THE STRENGTHS AND LIMITATIONS OF USING SITUATIONAL ANALYSIS GROUNDED THEORY AS RESEARCH METHODOLOGY

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This study used situational grounded theory to explore the potential impact of systemic design on 21st century education. Situational analysis grounded theory (Clarke, 2005) was selected over three other established grounded theory methods because it provided a suitable foundation to chart the complexities of systemic design and contemporary educative issues. Because early grounded theory methodologies served as underpinnings to situational analysis grounded theory, Glaserian, Straussian, and constructivist approaches were briefly examined, particularly for their perspective on "groundedness" (Raffanti, 2006). Then, using a snapshot version of 15 in-depth interviews with design philosophers, teachers, and practitioners, the author navigated through cartographic guidelines applicable to situational analysis. Three main cartographic approaches analyzed the study: situational maps, social worlds/arenas maps, and positional maps. A final map summarized the interview findings. The paper concluded with a discussion of the strengths and the limitations of the study as well as using situational analysis as a research methodology.

Systems designers believe that the world is ripe for paradigmatic frameworks that embrace both experience and complexity (Ben-Eli, 2010; Buchanan, 1995; Nelson & Stolterman, 2012). However, these paradigmatic frameworks must be supported with proper conceptual foundations and research methodologies. Traditional quantitative research inquiries that focus on stability, linearity, predictability and control are not able to contain the rich data gleaned from a postmodern approach that views nonlinear change, complexity, and unpredictability as attributes of reality (Nelson, 1994). Yet, even established qualitative research methods often fail to capture the relational dynamics of a given situation. Clarke's situational grounded theory (2005) offers a "radically different conceptual infrastructure" for investigating complex situations of inquiry (p. xxii). Not only does the methodology integrate wide arrays of research projects within a situation, but it also supports research across trans-disciplinary boundaries.

In this paper, I explore situational analysis grounded theory as a research methodology by integrating situational analysis theory alongside a situational analysis study. Interest for my study grew from two very different situations. The first situation stemmed from my academic background in Whole Systems Design and the recognition that design thinking had emerged into the mainstream (Brown, 2008; Dunne & Martin, 2006; Rauth, Carlgren, & Elmquist, 2014). The second situation evolved

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from my fieldwork as a computer-based alternative educator and coordinator for rural students. From that experience, I learned that the alternative education learning labs had become a poor person's education, and the students enrolled in my program were a stark reminder of societal divisions. Further, on-line alternative education programs were missing huge components in meeting these students at both a learning level and a human level. Over the years, I noticed consistent patterns: flat thinking processes, a disorganization of the mind that manifested into physical disorganization, poor communicating skills, and a lack of self-knowledge or an inability to speak up for oneself. Could implementing design projects into the curriculum help student development academically and socially?

Although fragments of design thinking, design inquiry, and design practice were found within general education (Carroll et al., 2010; Chiasson, 2005; Koh, Chai, Wong, & Hong, 2015; Luka, 2014; Taking Design Thinking to Schools, n.d.), design educative practices remained mostly within traditional design fields such as architecture, art, information technology, graphic design, and industrial design (Lau, Ng, & Lee, 2009; Hokanson & Gibbons, 2013; Vanada, 2014). Design culture and design thinking, as its own discipline, had yet to make an impact on contemporary education, both in K-12 and higher education (Banathy, 2001; Horn, 2001; Jenlink, 2001b; Schon, 1987). Thus, the two situations-the emerging design culture and the continued educational crises that I found within my practice—presented a unique opportunity for a research inquiry.

The significance of my study revolved around design's transformative forum on several levels. First, the popularity of design thinking was growing beyond the boundaries of traditional design arenas into the mainstream, offering the logic and the creative process for handling complex innovative ideas, solving difficult problems, and moving beyond the onesize-fits-all predominant educational paradigm. Second, design thinking strategies opened range and depth to traditional learning processes. Chiasson (2005) reported that design strategies could provide three fundamental learning capabilities: qualification, analysis, and interpretation (p. 207). Third, design inquiry and action included abstract knowledge and embodied knowing, thereby unifying the mind and body (Nelson & Stolterman, 2012). Fourth, design thinking strategies cultivated autonomy by allowing participants to create meaning from their own histories and backgrounds. Fifth, because design projects revolve around conversation, participants had opportunities to better communicate ideas as well as converse with each other (Jenlink, 2001a).

If design thinking, inquiry and practice could impact traditional pedagogy, methodology and curriculum to better fit the complex needs of the 21st century, what specific tools, modes of logic, and design thinking strategies might design instructors share to enhance current educative strategies? The questions that emerged from my two experiences eventually formed my overarching research question: What potential impact could design culture, inquiry, and practice have on traditional education?

Method

Of the different types of qualitative research, grounded theory was chosen for my research methodology. There are four different grounded theory approaches: Glaserian, Straussian, constructivist, and situational analysis. Because situational analysis grounded theory pushed the grounded theory framework "around the postmodern turn" and because it was highly relevant to design inquiry, situational analysis was selected over the three other established grounded theory methods (Clarke, 2005, p. xxi). However, in order to grasp the foundation of situational analysis, it was necessary to understand the background information, conceptual infrastructures, and differences between the four grounded theory methods as well as the concept of groundedness for each method (Raffanti, 2006).

Glaserian and Straussian Grounded Theories

Glaser and Strauss developed classic grounded theory (Allen, 2010; Glaser & Strauss, 2011) in the late 1960s as a reaction to positivist methods and doctrinaire approaches in the social sciences research arena. Glaser and Strauss (Suddaby, 2006) rejected the idea of scientific truth reflecting an independent reality. Instead, they offered an empirical reality that emerged from the observations and the consensus of a community of participants. Their methodology (Corbin & Strauss, 2008) was influenced by two epistemologies or ways of knowing: (a) the tradition of Chicago Symbolic Interactionism which emphasized interpreting actions based on one's own meaning; and (b) the pragmatism of John Dewey and George Mead. Both Dewey and Mead believed that knowledge did not exist independent of the knower: "Knowledge is created through action and interaction" (p. 2). Glaser and Strauss also maintained that the experiences of engaged inquirers were vital to the research thought processes.

