POSTSECONDARY FACULTY EXPERIENCES WITH DESIGN THINKING AS A FRAMEWORK FOR INSTRUCTIONAL DEVELOPMENT

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Melissa Kane
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Abstract

This descriptive phenomenological study examined how postsecondary faculty experienced instructional development workshops framed around the tenets of design-thinking. Semi-structured interviews were conducted with seven participants of varying disciplines from a private, R1 institution in New England. Transcripts were analyzed inductively using values and in vivo coding and pattern and axial coding were engaged during second cycle coding to examine emergent themes. From the analysis, four predominant findings were identified: the relationship between quickly-paced activities and their alignment to practice is an important consideration for promoting innovative thinking through instructional development; collaboration and communication across disciplines helps facilitate one’s thinking around instructional practice; the importance of incorporating ways for participants to obtain authentic student feedback when planning learner-centered instructional development; the importance of allotting for multiple opportunities for review and reflection on identified problem(s) and solution(s) when implementing problem-based instructional development. This study suggests opportunities to implement design thinking instructional development in broad academic areas and recommends future areas of research around the effectiveness of this model of instructional development.

Keywords: design thinking, instructional development, professional development, postsecondary education, learner-centered instruction
Dedication and Acknowledgements

*Choose people who lift you up.*
— *Michelle Obama*

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Chapter One: Introduction to the Study

A shift in the global economy has precipitated a shift in higher education centered on quality assurance and accountability for students’ success (Ramsden, 2003). Wherein higher education traditionally measured quality through the number of employed Ph.D. faculty, institutional prestige and financial resources, today’s knowledge-based economy necessitates different quality measures relating to student learning and engagement (Organisation for Economic Co-operation and Development [OECD], 2012; Ramsden, 2003; Umbach & Wawrzynski, 2005). Additionally, higher education’s struggle with student retention, persistence and completion, particularly with historically disadvantaged students, suggests that it is imperative that institutions focus on student learning outcomes (Tinto, 2004). As the landscape continues to change in higher education, instructors must acquire skills to teach to the current and future challenges students will face in the growing complexities of the workforce (Holdsworth & Hegarty, 2016).

Empirical research suggests that while pedagogical innovations proven to align with student success do exist in higher education, many instructors lack the training or support necessary to scale these innovations into their classrooms (EAB, 2016; Ramsden, 2003). In fact, higher education remains the one academic environment in which the instructors are not required to have training in evidence-based teaching practice (Tinto, 2004). Research conducted by Umbach & Wawrzynski (2005) shows a positive correlation between faculty who use pedagogical innovations (e.g., active learning, collaboration, problem solving) and student gains (p. 165), it is essential for institutions of higher education to prioritize instructional support for faculty. However, and despite evidence supporting the role of faculty as contributor to students’ success, instructional development in higher education remains of low priority over research scholarship (Gyurko, MacCormack, Bless, & Jodl, 2016; OECD, 2012; Umbach & Wawrzynski,
2005). Precluding factors for such initiatives remain situated in faculty’s lack of time, resources, and desire to engage in singular workshops that are not aligned with their praxis (Darling-Hammond, Wei, Andree, Richardson, & Orphanos, 2009; Doppelt et al., 2009; Graham, 2007; Guskey, 2002; Stes, Coertjens, & Van Petegem, 2010; Trust, Carpenter, & Krutka, 2017; Trust, Krutka, & Carpenter, 2016; Hendry & Dean, 2002; Van Schalkwyk, Leibowitz, Herman, & Farmer, 2015). Thus, efforts to engage postsecondary faculty in quality instructional development should be grounded in their current practice and should be designed to increase faculty’s responsiveness to real-time classroom events (Stes et al., 2010; Stes, Min-Leliveld, Gijbels, & Van Petegem, 2010).

The purpose of this phenomenological study is to understand the ways in which postsecondary faculty at an R1 institution in New England experience a design thinking process as a model for their instructional development, specifically when situated in a collaborative setting with their peers from various disciplines. At this stage in the research, the design thinking process is defined by the d.Hasso Plattner Institute of Design at Stanford University (2010) as a solutions-based approach to human-centric problem solving. In the context of this study, participants engaged in design thinking processes during workshops relating to their instructional design. The term instructional development is aligned with Stes and Van Petegam’s (2011) definition, comprising any planned initiative designed to enhance instructor’s teaching and maximize student learning (p. 461). In the context of this study, instructional development focused on activities relating to problem-solutions that participants identified in the context of their own practice as areas with which to support and scaffold student learning. Knowledge generated from this study has implications for the way in which faculty instructional development is designed and implemented in higher education.
This chapter begins with a statement of the problem with evidence from the literature supporting the need to restructure instructional development in higher education. The significance of the study is discussed next, drawing connections to potential beneficiaries of the work, followed by the research question. Finally, the theoretical framework that serves as a lens for the study is introduced and explained.

**Statement of the Problem**

Pressures for postsecondary faculty to “publish or perish” in research institutions often overshadows the importance of high-quality pedagogy (OECD, 2012). Given this strong emphasis on research scholarship across higher education institutions, many academics worry that added emphasis on teaching could hinder their efforts for promotion or tenure (OECD, 2012). However, recent changes in student demographics and enrollment signify that institutions must examine quality teaching as a priority to meet all students’ learning needs (OECD, 2012; Satscope et al., 2015). Data show that in recent years, postsecondary student enrollment has increased rapidly, and the demographic has become more racially, economically, and socially diverse (Alexander, 2000; Hendry & Dean, 2002; Kivunja, 2014; OECD, 2012; Van Schalkwyk et al., 2015). In addition to the massification and diversification of higher education, a shifting workforce demands that higher education refocuses its efforts on institutional outcomes over inputs (Alexander, 2000; Holdsworth & Hegarty, 2016). Given correlative research supporting the link between faculty and student outcomes, and a predominant opinion that the quality of higher education determines a society’s economic potential, there is increased urgency for higher education to prioritize quality instruction (Alexander, 2000; Hendry & Dean, 2002; Holdsworth & Hegarty, 2016; Major & Palmer, 2015).

Notwithstanding, postsecondary faculty often express difficulty adapting to the shifting landscapes of the ever-changing internal and external environment surrounding the institution
(Hendry & Dean, 2002; Kivunja, 2014; OECD, 2012; Satscope et al., 2015; SHEEO, 2016; Ward & Sylvester, 2012; Willness & Bruni-Bossio, 2017). Looming demands on academics to maintain research scholarship allows little extra time for faculty to grow professionally in their teaching practice (Billing, 2011; Norman & Spohrer, 1996, OECD, 2012). These struggles are further complicated by the pedagogical demands specific to each discipline, wherein faculty’s needs relating to pedagogical content knowledge differ across “soft” (e.g., humanities) and “hard” (e.g., science and math) disciplines (Major & Palmer, 2015).

As educators, many of whom lack formalized training in teaching and learning, a vast majority of postsecondary faculty frame their teaching methods around the ways in which they learned the content, and they use their disciplinary beliefs to influence their instructional planning (Major & Palmer, 2015). Therefore, it is imperative that professional learning opportunities at the institution level are sensitive to the nuances surrounding faculty’s teaching responsibilities, and that any effort to support faculty’s pedagogical transformations are mindful of their experiences within the classroom (Major & Palmer, 2015). Thus, any initiative for instructional growth must be efficiently maximized so faculty may connect professional growth with high-quality and responsive teaching practices that adapt as the demands of the field shift.

**Rationale and Significance**

Today’s knowledge-based economy places new demands on postsecondary educational institutions, requiring faculty to move away from knowledge transmission and towards learner-centered pedagogy designed for deep learning (Billing, 2011; Major & Palmer, 2015; Norman & Spohrer, 1996; Stukalina, 2008; Van Schalkwyk et al., 2015; Wenger & Snyder, 2000; Wiggins & McTighe, 2005). The implications of a workforce dependent on employee competency with complex cognitive skills means that institutions of higher education must foster learning environments in which instructors teach for deep understanding and contextualized learning
(Billing, 2011; Stukalina, 2008; Wiggins & McTighe, 2005). While the notion of teaching for understanding has dated back to Benjamin Bloom’s establishment of the cognitive domains taxonomy, many postsecondary instructors’ pedagogical practices are not synergistic with this theory (Kivunja, 2014).

Pedagogy that situates students as partner in the recursive, social construction of content knowledge thus galvanizes deep understanding (Stukalina, 2008; Wenger & Snyder, 2000; Wiggins & McTighe, 2011). In this manner, with faculty acting as facilitator rather than gatekeeper of knowledge, novice learners become experts in their ability to critically navigate, analyze and apply knowledge, thereby aligning their competencies with growing industry demands (Billing, 2007; Kivunja, 2014; Stes & Van Petegam, 2011; Stes et al., 2010; Wenger & Snyder, 2000). However, although research supports the benefits of learner-centered pedagogies, the culture within postsecondary education continues to trend towards an instructor-as-lecturer paradigm (Hendry & Dean, 2002; Wismath, 2013). Promotion policies across institutions of higher education underscore scholarship and publication of discipline-specific research, placing little emphasis on the benefits of high-quality pedagogical practices aimed at preparing students for a knowledge economy (Hendry & Dean, 2002; Kedraka & Rotidi, 2017; Kivunja, 2014; Satsope, John, Kabelo, & Mahlapahlapana, 2015). At the same time, academics with little formal training in pedagogy are left lacking guidance and support to undertake the task of improving their instructional praxis (Hendry & Dean, 2002; Satsope et al., 2015).

Empirical research suggests that effective professional development extends beyond a singular in-service tool or training, and that paradigmatic shifts occur when professional learning is interconnected with the participants’ practice (Darling-Hammond, Wei, Andree, Richardson, & Orphonos, 2009; DuFour, 2004; Holdsworth & Hegarty, 2016). Research also suggests that traditional methods of teacher professional development are largely ineffective in improving
participants’ knowledge, attitudes and innovative practices, and administration must be mindful not to oversimplify the complexities associated with the variability of role that postsecondary faculty encounter (Darling-Hammond & Mclaughlin, 2011; Darling-Hammond et al., 2009; Van Schalkwyk et al., 2015). Further, given postsecondary faculty’s natural proclivity towards transactional pedagogy, faculty must be encouraged to reflect on their conception of teaching as it ties directly to their practice and their disciplinary beliefs (Major & Palmer, 2015; Van Schalkwyk et al., 2015). Therefore, professional development should be structured in a reciprocal fashion in which instructors are challenged to interrogate their expectations for how students learn in conjunction with their instructional approach (Major & Palmer, 2015). Central to this notion is a requisite environment supportive of faculty peers’ engagement, both individually and collectively, as they learn from their current practice and use that to inform shifts in their future practice (Major & Palmer, 2015). Such targeted design for instructional development is believed to enact paradigmatic shifts towards transformational pedagogy and build faculty responsiveness in their instructional practices despite the complexities they will face (Willness & Bruni-Bossio, 2017; Schildkamp & Poortman, 2015; Van Schalkwyk et al., 2015). Yet, as it stands, current top-down initiatives of formalized instructional and professional development framed around the transmission of evidence-based instructional methods has done little to change the habits of academics (Major & Palmer, 2015; Ramsden, 2003; Stes & Van Petegam, 2011; Stes et al., 2010; Van Schalkwyk et al., 2015).

For postsecondary faculty to grow as educators and to prepare their students for a global economy, they must engage in professional learning aimed at supporting their pedagogical growth with the human at the center (Beaird, Geist, & Lewis, 2018; Drago-Severson, 2007; Drago-Severson, 2009; Drago-Severson, 2016; Gobble, 2014; Hendry & Dean, 2002; Luka, 2014; Quinlan, 2014; Satsope et al., 2015; Stukalina, 2008). Just as students need to socially
engage in knowledge as practice to build a deep understanding of new concepts, academics who seek to improve pedagogical capacity must engage with their colleagues in activity centered on transformative teaching and learning practices (Drago-Severson, 2016; Hendry & Dean, 2002; Kedraka & Rotidi, 2017; Quinlan, 2014; Satsope et al., 2015). Such an endeavor in higher education requires a formalized system of support that acknowledges academics’ current practical knowledge and fosters their social construction of new knowledge garnered from engagement with colleagues (Clegg, 2003; Darling-Hammond, Bullmaster, & Cobb, 1995; Darling-Hammond, Wei, Andree, Richardson, & Orphanos, 2009; DeFazio, 2016; Guskey, 2002; Stes & Van Petegam, 2011; Stes et al., 2010).

Emerging research in fields outside of education, such as management and medicine, provide data showing that implementation of design thinking across the organization can shift the behavior and culture of its members (Elsbach & Stigliani, 2018). Specifically, design thinking tools encourage organization members to question current practice, generate potential solutions to identified problems, and develop small scale prototyping based on the throughputs and outputs of the organization (Beaird, Geist, & Lewis, 2018; Elsbach & Stigliani, 2018; Gobble, 2014; Luka, 2014). Because of the focus of design-thinking on the human experience and human-centeredness, research in management and medicine in the past five years have identified design thinking tools as valuable method for organizational learning (Beaird, Geist, & Lewis, 2018; Elsbach & Stigliani, 2018; Gobble, 2014; Luka, 2014). In this way, other human-centered professions like education might also benefit from implementing design thinking for organizational learning; however, to date little research has been conducted on its effectiveness in an educational setting (Luka, 2014). Thus, the purpose of this phenomenological study is to examine the role of the design thinking framework as a method for instructional development centered on nurturing innovation in the participants’ teaching practice. The research will
document faculty members’ perceptions and experiences with the design thinking processes as it relates to their development of instructional design and practice.

**Research Problem and Research Question**

The problem of practice being explored in this study centers on the higher education imperative to engage faculty in a pedagogical transformation towards learner-centeredness; however, studies reveal that traditional, top-down faculty development training have had little long-term effects on faculty’s practice (Stes & Van Petegam, 2011; Stes et al., 2010). Further, because ongoing research suggests that instructors’ teaching methods are predicated on their conceptions of their own practice, there is great urgency to examine instructors’ experiences with human-centered instructional development training grounded in their own practice (Major & Palmer, 2015). The purpose of this phenomenological study is to gain insight in the ways in which postsecondary faculty perceive human-centered, design thinking process as a framework for instructional development. This research study examines the question: How do postsecondary faculty members perceive design thinking as a model for instructional development?

This question guided research in the examination of how postsecondary faculty experienced instructional development training less formalized by transactional concepts and more centered on instructors’ reflexive and reflective thinking as guided by the design thinking protocol. Ultimately, this question seeks to understand the potential of instructional development framed by the design thinking process as an effective method for implementing future postsecondary faculty development in this area.
Definition of Key Terminology

The following comprises a list of key terminology used throughout this study. This list provides the working definition of terms within the context of the research problem with the aim of providing clarity to core ideas presented in the study.

**Design Thinking** – a framework for creative problem-solving based on processes employed by experts in design fields (e.g., architecture, engineering) to leverage the interplay between new knowledge exploration and existing knowledge (Elsbach & Stigliani, 2018)

**Formal Instructional Development** - intensive, organized activities (e.g., seminars, workshops) where attendees are accountable for attendance and an established set of deliverables

**Instructional Development** – a term interchanged and interconnected with professional development, faculty development or academic development. However, within the context of the study, it is delineated most closely with the Stes et al. (2010) definition, in which instructional development involves activities specifically aimed towards faculty developing their role as an instructor (Stes et al., 2010, p. 26)

**Learner-Centered Instruction** – instructional methodology that engages students as active meaning-makers in their learning with the instructor serving as facilitator of student understanding and transferability (Wiggins & McTighe, 2005)

**Pedagogy** – the art and science of teaching involving instructional strategies that support student intellectual engagement including knowledge acquisition, meaning-making and transfer

**Pedagogical Content Knowledge** – an understanding of a discipline (e.g., content area), in addition to understanding the most effective methodologies in which to represent ideas relating to the discipline to ensure it is comprehensible by others (Shulman, 1987)

**Professional Development** – activities aimed at developing skills relating the career of an educator, not simply limited to their instructional practice, but also including research,
disciplinary knowledge, and social services (Darling-Hammond & McLaughlin, 2011; Stes et al., 2010)

**Transactional Pedagogy** – refers to instructional practice in which the teacher employs instructional strategies designed for students’ knowledge acquisition

**Transformational Pedagogy** - refers to instructional practice in which the teacher employs instructional strategies designed for students’ deep understanding and application of concepts

### Theoretical Framework

A theoretical framework acts as a roadmap by which to shape one’s research from the framing of the problem statement, research question and research design (Anfara & Mertz, 2006). In an effort to understand how faculty perceive the framework of design thinking as it relates to their own professional development, it is crucial to first understand the conceptual framework and its historical trajectory. This section examines the alignment of d.Hasso Plattner Institute for Design at Stanford’s (2010) design thinking process framework to the proposed study involving postsecondary faculty instructional development. This section will first examine the design thinking framework informed by the seminal works of design theorists and will then evaluate the alignment of the theoretical framework to the study and will finish with a brief summation of the ideas presented below.

### The Design Thinking Framework

Design thinking is a new paradigm for engaging innovation and creativity in business, medical and education, and hails from design theory in fields like architecture, art and engineering (Beaird, Geist & Lewis, 2018; Gobble, 2014; Luka, 2014; Johansson-Skoldberg, Woodilla, & Çetinkaya, 2013). In all its applications, the design thinking framework is an abductive, problem-solution-based model that relies on building and testing hypotheses to consider “what might be” in future practice (Beaird, Geist & Lewis, 2018; Luka, 2014). Brown
(2008) describes design thinking as three metaphoric spaces functioning at the core of innovation (see Figure 1). Brown (2008) explains that while these spaces comprise a system for thinking, designers engage in activities within each of the spaces in an iterative and reflexive manner along the continuum of innovation (p. 88). In Brown’s (2008) model, inspiration is the first space, which involves the identification of the problem, the opportunity, or a combination of both. The second space, ideation, is dedicated to generating, developing, and testing ideas, and the third implementation space is dedicated to building a pathway to market for the new innovation (Brown, 2008, p. 89).

From Brown’s (2008) model for design thinking systems and in conjunction with seminal work by Roth (1973), the d.Hasso Plattner Institute of Design at Stanford (2010) constructed a visualization of the framework for design thinking processes (see Figure 2) reliant on convergent
and divergent thinking with the end user in mind. Like Brown’s (2008) design thinking systems, even though the design thinking processes are outlined linearly, they are iterative when operationalized and the designer must work reflexively to maximize innovative change (Beaird, Geist, & Lewis, 2018). In this model, d.Hasso Plattner Institute for Design at Stanford (2010) carefully outlines the processes for broad application of innovation. Design thinking always begins with empathetic exercises toward the end user (e.g., student), wherein the designer engages in ethnographic approaches and data collection to understand and gain insight on the individuals experiencing the problem (d.Hasso Plattner Institute for Design at Stanford, 2010).

