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LearnxDesign

The 3rd International Conference for Design Education Researchers

Design Thinking and the Internal: A Case Study

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Abstract: *'Design Thinking' commonly refers to a set of cognitive activities one engages in during a design process. These activities are regularly applied by design practitioners to external problems – often in the role of mediation between ourselves and our environments, objects, and information ('material culture'). A designer's efforts are intended to solve the problems of others, but this externalization is only one half of the equation. Rarely is such energy and focus turned inwards mastering the self first. Students from ART 111: Design Thinking (fall 2014 and winter 2015) at Portland State University investigated how specific tactics and tools of design (including divergent thinking, mapping, ethnography, 'wicked problems,' systems thinking, and process) augmented self-discovery and awareness through their own lived experiences. Tasked with addressing a minor personal dilemma, students learned to apply design thinking to meaningful outcomes. The goal was not to solve the issue at hand but to understand how to change one's relationship to it through a series of cognitive, design-based explorations. By applying design thinking to one's own lived experience, students become aware of how to approach problems first for themselves, while also broadening and deepening their understanding of complexity.*

Keywords: *design thinking; lived experience; design education; self-awareness*

Introduction

Design thinking is defined as the cognitive abilities or tools designers use as a part of their working practice, typically as a mechanism for solving ill-defined problems. I will begin with a simplified taxonomy of problems themselves, informed by Jonassen (2000), Buchanan (1992), Rittel and Weber (1973) – who have already established links between wicked problems and design thinking. Then I will outline the existing scholarship surrounding the concept of design thinking as we commonly refer to it today and how in my analysis, there is an implicit void that exists in its application – that of applying design thinking tools to our own internal dilemmas. This inquiry addresses such a gap, through the construction of projects for ART 111: Design Thinking at Portland State and I include a summary of the methodology and findings below. For me, design thinking, (wicked) problems, cognitive development, and everyday experience are intertwined, often dependent upon, overlapping, and influencing one another. The projects I create do the same.

Background

As far as problem-solving is concerned, design in general education must be justified in terms of helping to develop an ‘educated’ person, able to understand the nature of ill-defined problems, how to tackle them, and how they differ from other kinds of problems (Cross, 2006).

Design thinking is, in its essence, about solving problems. There are essentially four types of problems designers come across:

- 1) Problems that have a clear / defined / determined self; with solutions that have a clear / defined / determined self. An example being, *how much rice fits into this bowl?*
- 2) Problems that have a clear / defined / determined self; with solutions that have an unclear / ill-defined / undetermined self. *How to get to work* is an example offered by my winter term students, we know the problem, but there are a multitude of possible answers. The best-ness of any given answer is also contingent upon other factors, like the particular day, weather, traffic, etc.
- 3) Problems that have an unclear / ill-defined / undetermined self; with solutions that have a clear / defined / determined self. The example of computer viruses is also from my winter term students. We may not know what the original issue is, but the task of solving it is still relatively clear.
- 4) Problems that have an unclear / ill-defined / undetermined self; with solutions that have an unclear / ill-defined / undetermined self. We call these ‘wicked problems’ (David Jonassen [2000] terms them ‘dilemmas’).

Regarding design thinking – our cognition as it applies to design (a subject with an infinite number of possibilities) – it is in the wicked problems that we can exercise our minds and where our discussion should start. The first assignment I give students in ART 111 is to choose a wicked problem and attempt to map it in its entirety. This visualization is an exercise in wrestling with the ill-defined, getting it down on paper.

As a concept, wicked problems originated with Horst Rittel and Melvin Webber in a 1973 article on planning. Wicked problems are the large systemic issues that appear to be

impossible to solve due to the indeterminate nature of both the problem itself and the indeterminate nature of any possible solution. Additionally, social and cultural dilemmas do not have a fixed start and end point, they are as alive and wiggly as we are (the misconception that some problems have a specific beginning and end is a popular myth – rather insertion points are invented, bracketing off external influences for the sake of ease). Even defining such a concept as *wicked problems* immediately adds clarity – admitting we have complex and interdependent problems that are essentially impossible to solve. And the ten defining traits outlined by Rittel and Webber help us to recognize what falls into a wicked category or a non-wicked one (1973).