As an overall philosophy, systemic design shared epistemic commonalities with classic grounded theory. Like classic grounded theory, systemic design generated information from the ground up rather than following prescribed steps and static descriptions. Systemic design's philosophy also matched classical grounded theory's adherence to symbolic interactionism: A designer's preconceptions and practices always influenced how they worked (Stolterman, 1991). Finally, much like the grounded theorists, many design philosophers (Buchanan, 1995; Schon, 1992; Waks, 2001) expressed interest in the works of pragmatist John Dewey. Both grounded theorists and systems designers were attracted to Dewey's "epistemology of practice" where reflective thought and pragmatic action intertwined and built upon each other (Schon, 1995, p. 29).

Yet another commonality between grounded theorists and systemic designers appeared in the way that classical grounded theorists analyzed their data. Classical grounded theorists emphasized generating data systematically in order to build theories with varying levels of scope and complexity (Glaser, 1998). From this data, theorists open coded the data and discovered possible emerging concepts and categories. Through constant comparison of the various codes, concepts, and categories, patterns emerged that pointed to a central category, known as the core variable (Glaser, 1998). This comparative method of building a theory was similar to a designer's mode of reasoning, abductive logic (Martin, 2009). An abductive stance differs from an inductive (specific to general) or deductive (general to the specific) stance in that it compares the relations between

parts (Bateson, 1979). While abduction provides a tool for designers to add dimension and depth to their evolving composition, a similar comparative process in grounded theory allows a researcher to develop concepts and categories.

However, there was also a major difference between classic grounded theorists and systemic designers in how they accomplished their tasks. When a grounded theorist generated "a basic social process" (Clarke, 2003, p. 558), the researcher took on the role of a "restrained analyst" and lay preconceptions and prior knowledge aside (Raffanti, 2006, p. 73). They were even encouraged to avoid a literature review. Except for categorizing and theorizing their data, their role as researchers were to disengage from the research process so they could remain open to information and data that emerged from the participants. Thus, grounding depended on the openness to discovery and the generation of a theory about the participants' concerns.

This disengaged stance of traditional grounded theory inquiry differed from a systemic design inquiry in that designers attempted to create a design culture (Nelson & Stolterman, 2012). Rather than divorce themselves from the emergent proceedings, all participants, designers as well as clients, were invited to create a broader perspective. Yet, while grounded theorists remained detached from their inquiry and systemic design sought participation through the process, their desires were similar: "A systematic method by which to study the richness and diversity of human experience" (Hutchinson, 1988, p. 126).

Grounded Theory's Evolution

Eventually, Strauss broke away from Glaser and collaborated with Corbin. Strauss and Corbin established their version of grounded theory with less emphasis on emergence and more emphasis on directive techniques. Although they did not initially emphasize context or situatedness, Corbin and Strauss sought to develop as many potentially relevant categories as possible through their conditional matrices. The Straussian analyst (Raffanti, 2006) often structured the data using the following techniques: (a) asking the questions—Who? What? When? Where? Why? and How?; and (b) incorporating the "Six C" family of theoretical codes—causes, conditions, contexts, contingencies, co-variances and consequences. Axial coding was also used as a grounding mechanism. In this technique, a category was identified but the conditions, the interactional strategies of the participants, and the consequences managed the process. In other words, the analysts' idea of "groundedness" was to "actively provoke the data" (Raffanti, 2006, p. 68). Acknowledging one's "assumptions, biases, and experiences" was also considered an integral part of the research formation (p. 67).

Corbin & Strauss's version of grounded theory exhibited another similarity to systemic design. Designers often used markers to move through a design process such as Brown's (2009) inspiration phase, ideation phase, or ideation phase or Nelson & Stolterman's (2012) palette of skills used to sustain a design inquiry and composing process. However, some designers rejected methodology altogether within a design process, considering any rational foundation too scientific and too technical (Waks, 2001). A distinction grew between Dewey's scientific "epistemology of practice" and design philosopher Schon's "knowing in action and reflection in action" (Schon, 1987, pp. 25-28).

Although Schon agreed with Dewey's theory of reflective practice, he also believed that Dewey's thinking was still entrenched in separation, thereby creating an ontological division between theory and practice. While Dewey favored a 'time-out' period of reflection for practitioners when methods of science and connection to practice did not apply, Schon viewed designing as a unifying process in which reflection and practice worked together with messy, confusing, real-life problems. Schon rejected a 'time-out' reflection and believed that design practitioners held "esoteric knowledge codes woven into their practices" (Waks, 2001, p. 40). The difference between the two pragmatic philosophers could be described as a dilemma between "rigor vs. relevance" (p. 39).

Constructivist Grounding

The same dilemma between scientific rigor and practical relevance found in the field of systemic design also emerged in the field of grounded theory. Charmaz (2006), a student of Glaser and Strauss, brought constructivist underpinnings to the grounded theory arena. Unlike traditional grounded theorists, Charmaz assumed that data and theories were not discovered. Rather, they were constructed by both the researcher and the research participant. Much like Schon's reluctance to divide theory and practice in the world of design, Charmaz preferred a more seamless process of theorizing that included the researcher's interpretations and views alongside the collected data. From this stance, Charmaz (2006) moved beyond shaping a core category, and presented a constructivist perspective that emphasized constructing grounded theories "through our past and present involvements and interactions with people, perspectives, and research practices" (p. 10).

Her interpretive perspective also carried over into the literature review. Charmaz saw the area of literature as enhancing the researcher's overall perspective as long as it did not deter the creative process. Her view sharply contrasted with traditional grounded theorists who feared that a literature review would contaminate or impede the analysis (Mills, Bonner, & Francis, 2006). Thus, not only did Charmaz's constructivism move grounded theory beyond a positivist stance and a theoretical product, but it provided a forum for participant voices to tell a story and build a foundation in which "richness and sufficiency of data" became the grounding mechanism (Raffanti, 2006, p. 70).

Situational Grounding

Drawing from Charmaz's constructivism, Clarke (2005) established situational analysis grounded theory as more open-ended with flexible strategies. Clarke's (2003) situational grounding took on the image of the researcher as a cartographer. Her framework offered a different "conceptual infrastructure or guiding metaphor" than classic grounded theory's framing of basic social processes (p. 554). Clarke extended her perspective beyond Strauss' social worlds/arenas/negotiations framework and presented three main cartographic approaches: situational maps, social worlds/arenas maps and positional maps. These maps were intended to be used as analytic exercises or "fresh ways into social science data" (p. 554); they shed light upon research complexity and difference without making the data so dense that it became chaotic.