When designers have collected data, they then synthesize it into themes to define a problem statement of which the end user is facing. Within the ideation stage, designers engage in activities that activate divergent thinking with the goal of generating new ideas. Ideation usually occurs in collaboration with other designers, and steps beyond obvious solutions as collective perspectives work to uncover unexpected areas of exploration (d.Hasso Plattner Institute for Design at Stanford, 2010). Prototyping is the generation of artifacts by way of active modeling that are intended to answer questions that lead toward a possible solution to the problem statement. This process can manifest in a storyboard or an outline of ideas, but it must be biased toward action (Beaird, et. al., 2018; d.Hasso Plattner Institute for Design at Stanford, 2010). The final mode of the design thinking framework, testing, involves implementing the prototype with the end user and gaining feedback on their experience. As the prototype is tested, the designers ask of their end users, “Why?” as a means to more deeply understand the user as well as to inform future iterations of the prototype (d.Hasso Plattner Institute for Design at Stanford, 2010).

Even though the design thinking processes are expressed in linear progression, it is important to note that the various modes of the framework are visited in various orders (see
For designers to engage deep innovation and creativity, they must continually revisit the definition of the problem that the end user faces and engage in multiple iterations of ideations and prototyping through collective meaning-making with other designers prior to the final testing (d.Hasso Plattner Institute for Design at Stanford, 2010).

Seminal Authors and Historical Trajectory

While a framework for the theory of design was first examined by Simon (1969) in his book, *The Sciences of the Artificial*, the processes of design thinking are grounded in Roth’s (1973) framework within *Design Processes and Creativity*, in which he presented experiential processes necessary for engineering students to engage authentic problem-solving behaviors. Since Simon’s foundational work, there have been five sub-discourses relating to design thinking of which eighty percent of the scholarly literature has been written after 2000 (Johansson-Skoldberg, et. al., 2013; Luka, 2014).

Considered the first sub-discourse of design thinking, Simon (1969) describes the theory of design as one synonymous with the creation of artifacts (Johansson-Skoldberg, et. al., 2013).
In this way, Simon (1969) saw design as a way to transform “existing conditions into preferred ones” (Simon, 1969, p. 4), and he differentiated between activities that created something new from activities that improved upon something that was already created (Johansson-Skoldberg, et. al., 2013). Even though Simon (1969) never used the term “design thinking” in his works, he framed design theory around the creation of new artifacts, and associated adaptation of existing reality as a phenomenon dedicated solely to the sciences (Johansson-Skoldberg, et. al., 2013). In this way, Simon framed design as situated in creativity and innovation of something new.

The second sub-discourse for design thinking stems from Schon (1983) that was grounded in reflective practice (Johansson-Skoldberg, et. al., 2013). In his work, Schon challenged the ideas presented by Simon and considered design and “designerly” thinking as technical knowledge over creative artistry. In contrast to Simon’s theory, Schon (1983) situated design thinking as a practice-based model centering on the reflexive creation and reflection-on-creation of artifacts that, over time, leads to improved competence and recreation (Johansson-Skoldberg, et. al., 2013). Additionally, Schon (1983) was the first theorist to associate design thinking to fields outside of design-based occupations (e.g., architecture, engineering, design), as he introduced the possible application of reflexive design thinking to management (Johansson-Skoldberg, et. al. 1983).

The third sub-discourse presented by Buchanan (1992), borrows from Rittel and Webber’s (1972) “wicked problem” approach (Johansson-Skoldberg, et. al., 2013). Buchanan’s (1992) work was foundational in current design thinking processes, establishing design solutions as indeterminate and without a single solution that can be found from a single-process approach (Johansson-Skoldberg, et. al., 2013). In his model, Buchanan (1992) outlined two processes for problem-solution approach to design: an analytic process involving problem definition, and a synthetic sequence of problem solution (Johansson-Skoldberg, et. al., 2013). Buchanan’s (1992)
model framed the analytic and synthetic approaches as “placements” for contextualization, which allowed the processes of design thinking (e.g., shaping the design problem, creating hypotheses, identifying views of the participants) to occur simultaneously and recursively rather than as sequential steps (Johansson-Skoldberg, et. al., 2013; Luka 2014). In this model, Buchanan (1992) specifies four areas of design thinking as interventions to the problem-solution approach, including (a) graphic design (visual), (b) industrial design (physical), (c) service design (practical), and (d) interaction design (communication) (Johansson-Skoldberg, et. al., 2013).

The fourth design thinking sub-discourse by Lawson (2006) and Cross (2006), named creative design thinking processes as abductive ways of knowing and a practice-based activity rather than a philosophical perspective (Johansson-Skoldberg, et. al., 2013; Luka, 2014). The model is presented as the science of design and aligns principles of Schon’s (1983) notion of design thinking as reflexive practice to a series of steps that a designer takes recursively in his/her design strategy (Johansson-Skoldberg, et. al., 2013). This differs from Simon’s (1969) theory of design science in that it moves away from design as a pragmatic and scientific activity in artifact creation and builds upon the ethnographic research.

The final design thinking sub-discourse stems from Krippendorff (2006), who diverges from Simon’s (1969) design processes as creation of artifacts towards design processes as creation of meaning (Johansson-Skoldberg, et. al., 2013; Luka, 2014). For Krippendorff (2006), meaning lies at the core of design thinking for innovative processes, and from this idea stemmed Verganti’s (2009) argument that innovation in meaning is equally important to technical innovation (Johansson-Skoldberg, et. al., 2013).

Based on the historical trajectory of design theory that began with Simon (1969), Figure 2 exemplifies the current framework for design thinking that borrows heavily from the components of philosophical (e.g., Simon), practice-based (e.g., Schon, Buchanan, Lawson &
Cross), and intellectual reasoning (e.g., Krippendorff, Verganti). The current framework follows a human-centered problem-solving method that is grounded in artifact and meaning creation intended to lead toward innovation (Luka, 2014). While first intended solely for the design fields like architecture and engineering, the current framework for design thinking extends beyond to human-centric fields such as medicine, management and education (Beaird, et. al., 2018; Luka, 2014).

**Justification for Theoretical Framework**

Despite its origin in the architecture and engineering fields, design thinking is emerging in the literature in multiple contexts, including education (Willness & Bruni-Brosso, 2017). Based on its pursuit of innovation by emphasizing end users’ needs, the design thinking framework aligns well to education by allowing reflexivity and indeterminacy to permeate an iterative approach to instructional design (Willness & Bruni-Brosso, 2017).

**Alignment to Problem of Practice**

Design theory and the design thinking framework is structured around the notion that reflexive and collaborative practice conducted in a solution-based approach equips designers with guaranteed sustainability in practice (Luka, 2014). This aligns well with the education profession as the influential internal and external environments keep the field in constant flux, and thereby require its organization members to remain responsive. Additionally, as the postsecondary education field grows in complexity, institution leaders must examine the effective practice of solutions-based responsiveness from organizations in other professional areas. Design thinking proves to invite sustainable innovation and creativity in design fields through its iterative problem-solution processes, it seems promising for a human-centered field like education as well.
In the education field, there is a clear correlation between the structure of design thinking and effective instructional design as a process (Luka, 2014). Therefore, this study will examine faculty’s perception of the effectiveness of the design thinking framework on their professional development relating to their teaching practice. The essence of each of the five components of design thinking (e.g., empathize, define, ideate, prototype, test) have independently appeared in research surrounding teachers’ professional learning experiences, but rarely has the process been evaluated wholly. By applying the design thinking framework to this study, it will address the gaps in the literature while also providing experiential evidence of faculty’s participation to provide first-hand perceptions of design thinking in educational practice.

Alignment to Research Questions

The alignment of the theoretical framework to the research question extends from its alignment to the problem of practice. To understand how the participants of the study experience the design thinking process as a professional development model, it is important to consider in the research question both the current framework as well as the seminal research that comprise the framework. The central research question suggests a broad, phenomenological approach to the study by investigating ways in which participants experience design theory as a professional development practice.

Specifically, while broad, the central research question aligns directly to the practice-based design scholars’ philosophy around the human-centrism that comprises design thinking. By asking how participants engage with their colleagues around attention to the end-user’s needs, the question aligns to Schon’s (1983) and Lawson and Cross’s (2006) foundational principle that innovation is formulated with the end-user in mind (empathize/define), and that it is through reflexive and collaborative practice (ideate) whereby one disrupts status quo. The research question aligns directly with Buchanan’s (1992) problem-solution design methodology,
evidenced in the “define” and “test” portions of the design thinking framework. Additionally, the research question attends to the broader notion of design thinking as sense-making activity presented Krippendorff (2006) while still considering Buchanan’s (1992) conceptual processes that defined the iterative (analytic, synthetic) nature of design thinking. Finally, the central research question investigates design thinking as incubator for innovation by asking participating faculty their beliefs and attitudes toward its incorporation into professional development as it relates to their instructional practice. This seeks to explore the design thinking process as a whole, and to gauge any alignment between the iterative, multiple-solution method to the structure of participant’s instructional design planning.

**Application to Study**

The fundamental goal of this study will be to understand how faculty experience the “messy” processes of design thinking and to understand their perceptions and beliefs on this framework as a methodology for professional development. To best capture how postsecondary faculty of various background engage with design thinking, this study will employ a phenomenological approach that will include two interviews with each of the individuals who participated in the same design thinking workshop(s). The research question is framed around the components of the design thinking framework and thus serve as a valid alignment to the theoretical framework. Further, because the research question is aligned with the design thinking framework, there is a stronger likelihood that there will be a consistency across the data for which significant statements can effectively be grouped into units.

**Conclusion**

As stated previously, the higher education landscape is shifting rapidly and growing in complexity that is difficult for faculty to provide high-quality pedagogy that meets the demands of the context (Hendry & Dean, 2002; Kivunja, 2014; OECD, 2012; Satsope et al., 2015;
SHEEO, 2016; Ward & Sylvester, 2012; Willness & Bruni-Bossio, 2017). With limited time to dedicate to scholarship of teaching due to the requirements or research scholarship, postsecondary leadership and faculty must find ways to incorporate opportunities for professional learning that is efficient and based on the practitioner’s experience (OECD, 2012; Willness & Bruni-Bossio, 2017). With research touting design thinking framework as a method for igniting innovation and sustainability in adaptive thinking, there is promise for its effectiveness in higher education for professional learning.

Therefore, this study focuses on faculty’s experiences with design thinking that was central to faculty development workshop. First conceptualized in Simon (1969) as design theory, the design thinking framework has grown into a model wherein the key tenets include human-centeredness, collaboration, reflexive practice, and bias toward action in a problem-solution approach (Beaird, et al, 2018; Brown, 2008; Gobble, 2014; Luka, 2017; Willness & Bruni-Bossio, 2017).

The design thinking framework was selected because of the research conducted on its effectiveness in design fields as well as the emerging data showing its effectiveness in service fields such as medicine and management (Beaird, et al, 2018; Brown, 2008; Gobble, 2014; Luka, 2017; Willness & Bruno-Bossio, 2017). Because the design thinking framework has not yet been applied to faculty development in education, there are clear limitations to this study. However, this study will serve as a window into the ways in which education faculty use design thinking to shape meaning around their teaching practice. In the end, this study will help inform the literature and could serve as a springboard for future theory relating to how design thinking is adapted to fit within the context of postsecondary education and potentially change an R1 institution’s approach to faculty instructional development.
Chapter Two: Literature Review

Introduction

External factors associated with a globalized economy place pressures on postsecondary educational institutions to move away from an input-output model towards an outcomes-based model (Fink, 2013; Organisation for Economic Co-operation and Development [OECD], 2012). This pressure is precipitated by a transformed societal expectation of what and how learners engage with requisite cognitive and noncognitive competencies (Fink, 2013; OECD, 2012). Research suggests that institutions stuck in the traditional, “factory model” approach to teaching and learning remain at a competitive disadvantage to institutions that foster quality teaching beyond a lecture-based approach (Fink, 2013). Furthermore, research has long indicated the relative ineffectiveness of lecture-based teaching in learner’s knowledge retention and mastery learning in cognitive and noncognitive competencies (Fink, 2013). Thus, institutions that wish to remain competitive in the global market must encourage faculty to engage modes of teaching that are outcomes-driven and that create a high-quality learning environment for students (Billing, 2011; Fink, 2013; Norman & Spohrer, 1996; OECD, 2012; Stukalina, 2008; Wenger & Snyder, 2000; Wiggins & McTighe, 2005).

This notion of transitioning faculty from acting primarily as lecturers to faculty acting primarily as designers of high-quality learning environments is a complex and multi-layered process that requires intentionality in the faculty’s instructional development (OECD, 2012). While there is an increased number of teaching excellence centers in higher education institutions experimenting with singular teaching and learning initiatives around active and experiential learning, there still remains disparity between these initiatives and a change in faculty practice (Fink, 2013). Research shows that it is difficult to change ingrained beliefs and behaviors that have been reified over the course of one’s career (Burke, 2014; Drago-Severson,
2009; Fink, 2013). This is further complicated by research showing that professional development not coupled directly to the instructors’ practice does little to change their behavior (Darling-Hammond, Wei, Andree, Richardson, & Orphonos, 2009; DuFour, 2004; Holdsworth & Hegarty, 2016). Therefore, attention must be directed towards finding a method of professional development wherein practitioners can problematize their practice through a deep approach to learning (Fink, 2013). To do this effectively, this first requires an understanding of the various identities comprising the postsecondary institution and its instructors, as well as an understanding of the history of related instructional development programming designed to foster professional educator identities.

Thus, this literature review will investigate three strands of the field literature surrounding postsecondary faculty identity and professional learning. First, this literature review will explore the intersectional identities comprising higher education institutions and postsecondary faculty. Next, this review will examine professional learning in education institutions and its potential structures for instructional development to best impact transformational change in postsecondary education. Third, this review will investigate the foundations of learning and explore the science around deep, cognitive understanding. Finally, a summation will synthesize the key ideas of the literature and provide an analysis of the gaps in the research as it applies to the design of postsecondary faculty professional learning and instructional development.

Identities within the Higher Education Structure

Over the course of the 20th century and now into the 21st, the priorities of higher education institutions in America have evolved to include an interdependency between the university and its constituents and stakeholders (Flecknoe, Choate, Davis, Hodgson, & Johansen, 2017; Jongbloed, Enders, & Salerno, 2008). Rapid changes stimulated by information
technology’s ability to compress both space and time has also increased the number of constituents invested in higher education’s societal role, and institutions have become increasingly dependent on the audit culture of such public domains (Clegg, 2009; Flecknoe et al., 2017; Jongbloed et al., 2008).

Within the context of the higher education structure, academics’ roles have also evolved into an interconnectedness between their discipline-specific research, their teaching capacity, and their service contributions to the broader academic and social community (Flecknoe et al., 2017). This is more complex than the 19th century Humboltian model for higher education that promoted academics’ union between their research interests and their teaching (Flecknoe et al. 2017). Additionally, the massification of higher education and an increasingly diverse student population has created a tension within an academic culture that has historically reproduced the values of a predominately white, male, professional class (Clegg, 2009). Thus, it is important when developing a framework for instructional development to understand the contexts and tensions that faculty face in this shifting role and to examine research dedicated to their identity formation. The following section will first provide insight into the various contexts of identity within higher education institutions. Next, this section will investigate the professional identities of postsecondary faculty, including their roles as disciplinary researcher, instructional scholar and engaged leader. Finally, a conclusion will synthesize the literature and examine the salient takeaways as it applies to the proposed research study.

**The Context of Institutional Identity**

The evolving role of higher education institutions in the 20th century resulted in a clear delineation between the research institution and the polytechnic institution in terms of their relative prestige (Clegg, 2009). This hierarchical divide originated first in the United Kingdom (UK) in the 1950s, but such a binary separation could also be seen in universities across America
based on its colonial connection to the UK (Clegg, 2009). As its identities were evolving throughout the 20th century, the higher education institution in America developed systems that underscored research over teaching (Clegg, 2009; Flecknoe et al., 2017). This was further complicated in the advent of the 21st century, when higher education institutions began facing economic pressures associated with a relative decrease in government funding (Flecknoe et al., 2017; Jongbloed et al., 2008). This has resulted in postsecondary institutions’ greater reliance on competitive research grants for funding, thus motivating institutions to recruit and promote academics based on research reputation rather than the quality of their teaching (Flecknoe et al., 2017). In this way, by placing focus on the revenue generated by research grants, the university’s prestige continues to be determined by the scholarly attainment of its academics as it were in the 20th century (Jongbloed et al., 2008). Additionally, the increased revenue experienced in research-rich institutions provides them economic competitiveness analogous with elite status that generates enrollment (Clegg, 2009; Flecknoe et al., 2017). This leaves research-poor, teaching institutions struggling with funding gaps, and a lesser status that leads to a negative societal perception of the teaching-centric model (Clegg, 2009; Flecknoe et al., 2017).

However, despite pressures to obtain research grants, the higher education institution has always been a complex social actor whose underlying role is preparing learners for contributions to society (Clegg, 2009; Jongbloed et al., 2008). In addition to developing systems that foster financial sustainability, higher education institutions must strategically plan for social equity considerations surrounding the diverse learning needs of a student population with varied backgrounds (Flecknoe et al., 2017; Jongbloed et al., 2008). This obfuscates an already complex identity of the higher education institution, triggering a reassessment of the institutions’ function within the “social contract” between the institution and society (Jongbloed et al., 2008, p. 306). This social contract comprises the institutions’ mission to provide access options and varied
educational experiences to meet the individual needs of a diversified student body and assume a public service identity that is directly associated with social change (Jongbloed et al., 2008). This has precipitated change in higher education institutions’ position within the societal communities, thus pressuring them to center their missions beyond excellence in discipline-specific research to include excellence in teaching and significant contributions of community service (Jongbloed et al., 2008).