It is crucial that designers recognize the contexts and contingencies that are endemic to a wicked problem when attempting to address it. For example, we cannot solve the layout of the ballot without also considering low voter turnout, the increasing disconnect of the electoral college, the process by which proposals get on a ballot, literacy, voting inequities, redistricting, and a myriad of other concerns. Complexity matters. Within the classroom, students often experience discomfort and hesitation in attempting to map a wicked problem, due to ‘satisficing,’ the notion that we are satisfied with our first pass, and early identifications of what the problem is (Simon, 1996 and Adams, 2001). In doing so, we often fail to see alternatives.

Through the mapping exercise, a student’s competing values and motives directly influence his or her perception of the particular problem, including a refusal of bias. For example Student A, inspired by events in Ferguson, Missouri, selected racism as the wicked problem he chose to map. Throughout the process a debate evolved, as different students identified with opposing viewpoints – some with the police, some with rioters, some with the family and friends of Michael Brown. What resulted for this student, and for the larger class, were discussions on inclusion and exclusion from problem definition – what do we keep in, what do we keep out? Why? Who makes such decisions? Where is the designer located within the larger context of the problem? And what are the cognitive biases that frame his or her vantage point?

When we ask such questions, complexity, bias and reflexivity become key conversation points. Simply mapping a wicked problem challenges all sorts of cognitive abilities, from categorization to divergent thinking to the extent to which bias influences perception. This is the first exercise I ask of my students as it illuminates how they relate to the larger world.

Of the forty students who have completed such an assignment, the overwhelming majority face difficulty in reflecting the complexity of the topic due to cognitive blocks. Futility initially arises regarding the perceived success of the project. I frequently hear ‘everything relates in some way.’ This leads to fatalism, believing that wicked problems are unsolvable, entrenched, inevitable, and should therefore be avoided. When pushed to try anyway, many students find difficulties categorizing nebulous topics; hierarchies are not obvious, often need to be reworked, and several iterations must be created. Notably, every student has found difficulty in balancing the specific and the general. When Student A relates the incidents in Ferguson to racism in general, he is also tasked with clarifying those links and determining if they are factual, perceived, or biased.

Our Current Understanding of Design Thinking

Design thinking is a process anyone can use to come up with more engaging and innovative solutions to problems. This concept has flourished through the joint efforts of IDEO (a San Francisco design consultancy) and Stanford's Hasso Plattner Institute of Design (d.school), with a process that emphasizes: (1) empathy in understanding who we do our work for and why (often involving them at multiple points), as well as (2) the need for rapid conceptualizing – ultimately resulting in an ongoing process of collaborative refinement. IDEO and Stanford have by no means limited design thinking to the activities of designers. Non-designers are empowered through a specific design process to affect change from within. Businesses and business schools have been relatively quick to adopt such measures, as the commercial base of much American design induces a seamless fit. The education sector has also openly adopted the tools of design thinking. *The Design Thinking for Educators Toolkit* crafted by IDEO includes materials aimed at enhancing the classroom experience, allowing teachers, who are by and large not trained as designers, to augment meaningful change themselves (2013). The methodology outlined in the educators' toolkit is similar to other design thinking methodologies: **discovery > interpretation > ideation > experimentation > evolution**. The d.school's similar, also widely disseminated *Virtual Crash Course in Design Thinking* describes a process of: **empathize > define > ideate > prototype > test** (d.School, 2015). Through analyzing several of these influential processes, core attributes arise: empathy, problem identification, letting go of control, and the use of a research-driven (frequently ethnographic or human-centered) process. These tools offer a common base from which design thinking can be defined and applied by designers and non-designers alike.

Although these may be fruitful applications of design thinking, they neglect crucial core responsibilities of the *intrinsic value of design education*:

There is therefore a strong educational justification for design as an introduction to, and assisting in the development of cognitive skills and abilities in real-world problem solving (Fox, 1981)... As far as problem-solving is concerned, design in general education must be justified in terms of helping to develop an 'educated' person, able to understand the nature of ill-defined problems, how to tackle them, and how they differ from other kinds of problems. This kind of justification has been developed by McPeck (1981) in terms of the educational value of 'critical thinking.' A related justification is given by Harrison (1978)...in terms of the radical connections between 'making and thinking' (Cross, 2006).

Real-world problem-solving is the key to a design discipline, not just in terms of practitioner application, but rather for the sake of one's own development. What Cross suggests is the demand on educators to develop spaces where the *intrinsic values of design* is at the forefront (2006).