By providing cognitive mappings, situational grounded theory enabled people to better understand their world. Why do certain things connect? Why were they important? Why were some items isolated? What points or considerations provided the major landmarks or the minor features? The framework also presented a flexible perspective for the researcher to collate the research in a myriad of possibilities: individually, collectively, organizationally, institutionally, temporally, geographically, materially, culturally, symbolically, visually, and discursively.

Finally, situational analysis mapping also allowed for both inductive movement as well as abductive movement. Inductively, new concepts could be built from categories established from open and axial coding. Abductively—a lateral extension—distinctions could be drawn between maps, concepts, and categories. This procedure cultivated depth as well as a wider theoretical frame, embracing both difference and complexity.

Results

Situational analysis grounded theory was chosen as my research methodology for several reasons. First, situational analysis focused on differences and complexities found in the postmodern world, which made it a good match for the primary purpose of the study that was to use 15 in-depth interviews with design philosophers, teachers, or practitioners to generate information on the potential impact of design culture on contemporary education. Second, situational analysis evolved from rather than supplanted classic grounded theory: "Situational analysis is intended to supplement rather than replace the basic analytic approaches of grounded theory" (Raffanti, 2006, p. 71). Therefore, the twofold foundations of "interactionism" and "pragmatism" found in both classical grounded theory and in systemic design that were described in the preceding pages proved epistemologically and ontologically stable. Third, situational analysis promised to fully examine the "situation of inquiry" needed to explore three levels of inquiry in the study: (a) the need to use design inquiry and practice in pedagogy and methodology; (b) the need to teach design culture, design inquiry, and design practice as curriculum components; and (c) and finally, the need to embrace design cognition as a form of intelligence.

Research Design

The object of this particular situational grounded research study (Clarke, 2003) was to form a theorizing proposition of design's impact on contemporary education by categorizing the collected data from 15 designers into three mappings or charts. The three inquiries or "situations" became the units of analysis for the project and the situation, and understanding its elements and their relations was the primary goal. This was accomplished through the makings of three kinds of maps: situational maps, social worlds/arenas maps, and positional maps. The first map-a situational maplaid out the major discursive elements of the discussion and provoked an analysis of relations among them. This map portrayed "the messy complexities" of the discussion. The second map-social world/arena maps-examined "meso-level interpretations" and "ongoing negotiations" within the design/educator field collective. The third map-positional mapsexplored the range of positions "taken and not taken." It also allowed multiple positions and even contradictions within both individuals and collectives to be fully articulated (pp. 559-560). Finally, the three maps were juxtaposed in order to view the relationship between the categories, fitting with design's abductive stance.

Data Collection, Theoretical Sampling, and Research Participants

According to traditional grounded theorists (Glaser & Strauss, 2011; Corbin & Strauss, 2008), theoretical sampling was a method of data collection that generated theory as the data was analyzed. In this manner, theoretical sampling differed from conventional methods with established procedures and allowed for a more responsive and flexible process. Once again, grounded theory's theoretical sampling method of collecting data provided an excellent match with systemic design. Like the theoretical sampling process, a designing process does not follow fixed procedures. Both theoretical sampling and the design process were cumulative and built upon previous information. Grounded theorists started with a wide range of questions Uri

Table 1Three Maps of Research Analysis

Central Research Question:			
What potential impact could design culture, inquiry and practice have on traditional education?			
Map 1: Situational Analysis (relational components)	<u>Map 2</u> : Social Worlds/Arenas (multiple social worlds overlap)	<u>Map 3</u> : Positional Maps (positions taken/not taken)	
"Who and what are in this situation?"	"What are the patterns of collective commitment?"	"What were the positions on basic issues and topics central to the situation under study?"	
"Who and what matters in this situation?"	"What are the salient social worlds operating here?"		
"What elements make a difference in this situation?"			

and then asked more specific questions as the categories emerge. Designers began with a preferred outcome and used emergent variables and constraints as well as feedback from participants in an iterative fashion to shape, refine, and hone their design.

In accordance with classical grounded theory, my data collection procedure began with a homogenous group of design teachers who taught systemic design at a graduate level. The first interviews were constructed around openended questions that served as guideposts. They included: (a) What does it mean to be a designer? (b) How might your view of design impact education? (c) How might design be difficult to teach in a traditional educational setting? and (d) How do you define design cognition or design intelligence? Data was analyzed immediately after these first interviews. As the data collection proceeded, and elements and categories emerged, a larger, heterogeneous sample was selected and the questions became more refined based on the collected information. Clarke (2005) noted that like traditional grounded theory, theoretical sampling in situational analysis was not driven by attempts to be representative of a particular social body: It grows and evolves "especially and explicitly by theoretical concerns that have emerged in the provisional analysis" (p. xxxi). By the conclusion of the study, a total of 15 design practitioners, philosophers, and instructors from

across the country were included in the interviews. Fifteen participants satisfied my aim of collecting enough information to saturate the categories.

Research Credibility

This study used both Glaser and Strauss's (2011) and Corbin and Strauss's (2008) criteria for establishing a quality, credible research study. Credibility for Glaser and Strauss (2011) was twofold. First, the study should be descriptively convincing. Second, the range of events and the diverse groups of interviewees should allow a researcher to come to a strong conclusion. Credibility for Corbin and Strauss (2008) involved fostering the following conditions: (a) following methodological consistency, (b) aiming for clarity of purpose; c) recognizing researcher's biases and assumptions, (d) training in qualitative research, (e) possessing a sensitivity for the topic, (f) willingness to work hard, and (g) carrying out the data collection and analysis in order to contribute to the study's credibility.

Research Analysis

Because situational analysis relied on traditional grounded theory methodology, the seven categories (four situational maps, one social arena map, and two positional maps) were developed by generating elements from the raw data (open coding), interconnecting these elements into categories (axial coding), and finally building narratives or stories using "thick description" to connect the seven categories (selective coding). The relational and positional aspects were particularly emphasized in this analytical process. Eventually, this resulted in a final project map that portrayed the overall situation.