Jongbloed and colleagues (2008) posit that to thrive in a complex environment with its equally complex identity, higher education institutions should adopt a stakeholder approach to management to avoid “mission confusion” (p. 308). By using the stakeholder concept, higher education institutions can purposefully assess the attributes of the various stakeholder groups and prioritize their obligations to certain stakeholders based on their influential power, relationship legitimacy and sense of urgency with the organization (Jongbloed et al., 2008). Institution adoption of the stakeholder concept will also prevent additive solutions to stakeholder demands or “mission overload” in trying to meet all the demands of all the stakeholders (Jongbloed et al., 2008, p. 321). In this manner, it is important to note that based on the three attributes of the stakeholder concept, students remain at core and higher education institutions must ensure they meet the needs of students (p. 305). Academics also remain an important stakeholder within this structure, as their role involves implementing the services directed by the institution (Jongbloed et al., 2008). Finally, societal accountability and corporate responsibility demands that higher education institutions commit to significant innovation contributions to a knowledge beyond rudimentary research outputs (Jongbloed et al., 2008, p. 321). In the end, higher education institutions are responsible for their responsiveness to prioritized stakeholders, and in their ever-changing identities, the institution must continually reorient the legitimacy and accountability of its academic norms to meet the demands of this constituency.
Professional Identities of Postsecondary Faculty

Abu-Alruz and Khasawneh (2013) define professional identity as a “core set of values, beliefs and assumptions about the distinctive characteristics of one’s selected career…” that is based on their commitment to their professional practices (p. 431). There is agreement in the literature that educators’ professional identity is dynamic, and that multiple factors influence its fluctuations over time and in an ongoing process (Abu-Alruz & Khasawneh, 2013; Beauchamp & Thomas, 2009; Mathany, Clow & Aspenlieder, 2017). The meaning behind one’s professional identity is linked inextricably to one’s self-identity and is populated by the interplay between one’s actual self (e.g., current identity), their ought self (e.g., external or societal expectations), and their ideal self (e.g., individual goal) (Beauchamp & Thomas, 2009). This ever-changing identity is one that connects meaning of past practice with current practice, thus informing the future direction of one’s practice (Abu-Alruz & Khasawneh, 2013; Mathany et al., 2017). One’s core identity is composed of both a person and a context, and research suggests that the more committed that educators are to the context of their practice, the stronger their professional identity as an educator (Abu-Alruz & Khasawneh, 2013; Beauchamp & Thomas, 2009; Mathany et al., 2017).

Postsecondary faculty identity is multi-dimensional and intersectional based on their varying roles within the institution (Abu-Alruz & Khasawneh, 2013; Beauchamp & Thomas, 2009). Further, there are constant tensions for postsecondary faculty between their disciplinary researcher identity and their educator identity; both of which are influenced by society and culture (Abu-Alruz & Khasawneh, 2013; Mathany et al., 2017). In fact, Mathany and colleagues (2017) suggest that the degree to which a faculty member engages in disciplinary research in comparison to their level of engagement in scholarship of teaching can have a large impact on their professional identity (p. 2). This is particularly significant given that research shows that
educators who possess a strong professional educator identity are also individuals who are more inclined to develop professionally and cope with educational change (Abu-Alruz & Khasawneh, 2013).

**Faculty as disciplinary scholar.** The disciplines remain central to the lifeblood of the institution as they serve as the primary social foundation of higher education (Becher, 1994). Because of this emphasis of the disciplines within higher education, faculty experience pressures from the institution and broader academic society to prioritize their identity as disciplinary researcher within the contexts of their discipline area (Andreson, 2013; Beauchamp & Thomas, 2009; Mathany et al., 2017).

Since the 20th century, the disciplines have been categorized into four academic clusters including the hard pure (e.g., natural sciences), soft pure (e.g., humanities and social sciences), hard applied (e.g., science-based professions) and soft applied (e.g., social professions; Becher, 1994). Within these disciplines exists a common culture by which the discipline and its cognitive aspects are intertwined (Becher, 1994). This community culture that exists among the four academic clusters respectively consists of individuals who embody similar ways of knowing and approaches to the disciplinary work (Becher, 1994).

In academia, recognition as a researcher is paramount to a faculty member’s success and promotional opportunities (Mathany et al., 2017). Because institutional growth is often tied to a faculty member’s research earnings, and their promotional criteria is based on the number of disciplinary publications produced, identity as a researcher is one of most concern to most faculty (Andreson, 2000; Mathany et al., 2017). Therefore, as one’s perceived professional integrity and status lies in the degree to which a faculty member engages in scholarly research, many spend their time focusing on their scholarly research, especially in the early years when they are trying to build credibility in their discipline (Mathany et al., 2017). Mathany and
colleagues (2017) suggest that this delineation is established as early as when faculty are still graduate students (p. 2). In their study, Mathany and colleagues (2017) reported that most graduate students prioritized the research that directly protected their status as disciplinary researchers (p. 2). Further, academics require a deep knowledge of their discipline to obtain this status, specifically a strong understanding of the epistemological beliefs held by other members of the community (Andreson, 2000). Thus, academics’ research quests tend to be focused on their personal well-being as an intellectual in their field over the commitment of caring for others’ learning (Andreson, 2013). In this way, faculty’s continued focus over time on their identity as disciplinary researcher begets a culture that reifies the perceived credibility of research scholarship over teaching scholarship (Andreson, 2013; Beauchamp & Thomas, 2009; Mathany et al., 2017).

Faculty as instructional scholar. Empirical research suggests that faculty’s professional educator identity is conceived by their cognitive possession of their subject matter, pedagogical and didactical knowledge (Beauchamp & Thomas, 2009). In addition to the influence of faculty’s self-identity, professional educator identity is mostly informed by external factors like their historical educational experiences both as student and teacher, as well as the contextual forces associated with institutional and political agendas (Abu-Alruz & Khasawneh, 2013). While research suggests that strong educator identity positively affects student learning and improves faculty’s coping abilities with educational change, many faculty scholars still hold a negative perception regarding the scholarship of teaching and learning (Abu-Alruz & Khasawneh, 2013; Beauchamp & Thomas, 2009; Mathany et al., 2017). This is due in part by the prestige surrounding disciplinary research and the lack of credibility that instructional scholarship possesses in the research hierarchy (Beauchamp & Thomas, 2009; Mathany et al., 2017). Other researchers suggest that for faculty to develop a strong professional educator
identity, they must scale back their discipline-specific research to engage with teaching and learning scholarship and reprioritize their collegial role within their disciplinary community (Flecknoe et al., 2017). This could negatively affect faculty’s perception of their status, thus affecting their self-esteem and ultimately their overall professional identity (Beauchamp & Thomas, 2009; Flecknoe et al., 2017). Many instructors are afraid that focusing on instructional scholarship could compromise their reputation as a disciplinary researcher and leave them “pigeonholed” into being viewed by their peers within their disciplinary community as an instructional scholar (Mathany et al., 2017).

Faculty’s professional identity as an instructional scholar is malleable and research shows that it is important to consider the emotional and situational context by which it is influenced (Beauchamp & Thomas, 2009). In a study conducted by Mathany and colleagues (2017), all participants expressed that formal training promoting teaching and learning scholarship increased their awareness and confidence in their professional educator identity (p. 11). In another study, Flecknoe et al (2017) illustrated that faculty’s participation in academic development training with their peers helped shape their professional identity by easing their feeling of inadequacies and guilt (p. 4). This aligns with research conducted by Abu-Alruz and Khasawneh (2013) reporting that faculty maintained strong professional educator identity and feelings of efficacy when they belonged to a group of educators with whom they could share experiences (p. 432; p. 439). Indeed, situating faculty’s professional identity development within an emotionally positive context that fosters faculty engagement with other practitioners could have an influential impact on their overall identity as an instructional scholar (Beauchamp & Thomas, 2009).

Faculty as engaged leader. Given the prevalence of their role in running the university system from an instructional and research delivery perspective, academics also maintain work-related identity as engaged leaders in the academic decision-making surrounding the university
According to Collinson (2012), teachers develop their learning and grow professionally by being actively involved in leadership activity (p. 257). By placing instructors as collaborative and engaged leaders, Collinson (2012) argues, creates new possibilities for learning that may not otherwise transpire. This could positively shape the professional identity of the educators (Abu-Alruz & Khasawneh, 2013). Further, informal teacher leadership opportunities enable reciprocal relationships between colleagues and results in the sharing of diverse perspectives that challenge traditional practice (Collinson, 2012; Drago-Severson, 2009). In this capacity, teachers obtain a leadership position organically from the inside-out as they “learn by doing” (e.g., team teaching) or “learn by leading” (e.g., peer observation) (Collinson, 2012). This positive interaction with colleagues in an active decision-making role with their colleagues beyond their discipline could serve to boost their identities beyond disciplinary researcher (Jongbloed et al., 2008).

Given that the meaning-making process is limited by the social context of the individual, informal leadership opportunities enhances the extent by which professional growth occurs in an organization (Uhl-Bien, 2006). In fact, educators participating in leadership as a network of professionals bring with them diversity in perspective for the best ways to meet the desired outcomes of the organization (Conway & Andrews, 2015; Denis, Langley, & Rouleau, 2010; Heck & Hallinger, 2010; Kosterelioðlu, 2017). Valcea and colleagues (2011) posit that participatory leadership is not only agentic to individual cognitive and professional identity development, but it also leads to effective problem-solving and “inter-systemic thinking” due to the multiple perspectives embedded within (p. 609). For the individual faculty member, collaborative leadership plays an integral role in helping them develop cognitively (Valcea et al., 2011). The collaborative decision-making initiates disequilibrium in the established behaviors of the organization, and it also sparks disequilibrium in the individual as s/he engages in multiple
perspectives of the group (Valcea et al., 2011). As a collaborative and engaged leader, the individual member of the group questions “big truths” that are fundamental to their belief system and work through their own cognitive development (Drago-Severson, 2009). According to Drago-Severson (2009), in this context of collaborative leadership, individual change arising from participation in multiple perspectives and reflective practice provokes change in the faculty’s professional identity (Beauchamp & Thomas, 2009).

Conclusion

Higher education is a complex system with many influences shaping the institutions’ and the practitioner’s identity (Flecknoe et al., 2017; Jongbloed et al., 2008). On the institutional level facing new challenges presented by its external environment, an increase in stakeholder interest can cloud the mission and focus of the institution (Jongbloed et al., 2008). In this way, Jongbloed and colleagues (2008) propose that higher education institutions utilize the stakeholder concept (e.g., stakeholder legitimacy, urgency and power) to avoid mission confusion and mission overload. Based on this stakeholder concept, Jongbloed and colleagues (2008) posit that the students remain at the center of influence and the institution should maintain this stakeholder group as its utmost priority next to the faculty, whose role it is to execute the majority of initiatives driven by the institution.

Like the institutional identity, faculty professional identity is also complex and multidimensional. At the core, faculty strive to maintain credibility as a disciplinary researcher and with current funding gaps, institutions provide more incentive to scholars who produce publications (Flecknoe et al., 2017; Jongbloed et al., 2008). The institutions’ emphasis and subsequent incentivization of disciplinary research negatively affects faculty’s desire to engage in the scholar of teaching, learning and leadership (Beauchamp & Thomas, 2009; Flecknoe et al., 2017). Faculty worry that emphasis on instructional scholarship will result in a lesser reputation
as a disciplinary researcher (Flecknoe et al., 2017). Nevertheless, research affirms that faculty who are engaged with the multiple perspectives of their colleagues’ helps positively shape their professional identity.

This narrative is important for this study because of its focus on instructional development within a system that does not often prioritize scholarship of teaching and learning. Research indicates that a changing higher education landscape must also precipitate an evolution in the focus of the institution and the role of the faculty (Abu-Alruz & Khasawneh, 2013). Nuanced identities of the faculty per their respective discipline make developing instructional development for the masses difficult, if not wholly ineffective (Clegg, 2009). However, instructional development that aligns with the social construct of design thinking may, in fact, make a larger impact on individual faculty’s professional identity development. Not only does design thinking occur in rapid succession, making the most effective use of participants’ time, but it also allows for individualized thinking within a group setting rather than to spotlight group thinking and consensus in the traditional model of instructional development (Brown, 2009).

Professional Development

Research suggests that effective implementation of problem-based, educator professional development can improve the teaching practice and overall learning outcomes of an academic institution (Darling-Hammond, 2005). The following section will first provide an overview of effective professional development implementation within an academic setting. Next, this section will examine models of professional development, including professional learning communities and professional learning networks, and analyze their implementation in a higher education setting. Finally, a conclusion will synthesize the literature and examine the salient takeaways as it applies to the proposed research study.
Many scholars have established that professional development is central to improving teacher practice and student achievement (Daniels, 2017; Darling-Hammond, Wei, Andree, Richardson, & Orphanos, 2009; Doppelt et al., 2009; Drago-Severson, 2007; Trust, Carpenter, & Krutka, 2017). These studies indicate that traditional professional development is designed to initiate systemic changes in professional practice by targeting specific skills and knowledge, particularly in primary and secondary education, where teacher improvement efforts are ubiquitous (Guskey, 2002; Trust, Carpenter, & Krutka, 2017; Trust, Krutka, & Carpenter, 2016). However, scholars agree that traditional professional development often consists of short, day-long workshops that are driven by administration who fail to contextualize the content of the workshop with the actual practice of teachers (Darling-Hammond, Wei, Andree, Richardson, & Orphanos, 2009; Doppelt et al., 2009; Graham, 2007; Guskey, 2002; Trust, Carpenter, & Krutka, 2017; Trust, Krutka, & Carpenter, 2016). Thus, professional development efforts often fail when their focus belies teachers’ experiences in their classrooms (Darling-Hammond et al., 2017; Guskey, 2002). Additionally, when considering the higher education landscape where instructors are highly specialized in a specific discipline, Trust and colleagues (2017) show that institution- and department-wide professional development workshops rarely serve to support improved practice that leads to transformational change. This data is further supported by Fink (2013), who posits that despite faculty and administration knowledge of high-yield and highly effective instructional practices, they are not implemented with enough prevalence to initiate significant change across the institution (p. 3).

Quality professional development derives from sustained professional learning that is connected to instructors’ praxis and that challenges espoused beliefs (Daniels, 2017; Darling-Hammond et al., 2009; Doppelt et al., 2009; Dufour, 2004; Dufour, 2007; Trust et al., 2017; Trust et al., 2016; Wood, 2007). This means that professional development is only successfully
implemented when it transcends the one-off workshop or day-long in-service training and embeds itself into the recursive culture of the learning institution (Darling-Hammond et al., 2009; Dufour 2004; Guskey, 2002; Trust et al., 2016; Wood, 2007). In addition, because of the social nature of education, effective professional development must be grounded in educator’s experience and it must take on a social and constructivist approach to professional learning (Darling-Hammond et al., 2009; Dufour, 2004; DuFour, 2007; Trust et al., 2017; Trust et al., 2016). In this way, educators maintain agency over their practice, while also building capacity through collaborative reflection with their peers (Dufour, 2004; Drago-Severson, 2009; Trust et al., 2016).

Professional Learning Communities for Professional Development

Because of the research detailing the ineffective nature of traditional professional development, researchers call for a semantic shift toward “professional learning” (Trust et al., 2016). In context, professional learning expands upon the tenets of traditional professional development (e.g., sustained trainings embedded in school culture and tied to the practitioner’s praxis), because while it still focuses on improving teacher practice, this less formal, ongoing learning structure is framed around generative practitioner collaboration (Daniels, 2017; Dufour, 2004; Dufour, 2007; Drago-Severson, 2009; Guskey, 2002; Trust et al., 2017). A majority of professional learning of this caliber is situated in K-12 settings in the form of professional learning communities (e.g., PLC; Dufour, 2004; Dufour, 2007; Trust et al., 2017). Here, educators engage with their colleagues in critical conversation and critical reflection about their practice as it aligns to student achievement (Daniels, 2017; Dufour, 2004; Drago-Severson, 2009; Guskey, 2002; Popp & Golman, 2016; Trust et al., 2016). Through professional dialogue that centers on student achievement and shifts in institutionalized practices, all PLC participants sustain mutual accountability for school improvement (Dufour, 2004). Researchers show that
when implemented properly, PLCs lead to paradigmatic changes in the individual and collective group across institutions (Dufour, 2004; Dufour 2007; Popp & Goldman, 2016).

Within a PLC, it is a collective belief that teachers will expand their knowledge and skills, build their capacity and ultimately improve their efficacy beliefs relating to their pedagogy (Doppelt et al., 2009; Dufour 2004; Popp & Goldman, 2016; Takahashi, 2011). Guskey (2002) argues that increasing teachers’ competencies is an arduous and prolonged process that is hindered by teachers’ reluctance to shift their belief that new practices or procedures will work in their classroom (p. 386). However, because knowledge is socially constructed, as members of the learning community challenge deep assumptions and practice, teachers’ participation in a learning community leads to mental model shifts (Drago-Severson, 2009; Popp & Goldman, 2016). When teachers engage with colleagues in critical conversations that center on questions of information seeking, elaboration and negotiation, the individual is likely to build knowledge capacity away from his/her espoused beliefs (Popp & Goldman, 2016).

In the social network of a PLC, participants are also able to build self-efficacy beliefs as they co-construct knowledge (Takahashi, 2011). Research shows a strong correlation between teachers’ self-efficacy beliefs, their pedagogical decisions and student performance (Takahashi, 2011; Popp & Goldman, 2016). Through critical collaboration in a PLC, Takahashi (2011) found that teachers who worked in a low-performing middle school were able to co-construct high efficacy beliefs, which separated from the school’s propensity for a self-perpetuating, negative cycle of low performance and low efficacy among its teachers (p. 740). In the study, as teachers shaped dialogue around student performance, they collectively negotiated their meaning-making of their shifting identities as teachers through shared experience among a community of practitioners (Takahashi, 2011). For example, Takahashi (2011) reported that four teachers of different content areas (e.g., special education, science, humanities) examined student
data in a collaborative setting to collectively make meaning of the information presented by student performance. It was within this social context, as the teachers collectively established evidence-based decisions, their conceptualization of their teaching practice as well as the school environment was positively impacted (Takahashi, 2011).

One limitation of the professional learning community, however, as noted by both Takahashi (2011) and Popp & Goldman (2016), is that the depth of knowledge building was determined by the participating members of the collaborative community and the foci of the meetings. While a defining tenet of a professional learning community is that it is generative based on its members’ participation and the evolutionary co-construction of knowledge, transformative change is limited by the context and content of the meetings (Doppelt et al., 2009; Popp & Goldman, 2016; Takahashi, 2011). Popp & Goldman (2016) posit that in the collaborative setting, the type of questions that are asked can lead to developmental learning that improves ideas from weak to more robust (p. 358). However, in a generative, inquiry approach indicative of a traditional PLC, teachers’ knowledge building development was shown to fluctuate based on the focus of the meeting (Popp & Goldman, 2016). When teachers used student performance on assessment, there was greater knowledge building than when teachers discussed pedagogy (Popp & Goldman, 2016). Takahashi (2011) also found that teachers maintained higher efficacy and knowledge construction surrounding student performance and assessment rather than instructor’s pedagogical content knowledge (p. 737).