The Intrinsic Value of Design

Taking on the challenge issued by Cross, I would suggest the following additional attributes: time devoted to developing empathy, contextual awareness, and the value of a language that further enhances cognition.

ACTIVE LISTENING

Active listening occurs when we set our own selves, influences, arguments, and biases aside, in order to truly understand another's experience. It is an act of selflessness. Actively listening to another means being open to them, not assuming that as a designer one knows better or more than they do about their own lives and environments. Active listening means refraining from formulating additional questions, arguments or thoughts while listening to another. This is the foundation of empathy.

CONTEXT

Problems in everyday and professional contexts are embedded [with]in those contexts, which requires the problem solver to disambiguate important from irrelevant information in the context and construct a problem space that includes relevant information from the context (Jonassen, 2000).

Regarding a specific context, there are essentially four basic influences. First, the factual information of time, place and scale in which the problem occurs. What may be a problem now may not have been a problem in the past, and also may not be a problem in the future. Second, the person(s) involved – *all of them*. What is a personal dilemma for one of us may not be for another. Such situations and responses are highly based on perception and subjectivity. Satisficing and bias are responsible for regularly ignoring individuals or groups directly affected by the problem. Third, the tools. With contingent problems the tools necessary to solve are not immediately apparent and are identified through discovery: which tools make the most sense for the problem at hand. The tools we choose can be physical objects, mindsets, or even small things that make the messiness of the problem more approachable.

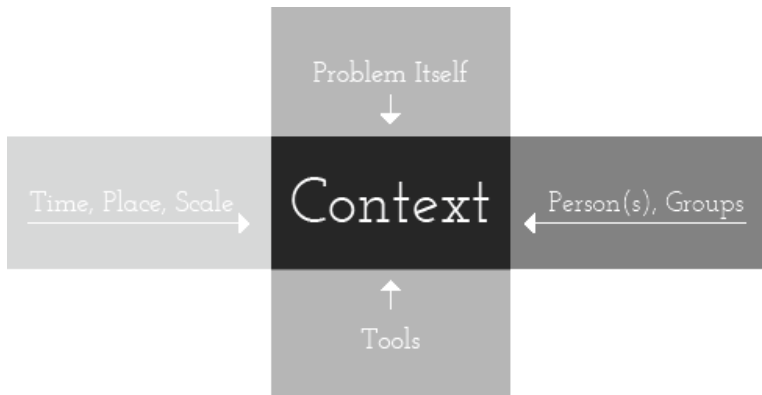


Figure 1: Influences of Context

Part of the wickedness of indeterminate problems is their complete and total embeddedness in context. They change. And once a solution has been offered back into the social fabric the dynamic is altered and the process must be started again. This is commonly why design practitioners either include a second research phase (also known as

an evaluative phase after the end-product has been produced) or employ a cyclical process (Dubberly, 2005: see Alice Agogino, et al).

Real-world dilemmas change with us, and are anything but fixed. Formulaic processes ignore the contingent. Any one of us at any given point may find that the tools we choose are more or less helpful than they were in the past. Suddenly confronted with the possibility that the tool no longer suits the purpose (a hammer when a screwdriver is necessary), we are again confounded as to how to approach the problem. Suddenly, it matters where one is coming from – the key step of disambiguation (Jonassen, 2000). Flexibility, adaptability, and awareness of change matter. As attributes of a designer's working process, they also mirror how problems exist in reality. Nothing in our everyday lives is fixed.

DIVERGENT THINKING

Divergent thinking is our ability to see many different possibilities in any given scenario. If design thinking is defined as a set of cognitive abilities, our cognitive abilities then frame any and all responses. Divergent thinking is mental exercise. In *Conceptual Blockbusting*, James Adams highlights a tried-and-true example of conceptual blocks: the invisible self-inflicted boundary / parameter. Once a suggested boundary has been perceived, it becomes difficult to refute.

Divergent thinking includes the impossible, improbable, creative, the ridiculous, anything and everything. This approach is significantly more appropriate to the boundary-less world of art and design than the pragmatics of the sciences. To return to the voting example mentioned above, in trying to solve ballot inconsistencies, divergent thinking asks: what if we eliminated the electoral college? What if the whole country voted by mail? Or by a switch? Or by hand-raising? What about literacy? How do various ballot formats and language exclude voters? How do voter registration forms exclude voters? What if we dismantle the two-party system? Any and all ways to look at the problem become relevant, if even for just a short while.