Each category was built by gathering enough information to develop a category through saturation. Saturation was an important component in grounded theory methodology. Glaser and Strauss (2011) stated that saturation took place when no additional data are found to develop category properties. Saturating categories required constant comparison of collected data. This entailed a zigzagging process of gathering information and then mapping ideas as the study evolved. Grounded theorists

Figure 1

Map 1: Situational Mapping – Working Version.

- 1. Difficulty of defining design
- 2. Defining Design
- 3. Art and design
- 4. Liberal art of technology
- 5. Aesthetics
- 6. Difficulty of teaching design
- 7. Messiness of design
- 8. Design Educating Process
- 9. Conversation
- 10. Wholeness/Autonomy
- 11. Boundaries/Constraints
- 12. New Age of Product Design
- 13. Ethics/Well being
- 14. Body
- 15. Emotions
- 16. Worker vs. Thinker
- 17. Wasteful systems
- 18. Human condition
- 19. Empowerment
- 20. Design Learning Experiences
- 21. Design's Fluidity
- 22. Naïve/Expert/Mastery
- 23. Alternative learning method
- 24. Developing Design pedagogy

(Corbin & Strauss, 2008) defined these methodological components as using a constant comparative approach—"the analytic process of comparing different pieces of data for similarities and differences" (p. 65) and memoing— "written records of analysis" (p. 117).

In the early stages of data collection, memo writing, and initial coding, preliminary elements emerged as well as the "big picture" (Clarke, 2005, p. 226). As the mapping progressed, relational insights were sought among the elements and categories. Once the interviews were completed and the data analysis process begun, the following were noted: categories and subcategories, areas of theoretical interest, relational modes of analysis, and inadequate data where further material was either gathered or deleted. Finally, the categories were plotted unto appropriate maps.

- 25. Traditional pedagogy
- 26. Design educating
- 27. Design projects
- 28. Democracy and human liberty
- 29. Human being
- 30. Cognition
- 31. Designer Mary Parker Follett
- 32. Goethean Science
- 33. Design's Importance/Change
- 34. Sustainability
- 35. Language
- 36. Technology
- 37. Design science/meta-design
- Spiritual leap/Cosmological Perspective
- 39. Design studio vs. Scientific-based
- 40. Lack of Support for Design
- 41. Existing Systems
- 42. Poor Design of Current Education
- 43. Conditions of Learning
- 44. Business
- 45. Misunderstanding Design
- 46. Current Popularity
- 47. Design as Intelligence
- 48. Implementing Design into System

Situational Maps

Simply defined, situational maps are "strategies for articulating the elements in the situation and examining relations among them" (Clarke, 2005, p. 86). Constructing situational maps required mapping both human and nonhuman elements. Drafting the maps included two stages. In the first stage, an abstract map entitled the Messy/Working version was constructed. This map was intentionally chaotic, accessible, and malleable and asked the following questions: Who and what are in this situation? Who and what matters in this situation? What elements make a difference in this situation?

Once the initial map was completed, it was re-organized into a second situational map called the Ordered/Working version. In the second map, coding was used to analyze the initial data. These abstract categories or codes included spatial, temporal, technological, moral and aesthetic concepts. The categories determined what was important, what needed to be collapsed and what needed to be expanded.

When the Ordered/Working map was complete, the next step involved asking questions about the various relations among the important elements and factors: What comprised the world of design? What are the consequences of differences between designers? What economic, political, and cultural conditions affected the discourse? Circling elements and drawing lines specified "the nature of the relationship" between map elements (Clarke, 2003, p. 569). The Ordered/Working version map was more abstract than the initial messy map and was considered complete when the categories were worked and reorganized to the point of saturation.

Social Worlds/Arenas Maps

Step two, or drawing the social worlds/ arenas map, required laying out the collective actors, key nonhuman elements, and the arena(s) of commitment, participation, and discourse within which they were engaged in ongoing negotiations. In making this map, I tried to make collective social sense. Clarke (2005) wrote that social maps focused on what created meaning for a particular group: "Specifying the key social worlds is the major analytic task for this map" (p. 112). In compiling segments of social worlds, the researcher might ask these questions: What are the patterns of collective commitment? or What are the salient social worlds operating here? The boundaries in this map were porous because multiple social worlds overlap.

Positional Maps

A positional map laid out the major positions taken, and not taken, in the data vis-à-vis particular axes of difference, concern, and controversy. In other words, it charted the major positions "taken in the data on major discursive

Figure 2

Map 2: Situational Mapping – Ordered Working Version.

Defining Design Difficulty of Defining Design Misunderstanding Design Language Art and Design

Design Education Difficulty of Teaching Design Design Educating Process Design Learning Experiences Constraints and Boundaries Communication Naïve, Expert, Mastery Human Being Embodiment Individuation and Autonomy Transformation

Human Condition Ethics Shift in Consciousness Design as Liberal Art Multiple Perspectives Aesthetics Technology Change and Human Evolution Democracy and Design Spiritual Dimension

Figure 4





issues" (Clarke, 2005, p. 126). In this mapping, there are no normal, deviant, negative or positive points. Instead, there are just positions, though some may be more marginalized. Further, these maps do not represent individuals or groups. Rather, various social settings are "captured and represented through the mapping process" (p. 126). To complete a positional map, I searched for basic issues from the data. Again, a good positional map is completed when the data is saturated or no new data presents itself. Positional maps indicate which positions speak and which positions remain silent.

Final Product or Project Map

The last step in the research analysis was to comprise a final project that brought all the maps of the 15 interviews together. The completion narrative (Clarke, 2005) did not further the analysis: Rather, it drew together "particular aspects of a specific project to intended audiences" (p. 137). While the three initial maps provided an analytical series, the final project map took the separate pieces and integrated them into a conclusive picture or an emerging representational whole. This final portrait provided a broader spectrum tailored for a specific audience that showed "the big news" as well as "close up shots" in an intersection of maps, images, and ideas (p. 142). In essence, the final project map presented a complex, dynamic, multidimensional display of the research project's data.