Doppelt and colleagues (2009) suggest schools should implement a framework for collaborative practice that operates in tandem with targeted knowledge building around curriculum reform. In this content-based collaborative inquiry (CBCI), teachers participate as teacher-learners in collegial inquiry, where they share personal experiences from their classroom, but they also participate in a series of workshops designed specifically around individual and
collective group needs for reforming curriculum (Doppelt et al., 2009). Researchers gauged student achievement across three research subgroups, including a control group of educators teaching established curriculum, a reformed curriculum implemented by teachers who did not participate in professional learning, and a reformed curriculum implemented by teachers who participated in collaborative practice around the development of the new curriculum. The results show that the reformed curriculum that was implemented by teachers who had participated in guided, collaborative practice designed to meet their knowledge building needs had a greater impact on student achievement than the other two subgroups (Doppelt et al., 2009). These results verify the effectiveness that an individual’s knowledge building has on student learning, and they also provide greater merit to frameworks for guided inquiry such as a PLC. Thus, a study conducted by Doppelt and colleagues (2009) shows that through intentional collaborative practice, teachers’ pedagogical content knowledge is deepened both individually and as a group, which has a significant impact on student learning (Popp & Goldman, 2016).

While research surrounding the effectiveness of professional learning communities is pervasive in K-12 education, very little research is dedicated to their role in advancing knowledge for higher education faculty (Daniels, 2017; Trust et al., 2017; Trust et al., 2016). This is partly due to the isolative nature of higher education, where highly specialized faculty work in research silos among their departments (Trust et al., 2016). Other limitations stem from the structure of higher education and the “academic culture clash” that exists across the disciplines (Bui & Baruch, 2010). This makes systemic and systematic professional learning communities difficult to enact in the same way that the practice is commonly implemented in K-12. However, given research that shows the transformational impact that PLCs have on teachers’ praxis in K-12 districts, there is evidence to support the benefits of similar practice in higher education (Trust et al., 2016; Trust et al., 2017).
Praxis in Action

Employing the principles of adult learning, it is important for higher education to prioritize a framework for organizational learning across the institution that stresses a collective accountability for effective teaching, learning and leadership (Drago-Severson, 2009; Bui & Baruch, 2010). Daniels (2017) suggests that higher education institutions should promote contemporary professional learning practices that allow professionals across the organization to engage in praxis in action rather than focus strictly on building competencies (p. 179). Through “praxis in action,” all faculty participate in individual scholarship of research as well as scholarship in teaching, which they then apply and adapt to new ideas, reasoning and reflection as they develop their learning (Bui & Baruch, 2010; Daniels, 2017; Drago-Severson, 2009).

An example of “praxis in action” is demonstrated in the study conducted by Szteinberg and colleagues (2014), where postsecondary chemistry faculty engaged in a design-based community of practice with postdoctoral researchers and secondary science teachers with the collective goal of bridging gaps between chemistry teachers and contemporary chemistry research (p. 1402). Here, the group structured the collaboration as an iterative process designed to be reflexive based on the university researchers’ findings from research, as well as the classroom experiences of both the secondary and the university faculty (Szteinberg et al., 2014). The group first engaged in professional learning by examining existing knowledge and beliefs of each individual pertaining to the chemistry curriculum, and then began contextualizing research findings with classroom pedagogy and curriculum. The collaborative community maintained a similar structure for each of its meetings, though the content of the information discussed changed based on the group’s increased knowledge capacity (Szteinberg et al., 2014). This reflexive process developed from individual and collective learning experiences and resulted in participants’ perception that the social co-construction of knowledge increased their efficacy.
beliefs as well as their adaptability for the evolutionary changes associated with chemistry education (Szteinberg et al., 2014).

Given the time and location constraints of higher education, Trust and colleagues (2017) suggest that postsecondary faculty can engage in impactful communities of practice in a virtual setting, referred to as professional learning networks (e.g., PLNs; p. 18). First introduced by Trust and colleagues (2016) as a way for K-12 teachers to engage in collaborative professional learning in an online community, Trust and colleagues (2017) posit that a similar structure in higher education can break down the silos of practice that occur in higher education (p. 2). Trust and colleagues (2017) argue that due to the shifting landscape of higher education, more faculty are engaging in digital learning spaces and social media platforms than they have before (p. 2). These professional learning networks work similarly in design as the professional learning communities commonly implemented in K-12. These professional learning networks are designed to promote shared knowledge-building, develop social capital and provide space for faculty to give and receive emotional support (Trust et al., 2017; Trust et al., 2016). Like a PLC, participants in a PLN contribute to collective knowledge building by sharing professional experience and research relating to practice. The difference, however, is that in a PLN, participants interact with blog posts, hashtags that categorize and archive information, and virtual projects that transcend space and time (Trust et al., 2017). According to the results of the study conducted by Trust and colleagues (2017), there are limited barriers for postsecondary faculty and staff to participate in a technology-enhanced PLN, (e.g., greater access to the Internet and social media), and many of the higher education faculty who participated in their study reported positive impacts on their professional growth in teaching and learning (p. 8).

Research shows that there are many benefits stemming from intentional and sustained professional learning opportunities, including improved educator self-efficacy, deeper content
knowledge, and increased student performance (Bui & Baruch, 2010; Daniels, 2017; Darling-Hammond et al., 2009; Doppelt et al., 2009; Dufour, 2004; Dufour, 2007; Guskey; 2002; Popp & Goldman, 2016; Szteinberg et al., 2014; Takahashi, 2011; Trust et al., 2017; Trust et al., 2016). Despite the effectiveness of a professional learning community in a K-12 setting, limitations in time, specialization, and organizational structure make implementation of a sustained professional learning community difficult in higher education (Daniels, 2017; Szteinberg et al., 2014; Trust et al., 2017). For example, the tendency for senior leadership in higher education to physically and socially organize faculty by disciplines with little incentive for interdisciplinary collaboration continues to challenge systemic professional learning (Daniels, 2017). As a way to shift mental models beyond the boundaries of the isolative departments of higher education, Trust and colleagues (2017) suggest that higher education faculty development centers implement an online professional learning community in the form of a professional learning network to allows faculty the ability to participate and improve praxis in an online setting. While results of the study were generally positive, the limited empirical research and lack of consideration for technology as a barrier justify the need for more research in this area when looking into research surrounding transformational change in higher education.

Conclusion

Due to the lack of evidence of design thinking as a framework for instructional development in education, PLCs and PLNs are important to examine as the principles surrounding them are synergistic with the tenets of design thinking (Brown, 2009). Both support the notion that transformation stems from the participation of group members to solve a problem, but PLCs are limited by its reliance on co-construction of knowledge within the context of a meeting (Doppelt et al., 2009; Popp & Goldman, 2016; Takahashi, 2011). Design thinking, however, fosters a culture of innovation by encouraging an interdisciplinary team to work
together, but through encouraging continuous innovation through ideation and iteration (Brown, 2009). Design thinking adopts the tenets of PLC (e.g., collective meaning making to shift identity through shared experience) and improves upon them by crafting a learning experience that is derived from the ideas of the group but personalized to the individual faculty based on their unique set of established problems (Brown, 2009; Takahashi, 2011). Finally, research shows that, historically, when instructors were tasked with engaging conversation around instructional development in a PLC, they often discussed problems with student assessment rather than proactive pedagogical practice (Popp & Goldman, 2016). A design-thinking approach to instructional development circumvents this, as it is inherently problem-solution based, by asking participants to engage with the problem and then to devise the solution (Brown, 2009). In this way, a framework for instructional development that borrows that effective tenets of PLC while embedding functional requirements of a design thinking framework, may serve to initiate lasting change.

**Learning Foundations and Deep Understanding**

Core to conversation about learning is the considerations for the meaning of the word “understanding” in a biological and academic context. The following section provides an overview of the ways in which academic researchers have historically qualified and quantified the term “understanding.” Next, this section will examine the neurobiology of learning, including synaptic plasticity, effective neural pathways and long-term potentiation. Finally, this section discusses the characteristics of deep understanding and its application to one’s learning experiences.

By definition, the notion of qualifying “understanding” derives from Benjamin Bloom’s (1956) taxonomy for learning, wherein he identified six cognitive domains thus qualifying understanding. These six domains appear on a hierarchical scale from cognitively easy to
cognitively difficult and each domain was meant to gauge levels of understanding (Bloom, 1956; Fink, 2013; Wiggins & McTighe, 2011). Foundationally, the cognitive domains taxonomy developed by Bloom (1956) indicates that understanding and knowledge coexists in each domain; however, deep and transferable understanding involves one’s ability to propagate specific knowledge and skills for a task and successfully transfer them to novel situations (Billing, 2011; Wiggins & McTighe, 2005).

Years removed from Bloom’s taxonomy, Fink (2013) proposed a new taxonomy for “significant learning,” which defines learning as information that is committed to the everyday lived experiences of the learner rather than as content merely committed to short-term memory (p. 7). Here, Fink (2013) identified six, interrelated categories that learners must engage in order to evoke a lasting transformation of their learning (p. 34). Similar to Bloom’s (1956) taxonomy, Fink’s taxonomy (2013) includes hierarchical cognitions that include: (a) foundational knowledge; (b) application; (c) integration; (d) human dimension; (e) caring; (f) learning how to learn (p. 35). Unlike Bloom’s (1956) taxonomy, Fink’s (2013) taxonomy includes broader categories for ways of understanding (e.g., human dimension; integration; etc.) and each category interacts with the other five (p. 34). In this way, each category for learning complements and enhances the others when they are engaged by the learner (Fink, 2013).

While both Bloom (1956) and Fink (2013) developed their respective taxonomies to apply to the teacher-student educational relationship in a K-20 environment, many of the foundational principles are not mutually exclusive from adult learning. In fact, based on the neuroscience of learning, these same principles can apply to adult who engage in new learning experiences (Friedlander et al., 2011). In this way, to foster a transformative learning experience for faculty instructional development with lasting impact, it is important to understand how
humans, in general, construct significant learning and engage deep understanding (Hendry & Dean, 2002; Kedraka & Rotidi, 2017; Quinlan, 2014; Satsope et al., 2015).

**Neurobiology of Learning**

Much research conducted in the past fifty years has significantly changed the way that scientists understand the biological foundations behind learning and memory (Friedlander et al., 2011). Scientists have long understood synaptic plasticity as a foundational component of the ways in which human brains are shaped over time (Vogels & Griffith, 2017). This neurobiological process of associative learning, known as the Hebbian rule, explains that synaptic plasticity is elicited by the adaptation of neurons in the brain, specifically when two synaptic neurons fire simultaneously and repeatedly over time (Gallistel & Matzel, 2013; Milner, 2003). Often understood in association with Pavlovian conditioning, synaptic plasticity is thought to be the foundation of learning and memory (Collins, 2007; Milner, 2003; Vogels & Griffith, 2017).

In aligning with the Hebbian rule, scientists believe that for short-term memory to be converted to long-term memory then neurons must be structurally changed, which occurs through repeated conditioning trainings spaced out over time (Collins, 2007; Hattie & Yates, 2014). From this foundational knowledge, scientists inextricably link learning with long-term memories, which are established through declarative (e.g., semantic/facts, episodic/events) and nondeclarative (e.g., procedural/skills, perceptual/sensory, conditioning/emotional response) memory (Collins, 2007). Modern technology that allows for functional brain imaging (fMRI) has informed scientists’ understanding of learning, specifically the areas of the human brain where information is acquire, store, and retrieve information and the ways in which the human brain processes information (Friedlander et al., 2011). This has provided much insight into the
principles surrounding its application in areas like teaching and learning (Collins, 2007; Friedlander et al., 2011; Hattie & Yates, 2014).

Scientists agree that memory is not an entity that lives in a stable form, but rather it is a dynamic process in which presented information is subject to the context of one’s personal experiences, learning environment, levels of attention and stress (Friedlander et al., 2011). The varied experiences and contexts aid in the structural changes of neurons, thus leading to lasting learning (Collins, 2007; Friedlander et al., 2011). Further, whereas scientists once believed that synaptic plasticity was attributed to youth, they now know that even mature brains can generate new neurons (Friedlander et al., 2011). Discoveries in neuroscience shows that learning occurs in multiple ways (e.g., associative, non-associative, perceptual and motor), and that there are several ways to deliver new material to activate neural pathways and accommodate these various learning approaches (Collins, 2007; Friedlander et al., 2011).

Based on this new knowledge, scientists have established several foundational aspects of learning that have implications for practice in adult instructional development. To begin, research suggests that “planned redundancies” in new learning experiences that are spaced out over time will engage neural processes and support them in becoming more efficient (Friedlander et al., 2011; Hattie & Yates, 2014). Thus, the newly formed neural pathways allow for information to be committed to memory, thereby reducing future cognitive load for future retrieval of related information (Friedlander et al., 2011; Hattie & Yates, 2014). Along these lines, reward and reinforcement associated with accomplishing goals also serves to support associative learning regardless of the stage of one’s life (Friedlander et al., 2011). Visualization, whether outwardly or inwardly engaged, has been attributed to aiding in the creation of internal representations that lead to deepening the knowledge and expertise of a new learner (Friedlander et al., 2011; Hattie & Yates, 2014). Research also shows that active engagement and
involvement in one’s learning serves to foster the episodic memory retrieval and promote neural motivation through personal accountability (Friedlander et al., 2011). Finally, research shows that stress is linked to long-term synaptic potentiation and that small to moderate amounts of induced stress aids in the shaping of one’s long term memory (Friedlander et al., 2011).

Neuroscience has made considerable gains in the past fifty years with real-world implications for practice in fields where learning is the substrate to innovation. This knowledge of how the human brain receives and decodes new information on a molecular level can assist in the design of educational programming. Finally, because neuroscience research shows that the concept of synaptic plasticity and long-term potentiation is not exclusive of younger generations, these principles described to mediate change in the brain can be applied to adult learning (Friedlander et al., 2011).

**Characteristics of Deep Understanding**

In practice, the terms “knowledge” and “understanding” are often used interchangeably, and the concept of deep understanding is commonly poorly defined and misunderstood (Wiggins & McTighe, 2005). In parallel with the knowledge garnered by modern advancements in molecular neurobiology of learning research, it is also important to examine the various manifestations of deep understanding as it has implications for designing transformative learning experiences (Wiggins & McTighe, 2005; Wiggins & McTighe, 2011). At a high-level, understanding is one’s ability to move beyond rote memorization to access memories in a mindful way and in new situations (Wiggins & McTighe, 2005). Deep understanding of a concept involves one’s ability to accurately explain the how and why a skill or body of knowledge is appropriate in a given context (Wiggins & McTighe, 2005, p. 39).

The goal of deep understanding is the transferability and practical application of knowledge to new and novel situations (Billing, 2011; Bloom, 1956; Fink, 2013; Norman &
Transferability moves beyond factual or skill recall from a previous lesson and involves one’s ability to contextualize and apply germane knowledge at an appropriate time and with an appropriate situation (Billing, 2011; Kivunja, 2014; Norman & Spohrer, 1996; Stukalina, 2008; Wenger & Snyder, 2000; Wiggins & McTighe, 2005). Further, one’s ability to demonstrate deep, transferable understanding also means that they are able to creatively and flexibly adapt their knowledge to meet current or new challenges (Wiggins & McTighe, 2005). Merely remembering information does not support deep understanding, and it is important within a learning environment to tightly weave the social acquisition of knowledge and requisite skills application to galvanize deep understanding (Stukalina, 2008; Wenger & Snyder, 2000; Wiggins & McTighe, 2005; Wiggins & McTighe, 2011).

Deep understanding is an important consideration when designing learning experiences for any individual or group. Deep understanding empowers learners to apply concepts independently from the learning experiences and use knowledge-based judgments to adapt to future learning challenges that will then serve to increase future understanding (Fink, 2013; Wiggins & McTighe, 2005). In this manner, it is crucial to design learning experiences in a manner that promotes flexibility and adaptability for future use of the knowledge rather than to simply cover the new content with facts and details (Wiggins & McTighe, 2005). Through these empowered learning experiences, learner agency will be stimulated, thereby transforming their previously espoused beliefs (Cebrian et al., 2015; Dufour, 2012).

**Implications**

This literature review was written for the purpose of better understanding the complexities associated with the ingrained culture of and within higher education and the processes by which professional learning occurs across institutions of higher education. The
review centered on three strands of literature that are interrelated regarding effective professional learning. The first strand of literature focused on the various societal obligations surrounding the higher education system, and the constructed professional identities of its faculty. The second strand of literature focused on structures of professional learning and their impact on transforming participants’ espoused beliefs and behaviors. Finally, the third strand examined the neurobiology of learning and researchers’ current understanding of the characteristics of deep understanding.

The basis for this literature review lies in the shifting economic expectations associated with a knowledge-based society that are influencing the way in which higher education tends to student learning experiences and related competencies (Billing, 2011; Flecknoe et al., 2017; Kivunja, 2014; Norman & Spohrer, 1996; Stukalina, 2008; Wenger & Snyder, 2000; Wiggins & McTighe, 2005). While these industry demands require that academics respond flexibly to the pedagogical practices of learner-centered design that promotes students’ active and social construction of knowledge, many postsecondary instructors continue to favor the lecture-based approach to instruction (Billing, 2007; Kivunja, 2014; Wenger & Snyder, 2000). Furthermore, given time and space constraints in addition to financial incentives for disciplinary research over instructional scholarship, many academics do not prioritize professional learning relating to their pedagogical practice. However, as the external environment continues to evolve and trend toward these new, knowledge-based competencies, teaching excellence programming must prioritize instructors’ professional growth as educators. To do this, research suggests that programming must be adaptive and align with faculty’s practice as well as with the institution’s vision (Burke, 2014; Blase & Blase, 2000; Conway & Andrews, 2015; Denis, Langley, & Rouleau, 2010; Heck & Hallinger, 2010; Kosterelcioglu, 2017).
Based on the literature, the identity of higher education institutions is situated in a complex and changeable environment that has undergone consistent evolution since the beginning of the 20th century. A broadened range of stakeholders have further complicated the higher education landscape putting many at risk of experiencing “mission overload” as they work to meet the demands of all stakeholders (Jongbloed et al., 2008). At the same time, faculty within the higher education structure also struggle with intersectional identities that are constantly evolving with their professional experiences they have with the internal and external learning environments (Clegg, 2009). Academics operate in liminal space between their identity and perceived credibility as a disciplinary researcher and feelings of obligation associated with instructional scholarship (Mathany et al., 2017). While research states that students are always central to the institution’s priorities, therefore suggesting that the learning needs of students is of first concern, faculty fear sacrificing their reputation as a disciplinary researcher to engage in long-term instructional scholarship.