Where divergent thinking intersects methodology, some critical questions arise:

- Should we have a process? What shape should it take? Why?
- If and how should a base methodology be altered, modified, or abandoned altogether?
- How does the methodology influence the outcomes?
- Are we enforcing a protocol that is in opposition to what we are trying to achieve?
- Are we being messy enough?

Design with a capital 'D' requires us to conform not to existing scientific or humanistic methodologies, but to those native to the design discourse, because design processes are unique unto themselves and specific to *designerly ways of knowing* (Cross, 2006; Baynes, Langdon, and Myers 1977). These questions potentially disrupt a standardized process such as those outlined by CABE, the d.School and IDEO.

Hypothesis

The tools highlighted above are fundamental to design thinking and can apply to any number of problems. 'There is no area of contemporary life where design – the plan, project, or working hypothesis which constitutes the 'intention' in intentional operations – is not a significant factor in shaping human experience' (Buchanan, 1992). Buchanan goes on to identify 'the four broad areas in which design is explored throughout the world by professional designers and by many others who may not regard themselves as designers,' namely:

- Symbolic and visual communications
- Material objects
- Activities and organized services
- Complex systems or environments for living, working, playing, and learning

'Properly understood and used, they are also places of invention shared by all designers, places where one discovers the dimensions of design thinking by a reconsideration of problems and solutions' (Buchanan, 1992). His categorization is clear, comprehensive, and as far as I have seen, best articulates the areas of inquiry in which design occurs.

As Buchanan implicitly shows, whether used in a commercial, non-profit, social justice, or classroom capacity, whether used by designers or non-designers, all examples have one shared characteristic: they are valid mechanisms by which we approach and respond to *external problems*. Tim Brown's challenge for designers to 'think big' also illuminates only external applications: 'global warming, education, health care, security, clean water' (Brown, 2009). What is categorically, implicitly agreed upon by the entire field, is that design (thinking) is an external activity between us and our environments, artifacts, and concepts, also known as our material culture. Even when re-framed as *placements* rather than *categories* (Buchanan, 1992), in all capacities these are external mediations, all existing outside of the self. They involve problems to which we as professional designers may or may not have had any direct exposure.

In this explanation our relationships and material culture mediations are between the self and something *else*. None of these include the intrinsic value argued by Cross. Buchanan illuminates the four placements of externally applied design thinking, whereas Cross argues for the theoretical base that underpins them all. What we are lacking is an internal application. And in developing one, we immediately **separate out the tools and processes of design thinking for the development of the 'educated man' (Cross, 2006) from those that are used in the development of material culture.**

Defining the Internal

An internal application in this sense can have two meanings. First, the internal application of design thinking tactics within a group, organization or community, and second, the internal application of design thinking to one's own self and life.

INTERNALLY WITHIN A GROUP

Group-native applications of design already exist in regular practice, effecting change through design thinking within an organization itself, either as acts of design by non-

designers, or as participatory design. Using the *Design Thinking for Educators' Toolkit* again as an example, the tools of design thinking are given to empower educators to affect change on their own (2013). 'Design's too important to be left to designers' (Brown, 2009). This is but one way to effect change internally within a group or organization and works best for those who do not have access to professional designers, because ultimately design is not something that can be learned in an abbreviated manner.

An alternative is to integrate design with education – when participants have expertise in both. One of the more notable examples of the integration of 'design with' can be seen in the work of Project H. Founders Emily Pilloton and Matthew Miller immersed themselves in Bertie County, North Carolina, living and working with all vested groups on the integration of design *with* education, from learning outcomes to physical spaces. 'Design with, not for' on a seemingly wicked problem (Pilloton, 2010).

INTERNALLY WITHIN THE SELF

The second way in which we can apply design to an internal investigation, is to actually use design thinking to solve one of our own problems. Much research is aimed at gaining a better understanding of the life of another. We have focus groups, questionnaires, personas – all sorts of techniques to better understand other people. What if instead of trying to design from the outside, we first learned to design from the inside? Personal problems, due to their subjective, perceptual nature, seem entirely evasive and vague, but several contextual components are fixed. The people involved in the problem, as well as the time, location and scale are all known. Learning can thus focus on the tools necessary to arrive at an authentic problem statement.