Discussion

Clarke (2005) made a list of what she perceived as six strategies that "push grounded theory more fully around the post modern turn" (xxi). She viewed these six strategies as methodological strengths in that they regenerated and expanded traditional grounded theory. Her attempt was to integrate professional disciplines and practices of inquiry; to move from simplification, regularity, and homogeneity to complexity, irregularities and heterogeneities; to shift from collecting components and descriptors to focusing on interactions and relations; and, finally, to include all voices. Clarke felt strongly that new methodologies were needed to address complex global situations and that claims of universality were "naïve at best" (p. xxv). Below, each strategy that Clarke posited as strength is applied to the research analysis.

Strength One: Acknowledging Embodiment and Situatedness

Historically in grounded theory, the researcher is considered invisible. In particular, a Glaserian grounded theorist approaches his or her data as a blank slate. However, Clarke (2005) considered this "tabula rasa" stance problematic. She believed that an analyst cannot help but come into a research project already knowing: "We are, through the very act of research itself, directly in the situation we are studying" (p. 12).

My academic background in Whole Systems Design brought considerable knowledge about systems thinking and design action to the research project. This was an embodied situatedness and the reason why I was drawn to the study. This background information was particularly useful when interviewing 15 designers. Early on in the research process, an important point surfaced about design's perception among professional designers and design instructors. There seemed to be two schools of thought in how design was approached and the epistemology from which it was perceived: a reductive perspective and an integrated whole perspective. The former entailed using a prescriptive procedure of following directions; the latter utilized an artistic shaping process unique to each new encounter. The difference between the two approaches was substantial, entailing a paradigmatic shift from an objective scientific approach to a designer constructivist approach. Meta-design also emerged as a well-defined design paradigm.

The variances between approaches became "talk" in several conversations, and I was able to carry the evolving context into further questioning. Besides my background in Whole Systems Design, my stance as a constructivist grounded theory researcher served an important role. As a researcher, fully emerged in the process alongside the participants, I could ask detailed questions about the design process differences. If I had selected a traditional grounded theorist stance and remained detached, vital information may have been lost.

The participants also came to the study from their own embodied design experiences. This variety brought richness to the table. The differences were notable with the first question when all participants were asked to define design. Not many gave a quick answer. Most of the interviewees hesitated, laughed, and expressed frustration or concern. Their responses to this duestion set the tone of the analysisthe continual insistence that design be properly interpreted. Participants fiercely protected the ambiguities of designing, both in how it was understood and misunderstood. On the one hand, the confusion of defining design lies in its ubiquitous activity. It occurs within many disciplines with different vocabularies and different methodologies. "What are we talking about-industrial design, graphic design, product design, service design?" On the other hand, what previously was more specialized is now becoming more multi-disciplinary. Participant 4 aptly described design's ambiguity: "Are we talking about design as intention or are we talking about design as kind of creating a sort of map of where you want to go? Each of those I would answer differently."

As a researcher, I learned that "how" a designer designed was just as important as "what" a designer designed—suggesting artistry. Integrative holisitic designing always looked toward the bigger picture, the larger questions. It differed from a reductive approach of following instructions. Like constructionist grounded theorists, designers preferred to invert the design process, building their story rather than following a defined procedure.

Strength Two: Grounding in the Situation

The second strength of situational grounded theory—embracing the concept of situational groundedness—drew from the first strength. It paid attention to the embodied situational context of the interviewee. The research analysis was also grounded in situational questions that provided the focus for the data collection. In other words, situations became the units of analysis, and the research project focused on an emergence of the relational gestalt rather than the reductive analysis of finding fact. Exploring one situation often lead to other situations and produced a mind map analogy rather than a linear sequence. The mind map image provoked new relations. Clarke (2005) called this "relations among situations" (p. 23).

Guiding questions were used for situational mapping to open the data and codify key elements. In this "messy working version," 48 elements were garnered. This initial list showed how one situation led to other situations or how one thought led to other thoughts.

In step two of the analysis, the relationship between the elements were examined and placed into categories. This process took several reorganizations. Categories were not fixed, and elements could be used in more than one grouping. Minor elements were either eliminated or collapsed into larger categories while elements with "thick descriptions" were expanded. The goal of step two was to decide which stories to pursue and which relations were prominent. It generated what Clarke considered a situational grounding strength, a dynamic gestalt in which the "situation is always greater than the sum of its parts" (p. 23).

Strength Three: Differences and Complexities

The second strength of situational grounding easily folded into the third strength, that of embracing differences and complexities. While Clarke's (2005) second strength placed emphasis on a relational gestalt, the third strength embraced the differences and complexities found within the relations of the overall composition rather than a uniform conclusion. Clarke (2005) wrote that we have been educated to automatically fall back into the norm: "The normal curve is the implanted default drive of Western science" (p. 23). She even criticized traditional grounded theory's method of finding a single social process as too homogenous and believed the overemphasis on the normal curve has resulted in single dimension studies with linear plots that leave out multidimensional mappings and varieties of positions. Instead of automatically falling back into the curve, Clarke advocated examining the differences and complexities found in the fringes: "It is the boundaries that produce the center" (p. 24).

In this study, difference, complexity, and sameness were best exhibited in the social arena maps that focused on meaning-making (Clarke, 2005). Questions were asked about how designers organized as groups or collective actors and how they organized themselves in larger broader structural situations. In other words, I attempted to make a collective social sense of size, placement, power, enlarged worlds, or diminished worlds. The participants drew tight boundaries between design thinking and conservative systems, but they also expressed an enthusiasm for design's emergence in areas such as business, engineering and service design. Participants talked about the current educational system, conditions of learning and lack of support for design thinking in education, design studio versus traditional education in higher education, and the current growing popularity of design in fields such as business, engineering and organizational leadership. In short, the mapping broke down boundaries and looked at difference through the integration of disciplines.

Strength Four: Sensitizing Concepts, Analytics, and Theorizing

In contrast to traditional grounded theorists, Clarke (2005) recognized that the search for "purity" and "objectivity" by the more positivist grounded theorists tended to prevent change and innovation. Like constructivist grounded theorist Charmaz (2006), Clarke proposed ongoing theorizing over establishing a theory and viewed her stance as an analytical strength: "It makes no sense to write a grand theory of something that is always changing" (p. 28). In so doing, Clarke hoped to keep grounded theory vital and dynamic. However, she also cautioned against a light or haphazard analysis. Rather, sensitizing concepts are intended to avoid the overgeneralization and over-abstraction that is often found in more linear studies.

