation. Next, he describes three groups of personas that are highly effective in countering the negative effects of the devil’s advocate. First, the “Learning Personas” are driven to continually expand knowledge and grow. Second, the “Organizing Personas” understand how organizations move forward and use that understanding to create a balance between innovation and realism, allowing for growth and forward movement. Finally, the “Building Personas” make innovation happen by using the knowledge from the “Learning Personas” and the organizational skills from the “Organizing Personas.” Kelley’s ability to create personas with which people can identify helps individuals and companies see how to value and encourage innovation and creativity within their own organizations.

Lockwood (2010) defines design thinking as a human-centered process for innovation and enablement. Key features are involving the consumer, collaborating in teams, creating prototypes, and visualizing concepts. A distinguishing tenet in Lockwood’s view integrates creative ideas with the traditional aspects of the firm. Design management and leadership issues are addressed in Lockwood’s contribution to this book. He addresses the issues involved in moving a firm to a design thinking organization with a particular emphasis on service design. Service design emphasizes designing emotionally positive consumer experiences, as contrasted with the traditional focus on product design.

### ***Design and Education***

The evolution of design thinking is sometimes represented as a series of generations (Bousbaci, 2008). The first generation of design thinking and design methods (1950s – 1960s) depicted the designer as rational and logical (Broadbent & Ward, 1969; Simon, 1996), a reaction to the early view of the designer as intuitive and artistic. Reacting to this systematic view in the 1960s through the 1980s was a second generation focused on participatory processes (Alexander, Ishikawa, & Silverstein, 1977; Cross, 1972) and a third generation that attempted to understand a designer’s thinking processes (Rowe, 1987). Moving beyond looking at designers in their

traditional forms of practice, Cross (1981) and Schön (1987) advocated a reflective approach, seeing design in a broader context.

Rowe (1987) wrote *Design Thinking* to address design thinking and design inquiry within an architectural setting. Rowe provides a collection of ideas, theories, and systems that give a historical overview of the doctrines of problem-solving. At the time of publication, information-processing theory was a prominent approach to creative problem-solving, and much of Rowe's narrative is based upon this theoretical view. The author describes the design process as periods of heuristic activity where problems are identified, defined, and potentially solved. He discusses the necessity of using different design processes to address different types of problems such as well-defined problems, ill-defined problems, and wicked problems. The book provides a scholarly overview of design inquiry.

Nigel Cross' articles on *Designerly Ways of Knowing*, published in *Design Issues* in the 1980's were later expanded into a text (2006, 2007). Cross's work provides a foundation for situating design into our educational systems as an equal to science and humanities. Based on his writings, each discipline area responds to a specific overarching question:

Design asks: "how can we make it better?"

Science asks: "what is?"

Humanities asks: "how does it affect me?"

The major idea of Cross's work is that design abilities exist in everyone and that design should be a part of a general education. These "core features of design ability: include an ability to resolve ill-defined problems; adopt solution-focusing strategies; employ abductive, productive, appositional thinking (e.g., reason from function to form); and ability to use non-verbal, graphic and spatial modeling media" (p.63). For decades Cross has challenged us to reconsider the critical nature of design thinking in our culture. His message is particularly valuable today as we begin to create new approaches to our economic, healthcare, and international systems.

Another influential design practitioner book was Schön's *Educating the Reflective Practitioner* (1987), which was set in the architectural design studio. Here Schön discusses the reflective habits of new designers as they design or reflection-in-action. Schön reminds readers that technique and artistry are both necessary in the development of a design professional. Design thinking seems most closely addressed in the chapter on the design process, particularly how one frames and re-frames a design process and brings past experiences to bear. Also, in the chapter on the paradox of learning to design Schön discusses the difficulty some students have with the demands of an architectural curriculum and the challenges of having a dialogue with the instructor throughout. Educators frequently cite this text, particularly those in teacher education, as the image of the teacher as a professional and reflective practitioner offers guidance and inspiration.