At Portland State, we use a research-driven process similar to those referenced above, but modified for the requirements of the personal dilemma. *And we conduct this process before any efforts to turn our gaze externally.* Students need not spend time inventing problems, since their own personal dilemmas are generally obvious. Throughout the research phase, problem identification typically shifts, becoming clearer and more specific as information is gathered. For example, during the 2015 winter term, seven students initially identified 'procrastination' as their problem of choice. Through tracking exercises, the problem statement adjusted to become more specific, reframing the dilemma as one of time management, motivation, balancing responsibilities with quality of life experiences, or quite realistically about hating math and thus avoiding it.

Attending to a dilemma without attempts to change it is an uncomfortable exercise. To temporarily freeze the problem-solving process in order to understand it in greater depth goes against our satisficing tendencies. Still, the spirit of the project is less about solving the particular problem than it is to highlight our approach to problems themselves using content that is familiar and has already been identified as failing in some way. The tracking methods are visual and emphasize documentation. No student has yet had experience in documenting his or her own motives and actions in such detail. Again mapping the problem comprehensively sparks divergent thinking and awareness. Efforts are made to quantify wherever possible, while triangulating with secondary research and the qualitative. A significant emphasis is placed on how research and tracking inform problem identification, because **accurate problem identification has a radical consequence: the solution exists within it.**

If the problem statement is:

I let negative conditions exist for too long before acting to change my circumstances

The solution statement becomes:

I will recognize when my circumstances need to be altered

If the problem statement is:

I try to fix other people's problems when my fixing is unwanted

The solution becomes:

I would like to be more cognizant of when someone is or is not asking for my help

If the problem statement is:

I have an issue with anger at others

The solution statement is:

I'll find out what causes me to be angry with others, and asking myself if my responses are or are not appropriate to the situation

When accurately defined, the problem statement illuminates the solution. We then spend some time testing our solutions, framing them as hypotheses until they are verified or, if not, consequently reworked.

As with the wicked problems map, this project requires a high level of honesty and self-reflection. Students who have no interest in truly solving the problem will ultimately be confronted with the decision to force an inappropriate solution or accept such realities within themselves. Three types of solutions emerge: changing one's own behavior, changing the circumstances, or simply acknowledging an awareness of the problem and allowing it to continue. Students must come to terms with the respective directions they choose to go. The process deserves reiterating. Once problems are fully articulated, a crucial question arises: *Who (or what) is it that needs to change?* Is it the individual behavior, or the environment / circumstance / situation, or is it a matter of accepting difficulty and letting go? This question is rarely asked; instead, our models default to an assumptive behavior modification via forced external influences. Abundant examples can be found in Donald Norman's *Design of Everyday Things* (2002).

If the solution is to change the self / one's own behavior, the courses of action are specific to the self and are framed by personal development, an intrinsic value. Several benefits arise. Learning how to approach a personal dilemma begins with self-awareness, addressing a language that is only partially developed in most of us. This requires accepting our own vulnerabilities, something Brené Brown argues is the origin of creativity and ingenuity (2013). Through exposing our own vulnerabilities, the difficulties others face in exposing theirs also become clearer, empathy and ethics are enhanced. Recognizing the complexities and nuances of our own lives and dilemmas, we are more likely to be sensitive to those of others. Moreover, all sorts of problems can be of a personal nature or affect us on a personal level – we are after all, citizens / users / participants / the audience too. In applying design thinking to our own problems, we are forced to reckon with difficulty, ethics, and our own cognition. Working on our own problems first is non-colonial, solutions are more likely to be ethically sound as we always have the option to abandon or redress them, a task much more difficult when something has been done for us or put upon us.

Additionally, we make the world in our own image. How many of us in our various social roles are quick to condemn the actions of others without first assessing our own? For example, when asking others to change, grow, limit, or conserve, are we doing this ourselves? Colin Beavan's *No Impact Project* is a good example here (n.d.) and is highlighted in the documentary *Surviving Progress* (Roy and Cooks, 2011). Beavan examines his own role in consumption and sustainability as a resident of New York, a challenge he issued himself after recognizing how easy it is to point fingers.

Finally, change within the self can be augmented by a more comprehensive understanding of one's own mind and cognition regarding personal dilemmas. Given the current scientific understanding of the responsiveness and adaptability of the physical brain, implications for how design thinking can help direct cognitive changes are not so far removed from a kind of self-directed neuroplasticity.

If the solution suggests a change to the environment, circumstance or situation, then our external gaze and traditional design thinking tactics readily apply.