Early in my memoing process, a phrase contributed by participant who had an extensive background in the work of designer Mary Parker Follett provided an "in vivo code" or the exact words of the interviewee to describe the connection between the seven categories (Creswell, 2007; Corbin & Strauss, 2008). The idea of integrating differences emerged over and over again throughout conversations. It became what Clarke (2005) called the "sensitizing concept" or the most developed concept of the study (p. 28). The "sensitizing concept" supported ongoing theorizing. Clarke used the concept of theorizing over the concept of theory because the main objective of a situational analvsis is to open the data and the situation to ongoing negotiations rather than promote an obiective truth.

Follett's terminology—integrating differences—allowed me to draw from my own reflexivity. Self-reflexivity is an integral component of a situation analysis study. Clarke contended that in a postmodern world, self-reflection is no longer an option: "A significant aspect of the postmodern turn in qualitative/interpretive research has been an intensive focus on the presence and the consequences of the researcher in the research—as an actor, designer, interpreter, writer, co-constructor of data, and the ultimate arbiter of the accounts" (p. 12). Clarke insisted that self-reflexivity questions needed to be asked: Who is the researcher? How is who they are consequential? Who/what is researched?

In accordance, designers (Brown, 2009; Nelson & Stolterman, 2012) asserted that design is best learned through reflective embodied practice rather than following the directives of an abstract theory. Judgment (Nelson & Stolterman, 2012) is developed when designers practice and then, reflect on their practice: "Design judgment is the ability to gain subconscious insights that have been abstracted from experiences and reflection" (p. 145).

Strength Five: Doing Situation Analysis

Clarke's (2005) fifth strength revolved around examining and analyzing the most salient elements and relations within particular situations. Sometimes, a situation required looking "inside the situation itself" (p. 30). In more complex research endeavors, a situational analysis could encompass many situations, requiring a repertoire of discursive mapping devices. One of the purposes of research is to enable people to better understand their world, and mapping or creating visual arts play a role in providing landmarks in the cognitive mapping of the design world. "Why do certain things connect? Why are they important? Why are some items isolated? What points or considerations provide the major landmarks or the minor features? Maps re-construct the terrain by providing "altitudes, topographies, scales, textures, and so on" (p. 304).

Clarke (2005) viewed maps as "shifting devices," and ways to "rupture" our normal way of working (p. 30). Maps make connections, open knowledge spaces, and handle multiplicity. They also work well as spatial and temporal narratives. Efland (2002), in his research on art and cognition, suggested that maps "embody metaphoric visions of human potential and possibility" (p. xii). When mapping, a researcher can assume that knowledge is the construction of the participants because people carry mental models of their internal and external environments. Jameson (1988; 1992) argued that maps involve perception and that, as Efland (2002) summarizes, "Individuals need some sort of image or map of their society as whole" (p. 124). Cognitive maps present a representation of spatial arrangement. For example, Efland (2002) noted that when people are given maps of a city, they often focus on five typical features: paths, edges, districts, nodes (where paths converge) and landmarks. Clarke (2005) compared maps to stories because both provided coherence, linking "together-however unevenly and episodically" (p. 300).

Clarke (2003) also suggested that the cartographic approach of situational grounded theory provided ways out of the methodological problems that come with the postmodern world. These included the deepening recognition of the political nature of research, the enhanced reflexivity on the part of researchers, the recognition of the problems of representation, the questioning of the legitimacy of both the research and the researcher, and the de/re-positioning of the researcher from the "all-knowing analyst to acknowledged participant in the production of always partial knowledge" (p. 556).

In my final analysis, both a "narrative" and a "map" were used to exhibit each category. While the narrative (story) allowed for detail, the map provided a bird's-eye view. Juxtaposed

Figure 3 Map 3: Bird's Eye View Map – Defining Design



together, both the map and the narrative presented a more comprehensive and thorough analysis.

Strength Six: Turning to Discourse

Clarke (2005) stated that analyzing only individual and collective actors no longer suffices for the heterogeneous and comprehensive research of the 21st century (Clarke, 2005, p. 145). She emphasized the need to move beyond field notes and interview transcripts to include many types of discourse: "It is the combination of the groundedness of interpretation with the systematic handling of data that makes grounded theory and situational analysis robust" (p. 146).

This came to the forefront in charting the culminating integrative map. The seven categories that emerged from the data were enclosed within an ellipse depicting the chosen cartographic category. The map exhibited, as situational analysis should, that the study remained open, indeterminate, changing, unstable, unfixed, tenuous, and temporary. It was from that perspective that the term integrating differences made sense and created meaning for each narrative and also addressed the central question of the study. In its entirety, the research project was only an "analytic snapshot in time" and stood true to the ongoing idea of theorizingmeaning that a theorizing is never stable butever changing (Clarke, 2005, p. 296). Because of this stance, further studies and discussions are needed between designers and K-16 educators. This initial research provided a nexus from which many research projects could branch into a multitude of directions and discourses.

Limitations and Future Research

Clarke's (2005) situational analysis bravely steps into a new world of research and does offer a "radically different conceptual infrastructure" for investigating complex situations of inquiry (p. xxii). Situational analysis provides a methodology that integrates information within a situation as well as between situations. However, as Clarke indicates, much work still needs to be done in collecting, writing, and charting complex information. After having used situational analysis as research methodology, two limitations surfaced in the experience of working with complexity and difference.

Limitation One: Knowing Where and When to Create Boundaries

As a grounded theorist, Clarke (2005) stated that we lack adequate vocabulary and research methods to examine "genres of difference" (p. xxx). This acknowledgement pointed to a limitation of situational analysis. The analyzing process can easily become overwhelming. How does the research analyst handle all the data and layers of information? Systems designers face the same challenge. Design processes are very complex, and different interest groups must converge into one alternative design. Because they handle a lot of information, systems designers must look for limits and restrictions in the design process or experience "analysis paralysis" (Stolterman, 2001, p. 1). They must also avoid "value paralysis" or the attempts to satisfy as many needs, wants, and desires as possible (p. 3). If boundaries are not made, a designer may begin to feel responsible for the whole world. Thus, designers learn to make judgments, a process that demands both courage and creativity. Courage is the deliberate choice to neglect certain information. Creativity is needed to "transcend the contradictions" (p. 4).