### ***Design and Designers***

Several current titles on design thinking attempt to define it by describing the skills that a designer uses, akin to the third generation of design thinking (Bousbaci, 2008). According to Lawson (2005) in *How Designer's Think*, "design is a form of thinking, and thinking is a skill. Skills can be acquired and developed" (p.303). He presents an accessible discussion of design thinking set in the context of design process and practice, typically within the professions of

visual design, including architecture, interior design, and industrial/product design. Designers, as he believes, must employ almost equal parts of divergent and convergent thinking to produce successful design solutions. Lawson talks about the historical progression from initial writing on the design process to evidence-based study in all areas of design. He acknowledges that the study of design thinking is in its earliest stages, and that much more work is necessary in this field.

In addition to his discussion on design thinking, Lawson also proposes a model of design activity. He bases the model on Cross' early work, but incorporates current information about design processes and design thinking, creating a model for architectural problem-solving.

Brown (2009), the CEO of IDEO, characterizes design thinking as a means to leverage what humans already know to tackle a broader range of problems than before. He sees design thinking as a means to help skilled practitioners think like a designer, to couple one's technical abilities with a new empathic sensibility of what humans need. Features of design thinking, as viewed by Brown, can be characterized in four ways. The first feature is a focus on people; observing them, developing empathy, and developing new insights on human needs. The initial focus was for design to meet basic needs, but it has become increasingly important to design emotionally-satisfying experiences. A second feature of design thinking is a different view on problems. The constraints of problems are readily embraced by design thinkers who recast problems as projects. Constraints are not so much resolved as placed in an appropriate balance. The process to address these opportunities is nonlinear. A third feature includes the thinking processes employed in design thinking. Brown cites two paired sets of mental states that design thinkers work between. Divergent thinking creates options, while convergent thinking is making decisions about choices. Designers also move between analysis or studying the problem-opportunity with synthesis or extracting structure and pattern from the data. A fourth feature of design thinking is the range of tools to be used. These can include visual thinking, prototyping, storytelling, collaborating, and the physical and electronic spaces for collaboration.

Figure 1.  
Readings Summary

<b>Society</b>	<b>Work</b>	<b>Individual</b>
<b>Design and Society</b>		
We live in a designed world framed by cultures (Fry, 2003)	Designing a sustainable world	Understand the designed world of other cultures
Respond to human needs (Pink, 2006)	Big picture	Right-brain use
Revisioning human systems (Farson, 2008)	Metadesign and systems thinking	Leadership tool
<b>Design and Organizations</b>		
Customer experience (Brunner & Emery, 2006)	Top-down and bottom-up	Design awareness; customer focus
Innovation (Kelley & Littman, 2005)	Forward movement of organization	Learning, organizing, and building personas
Thinking through design (Lockwood, 2010)	Methodology for innovation and enablement	Thinking like a designer
<b>Design and Education</b>		
Design thinking is a cognitive, rational process (Rowe, 1987; Simon, 1996)	Problem solving in architecture	Creativity and systematic thinking
Design educational outcomes (Cross 2007)	Design curriculum or integration in other courses	How to teach and assess?
Reflective practice (Schön, 1987)	Practicum design	Reflective processes
<b>Design and Designers</b>		
Design thinking is a skill (Lawson, 2005)	Problem solving in architecture	Developing design thinking
Design thinking is a human-centered skill-set (Brown, 2009)	Problems as projects, human-focus, thinking processes, and tools	Leverages existing skills with a broader design mind-set

## Translating Design Thinking for Contemporary Uses

### **Learning Design Thinking**

Acquiring knowledge of and experience with design thinking are rarely learning objectives within traditional educational settings. However, based on the readings discussed in this paper, the importance of design thinking to the success of future generations is becoming irrefutable. Issues such as global climate change, failing healthcare systems, and worldwide economic instability, to name a few, are problems that require new thinking processes to successfully address. Situating design thinking opportunities into current curriculums must be considered and incorporated to fully prepare the next generation for the challenges they will face.

*Cultural influences.* Fry (2003) claimed that designers create our world and have a moral responsibility to ensure sustainability. Designers and other informed individuals need to learn to see the nature of things differently, carry on a global conversation, and develop a stronger reflective capability. To develop any educational interventions on the basis of cultural knowledge, Leong (2003) advocates embracing the culture's value system in four design criteria. In a course taught at Hong Kong Polytechnic University, Leong cites one criterion as life-centering with a focus on human and cultural concerns and the well-being of living organisms. A second criterion is totality where society takes precedence over the individual. Reflectivity, meanwhile, involves people in the design process and design requirements. Finally, the criterion of unification is used to assess how human needs and designed objects together enhance human needs and the world.