The literature was consistent with the notion that faculty’s participation in systematic and sustained professional development leads to effective professional learning that positively affects student learning (Daniels, 2017; Darling-Hammond, Wei, Andree, Richardson, & Orphanos, 2009; Doppelt et al., 2009; Drago-Severson, 2007; Trust, Carpenter, & Krutka, 2017). While researchers disagreed on the connotation of professional development versus professional learning, the research consistently named the value of the social nature of knowledge construction and the importance of faculty voicing shared experiences in a collaborative group (Daniels, 2017; Dufour, 2004; Dufour, 2007; Drago-Severson, 2009; Guskey, 2002; Mathany et al., 2017; Popp & Golman, 2016; Szteinberg et al., 2014; Takahashi, 2011; Trust et al., 2016; Trust et al., 2017). Despite the research suggesting the value of professional learning communities on shaping K-12 faculty’s individual and collective mental models relating to
instructional practice, gaps existed in the literature for higher education. None of the literature focused explicitly on professional learning communities within a higher education structure; however, all of the research that was directed exclusively towards higher education recognized that professional learning is socially constructed, and that professional practice evolves over time as a result of critical conversation with peers (Bui & Baruch, 2010; Daniels, 2017; Trust et al., 2016; Trust et al., 2016).

With higher education in mind, Trust and colleagues (2017) conducted research on professional learning networks (PLNs), a digital alternative to professional learning communities which has potential to break down the isolative structure of higher education. In the study, many instructors reported improved sense of efficacy, but the small sample size does not provide sufficient evidence to make a judgement on the effectiveness of PLNs on a broader scale (Trust et al., 2017). Ultimately, more research must be done to investigate how postsecondary faculty engage in professional learning to build capacity and efficacy surrounding new initiatives within a higher education institution. Further, because research suggests that professional learning is most effective when implemented in context of one’s teaching practice, more research must be conducted on the ways that faculty instructional development can be sustainably designed to support disciplinary needs of the faculty while also encouraging adaptability and creativity surrounding their approach to an ever-changing higher education landscape. Additionally, frameworks for faculty development must allow faculty members to work collaboratively as leaders and learners to construct new knowledge surrounding shifting demands of the field without risking a perception that the initiative is drive from the “top-down.” In this manner, more research should be dedicated to examining elements of faculty instructional development programming that faculty believes serves to empower and thus incite change within the context of their own practice.
Finally, there was agreement in the literature on the neurobiology and learning that technological advances within the past fifty years have provided insight and opportunity for scientists to better understand the human brain’s approach to learning. These insights investigate the various types of learning associated with long-term and working memory and can be used to guide learners in effectively comprehending, retaining, and applying foundational and practical skills (Friedlander et al., 2011). The literature solidified the notion that specific behaviors trigger activation in the neural pathways leading to structural changes of the neurons, including the creation of new neurons, even in mature human brains. Despite this knowledge, more research needs to be conducted on applying these understandings of the neurobiology of learning to the formalized learning of adults in a professional context. Aligned with this research gap is the opportunity for more research to discern which of the foundational aspects of learning outlined by neuroscientists are perceived as most effective in shaping an adult instructor’s professional learning.

The literature on deep understanding reifies the research on the molecular neurobiology of learning, thus making the internal manifestations of learning both visible and tangible. The implications for practice in instructional development in higher education involve the way in which it is structured. The concept of deep understanding implies transferability of the learner’s knowledge into contexts that are different from the context in which it was learned (Billing, 2011; Kivunja, 2014; Norman & Spohrer, 1996; Stukalina, 2008; Wenger & Snyder, 2000; Wiggins & McTighe, 2005). While the literature thoroughly depicts examples of deep understanding in practice, it falls short of specifying the methods by which to cultivate deep understanding. Ultimately, research should be conducted on the supportive instructional methods that lead to deep understanding as well as the way in which learners qualify the experiences of own learning. Further, as the literature was aligned with the K12, teacher-student
educational structure, research must be conducted on adults to ascertain if their manifestation of deep learning aligns with pre-existing literature.

**Summation**

In general, professional learning in an educational institution can aid in shifting the mental models of its participants by encouraging them to engage in the social contextualization of their praxis as it relates to new educational initiatives. As organization members engage in conversations with one another relating to individual perspective and experience, their shared perspectives build capacity for the group to shift practice. To be effective, the literature shows that organizers of professional learning must first be cognizant of the various identities comprising the university and its faculty (Beauchamp & Thomas, 2009; Clegg, 2009; Flecknoe et al., 2017; Jongbloed et al., 2008). At the same time, organizers must also have a concrete understanding of the ways in which the human brain learns and find ways to efficiently and effectively develop programming that fosters this new learning in a way that is relevant both to the needs of the faculty as well as the needs of the organization (Daniels, 2017; Drago-Severson, 2009). Despite the prevalence of professional learning communities in public elementary and secondary education, higher education continues to struggle with successful implementation of professional learning based on its isolative nature (Daniels, 2017; Trust et al., 2017; Trust et al., 2016). Consequently, very little research is dedicated to professional learning in higher education as a means to promote faculty agency and capacity building as the educational landscape continues to change over time. Based on the existing research, the professional learning models implemented in K-12 are not synergistic with the needs of higher education and practitioners espoused behaviors (Trust et al., 2017; Trust et al., 2016). With this in mind, there is promise of looking at the design thinking process as a framework on which to build professional learning as its inspiration, ideation and implementation stages promote innovation,
adaptability and responsiveness. To determine whether professional learning with an underpinning of design thinking processes can have equally impactful results in higher education, more research needs to be conducted in this area.
Chapter Three: Methodology

The problem of practice in this study examines the experience of postsecondary faculty within instructional development workshops framed around design thinking. This study is precipitated by shifting demands for quality instruction in higher education, which challenges its historic emphasis on research scholarship (Holdsworth & Hegarty, 2016). Situated within a culture that underscores research scholarship over teaching scholarship, postsecondary faculty have little additional time to dedicate to honing high-yield pedagogical strategies (Hendry & Dean, 2002; Kedraka & Rotidi, 2017; Kivunja, 2014; Satsope, John, Kabelo, & Mahlapahlapana, 2015).

Additionally, formal and single-session instructional development for which scholarship of teaching is historically framed in higher education have only been marginally successful (Stes, Coertjens, & Van Petegem, 2010; Stes, Min-Leliveld, Gijbels, D., & Van Petegem, 2010). This is due, in large part, to the amount of time faculty must dedicate to conceptualizing and implementing a new, evidence-based initiatives in their discipline (Wang, Hsu, Reeves & Coster, 2014). Thus, the design thinking process, which has proven successful for organizational change in management and medicine, allows for innovation through rapid prototyping that maximizes time invested (Beaird, Geist, & Lewis, 2018; Elsbach & Stigliani, 2018; Gobble, 2014; Luka, 2014). The purpose of this phenomenological study is to examine postsecondary faculty experience with design thinking as a framework for instructional development. Within this context, the problem of practice examined the central question: How do postsecondary faculty members perceive design thinking as a model for instructional development?

The purpose of this research is to understand how postsecondary faculty perceive the components of design thinking embedded within their instructional development, with specific regard to the ways in which it impacts their conception of disciplinary pedagogy. The theoretical
framework and the methodology align with a constructivist-interpretive paradigm whereby the researcher seeks to interpret the process and knowledge construction of the participants of the phenomenon examined in this study (Merriam, 1991). This chapter first examines the research design for this study, its philosophical underpinnings and its alignment with the research topic. Then, this chapter examines the procedures surrounding this study, including the participants, data collection, data analysis and ethical considerations. Finally, the chapter audits the researcher’s positionality and the limitations that are associated with this study.

### Qualitative Research Design

A constructivist-interpretivist paradigm investigates one’s story as manifested by the individual rather than on a single truth (Merriam, 1991; Ponterotto, 2005). Comprising this research paradigm is the epistemology that multiple realities are constructed from the social contexts that influenced them (Merriam, 1991). The researcher in this paradigm is involved in the process, and their role in the research is to capture the lived experience of the researched (Ponterotto, 2005). Both the values of the researcher and the lived experiences of the researched are married. Thus, the researcher acknowledges that his/her values influence the research and that these values cannot be fully eliminated (Merriam, 1991; Ponterotto, 2005). Rather than eliminate, the researcher “brackets” his/her values and recognizes that they exist as s/he constructs the story. Truly, the constructivist-interpretivist paradigm involves a dynamic relationship between both the researcher and the researched; the researcher fully immerses him/herself in the culture of the researched in order to encapsulate the story (Ponterotto, 2005). In this research paradigm, it is the belief of the researcher that truths lie beneath the surface of the researched, and it is through dialogue that the consciousness is revealed. This method of research is authentically “field research” that is qualitative, subjective and transactional (Ponterotto, 2005).
Qualitative Approach to Inquiry: Descriptive Phenomenology

As a qualitative approach to inquiry, phenomenology examines the ways in which humans make sense of their life experiences (Creswell, 2018; Smith, Flowers, & Larkin, 2009). Specifically, phenomenologists view human experiences as subjective realities within an objective space and commit to the examination of human consciousness to discover meaning and essences through first-person accounts (Dowling, 2005; Giles, Smythe & Spence, 2012; Moustakas, 1994; Smith et al, 2009). While the term “phenomenology” was first used by philosophers like Kant, Descartes and Hegel, the philosophical underpinnings of modern phenomenology gained its traction from Husserl, who focused on intentionality as a foundational concept of human understandings and who posited that one should “go back to the thing themselves” (Moustakas, 1994; Sloan & Bowe, 2014; Smith et al, 2009). In other words, a researcher must closely examine one’s experience within the consciousness of that individual who experienced the phenomenon (Smith, Flowers & Larkin, 2009). Husserl’s transcendental phenomenology later influenced the research philosophies of psychologists Heidegger, Merleau-Ponty, and Sartre, who viewed phenomenological inquiry as hermeneutic in which objective knowledge and experiences are interrelated with the subjective knowledge of the individual (Dowling, 2005; Giles, Smythe & Spence, 2012; Moustakas, 1994; Smith, Flowers & Larkin, 2009).

As a framework for phenomenological inquiry, intentionality comprises the concepts of noema and noesis (Moustakas, 1994). Grounded in Husserlian philosophy, intentionality describes the awareness of a subject’s conscious awareness of one’s relationship and perception of an object, whether real or imagined (Moustakas, 1994; Smith, Flowers & Larkin, 2009). As meaning is embedded within one’s consciousness, noema embodies the experience itself, or the correlation between one and his/her interaction with an object. Noesis exists where noema is...
present because it involves the way in which an experience is perceived or judged either in real time or in memory (Moustakas, 1994). Noema and noesis are present in the consciousness as intertwined entities in which an objective reality is dependent on the subjective reality of the individual’s experiences and perception (Moustakas, 1994; Smith, Flowers & Larkin, 2009). It is important to note, too, that noema and noesis occur in phases or layers, and one’s perception or judgment of an object can change over time (Moustakas, 1994). Thus, it is the role of the phenomenological researcher to gather a complete and accurate description of the subject’s external perceptions of the objective world in relationship to their internal perceptions through memories and judgment (Moustakas, 1994; Smith, Flowers & Larkin, 2009). It is equally imperative for a phenomenological researcher to engage in the “phenomenological method” in which one needs to set aside presuppositions relating to the subjects’ perceptions, and for one to “bracket” our own perception of the world during the inquiry process (Smith et al, 2009).

Key Scholars

Husserl. Inspired by Brentano’s account of descriptive phenomenology, Edmund Husserl viewed phenomenological inquiry as that which focused on human experience embedded within one’s consciousness (Dowling, 2005; Moustakas, 1994; Sloan & Bowe, 2014; Smith, Flowers & Larkin, 2009). As a positivist, Husserl believed that human experience was central to one’s knowledge and he grounded his approach in scientific rigor with the intention of providing an unbiased understanding of human consciousness (Dowling, 2005; Lopez & Willis, 2004). Thus, Husserl developed a new phenomenological method in which the aim was for researchers to “bracket” their own experiences and engage in a series of “reductions” (Dowling, 2005; Lopez & Willis, 2004; Moustakas, 1994; Smith et al, 2009). Each reduction is viewed through a new lens free of the influence of the researchers’ own experiences and aid the researcher in building scientific constructs that reveal the core of human experience (Dowling, 2005; Smith, Flowers &
Larkin, 2009). In this manner of Husserl’s transcendental phenomenology, the researcher can investigate a phenomenon from an objective standpoint above the phenomenon itself, thereby allowing the researcher to generalize the essences of the phenomenon being observed (Sloan & Bowe, 2014).

Heidegger. As a student of Husserl, Martin Heidegger maintained many of the same philosophical understandings of phenomenological inquiry as Husserl (Smith et al, 2009). However, one divergent philosophy from Husserl that Heidegger maintained involved the notion of the researcher being able to separate him/herself from the process of identifying the essence of a phenomenon (Sloan & Bowe, 2014; Smith, Flowers & Larkin, 2009). To Heidegger, humans exists in context of their experience which is ever-changing based on one’s interactions with the world (Sloan & Bowe, 2014; Smith, Flowers & Larkin, 2009). Rather than to believe that human consciousness is an entity that can be isolated, Heidegger believed that Dasein (“there-being”) belonged in a pre-existing and intersubjective world that molds our core being (Dowling, 2005; Sloan & Bowe, 2014; Smith, Flowers & Larkin, 2009). For this reason of intersubjectivity, Heidegger believed that the researcher could never enter an investigation “pre-suppositionless,” therefore emphasizing the researcher’s need to engage in the hermeneutic circle during phenomenological reductions (Dowling, 2005; Lopez & Willis, 2004; Smith, Flowers & Larkin, 2009). Thus, Heidegger’s hermeneutic phenomenology focuses on a researchers’ analysis of humans’ experience the world socially, historically, personally, and the ways in which these experiences influences the choices they make (Lopez & Willis, 2004).

Merleau-Ponty. As an existential phenomenologist, Maurice Merleau-Ponty shared in Heidegger’s views that humans exist in context of their world in which one is faced with many choices that lead to one’s “situated freedom” (Lopez & Willis, 2004). However, unlike Heidegger, Merleau-Ponty believed in situated perspective of the individual wherein he posits
that one’s knowledge derives from one’s own particular viewpoint of the world (Smith, Flowers & Larkin, 2009). Additionally, Merleau-Ponty’s position that one develops embodied perspective of the world moves slightly away from Heidegger’s in that the human is but a contextualized object within the world (Smith et al., 2009). Rather, Merleau-Ponty believed that second-order knowledge can only be obtained from first-order experience, which is to say that a researcher can never fully represent or understand the lived experience of another person (Dowling, 2005; Smith, Flowers & Larkin, 2009). Therefore, like Husserl, Merleau-Ponty engaged in phenomenological reductions to better attempt to reach the core of one’s original awareness of a phenomenon (Dowling, 2005).

Sartre. Jean-Paul Sartre also maintained a belief in hermeneutic phenomenology like Heidegger as he maintained that humans were constantly “becoming” (Smith et al., 2009). To Sartre, the existence of a human in the world comes before their perception of ‘essence’ and that it is equally as important for a researcher to consider what a human doesn’t experience as it is to investigate that which they do experience (Smith et al., 2009). With this in mind, Sartre also shares in Heidegger’s notion that humans’ experience is intersubjective, and that one’s perception of the world is directly influenced by the presence of others within it (Smith, Flowers, & Larkin, 2009). However, Sartre focused his work more on the shaping of the individual and emphasized the importance of researchers investigating the context of one’s biological, social and personal life before discerning the “being” of an individual (Smith, Flowers, & Larkin, 2009).

Scholarly Debate

Phenomenological researchers maintain a central belief that phenomenology is grounded in lived human experiences; however, there is much debate amongst researchers as to the depth by which the experiences can or should be normalized (Finlay, 2012). In this way,
phenomenological researchers engage in an ongoing debate about the appropriateness of including the subjectivity of the researcher into one’s study or the extent to which interpretive analysis should be included (Finlay, 2012). Regardless of researchers’ philosophical beliefs relating to descriptive phenomenology or interpretive phenomenological analysis (IPA), there is general consensus that phenomenological research benefits from reductions in which the researcher provides rich descriptions of the lived experiences and abstains from inserting judgments relating to the validity of a phenomenon (Finlay, 2012). However, despite this consensus, phenomenologists vary on the use of transcendental or interpretive phenomenology as a research methodology. Whereas the transcendental (Husserlian) phenomenologist may investigate the nature of a phenomenon in a scientific sense with the intent to generalize the “essences,” an IPA phenomenologist may favor a more idiographic approach that emphasizes an in-depth understanding of one’s meaning-making and understanding in relation to the phenomenon (Finlay, 2012; Smith, Flowers & Larkin, 2009). In contrast, a transcendental phenomenologist would bracket themselves from the complex descriptions while an IPA phenomenologist would mindfully incorporate his/her methods for interpretation which would also include interpretations of the relationship between the researcher and the researched (Finlay, 2012).

Alignment to Study

The purpose of this phenomenological study is to understand the ways in which postsecondary faculty at an R1 institution experience a design thinking process as a model for their instructional development, specifically when situated in a collaborative setting with their peers from various disciplines. As design-thinking is a conceptual framework with limited research in the field of education, it is important to examine it as a phenomenon wherein the researcher seeks universal essences derived from the lived experiences of the participants. Also,
because the main purpose of this study, at its core, is to investigate the correlation between the noema (e.g., the what) with the noesis (e.g., the how), it is not imperative in this study to examine the deeper complexities of participants’ existence in relation to their social, historical and individual world (Moustakas, 1994; Sloan & Bowe, 2014). For these reasons, the research method most in alignment with the researchers’ study is transcendental phenomenology drawn on the philosophical underpinnings of Husserl and illustrated in Moustakas (1994) and in Creswell (2018).

**Research Site and Participants**

Given research surrounding the complexities of faculty’s role within a postsecondary research institution and the relative difficulty of scholarship of teaching at these aforementioned institutions, it is important to conduct this study within the context of a research institution. The study site includes a private, not-for-profit, R-1 postsecondary institution in New England (Carnegie Foundation for the Advancement of Teaching, 2017). The institution comprises undergraduate students (6,670), graduate students (2,494), and medical students (567) and a total of 758 full-time faculty. Within the site, participants were purposefully selected based on their volunteer participation in two instructional development workshops developed around the design thinking processes.