A situational analyst uses saturation to develop categories. A situational analyst can feel pulled in many directions, yet determining boundaries is important to keep the study in focus. From that perspective, it is important to understand what comprises a good composition. How does a researcher juxtapose information so that the messiness of complex data is not mired or important details are not lost? Systemic designers Nelson and Stoltermann (2012) use the metaphor of an artist's palette when framing a composition of complexity. When creating a painting, an artist selects an inventory of colors and makes choices concerning the framing of the composition. A design palette serves the same purpose. It is formed by interrelating "ontological and epistemological categories in matrix fashion" (p. 85). Designers and stakeholders choose the sets of categories that will supply the inventory of elements for the "palette of particulars" (p. 85).

Table 2Concluding Guiding Questions

Where in the world is this project?	Why is it important?	What is going on this situation?
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In the design process, a designer has to make judgments and decision about how to approach the project. The choices are always based on the particular design intention. This requires the designer to acquire a "working knowledge" of ideal types and categories as well as considerable time to reflect on the specifics of the design situation. A situational research analyst uses a methodological framework and guiding questions to shape the research process, but a designer's perspective on composition would aid a situational analyst when it comes to adding, deleting, combining, and layering data for the separate mappings as well as the overall composite map.

Limitation Two: Mapping Complexity

Postmodernists claim that the world is complex, dynamic and multidimensional, yet we continue to exhibit data using static and flat maps. I found this true of situational analysis. As a situational analyst, I struggled to find ways to clearly display complex information bevond circles, arrows, and positions between two axes. How does a researcher escape the flatlands when dealing with an enormous accumulation of material? How does a research project intersect images and text? What types of mapping can reveal both detail and complexity? Clarke also agreed that we need improved methods for "grasping the constructions of terrain—altitudes, topographies, scales, textures, and so on" (2005, p. 304).

Within the grounded theory spectrum, constructivist grounded theorist Charmaz (Raffanti, 2006) considered the richness of data as foundational. Charmaz (2006) even criticized Glaser for his lack of detailed narratives. Deep data rather than a superficial analysis provided "solid material for building a significant analysis" (p. 14). Yet, the collection of deep data must be artfully presented. Tufte (1990) suggested that effective layering of information is difficult. Mapping information is not about combining factors but rather showing how the factors interact. Too often, maps become confusion and clutter, resulting in a lack of clarity and understanding. Enriching the content of maps requires using techniques of "layering and separation, visually stratifying various aspects of the data" (p. 53). Cartography is an exciting research venture; yet postmodern multidimensional mapmakers need tips and examples on how to chart information so it truly conveys the rich complexity of multidimensionality.

Concluding Remarks

Although there were limitations to situational analysis grounded theory, the strengths far outweighed the drawbacks. The three analytical maps opened avenues of situational insight within design and education. The study, which explored the potential impact of design culture on the traditional educational system, also opened a myriad of possibilities for future research.

To assist in concluding a study, Clarke (2005) presented three guiding questions. In answering the first question, data from 15 designers suggested the popularity of design is growing beyond the boundaries of traditional design arenas into the mainstream because it offers a forum as well as the logic for handling complex innovative ideas and solving difficult problems. In answering the second question, design culture is important to the educational community because design principles and strategies could offer new learning platforms. Currently, the primary focus in education revolves around developing the knowledge base and improving standardized testing scores. However, many education philosophers (Gardner, 2004; Nussbaum, 2010; Thackara, 2006) are concerned about the limits of basic skills and education equated with economic growth. Design inquiry, if understood according to an integrative, holistic approach, could offer a comprehensive learning approach that takes a learner beyond today's overemphasis on basic skills, technology, standardized tests and a rationalized approach to learning.

The third question could be answered with the sensitizing concept culled from the categories and mappings of the study. Integrating differences—a term borrowed from a conversation about designer Mary Parker Follett—aptly described the many levels of designing from the integrative, holistic perspective advocated by all fifteen designers who participated in the study. Such an approach to design inverts a step-by-step, one-size-fits all procedure into an ever evolving artistic shaping process formed by constraints and recognition of difference. This perspective brings a fresh approach to research particularly as more studies demand integrative, inclusive, and connected thinking.

As a researcher, I appreciated the participants' concerns both about understanding design and misunderstanding design. This fundamental issue laid groundwork for the entire study. The peril inherent in reducing design to simple measures with simple answers was brought up in discussions many times over. As an educator in the K-12 system, I concur. The same reductive format is deeply entrenched within the education field where learning is still taught in a "one-size-fits-all" manner with uniform conclusions.

Yet, I also listened to Participant #8 when she stated that design culture was "not a silver bullet." To assume that design has the potential to cure all educative problems is to allow myself (the researcher) to fall into the reductive dualistic trap of adhering to one construct and denying numerous others. Further, it is important to note that with situational analysis, this research is only an "analytic snapshot in time" (Clarke, 2005, p. 296). Therefore, I stand true to its ongoing idea of theorizing-meaning that a theorizing is never stable but ever-changing. Because of this stance, I recommend ongoing discussions between designers and K-16 educators. It seems to me that we have a good deal to share with each other.

References

- Allen, L. (2010). A critique of four grounded theory texts. *The Qualitative Report*, *15*, 1606-1620.
- Banathy, B. (2001). We enter the twenty-first century with schooling designed in the nineteenth. *Systems Research and Behavioral Science, 18,* 287-290.
- Bateson, G. (1979). *Mind and nature: A necessary unity.* New York, NY: Bantam Books.