*Social obligations.* The social implications for design curriculum are not appropriately addressed by a separate course on ethics but an overarching integration of culturally-based awareness and value-orientation across the entire program. Raising student and layperson awareness of cultural issues would be aided by *Citizen Designer: Perspectives on Design Responsibility*, which addresses socially responsible design (Heller & Vienne, 2003). One section of readings addresses issues of social responsibility, such as the influence of one's ideals, conflicts or interest, working for free, and the hard lessons that design can never be consequence-free. A second section, professional responsibility, brings up the issues of brands and branding, trade organizations, and designing for real people. The third section on cultural responsibility features articles on plagiarism and working outside the mainstream. The fourth section contains readings from actual designers about situations that have disturbed them. Two articles of *Design Issues*, look at design and consumption with two contrasting views. Stairs (2005), in "Altruism and Design Methodology," looks at an alternative to design-for-profit practice. Meanwhile, Kostkinen (2005), in "Semiotic Neighborhoods" looks at the areas that exist in cities for the sole purpose of meeting the needs of upper class residents and tourists.

*Curriculum or what is taught?* Across design education are three long-term questions that influence the scope of what is taught and learned; namely, What is design? How does one think like a designer? How does one design? Newcomers to any design field must grapple with the inherent dilemma of defining design. How educators define a design discipline frames the curriculum and how it is taught. How novice designers define their design field frames how they view design, a design process, design thinking, and their role with clients and constituents. Design thinking, while attending to different details across specific disciplines, invites professionals to frame design education as a set of competencies. Such competencies also drive a

design curriculum and consequently what students attend to. The how-to question involves the application of competencies and resolution of the many design dilemmas between designer and client, and designer and process.

*Design studies.* The broader issues of design are now taking the form of programs in design studies. One of the field's earliest advocates is Victor Margolin. His book, *The Politics of the Artificial* (2002), is a good place to start. The major topic in the Design section is that of sustainability and how design problems might address the motivations of those who prefer expansion or sustainability. A major topic in the Design Studies section is developing more curriculums in design research, particularly in new graduate programs. Overall, design studies as a field, helps to unify the fragmented design fields, which also include design history, design management, ecodesign, and design thinking, as well as design research. Interested readers should also consult the journal *Design Issues*, which Margolin helped to establish.

*Educational context and teaching.* One educational context for teaching design thinking is in U. S. public schools. Cross (2006, 2007) has made a case that design be a part of general education, as all people have design abilities. One way in which design is becoming a part of school curriculum is through The Partnership for 21<sup>st</sup> Century Skills (2009), which twelve states have adopted. The framework, which makes explicit higher learning outcomes such as collaboration, teamwork, and global awareness, has identified creativity and innovation as a 21<sup>st</sup> century learning outcome. Design thinking is implied in being able to think creatively, work creatively with others, and implement innovations. Originally configured as a set of learning outcomes for secondary schools, the framework has been expanded across grade levels. A metaview framework for design thinking categories would be useful to guide state agencies and public school educators with specific student learning outcomes for integrating design thinking across the curriculum rather than treating design as a specific content area. Teaching strategies at the public school level would be project-based learning where students are tasked out in terms of challenging topics and guided through inquiry.

Another educational context is in post-secondary professional schools where design is a traditional topic and starting content point for professional preparation. An example is the Institute of Design at Stanford, or better known as the d-School which offers a graduate degree in design thinking. Students use design thinking to tackle the so-called "wicked problems" that characterize energy, human behavior, and business. Modelled on Stanford's d-School is Germany's Hasso-Plattner-Institute School of Design Thinking, which over the course of one year groups three to five students with two teachers into what are called constellations. The group constellations first learn the process, shift membership and tackle real problems of interest to partner companies. Interdisciplinary teams address differences between the needs and constraints of each disciplinary point of view. The curriculum is based on the ideas of David Kelly, the founder of the design firm IDEO. As further evidence of the growing commitment to design thinking, an ongoing series of Design Thinking Research Symposia (1991, 1994, 1996, 1999, 2003, 2007) has been sponsored by different universities around the world (Open University, 2009).