In alignment with Moustakas’ (1994) recommended approach to phenomenology, the researcher recruited a small selection of eight postsecondary faculty of varying titles and disciplines who have engaged in the phenomenon, and all of whom have taught for at least one year (Creswell, 2018; Moustakas, 1994; Sloan & Bowe, 2014). These participants were selected through purposeful, maximum variation sampling across the disciplines of the university, as it is important to examine participants who have each experienced the same phenomenon, but also maximize the likelihood that the findings will reflect multiple perspectives (Creswell, 2018;.
Sloan & Bowe, 2014). Upon human subjects review board (e.g., IRB) approval, the data collection comprised two, 45-minutes interviews per participant. As the study commenced, one of the eight participants withdrew from the study, citing scheduling conflicts and thus reducing the sample size to seven participants. Thus, the data collection resulted in 14 total interviews and approximately 10 hours and 30 minutes of total interview time.

**Procedures**

To recruit participants for this study, the researcher first sent out a recruitment email detailing the requirements for participating in this study (see Appendix A). This email was sent through a mail merge in which the researcher targeted faculty from a variety of the academic disciplines and roles across campus, including humanities, life sciences, physical sciences, medical sciences, and languages. After the initial email was sent, the researcher accepted response emails for approximately one and a half weeks. This initial email garnered no positive responses, which led the researcher to send a more targeted second recruitment email (see Appendix B). The researcher accepted email responses for approximately three weeks after the second recruitment email was delivered before receiving enough participant interest to engage in the study.

Once the researcher received eight positive responses from faculty members interested in participating, she scheduled a time and place convenient for each of the potential participants to review the informed consent document. The data collection process commenced in a location central to main campus with the first 60-minute workshop (see Appendix C), which is modified from the d.Hasso Plattner Institute of Design at Stanford (2010) design thinking active toolkit and the Interactive Design Foundation’s (2018) design thinking toolkit. The first workshop began with an ice-breaker activity in which participants were partnered up, were asked to sketch one another and explain their inspiration for their sketch. This activity was designed to promote
creativity and encourage the participants to maintain a beginner’s mindset throughout the workshop. After the ice-breaker, participants engaged in exercises to facilitate individualized and collaborative brainstorming around student empathy, and this transitioned into activities that engaged participants in individualized problem identification. One participant could not attend the session in-person, so the researcher implemented electronic methods of engagement including Zoom web-conferencing and Google Jamboard. The former was used for video conferencing, so that he could see the other participants in the room as well as the researcher-facilitator. The latter was used for digital Post-It noting, which was employed during the student empathy activity, as well as the individual and collaborative brainstorming. The first session ended with participants creating and reviewing a draft problem statement that would lead them into the second workshop. Between the time of the first and second workshop, the researcher interviewed each participant at a time and location that was most comfortable to the participants. The overarching goal of this interview was to obtain an initial gauge of participants’ past professional development experiences, as well as their experiences with this style and format of workshop in this study.

The second workshop (see Appendix C) was be held two weeks after the date of the first workshop and was designed to be a continuation of the activities conducted in the first workshop. The workshop began by participants revisiting the student personas generated in the first workshop and transitioned into a re-evaluation of the faculty’s identified problems. Next, the participants independently brainstormed in a “How-Might-We” solutions-oriented activity that invited participants to reframe their problem statement into a solution-generating question (d.Hasso Plattner Institute of Design at Stanford, 2010). This informed a “Crazy 8” solutions-creation activity in which the participants ideated eight solutions to their “How-Might-We” questions within eight minutes. At this point, individual faculty members were tasked with
rapidly prototyping their top solutions on poster paper based on their projected impact and feasibility. The final activity of the second workshop entailed a gallery tour of each participant’s prototype wherein participants offered guided feedback (e.g., two aspects of value; one suggestion for improvement). The session ended with a reflective conversation among the participants around an implementation plan they envision for their prototype. In the week after the second workshop ended, the researcher conducted the second and final interview focused on participants’ perceptions of this format of instructional development.

Through each of the two, semi-structured interviews (see Appendix D) with each participant, the researcher asked two intentional questions relating specifically to the noema and the noesis of the phenomenon (Creswell, 2018; Moustakas, 1994). These questions involved asking the participants to explain their experiences relating to the phenomenon as well as the contexts that influenced or affected their experiences with the phenomenon (Creswell, 2018). To better understand the phenomenon and the ways in which the participants experiences it, the researcher also kept observation notes and a reflective journal as forms of data collection (Creswell, 2018). Again, to maintain integrity to the descriptive phenomenology methodology, the researcher created an observational protocol (see Appendix D) and wrote any observational notes as a nonparticipant (Creswell, 2018). Finally, to provide the most scientific rigor and most credible contribution to the field of literature in this subject area, the researcher to bracket out her prior experiences and engage in a series of reductions to achieve a core description of the phenomenon (Finlay, 2012; Lopez & Willis, 2004; Moustakas, 1994).

**Data Analysis**

In qualitative research, it is important for the researcher to continually “work over their notes” as data is collected to mitigate any possible confirmation biases that may occur (Miles, Huberman & Saldaña, 2014, p. 70). Thus, the researcher approached data analysis as an iterative
process where the researcher worked to conceptualize data, deconstruct it, and then put the data back together in a meaningful way that wholly encapsulates the phenomenon (Schutt, 2012). In this phenomenological study, data analysis involved two cycles of coding. The purpose of the first cycle coding was to organize data into “chunks,” and then lead to second cycle coding in which the researcher applied pattern codes to the individual and collective participant data (Miles, Huberman & Saldaña, 2014). Accordingly, the researcher analyzed data at the individual participant level as well as at the relational level, to show how different concepts were connected, which therefore contributed to rich data reporting (Schutt, 2012).

As raw data were collected, the researcher transcribed them into verbatim transcripts, which were housed in a CAQDAS software, NVivo12 (Miles, Huberman & Saldaña, 2014). Once refined in transcription the researcher reviewed the data and utilized memoing techniques in the pre-coding phase (Creswell, 2018; Saldaña, 2013). The researcher then engaged in a reduction of the transcripts through first and second cycle coding as a way to identify significance statements and develop emergent themes (Creswell, 2018; Saldaña, 2013; Sloan & Bowe, 2014). These themes were established inductively as a way for the researcher to further ensure validity in the analytic process (Saldaña, 2013). Finally, throughout the analytic process, the researcher only considered the phenomenological themes from the data as they were most valuable in reporting the universal “essences” of the phenomenon in the findings (Sloan & Bowe, 2014). Once the data was fully analyzed, the researcher returned the descriptive themes to the participants to gauge the validity of the researcher’s analysis with the participant’s experience (Dowling, 2005). This process served to maximize ethical considerations and ensure the most accurate representation of the phenomenon (Dowling, 2005).
Presentation of Findings

For this study, the findings are represented through descriptive themes garnered during the analytic process (Creswell, 2018). The findings are organized thematically, to examine the universal essences of the phenomenology that participants experienced (Creswell, 2018). In this way, the text data was reworked and applied to the broader themes of the phenomenon that derived from the analytic process (Creswell, 2018). However, in addition to the broader essence description, the researcher also included narrower, verbatim excerpts from the data to represent and support the descriptive themes (Creswell, 2018; Moustakas, 1994). These verbatim excerpts are embedded throughout the reporting of the findings.

Criteria for Quality Qualitative Research

To maintain trustworthiness in qualitative research, it was imperative for the researcher to maintain ethical considerations throughout the study, and to ensure credibility, transferability, and dependability of the research that is being conducted (Lincoln & Guba, 1985; Tracy, 2010). The following section first discusses the ethical considerations undertaken from the beginning of the study through its completion. This leads into justification of the credibility and the transferability of the study and finishes with an exploration of the researcher’s sincerity through a discussion of self-reflexivity and transparency (Tracy, 2010).

Ethical Considerations

The participants of this study were protected by the ethical considerations taken by the researcher throughout the study, including procedural, relational, situational, and exiting ethics. Prior to their participation in the study, participants signed an informed consent form in which it was clear that participation was entirely voluntary, and their privacy and confidentiality would be protected to the best of the researcher’s ability. The informed consent also outlined the research topic and framed the potential risks and benefits of participating in this study.
The researcher reviewed the informed consent form with each participant and fielded any questions the participants had before asking them to sign the document. To safeguard participants’ identity in case of relative transparency of the research site, all participants received a pseudonym and a number, and their disciplines were generalized (e.g., medical/life sciences, physical sciences, humanities, social sciences). Collected demographic information was limited to gender, generalized discipline, and total number years of teaching. All data was stored electronically using cloud-based storage requiring two-factor authentication, and each participant was represented using only the pseudonyms provided each, respectively. Only the researcher and the other participants of the workshop know the true identity of the participants, which are documented in a file associating the participants’ name and their assigned number that is housed in a hard copy document locked in a filing cabinet in the researcher’s office. The researcher commits to destroying this hard copy document within one year of the completion of the study. It should be noted that the pseudonym will never appear directly in relation to the participant’s name.

To maintain relational ethics, the interviews were conducted in an environment selected by the participant and the researcher confirmed the interview environment with each interview. Additionally, the researcher shared the transcription of each interview with the respective participant to ensure accuracy and transparency in the data collection. Finally, upon completion of the data analysis, the researcher shared findings with the participants to ensure they maintain approval of their representation in the study (Tracy, 2010).

**Credibility**

The credibility in this study lies in the number of interviews per participant and the repeated member checking that occurred throughout the data collection and analysis phases. First, to provide rich description of faculty’s experience with design thinking as a framework...
for instructional development, the researcher conducted two interviews per participant. These interviews occurred first after the initial workshop, and the second after the second workshop. Each interview was accompanied by the researcher’s observation and field notes, which complemented the transcribed interview data with tacit knowledge ascertained in each interview (Tracy, 2010).

The researcher conducted member checks for each transcribed interview to ensure that the participant felt their voice was accurately portrayed in the transcription. However, during the data analysis phase, the researcher conducted member reflections in which she provided each participant with a summary of the findings and allowed them an opportunity to provide feedback on this information (Tracy, 2010). This process of engaging member reflections with the participants allowed them an opportunity to elaborate on the study’s findings are in adherence to the notion that reality is plural and dynamic (Miles et al., 2014; Tracy, 2010).

Transferability

The use of “thick description” is integral in this study’s transferability given its small sample size (Ponterotto, 2006). Within this context, the careful interpretation and data reporting akin to thick description allows the findings to resonate with a broad audience (Ponterotto, 2006). The researcher assured thick descriptions by first taking conscious action to accurately and thoroughly describe faculty’s experience with the phenomenon in the data reporting. This entails capturing the participants’ verbal commentary, but also accurately capturing the researcher’s observations of the actions as they occur (Ponterotto, 2006). In this way, the researcher was diligent to maintain accurate field notes during interviews and used analytic memoing to engage an internal audit to ensure that researcher bias does not corrupt these observations. Finally, to thoroughly ensure thick descriptions were obtained in this research, the research was written in a way that was generalized enough to extend beyond the
situation in which this study occurred but was also specific enough to prevent minimization of the participants’ experience (Ponterotto, 2006; Tracy, 2010).

**Researcher Positionality**

This study’s problem of practice centers on the ways in which postsecondary faculty experience design thinking as a framework for instructional development. As a professional educator whose work centers on innovative instructional design, it is important for the researcher to evaluate how her experiences influence her positionality and research (Briscoe, 2005). Thus, this section will first examine the multiplicity of the researcher’s identity as an educator. Then, the researcher will interrogate ways in which biases, privilege and power may lead to complicity in the research and will finish with ways that the researcher mitigated the risk for participants.

**Researcher Background**

**Public school educator.** The researcher began her career teaching English language arts in a public, Title I middle school in Central New York. The district comprised a student demographic where 63% of the total population was economically disadvantaged and 16% students were identified as students with disabilities (New York State Education Department, 2014). At the time in which the researcher began teaching in this district, the middle school was listed as a School in Need of Improvement (SINI) due to insufficient Annual Yearly Progress (AYP) on the New York State Regents English language arts exam for two consecutive years. Desperate in their second-year label as a SINI, the researcher was tasked by district administrators to use any pedagogical or curricular strategies to help students meet proficiency on the upcoming state assessment. The researcher at first relied heavily on high-yield pedagogical strategies, and she followed the district-issued literacy program scope and sequence. However, the researcher quickly noted the prescribed program was not agile enough to meet the students’ needs, and she began implementing just-in-time pedagogy and content. At the end of
the year, the assessment data showed that a majority of the researcher’s students significantly improved their literacy performance, and the school met their AYP for the first time in several years. The researcher carried this experience into her future positions in public schools and used her successes in responsive pedagogy to inform her future teaching practice for middle school, undergraduate and graduate students.

**Higher education instructional support.** The researcher transitioned from secondary school to higher education where she entered a role charged with supporting faculty in their pedagogical and technological skills development. In this new role, the researcher was privy to meetings with senior leadership in addition to her daily one-on-one consultations with faculty. On the one hand, senior leadership expressed concerns for student attrition, low graduation and course completion rates, and they recognized a shift in marketplace demands for which they needed to devise a strategic solution. On the other hand, in her one-on-one faculty consultations, the researcher discovered that faculty taught in isolation across the institution, akin to working in a vacuum, and many did not know the pedagogy or research of his/her colleague in the same discipline. Further, faculty members often expressed a deficit mindset toward their students and maintained a relative lack of flexibility in adapting their instructional practice to meet their students’ needs. Given her first-hand successes with responsive teaching in the secondary classroom, in combination with the new experiences in a struggling postsecondary environment, the researcher was inspired to explore the research topic.

**Positionalities**

**Biases.** Given the researcher’s strong educational philosophy toward learner-centeredness, she was aware that her views could affect her biases in a negative way. With its position within the social sciences, education is a discipline wherein knowledge production is humanly constructed, signifying subjectivity in context (Stanfield, 1985). While the researcher
may view traditionally minded instructors as well-intentioned, she also was careful not to
devalue their educational philosophies and assume their past experiences. The researcher was
careful not to look at traditional pedagogy as wrong, or to view learner-centered pedagogy as
correct. Rather, it was ethical of the researcher to encapsulate the constructed realities of each of
the participants as they engaged in the process, and to not interject her own biases that could
distort the results.

**Privilege and power.** The researcher approached this study from the intersectionality of
being a middle-class, White female. As a female, the researcher has experienced a degree of
marginalization that allows her to name hegemonic behaviors evident in American higher
education, identify privileges of capitalist patriarchy, and identify gender inequities she views
through a critical feminist lens (Anderson, Bryan, & Noblit, 2005). Because of her female
identity, the researcher has a heightened drive to expose implicit biases, institutionalized
oppression and bring awareness toward social justice in education. As a member of the White
community, the researcher possesses implicit power in the fluidity by which she can enter social
interactions. This fluidity can be leveraged by the researcher in a critical discourse, or, if ignored,
can be harmful against the researcher’s intentions. In this manner, the researcher was cognizant
of the invisibility of whiteness, and as she embarked on this research, was aware of the presence
of institutionalized oppression in our education system (Anderson et al., 2005). Thus, the
researcher made sure to use her power and privileges as an intersectional White female to
confront colorblindness and destabilize a hegemonic culture within a higher education structure
that historically reifies White patriarchy. Finally, adhering to recommendations by Briscoe
(2005), the researcher needed to free herself of her middle-class, white, female position in
society and remain open to the inclusive understanding and representation of the others.
Relationship to the Participants

Because this study followed a qualitative approach relating to the teaching and learning practices of faculty with whom the researcher works and supports, she needed to be intentional in the data collection to ensure objectivity and ethical behavior. The researcher was aware of her potential biases when crafting the interview questions and acted to prevent the inclusion of leading questions. During this study, the researcher maintained a researcher-observer role with participants, which required her to set aside presuppositions that may have been present around faculty’s beliefs about teaching and learning. Finally, to maintain credibility and objectivity as the researcher during the data analysis phase, she identified emergent themes from interviews and observations individually first before synthesizing them into universal themes.

Limitations

Despite its potential contributions to the literature field, this study has limitations that need consideration. Perhaps the greatest limitation in this study is its small sample size. While the number of participants in this study is appropriate for a phenomenological study, it begets limitations in the overall generalizability of the findings. This is further compounded by the fact that all participants stem from the same university. However, by recruiting participants from varying disciplines and by engaging thick descriptions in the data reporting, the researcher maximized the heuristic significance of this study. Further, because the research topic of design thinking is still emerging in education research, the heuristic significance is increased due to probable areas of exploration surrounding the study’s findings (Tracy, 2010).

Another limitation of this study involves its adherence to a qualitative methodology rather than a mixed method or a quantitative research design. Without incorporating quantitative data, this study is limited in its ability to ascertain the effectiveness this model of
faculty instructional development has on faculty efficacy or student learning. However, because this research topic is so emergent in educational research, it was important to first amass participants’ insight relating to the phenomenon so that it can inform the validity of continued research in this field. In this manner, the researcher provided methodological significance by providing thick description of the participants’ perceived experience, which has potential to lead to future research using alternative methodologies to evaluate the statistical significance of this research topic on faculty efficacy and student learning (Tracy, 2010).

Furthermore, there are limitations relating to the demographics of the participants who self-selected to engage in this study. The researcher experienced much difficulty in the recruitment phases of this study, in which the initial recruitment email that was sent to over 200 faculty members resulted in zero positive response. Of the faculty who responded to the email, many expressed an inability to participate due to conflicts with research sabbatical or a lack of desire to participate in a research study that focused on instructional development. The second recruitment email, which was sent to fifty faculty members, only resulted in ten total responses, though two withdrew immediately due to scheduling conflicts. Most of the individuals who agreed to participate are members of human-centric academic disciplines, including the humanities, social sciences and medical sciences. The one individual who is a member of the computer sciences discipline was unable to continue the study beyond the first workshop due to unforeseen conflicts. Thus, while the participants varied in disciplines (e.g., medical sciences, social sciences, humanities), most were aligned with the soft pure and soft applied disciplines, and the few who are members of hard applied sciences approached the study through the lens of human-centric clinical faculty (Becher, 1994). The absence of faculty from disciplines relating to hard pure or hard applied sciences (e.g., chemistry, physics, applied mathematics) limits the
perspectives, generalizability and transferability of this study.