- Ben-Eli, M. (2010, June 3). Architecting the future. Keynote address at Buckminster Fuller Institute, Washington, D.C.
- Brown, T. (2008). Design thinking. *Harvard Business Review*, 86, 84-92.
- Brown, T. (2009). Change by design: How design thinking transforms organizations and inspires innovation. New York, NY: HarperCollins Publishers.
- Buchanan, R. (1995). Wicked problems in design thinking. In R. Buchanan & V. Margolin (Eds.), *The idea of design* (pp. 3-20). Cambridge, MA: MIT Press.
- Carroll, M., Goldman, S., Britos, L., Koh, J., Royalty, A., & Hornstein, M. (2010). Destination, imagination and the fires within: Design thinking in a middle school classroom. *The International Journal of Art & Design Education*, 29, 37-53.
- Charmaz, K. (2006). Constructing grounded theory: A practical guide through qualitative analysis. Thousand Oaks, CA: Sage.
- Chiasson, P. (2005). Peirce's design for thinking: An embedded philosophy of education. *Educational Philosophy and Theory*, *37*, 207-226.
- Clarke, A. (2003). Situational analyses: Grounded theory mapping after the postmodern turn. *Symbolic Interaction*, 26, 553-576.
- Clarke, A. (2005). Situational analysis: Grounded theory after the postmodern turn. Thousand Oaks, CA: Sage Publications.
- Corbin, J., & Strauss, A. (2008). *Basics of qualitative* research: Techniques and procedures for developing grounded theory. Los Angeles, CA: Sage Publications.
- Creswell, J. (2007). *Qualitative inquiry and research design: Choosing among five approaches.* Thousand Oaks, CA: Sage Publications.
- Dunne, D., & Martin, R. (2006). Design thinking and how it will change management education: An interview and discussion. Academy of Management Learning & Education, 5, 512-523.
- Efland, A. (2002). Art and cognition: Integrating the visual arts in the curriculum. New York, NY: Teachers College Press.
- Gardner, H. (2004). *The unschooled mind: How children think and how schools should teach*. New York, NY: Basic Books.
- Glaser, B. (1998). *Doing grounded theory: Issues and perspectives*. Mill Valley, CA: Sociology Press.
- Glaser, B., & Strauss, A. (2011). The discovery of grounded theory: Strategies for qualitative research (6th ed.). Rutgers, NJ: AldineTransaction.
- Hokanson, B., & Gibbons, A. (2013). Design in educational technology: Design thinking, designprocess, and the design studio. New York, NY: Springer Publishing.

- Horn, R. (2001). Post-formal design conversation: Designing just and caring educational systems. *Systems Research and Behavioral Science, 18,* 361-372.
- Hutchinson, S. (1988). Education and grounded theory. In R. Sherman & R. Webb (Eds.), *Qualitative research in education: Focus and methods* (pp. 123-140). London, UK: The Falmer Press.
- Jameson, F. (1988). Cognitive mapping. In C. Nelson & L. Grossberg (Eds.), *Marxism and the Interpretation of Culture* (pp. 347-357). Champaign, IL: University of Illinois Press.
- Jameson, F. (1993). Postmodernism, or the cultural logic of late capitalism. In T. Docherty (Ed.), *Postmodernism: A reader* (pp. 53-92). New York, NY: Columbia University Press.
- Jenlink, P. (2001a). Activity theory and the design of educational systems: Examining the meditational importance of conversation. *Systems Research and Behavioral Science*, *18*, 345-359.
- Jenlink, P. (2001b). Introduction: Designing educational systems for the twenty-first century. *Systems Research and Behavioral Science*, *18*, 283.
- Koh, J., Chai, C., Wong, B., & Hong, H. (2015). Design thinking for education: Conceptions and applications in teaching and learning. Singapore, Singapore: Springer Publishing.
- Lau, K. W., Ng, M. C., & Lee, P. Y, (2009). Rethinking the creativity training in design education: A study of creative thinking tools for facilitating creativity development of design students. Art, Design & Communication in Higher Education, 8, 71-84.
- Luka, I. (2014). Design thinking in pedagogy. *Journal of Education, Culture, and Society, 2*, 63-74.
- Martin, R. (2009). *The design of business: Why design thinking is the next competitive advantage.* Boston, MA: Harvard Business Press.
- Mills, J., Bonner, A., & Francis, K. (2006). The Development of Constructivist Grounded Theory. *International Journal of Qualitative Methods, 12,* 8-13.
- Nelson, H. (1994) Learning systems design. Educational Technology, 34, 51-54.
- Nelson, H., & Stolterman, E. (2012). *The design way: Intentional change in an unpredictable world.* Cambridge, MA: MIT Press.
- Nussbaum, M. (2010). *Not for profit: Why democracy needs the humanities.* Princeton, NJ: Princeton University Press.
- Raffanti, M. (2006). Grounded theory in educational research: Exploring the concept of "groundedness." In P. Brewer & M. Firmin (Eds.), *Ethnographic and qualitative research in education* (pp. 61-76). Newcastle, UK: Cambridge Scholars Press.

- Rauth, I., Carlgren, L., & Elmquist, M. (2014). Making it happen: Legitimizing design thinking in large organizations. *Design Management Journal*, 9, 47-60.
- Schon, D. (1987). Educating the reflective practitioner: Toward a new design for teaching and learning in the professions. San Francisco, CA: Jossey-Bass.
- Schon, D. (1992). The theory of inquiry: Dewey's legacy to education. *Curriculum Inquiry, 22,* 119-139.
- Schon, D. (1995). The new scholarship requires a new epistemology. *Change*, *27*, 26.
- Stolterman, E. (1991). How system designers think about design and methods: Some reflectionsbased on an interview study. *Scandinavian Journal of Information Systems, 3,* 137-150.
- Stolterman, E. (2001). Two design traps: Analysis paralysis and value paralysis. Advanced Design Institute. Retrieved from http://www.advanceddesign.org
- Suddaby, R. (2006). From the editors: What grounded theory is not. *Academy of Management Journal*, 49, 633-642.
- Taking Design Thinking to Schools. (n.d.). *The Project* of Hasso Plattner Institute of Design (d. school) and The School of Education (SUSE). Retrieved from http://web.stanford.edu/dept/SUSE/taking-design/presentations/Taking-design-toschool.pdf
- Thackara, J. (2006). *In the bubble: Designing in a complex world*. Cambridge, MA: MIT Press.
- Tufte, E. (1990). *Envisioning information*. Cheshire, CT: Graphics Press.
- Vanada, D. (2014). Practically creative: The role of design thinking as an improved paradigm for 21st century art education. *Techne Series: Research in Sloyd Education and Craft Science, 21*, 21-33.
- Waks, L. (2001). Donald Schon's philosophy of design and design education. *International Journal of Technology and Design Education*, 11, 37-51.

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