Today's students prefer any hands-on activity where they can immediately experience the profession. These students would resist the traditional learning sequence of top-down or whole-to-part where design thinking is explained first and activities to practice it follow. A better teaching approach would be to give students real-world cases where design thinking naturally takes place. Students would be concurrently guided to think about how design thinking occurred,



as well as how design thinking is developing within themselves. A new type of teaching strategy is risk-taking, which is preferred by many of today's students. Allowing students to take risks in relevant tasks might provide better learning. Risk-taking, thus, provides a sequencing strategy. We have suggested, for example, that students be given more of an advocacy approach to real problems rather than the traditional approaches of service learning and independent study (Beacham & Shambaugh, 2009).

In summary, design thinking is a subjective idea in many design curriculums and is not usually an explicit learning outcome. Design thinking typically occurs in learning settings as an incidental, rather than a planned learning outcome. Today's students prefer an experiential approach to learning design thinking through actual designing of relevant, real-world topics, where risk-taking is a feature. In short, students learn design thinking through design practice rather than being told this is what "design thinking" is.

### ***Practicing Design Thinking***

Incorporating design thinking into our educational structures from the earliest years will prepare students to become adept at holistic problem-solving and ensure that they are able to critically evaluate and address issues they face on a daily basis. Design thinking necessarily moves beyond the borders of educational settings, though, and is important as a tool to explore, understand, and shape our culture as it evolves.

**Democratization of design.** Historically design has been delegated to professionals trained in specific disciplinary fields. The general public often viewed design in its many facets as esoteric, magical, and unreachable by the "common citizen". Designers were viewed as artists, radicals, and/or individuals with unexplainable talents that were seen as gifts more than skills. With the advent of the Information Age, access to facts, data, expert opinions, and international views are available with a click of a mouse. As a result, the mystique of the designer has been all but removed, and many individuals are able to create workable designs for products, spaces, landscapes, and systems. The designs may be flawed and less than professional expectations, but the result of placing this ability into everyone's hands is that design itself has become democratized. Everyone has greater access to "designed" work which is no longer only the realm of the elite. And with greater access comes greater knowledge, which translates into more informed consumers and higher expectations. Designers must now be able to discuss and validate their designs, and consumers can now engage more fully in that discussion. Design thinking aids in that experience, and provides everyone the opportunity to use aspects of the design process to work through issues of all types.

**Products, services, environments.** As consumers become more savvy in using and understanding design thinking, they will be better able to evaluate products, services, and environments using design language. They will also be better equipped to discuss their needs in relation to design options. These discussions, and the clear identification of characteristics important to the consumer, will lead to more efficient and effective designs in all disciplinary areas. Products will more closely reflect the consumers' needs. Services will be designed to provide good experiences for clients and workers alike. Environments will support the functions, comfort, and aesthetic needs of all individuals within the space, with a focus beyond minimizing litigation possibilities and supporting maintenance and delivery concerns. As consumers become more active in the design process, their tolerance of mediocrity will diminish

and design expectations will be elevated. This increase in expectation will provide even more opportunities for designers to explore new avenues of design collaboratively with consumers.

**Wicked problems.** Society has become more complex, and the problems faced every day reflect that increased complexity. Highly complex problems where the solution to one facet of the problem raises concerns (or causes additional problems) in other areas are considered wicked problems. Traditional problem-solving approaches are often not effective with wicked problems since they typically consider one issue in isolation, and look for incremental improvement as opposed to massive or complete changes. The characteristics of design thinking discussed in the writing addressed in this paper provide another approach to dealing with wicked problems. While design thinking is not a perfect solution in every case, it does provide opportunities to evaluate components of wicked problems in ways that more traditional problem-solving methods do not consider.

In conclusion, design thinking is a tool that provides designers, cultural groups, and individuals the means to improve their personal quality of life, and the quality of life of the culture in which they live. As Cross<sup>42</sup> discussed, the fundamental question asked by the discipline of design is “how do we make it better?”. Our challenge as we continue to investigate and advance the idea of design thinking as an important construct is to provide all people with a reasonable opportunity to take responsibility for improving their future through the understanding and use of design thinking.

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