A final limitation to the study is the context of which the workshops were held. Both workshops were held within a one-hour time block and they were spaced out over two weeks to allow time for interviewing participants. While spacing the learning experiences is supported by the literature, the iterative and recursive nature of design thinking calls for a shorter time span between workshops with clear deadlines so that participants do not lose momentum in their abductive processing from problem to project (Brown, 2009). Further, in the spirit of experimentation, the design thinking workshops for this study were limited to one-hour sessions. This limited the level of depth participants could reach in their reflexive thinking, which could ultimately impact their experience and the data.
Chapter Four: Research Findings and Analysis

The purpose of this qualitative, phenomenological study was to gain insight on the experiences of postsecondary faculty who engaged in an instructional development workshop series framed by design thinking methodologies. Research suggests that a shift in marketplace demands for college graduates has resulted in pressures on institutions of higher education to ensure instructional quality and evidence of student learning and engagement. (OECD, 2012; Ramsden, 2003; Umbach & Wawrzynski, 2005). This call to action comes with the imperative for institutions to prioritize instructional support for faculty surrounding learner-centered instruction and pedagogical innovations (Umbach & Wawrzynski, 2005). Yet, barriers associated with resource allocation, faculty’s lack of time and faculty development models maligned with faculty’s individual praxis have precluded significant progress in this area (Darling-Hammond, Wei, Andree, Richardson, & Orphanos, 2009; Doppelt et al., 2009; Graham, 2007; Guskey, 2002; Stes, Coertjens, & Van Petegem, 2010; Trust, Carpenter, & Krutka, 2017; Trust, Krutka, & Carpenter, 2016; Hendry & Dean, 2002; Van Schalkwyk, Leibowitz, Herman, & Farmer, 2015). The design-thinking methodology has been implemented in fields outside of engineering and design, such as business and medical fields, with relative success in promoting user-centered innovations ((Beaird, et. al, 2018; Brown, 2008; Goble, 2014; Luka, 2017; Willness & Bruno-Bossio, 2017). As the field of literature is limited in its application of design thinking methodologies to postsecondary education instructional development, a qualitative approach to this study was appropriate to ascertain the essences of the experience (Smith, Flowers, & Larkin, 2009).

This chapter begins with a review of the research question being explored in this study. Then, this chapter provides an introduction of each participants of the study, which includes seven postsecondary faculty of the same research institution located in Providence, RI. To
provide context, each participant introduction focuses on their professional identities as well as their previous experiences and beliefs relating to faculty instructional development. Finally, this chapter will present the findings in superordinate and subordinate themes and will conclude with overarching conclusions drawn from the emergent themes of this study.

**Research Question**

The data collection and analysis were guided by one central research question. The central question is inclusive of the various processes associated with the design-thinking protocol.

**Central Research Question**

- How do postsecondary faculty members perceive design thinking as a model for instructional development?

**Data Collection and Results**

**Recruitment of Participants and Interview Protocol**

The researcher engaged maximum variation sampling to recruit participants for this study. By scanning the research site’s outward-facing faculty department websites, the researcher selected over 200 faculty across the institution, which amounted to approximately four per discipline. The researcher sent an initial recruitment email (see Appendix A) that outlined the requirements of the research study to these 200 faculty members. Given the time in which the email was sent, many faculty responded that they did not have the time to commit to this study while others were on research sabbatical during the time in which the study was to take place.

A lack of positive responses to the initial recruitment email caused the researcher to send a second and more targeted recruitment email (see Appendix B) to different faculty members of various departments. This email was sent to fifty faculty members and resulted in
ten positive responses. When the researcher scheduled the workshops, two members needed to withdraw from the study citing conflicts in scheduling and external commitments. Before the first workshop took place, the researcher met with the participants to review the informed consent document as well as answer any questions participants might have relating to the study. Once the study commenced, interviews were conducted after each workshop at a time and place that was most convenient to the participant. After the final interview was complete, the researcher provided each participant with a written debriefing form (see Appendix G) for their records.

**Description of Research Participants**

In total, eight postsecondary faculty of varying titles, disciplines and experience participated in this study; however, one faculty member withdrew from participation before the end of the second workshop due to unforeseen scheduling conflicts, leaving the final number of participants at seven. Any data collected from the withdrawn participant was not considered in the analysis of this study. Each of the final seven participants entered the study with postsecondary teaching experience ranging from six to twenty-four years, and the median experience of sixteen and a half years. All participants regularly engage in research as it pertains to their discipline. Participants were provided a pseudonym (Jeffrey, Kara, Joseph, Margaret, Phillip, Robert and Sarah respectively) and a generalized discipline in this study to protect their anonymity. Table 1 provides a general overview of the study participants, including their pseudonym, gender and number of years and discipline taught. For the protection of the individual participant’s anonymity, disciplines have been generalized.
Table 1

Demographics of Study Participants

<table>
<thead>
<tr>
<th>Name</th>
<th>Gender</th>
<th>Faculty Role</th>
<th>Years as HE faculty</th>
<th>Discipline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jeffrey</td>
<td>M</td>
<td>Full Professor</td>
<td>21</td>
<td>Social Sciences</td>
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<td>Kara</td>
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<td>10</td>
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<tr>
<td>Joseph</td>
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<tr>
<td>Sarah</td>
<td>F</td>
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<td>13</td>
<td>Humanities</td>
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Participant Profiles

Data were collected from seven participants in the form of two, semi-structured 45-minute interviews with the researcher. The first round of interviews occurred during the second week of February 2019, after the conclusion of the first workshop. The second round of interviews took place during the fourth week of February 2019, after the conclusion of the second workshop. Throughout the interviews, the researcher gained deeper insight on each participant’s perceptions of professional identity, teaching philosophy, and instructional development, including the past and the present study. The individual participant profiles below provide a rich description of each participant’s professional identity, as well as their overall experiences with past instructional development and the current study’s instructional development model.

Jeffrey. Jeffrey serves as a full professor with twenty-one years of experience in teaching higher education and an additional eight years of teaching experience in secondary education. He is actively engaged in scholarly research and identifies himself as “…an applied macro
economist who does quantity education policy analysis research….” Jeffrey teaches in a variety of formats, including seminar, small and large lecture, but his educational philosophy values student engagement and student learning. Because of his emphasis on maximizing student engagement regardless of the class format, he is adaptive in the ways in which he instructionally approached his courses. In his words, “What I want out of both classes is the same but given the different subject matter and size of the class and context, I have to bring different practices to the table, obviously….”

Relating to past professional development, Jeffrey perceives instructional development as “…something that is structured specifically to work with instructors on issues of practice primarily …with some sort of structured intervention….” His past experiences with such structured interventions in higher education were vague, citing that “…I might have gone to the [teaching and learning center] and done something with a certificate…in my first years, but I don't remember…..” Relating to the instructional development model introduced in this study, Jeffrey expressed ambivalence. He explained that he didn’t know what to make of it and that he, “…didn't find it particularly useful in that it didn't spur me to think all that much about what I do…what I might do….” He added that he is commonly skeptical of the formats of instructional development and admits that he felt the approach of the study’s workshop “…felt a little contrived…like something that someone in the world of academic education schools would come up with and then publish…,” adding, “It didn't…hit me where I lived.”

**Kara.** Kara serves as an assistant professor in the medical school as well as a clinical faculty member who works with students who are on a medical rotation in her clinical specialty area. Kara does not identify herself as a scholarly researcher in the classical sense of the word but expresses that her continued scholarly research manifests in the form of curriculum development and medical education scholarship by way of continuing medical education credits.
When asked the ways in which she identified as an instructor, Kara stated, “I think something …that makes me a good clinical teacher and I think my learners would say about me is…I'm very patient.” This statement complements her philosophy of teaching and learning in which she expressed a priority on mindfulness and “psychological size and distance.” She expressed an emphasis on breaking down historic hierarchies evidenced in medical education to cultivate a sense of team. In her words, she stated, “I want them to see themselves and me more lateral…you know, as teammates, not like I'm the person at the top…I guess the word I use…is ‘teamliness.’ …we're all in it together.”

Kara’s past professional development experiences involve continuing medical education of various kinds, including her attendance to regional and national organization conferences. While part of her position as medical educator involves compulsory professional development, Kara explained that she is attends sessions that speak to a particular need she experiences at the time. The most impactful professional development sessions are ones that “…are impactful at different times depending on …whatever problem I'm having…and what I'm trying to solve.”

When asked about her overall perceptions of the study’s design-thinking framework for instructional development as compared to past methodologies, she explained, “…it feels like apples and oranges only because it's, in one way you think…it felt more experimental.” However, she added that, “I think the format...would totally work…” though she “…would have benefited more by if I were prepared with a real actual problem that I was having, that I wanted to solve.” Her overarching perceptions of the study’s framework for instructional development includes that, “I thought it was fun. I liked participating in it….“ and “I could imagine that if you were writing it at as a program in educational faculty development…it would seem interesting to me, like it might be something I would want to attend….“
**Joseph.** Joseph maintains a hybrid staff and faculty role as both a technical director and a lecturer within a humanities department. Joseph identifies himself as a scholarly researcher from the practical sense in that his scholarship comes in the form of practical application of skills. As he stated, “I have a creative practice. I don't publish a lot of papers.” He also added that his scholarly research is enhanced through collaboration with peers in his department, stating that, “…practical experience could be like collaborating with [Professor X] as a composer in our department...I do enough... to keep my skills in shape - keep relevant.” Joseph identifies himself as a “sensitive teacher” who pays a lot of attention to what students need. He deeply values “meeting students where they’re at” and “breaking down the barriers” that have been historically present in his field.

Regarding past professional development, Joseph’s experience is limited in that he has participated in one-on-one coaching from the online education instructional designers and stated that, “otherwise [professional development has] really been, you know, talking with colleagues....” In that manner, his instructional development has stemmed from experiences both in the classroom and in the field stating that “[my professional development] was a bit ad hoc…” and “…not an education thing… it was always apprenticeship.” Relating to the study’s format for instructional development, he added, “[this style of workshop] was different than a lot of the professional development I've done that has been specific to a content rather than process. So, it was, you know, useful to focus on process for a bit....” He expressed that at some points the workshops “felt like make work” but his overall thought included, “this might be particularly effective if you're trying to develop something new…although rethinking things you've been done doing for a while is always helpful, too.”

**Margaret.** Margaret is both a visiting and emeritus professor with many years of industry experience and twelve years of postsecondary teaching experience divided between a
teaching institution as well as the present research institution. Margaret identifies herself as an engaged researcher in that her scholarly research focuses on “…applying theory to practice always was sort of the goal of trying to actually make change.” Margaret’s professional identity as an instructor centers around deliberateness, in which Margaret notes that she spends a lot of time on her practice making sure that it is “aware of [students] as individuals.” She engages in reflection on action, stating, “I spent a lot of time trying to figure out what I think they know and how to get there….”

Margaret’s experience working in a teaching [postsecondary] institution has provided her ample opportunity to engage in professional development. However, she noted that, “I think [professional development] has had marginal value added in my experience....” Even though she admits that professional development is “…good because I think it raises your attention to the fact that you can be improving what's happening in the classroom and maybe you hear about something you hadn't thought of,” she cited learning from her peers as the most impactful professional development she had experienced. In fact, she stated that a multi-day retreat was the most impactful professional development she had experienced because “…you got to go deeper with people around the topic and around it.” When asked about her overall perceptions of the study’s format for instructional development, she stated that, “[This workshop] was better than I expected…” and that she, “…got a lot out of it….” She qualified this statement, stating that she entered the workshops with a negative perception of the term “design thinking” because, “I think it's branding something that's called ‘good problem solver’….” Yet, she felt this workshop model “…reinforces my belief that the best two things, I'd say one that the best way for me to learn about ways to improve my teaching is by talking with other people who are teaching…And the second that I think creating that purposeful space is valuable.”
Phillip. Philip maintains several faculty roles within the medical sciences that include clinical medical education on occasion. Phillip also serves in leadership on several education and research training programs that work in collaboration between the hospital and the university. Given his multiple roles, Phillip defines his scholarly research as focused “on areas that I am passionate about that... that really matter to me and that…try to make local impact while learning lessons of national and international importance.” He stated that of all the directions he could take with his research, he prefers to situate his scholarly work within a space of “local impact, national significance.” Relating to his identity as a teacher, he expressed that he is one who brings enthusiasm to the classroom. When asked, he stated that he, “hadn’t really thought of it that way…” but adds, “I love working with students, and I think I would say the themes [of my identity as an instructor] would be enthusiasm, always connecting to real world examples….”

Phillip’s perceptions of instructional development center around a few interactions he has had at the university in which he had guided support for curriculum development. However, he makes a general association of instructional development as a deep analysis of his own practice, which stems from a model promoted from the university teaching and learning center, and he stated, “I had some concerns of over-analyzing the way that I actually face-to-face teach. I somewhat have avoided… I've never looked at videotapes of myself and I have never sort of gone to many workshops about how to do that.” Phillip’s overall perception of the study’s workshop format included, “Yeah, I liked it…I thought it was useful…” attributing the reason for this as “…not only going over the stuff we were doing but looking at the way that you were doing it.” He added that, “I think that's part of the usefulness of it for me, because I think anything that helps me spark of different ideas... okay, how would I use this...that was most useful for me.”
Robert. Robert has been teaching since 2009, including as a graduate student, post-doctoral student and fellow, and most recently as an assistant professor. He identifies himself as a “cognitive scientist” and admits that, “It’s easier for me to say sort of what I work on than to do the identity thing…. ” With that in mind, his educational philosophy relating to his teaching practice includes a goal “…to get students interested in the topic and teach them a little bit about sort of how to think about a topic in the context of empirical work.” He views his role as instructor as facilitator of thinking as well as teacher of content but notes that there is more value to “teaching sort of thinking skills and writing skills” than “teaching content knowledge…they'll never practices ever again and never think about it ever again.”

Robert’s professional development experiences came from his own experiences, to which he describes as “supervised practice.” The most impactful professional development in shifting his perspective was when he experienced, “failing miserably and realizing that what I was trying to do was way too high level, I tried to teach like a graduate seminar and like these sophomores were really not interested…. ” In relation to the study’s workshops, he details his perception of the experience as, “I feel like you gave me a Likert scale. It's a neither satisfied or dissatisfied because I just I feel like satisfaction or dissatisfaction has to be sort of relative to a goal and I didn’t really even have a goal.” However, he added “I thought it was easy. It was fun kind of. It felt like it could be sort of as useful or as pointless as I wanted it to be.”

Sarah. Sarah’s professional career as an educator has involved teaching in the humanities for the past thirteen years, though she feels as though she has been an educator since she was much younger given her experiences with teaching in low-stakes environments such as summer or Bible camps. She stated that her teaching practice has most been influenced by “…teaching in summer literacy programs for kindergartners and first graders. I think that probably the elementary setting influences my college level teaching probably more than
anything else.” She added that she categorizes postsecondary teaching as a lecturer and “somebody who is not in that zone of responsivity” as it relates to students’ needs. In this respect, Sarah stated she has stopped referring to herself as a teacher, but rather identifies more as a facilitator who maintains a role as “an engineer, or an architect.” Sarah stays active in her scholarly research and identifies herself as a “walking researcher,” meaning that she is constantly collecting data from students and finding ways to be responsive to that.

Sarah defines professional development as “formalized coursework” that she experienced in graduate school that were centered around “teacher-research.” Her most impactful professional development as of late has been work in the social sciences research, as she identified this as a need in her current practice. Sarah’s general perception of the study’s workshop is that she enjoyed them as a whole and felt that the processes she engaged in with the workshop aligned with her craft within her discipline that is situated in the humanities. She elaborated further, stating that she found the workshops helpful in facilitating her thinking and she enjoyed the format “both in terms of the two workshops together where you're...moving.”

Data Analysis

Aligned with the processes described by Miles, Huberman & Saldaña (2014), the researcher first transcribed the raw data from the recorded interviews and the related observational notes using web-based transcription software, Temi.com and Reportex.io. Once refined in transcription, the researcher reviewed the data and engaged in pre-coding processes using the CAQDAS software NVivo12. Here, the researcher highlighted poignant quotes and descriptive narrative from the data (Saldaña, 2013). During the pre-coding process, the researcher also wrote preliminary jottings in the second review of the data, which were stored as memos for future reference in the CAQDAS software (Miles, Huberman & Saldaña, 2014).
Prior to the first cycle coding, the researcher revisited the central research question and research topic to avoid overload initiated by the coding process (Miles, Huberman & Saldaña, 2014). Because Saldaña (2013) describes first cycle coding as a broad exercise in summarizing, reducing, or condensing data that is open-ended in its processes (e.g., single-word to full paragraphs), the researcher chose to read the transcript in full once again through the lens of the research topic before establishing the coding methods that would be applied to the data. The researcher noticed words and phrases that were repeated by the participants and that were related to the research question. Therefore, the researcher decided it prudent to utilize value and in vivo coding for the first cycle process. The reasoning for this was two-fold: (1) values coding provides a reflection of participants’ perspectives around a phenomenon; and, (2) in vivo coding indexes patterns from the interviewee’s own language, which is imperative when sharing one’s story. Additionally, the researcher made the decision to “split” the data rather than to “lump” it (Saldaña, 2013). By doing this, the researcher hoped this process would allow for better representation of the data, thus better representing the interviewee’s story.

After reviewing the first cycle codes and making additions, adjustments or omissions where necessary, the researcher began second cycle coding by applying pattern coding techniques. The researcher first reviewed the transcription data to code word/concept frequency. Once categorized, the researcher then used functions within the CAQDAC software to examine node frequency from the first cycle coding. Here, the researcher solely considered the values and in vivo codes and used the computer software to establish a weighted list of key words and phrases across the nodes (Saldaña, 2013).

The researcher ran a query of word frequency of the codes that were identified in the first cycle coding process. This query informed the second cycle coding process in which the
researcher reviewed the coded transcripts against the word frequency query to identify emergent themes. Patterns emerged in the analysis in words associated with reflexivity (e.g., think/ing, learn/ing, inform/ing, mindful/ness, adapt), collaboration (e.g., talk/ing, tell/ing, listen/ing, share/ing, together/ness, connection) and engagement (e.g., engagement, active, brainstorming, impact/ful, use/ful, physical/ity). Given their frequency, engagement (108), reflexivity (77), and collaboration (57) were identified as superordinate themes, represented in Table 2. Additional analysis conducted by the researcher using axial coding processes resulted in the identification of subordinate themes respective of the superordinate themes (Saldana, 2016). Table 3 demonstrates an alignment of participants’ statements with the superordinate and subordinate themes.

Table 2

Emergent Superordinate Themes and Occurrences in Data Set

<table>
<thead>
<tr>
<th>Emergent Superordinate Themes</th>
<th>Number of Occurrences in Data Set</th>
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<tr>
<td>Engagement</td>
<td>108</td>
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<tr>
<td>Reflexivity</td>
<td>77</td>
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<tr>
<td>Collaboration</td>
<td>55</td>
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<tr>
<td>Collaboration</td>
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<tr>
<td>Superordinate Theme</td>
<td>Subordinate Themes</td>
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<tr>
<td>---------------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>Engagement</td>
<td>Application to Practice</td>
</tr>
<tr>
<td></td>
<td>Skepticism of Process</td>
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<tr>
<td></td>
<td>Innovation of Thinking</td>
</tr>
<tr>
<td>Reflexivity</td>
<td>Responding to Shifting Demographics</td>
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<tr>
<td></td>
<td>Iteration of Ideas</td>
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<td></td>
<td>Student Empathy</td>
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<tr>
<td>Collaboration</td>
<td>Interdisciplinary Perspective</td>
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<td></td>
<td>Discipline-Specific Insight</td>
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Findings

Data analysis revealed three superordinate themes and eight subordinate themes. Each theme emerged from statements made by the seven participants and through first and second cycle coding processes. The following section examines both the super- and sub-ordinate themes that emerged from the data analysis.