If the solution suggests an awareness of complexity, difficulty or acceptance of what is, a wholly different set of tools becomes necessary. In a complete inversion of traditional design applications, this particular direction involves letting go – another neglected area of design discourse. There are many instances when leaving something alone is the better alternative.

Methodology

At Portland State, I was given the opportunity to create the coursework for ART 111: Design Thinking, where I created a framework built upon the concepts discussed above. The course is structured as three cumulative projects: map a wicked problem, solve a personal problem, and then engage in a traditional research-driven design process. Before attempting problem solution, problem awareness must occur. The second project, the personal dilemma is the focus of this paper, and the methodology for which is expanded upon below.

The process we take for the personal dilemma project is: **research (tracking) > problem ID > hypothesis testing > conceptualization > execution**. Students are given five weeks to 'think of a problem in your life that could potentially be solvable with design thinking.' The emphasis is not on solving the problem at hand but on how to solve problems in general. As a first step, students loosely identify a problem they have been wrestling with and feel safe and comfortable sharing with the class. The first two weeks of the project are dedicated to a variety of research tactics that become increasingly more targeted as the problem becomes more clearly defined. Research and problem identification feed into one another.

Research starts with tracking existing patterns (not changing or altering them in any way), supplemented by interviews and secondary sources. All are tailored to the particular student / problem, reinforcing the contextual nature of such things. Students working on solvable problems such as transportation options or time management will potentially have more concrete, quantifiable tracking methods (how long, what cost, how many), whereas others who are working with quality-of-life issues will be inclined to chart or track their data in a more subjective manner. Additionally, the students themselves will respond

to particular tactics that appeal to them. I support this: no solution or awareness has any meaningful impact if the person involved has no interest in it.

During the research phase, students inevitably come across information they perceive to be neutral or unhelpful. We discuss how this information is in fact *also* good information if we can identify why to leave it behind. For example, I use the concept of an ‘anti-guru’ – someone with equally bad habits (or perhaps worse) regarding the problem at hand. If a student struggles with poor work-life balance, and that student’s mother does the same, but to an extreme, information on how this came about and why can tell us just as much.

The research and problem-identification phases culminate in a highly specific problem statement, one that has been refined and modified through the research process. Here are a few examples:

Student B, Transportation by Bus

I...took a full look at the costs and benefits of taking the bus, in a real objective way on its own merits. My findings surprised me. In terms of time I found the average high traffic commutes for Portland residents going from downtown to my side of town is approximately 50 minutes, which is only slightly shorter than the average times I found my trips would take per my tracking...In sitting back and taking these observations in as a whole I was able to come to the conclusion that my problem, was only a problem because I had set it up to be.

Student C, Unwanted Solving of Other People’s Problems

Utilizing this hypothesis...has helped me discover key attributes for all of my past and current relationships. My most important finding...was the amount of conversation that I have been missing out on over the last 21 years. During the last 2 weeks my conversations have been getting longer with classroom acquaintances all the way to deeper and longer conversations with my wife. By simply listening to them without any source of response, it opened them up to exploring their own thoughts aloud, and by doing so, end up solving their own problems. And just like my father said, this was excruciatingly tough to refrain from interacting or even active listening, but the results could not have been more clear.

The problem statements are defined enough that solution statements exist within them. In Student B’s case, his solution was to change his mindset. In Student C’s case, it was identifying the difference between solicited vs. unsolicited problem-solving strategies. In class, we do not talk about solution statements; rather I frame them in terms of hypotheses, something to test out and apply. Does it work, or not, if not, why not? If it does work, keep going with it. We test hypotheses and measure their success in a few ways: does the hypothesis address or resolve the problem? Does it help affect how we look at the problem as a means of changing our perception? An hypothesis should answer the question of who or what needs to change –one’s own behavior, or the external circumstances, or coming to terms with acceptance.

I ask students, does it work, is it sustainable, and are you going to really do it? I place no emphasis on whether the problems are solved or not; I do not want disingenuous results. I would rather students be honest about their circumstances. Do they now understand how to address their own problems in general; do they grasp the contextual nature of

dilemmas, which are not fixed; and, what should they expect based on the amount of effort and attention the problem is given?

Student D worked on changing his sleeping posture. He recognized his current posture had been years in the making and would not resolve in five weeks' time.

A solution to my problem will inevitably involve a major behavioral change...at the very least, my research, tracking, and my sound project have taught me a lot about the methodology of solving a problem. I do not know whether or not I will solve this specific sleep posture problem, but I will continue the methodology I've been using to attempt to solve this problem and other future problems I may encounter.

Student D hits on the point of the project exactly: using design thinking to learn about problem-solving itself. Success is not dependent on solving; rather success is defined as understanding a process that avoids satisficing, understands complexity, and perceives problems and solutions in a realistic manner.

For design thinking, problem definition and hypothesis testing may be enough. I ask myself each time if it is really necessary to add a making component to the project. Each time, I answer yes, because converting information into ideation is absolutely what designers do and what distinguishes design-thinking processes from similar ones within the social sciences. I expect students to wrestle with this difficult conversion to complete the design process. Once presented with the complete methodology, students then apply it to external problems via project three – but this time, with prior exposure to complexity, contingency, self-reflexivity, and the key mandate to examine who or what should be solved, if anything, and why.

Outcomes

I ask my students what they know about themselves that they didn't know or is different from what they knew before the start of the project. Their answers reveal a heightened awareness of self.

- I make assumptions that are derived from cognitive distortions.
- I am not as negative and aggressive as I thought I was.
- I know that time management doesn't necessarily stop me from procrastinating.
- It's positive gaining knowledge so I can do something about it.
- I no longer believe any of the assumptions I made earlier.
- I know more about how and why I procrastinate. While the action of procrastinating is a negative in my life, having more knowledge about the problem and myself is a positive.
- I use sleep as a coping mechanism...my mom reacts to it negatively and in turn, she puts forth negative connotations about it to me.
- I know how much my friends affect my personality.

Because the content of the project is personal, students are inclined to be interested. Yet even students making a minimal effort may learn something about themselves. None of my students had of yet any such educational exposure to formalized self-awareness.

An additional learning outcome consisted of seeing problems in a more empathic, internalized light. Asking students to share with one another a personal dilemma showed them how difficult it is for strangers to share their problems with designers.

The surprising outcomes are equally interesting. Some students privately shared with me their use of this approach on other, more personal problems than those shared with the class. I had hoped for this, but wasn't sure if it would happen. So far, yes, students do see lateral applications. Many students also saw solving their own problems as simultaneously addressing problems other people have as well. This ideal outcome is participatory, non-colonial and supports a more ethically minded design practice. Rather than gazing out at the world looking for problems to solve, which may or may not be fabricated in the mind of the designer, my students are spending efforts on situations that already *are* real problems.

Conclusion

The question is not whether design thinking can find applications for our own internal selves and in our own lives. Clearly, we can. Rather, what can we learn from doing so? How does our understanding of the discourse change when we step back and see a broader problem landscape? A disjunction exists between the work designers make as mediators and their own lives as citizens and individuals. There is potential for integration.

In my course on design thinking, we map the complexities of a wicked problem, apply research-based design methodologies to personal dilemmas, and *then* look to the external. External applications of design thinking are germane to the discipline and should continue to be included; I argue that in using the tools of design thinking, we no longer neglect the equally valid internal applications. At a minimum, testing out possible courses of action in terms of one's own problems opens up the possibility that agency exists. I believe that design education should be intrinsic and centered around the development of the individual. In my classroom, this includes our own selves and lives.

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APPENDIX 1: TERMINOLOGY

Design Thinking: broadly defined as the cognitive activities designers use as part of a working practice.

Divergent Thinking: seeing many possible options.

Empathy: in a design context is the ability to identify with and understand who it is we do our work for and why (often involving them at multiple points). A designer's audience may or may not be able to articulate fully what the problems are, however, they are

critical components to the discussion (this collaboration is also known as ‘participatory design’).

Participatory Design: is a key concept within the discipline. Design runs a frequent danger of being a colonialist (or perhaps more accurately, neo-colonialist) activity without direct involvement of the participants whom the work affects.

Research-Driven Design: A design process that originates from conducting (typically qualitative) research. Not to be confused with Design Research.

Wicked Problems: large, complex, systemic problems that involve a significant number of interdependent other problems.

Metaproblems: David Jonassen’s term for the complex web of interrelated ill-structured and well-structured problems (2000).

Rapid Prototyping: the process by which a designer makes quick and frequent mock-ups throughout the design process attempting to come closer and closer to the desired goals.