Engagement

The first superordinate theme identified, engagement, encapsulates the participants’ perceptions and experiences relating to the activities associated with each of the two workshops that were implemented as part of this study. A pattern was evident in the seven participants’ experiences, in which each described a positive correlation between the amount of time spent and the usefulness of workshop activities to the applicability to their practice. Each participant described their experience as “fun” and each expressed enjoyment in participating in the workshop. From the larger theme of engagement derives three subordinate themes, including application to practice, skepticism of the process, and innovation of thinking.

Application to practice. The first subordinate theme associated with engagement, application to practice, comprises the ways in which participants expressed their ability to connect the workshop activities to their practice and the value add associated with this. Margaret reflected on the individualized nature of the experience as compared to her past experiences with instructional development workshops:

I think [this format of professional development] was useful. It was good because it was both individualized, so you could be working on your own problem, but also had opportunities for interaction…. Even if [we] had to do group stuff, it wasn't necessarily you doing your own thing. You're doing something that they were trying – a method they were trying to teach you. So… I valued that. It let you focus in on something that was
your own concern, but then also share it and get feedback… I don't think all other forms allow for that.

In this excerpt, Margaret describes the perceived value add of instructional development that allows the individual to construct his/her own meaning based on the instructional needs of the moment. While the notion of a lecture-based workshop in which the participants receive methodological information relating to teaching practice, this study’s workshop format allowed for introspection that is not typically fostered in such professional development.

Phillip also expressed the usefulness of engaging in activities that allowed for individualized focus, stating:

I actually think the thing that was most helpful was… [being] introspective about… my curriculum planning…. The session was set up, very much to support my own thinking. Within this individualized focus, Phillip pointed out that the workshop was useful because it helped him develop his own thinking.

The deliberate time associated for individual participants to examine their own craft in teaching practice allowed participants to consider the feasibility and impact of their instructional planning. For example, in thinking of his comparative experiences with past professional development workshops, Joseph explained that:

[This style of workshop] was different than a lot of the professional development I've done in the past, which have been specific to a content or a bunch of prescriptive ideas rather than a process. So, it was, useful to focus on the process for a bit….I think that was interesting just to think about the craft of teaching a little more specifically. It was really useful

Phillip adds that, “I think that the way the session[s] were set up was… to support… my own thinking and… it's kind of making me quickly lay things out. I think that exercise helps
as… you're… thinking through what you're trying to do.” In these instances, both participants perceived a value for focusing on the processes of teaching as it relates to their individualized needs, rather than to focus on externally motivated workshops centered on concepts of teaching and learning.

**Skepticism of process.** Due to the open-ended format of the workshops that allowed participants to identify their own goals and outcomes for attendance, participants expressed a skepticism around the perceived value of the workshop on their long-term instructional practice. The second subordinate theme examines the ways in which the participants described the overall perceived benefits and values associated with this format of workshop. Jeffrey explained his perception of the value of a design-thinking workshop:

> I didn't feel like I got much out of it, and I'm not sure I see the value in this sort of foot-pace, off the top of my head responses. I'm always coming into these things skeptical and would need to be…convinced…by some kind of model that this [will] get some kind of good results.

For Jeffrey, the experimental nature of the design-thinking workshop format did not feel as though it produced actionable results that he could carry into his practice. His general skepticism related to the feeling that he did not think the workshop allowed him to “move the needle” on his teaching practice, and there was not enough research evidence of this model for the full investment of his participation.

The general reliance on the distribution of research-based instructional practices to guide a workshop proved to be a barrier in other participant’s perceived value of the design-thinking workshop. Joseph explained his skepticism surrounding the situational usefulness of the workshop, “…I'm a little, I am skeptical about the actual value of it overall. I know depending on the person, depending on the situation. I'm a little cynical about these kinds of workshops and
how useful they are.” Robert explains that the perceived usefulness of a workshop such as this one is relative to the creation of a goal, adding, “I feel like you gave me a Likert scale. It's a neither satisfied or dissatisfied because I just I feel like satisfaction or dissatisfaction has to be sort of relative to a goal and I didn’t really even have a goal.”

**Innovation of thinking.** The third subordinate theme within the superordinate engagement theme involves expressions of innovation that participants stated in their interviews. Many of the participants noted that no “earth-shattering” revelations came of the design-thinking workshop, there was evidence of continued curiosity for exploring this model for examining educational problems. Kara reflected on the unique structure of this workshop, noting:

…There's probably like a whole other world out there…that I am like completely unaware of. That thought of a little bit like scratching the surface of different methods for approaching educational problems. …Maybe this might be another way to… incorporate some creativity into the work that I do. So maybe that's around…my thinking of my professional identity as an educator who has…creative approaches to teaching.

Here, Kara discusses the alignment of the design-thinking workshop with her professional identity in which she defines herself as an instructor interested in exploring new pedagogies for her content area.

Other participants maintained similar attitudes as Kara, wherein the design-thinking model for instructional development supported participants’ shift in creative and proactive thinking. Joseph reflects on the perceived impact this workshop has on his future practice, stating, “It just put me in a place to be a little more proactive in my thinking rather than saying, ‘Oh, I've got x number of students, how am I going to organize laptops?’ And it's just a little, this is a slightly different angle that I think will inform my thinking going forward.” In Robert’s interview, he notes that the process was just different enough to ignite a small shift in thinking,
reflecting, “it certainly plants the seed of something that could be useful and that’s definitely something that I think is worth doing in the future.”

While some general innovative thoughts were present in reflective statements in the second interview, many of the participants expressed that the activities served as a catalyst for innovation of thinking, specifically the How-Might-We and the Crazy 8s activities. Both activities invited participants to engage in independent and quickly paced solution-generation brainstorms around their personal problem statement. During these activities, participants were encouraged to think beyond what is currently feasible and to consider any option that might be possible. In her interview, Sarah discussed the perceived impact of the Crazy 8s activity on the ability to think beyond current systems:

I liked [Crazy 8s]. And part of the reason that I liked it was because it got to the bigger pieces…like, “This is a perfect world.” That's the…ideal situation. I don't think there's often space to do that. I think we oftentimes start by thinking about the logistics - just because of pragmatic realities and…[that kind of ideation] … will change our ability to…think beyond the peripheral.

To complement this statement about thinking beyond the peripheral, Sarah took the opportunity to show the researcher an action plan she’d since created for achieving the solution that she had brainstormed during the Crazy 8s activity. This plan proposes a new solution to a system of discipline-writing support that was previously non-existent in her professional area.

Other participants described the lasting effect of the Crazy 8s activity on their innovative thinking. For example, Kara explains that rapid solutions-generation was a new concept for her, adding, “I don't think I've approached, um, teaching problems like that before and I definitely never pushed myself to sort of like, you know, brainstorming, brainstorming, brainstorm every, you know, thirty seconds or whatever to think of a different solution to a problem.”
Additionally, Phillip reflected on a major innovative insight he perceived of value with this activity as well as the prototyping activity that followed:

I actually …thought that [Crazy 8s] … was useful. …I also thought the [prototyping], quickly trying to sketch out what this would look like - … helped to reinforce for me that it does lead from one part to the next, and the next and then [which leads to thinking about] how to make sure that connection stays as I'm building the actual activities...

Summary

As noted above, participants expressed enjoyment in the active engagement they experienced with the design-thinking framework for an instructional development workshop. All but one participant described this model as superior to other forms of lecture-based or concept-based instructional development. This value add was attributed by the participants to the connection this work had to their own problems that they were experiencing in their practice. Despite the self-directed nature of the content of this workshop, some participants expressed skepticism around the perceived value that it had on their long-term thinking about their practice. Finally, all but one participant made a statement in their interview that indicated some form of innovative thinking as it related to their approach to educational problems. As such, six of seven participants stated that the activities associated with the workshop, specifically Crazy 8s, served as a catalyst to creative thinking that they will carry beyond the workshop.

Reflexivity

The second superordinate theme, reflexivity, captures evidence of participants’ examination of their own practice, thoughts and feelings as it relates to their instructional practice and the work created during the design-thinking workshops. Three subordinate themes comprise this superordinate theme, including participants’ recognition to shifting student demographics, iteration of ideas, and consideration for student empathy.
**Responding to shifting demographics.** In their interviews, many of the participants expressed a deep knowledge of their students and a noticeable shift in students’ learning needs that has occurred in the last few years. The participants’ recognition of shifting demographics informed many of their motivation while participating in the student-empathy and problem-generating portion of the design-thinking workshop. Phillip discusses a recognizable shift in the types of learning activities students expect in today’s classroom, and expresses frustration at the rapid pace at which their needs change:

I can't figure it out…there can’t be a generation effect in three or four years, but there seems to be some sort of cohort effect…that happens and you have to keep adjusting….I’m just amazed me at how short that cycle can be sometimes…So it's...constantly trying to think about what gets them engaged? What gets them really as passionate as I am about the stuff that we're talking about?

The notion of recognizing students changing needs and reflecting on practice to accommodate those needs resonated with other participants. For example, Kara explains:

…I think the needs of our learners are changing. I think… they are a lot more technologically savvy. It's...harder to hold attention …when you're not using…multimedia or…more entertaining teaching approaches. So, I think at a time I felt like I needed to be changing things up…that session was particularly helpful.

Here, Kara describes the ways in which students expect learning experiences that meet their cultural needs. She associates tech as the catalyst, but also identifies her reflexivity around her teaching practice to best accommodate those shifting needs. For Joseph, his belief that students learn differently impacts the way in which he thinks about and approached his course. He states, “…the idea that people learn differently is clear to us now …it wasn't always, so I think that's had an influence on me.”
For six of the faculty, a recognition that students enter their classrooms with different needs comparative to years’ past, motivates them to continue reflecting in and on action in their own classroom practice.

**Iteration of ideas.** Much of the design-thinking workshop was structured around stringent timelines in which bursts of activities would occur and quick succession and review and reflection would later follow. All participants perceived the value of the time and iteration of ideas. Margaret expressed that this form of quick-thinking without much room for contemplation went against her typical working style in which she appreciates thinking deeply and deliberately about a topic. She identified, however, a perceived benefit to this quick-thinking, stating:

> I guess the only challenges...in my deliberateness I am not a fast thinker. So, it was timed ... if I'd had more time, I might have gone in different directions. But, then on, the other hand you don't want to drag it out too long. I think it's good to keep it moving because otherwise people can stall.

The rapidity of the activities was a common mention by other participants in the study as well, and this had some influence on how the participants experienced the workshop. In reference to the initial activity where the participants were asked to empathize with students’ wants and needs, Sarah reflected:

> I liked the sticky notes that you could kind of pop up, and the rapidity of things ...it was so rapid that I didn’t have time.... I liked doing lots of short spurt rapid pieces and then moving back and...categorizing and problem-solving. …That’s also just how my head works…

Because this format aligned with Sarah’s natural approach to brainstorming and problem solving, the iterative activities associated with the design-thinking workshop were perceived as a benefit.
Margaret mirrors this sentiment when she describes her experience with creating/reviewing Post-it notes to define her problem statement:

One thing I did notice that I appreciated was when we got to the personal step of defining the problem statement. It was nice that you encouraged us to go back and look at all of [the stickies] because maybe you don’t even pick one of your own. So now you have this wider universe of issues that...you all have seen in some way. ...maybe...somebody else's idea calls to you to put into your personal problem statement. ...I appreciated that and the way that worked out.

Additionally, Robert explains his appreciation for quickly-paced, iterative activities because, “...There definitely wasn't...time or opportunity to get bored with any of those things, because [we moved] on to the next one. That felt good.” Finally, Phillip explains his perceived value of reflecting and iterating on his brainstorming activity:

It was good to reflect...to see what other people did and to start thinking about what those themes are. ...[It was also good to see] which ones resonate, and which ones didn't. I thought was helpful....

A final key finding relating to iterations of ideas involves the notion of participants’ engagement in iterative thought-processing after the workshop concluded. In her interview, Kara expressed further reflexivity of her practice and her planning for students as she reflected on the iterations of her prototype:

I thought of one solution, and then later one of the solutions I came up with was: well, the students themselves could be taught to improve their self-assessment skills, which is not, that's not something I really given any prior thought to. ...[Then] I sort of have to hash out ...,what does that mean? How would we teach students? ...What guidance can we give them? Maybe have to teach them better self-assessment so that they can identify
what their own areas of improvement are….It occurred to me when I was doing the exercise [it was] nothing I had really given much thought to before.

**Student empathy.** The third subordinate theme relating to reflexivity involves the human-centeredness of the design-thinking workshop, *student empathy*. To establish context for the workshop series, a significant amount of time was dedicated to the participants’ perception of what students want/need to enter their classroom. There was much evidence in the data suggesting reflexivity for how participants approached this topic. In a broad sense, participants felt it was easy to think about their instructional practice in conjunction with the students’ needs. Joseph describes the general perceived value of placing students’ needs first when instructional planning, stating:

> I think I've, in the background, understood that there was this range of students that had different levels of interest…but... it was interesting to flip that and start by thinking about what the students’ [needs were] and then thinking about how you apply the teaching materials.

In this instance, Joseph identifies as a naturally empathetic instructor, but that usually is reactive in his practice rather than proactive. Sarah expresses a similar attitude as Joseph of approaching the empathy piece with broad reflections of experience. She adds, “I think that we did…really…global type of thinking about students together as a group and then we did independent work thinking through our own problems….”

However, while many found this useful technique to remain proactive in general thinking and responding to students’ needs, there was a hesitation expressed by the participants on the validity and perceived disingenuousness of this reflective activity. Sarah continues her reflection of the process of deeply thinking of students’ needs, stating:
I found it beneficial to see some of the places where students… need additional empathy or where there [are] some communication breakdowns or where hard lines were drawn. But…I don't think that you can empathize with anybody without talking to them. …For me, that's missing - the student voice. In terms of student empathy, I think just hearing their voices and stories…

Other participants expressed a discomfort with attempting to identify the students’ needs and wants without first discussing the topic with them. For example, Kara explained, “There's…something a little uncomfortable about… generalizing… students…” On the other hand, Phillip expressed that the level of depth he was able to provide without first speaking with students was superficial and, in that regard, “that’s the way I think all the time… but I don't think my wants and needs change very much.”

Common in the data was the notion that most of the participants thought back to their own qualitative student data (e.g., student surveys, targeted student feedback) when asked about student-centric iterations, and they weighted this as a greater value add to their thinking about instructional practice than brainstorming based on presuppositions. Robert explains that he prefers to talk with his students directly when he is looking to inform his practice:

I think it's really hard, because I wasn't talking to students…. I feel like I was sort of generating some kind of like generic boilerplate-y things that I would imagine generating, and then that wouldn’t be all that hard to do.

Phillip parallels this sentiment, explaining, “…I've always found that the verbal interaction…much more useful than…the written ones, because the written ones frequently…they're either people who really liked it and are really kind...or people who really didn't…”
Summary

In total, every participant displayed a form of reflexivity as it related to their instructional practice, including their approach to teaching content and for accommodating students’ needs. All respondents recognized a shift in the student demographics and learning needs, and within the interviews, each participant expressed reflexive thought around negotiating these changes. Most participants found value in the iteration of ideas where they were asked to produce content, review and theme content. For some, this method aligned with their natural brainstorming process. Finally, all participants expressed a perceived value in reflecting on students’ wants and needs; however, they felt the activity was disingenuous without first having student data with which to work.

Collaboration

The third and final superordinate theme involves collaboration, which captures the perceived attitudes, values and beliefs participants had around collaborating with other instructors from a range of disciplines. Two subordinate themes emerged from the data analysis for this theme, including interdisciplinary perspective and discipline-specific insight.

Interdisciplinary perspective. A key finding in the data is the perceived value of the collaboration portions of the workshop. Every participant commented on their respective interest in hearing from another faculty member from another discipline. Like the rest of the participants, Joseph noted that, “Some of the problems are quite similar.” Others, like Margaret, talked about the perspective she gained as an individual based on the diverse perspectives of the other participants, adding, “It reminded me of how I have a world view and other people have different ones.” She goes on to say, “[I] guess…I was disappointed that there wasn't more direct interaction…because there wasn't enough sharing.”
Phillip also shared the sentiment that it was beneficial for him to collaborate with peers of different disciplines during the design-thinking workshop, stating:

…It was also helpful to see what other people did and how that related, but I think that the way the session was set up was very much to support…my own thinking and…it's…making me quickly lay things out and I just think that exercise helps as you're…thinking through what you're trying to do.

Joseph discusses the value that he sees in collaboration across the disciplines in a deliberate space designed to foster creativity and collaboration:

I think…that sharing is really useful. I don't get to do that too much actually. …I think it's common faculty are all…doing their own thing... and then we might chat casually, but you know, we don't have [here] [a common space where] people might talk about those problems a little more…in the kind of research environment we're in. So that was really useful just to hear [similar issues] from other people…even though the disciplines we were teaching are quite different.

In this quotation, Joseph identifies barriers within the higher education structure that prevent frequent cross-disciplinary conversations around instructional practice. Sarah complements this statement by explaining, “It's nice to…get to…place yourself and your pedagogy and your kind of philosophy…to your work in a broader…picture of people.”

In a general sense, participants valued the difference in perspective that was brought to the conversation with one another based on disciplinary experience. Sarah states that:

For me it was great because…There were really different opinions in that room in terms of perspectives on students, perspectives on the university's responsibility to students, students' responsibility to the university…so…to have those voices, even if they had nothing related to my particular problem made me so hyper-aware of that kind of
simultaneity of visions of the university, of students, of learning, of teaching, of how all of these things break down.

Jeffrey mirrored Sarah’s sentiment about the benefits of collaborating across disciplines by stating, “I think [discussing with colleagues from another discipline] is one of the most useful because often gives you an idea of the way people do things in other settings…it might be completely normal for their particular milieu, but very not normal for the milieu that I’m in and you can often get really good and interesting ideas that you can apply to your setting…."

Others in the group recognized a lack of connection between others’ work related to their discipline but valued a growing sense of collegiality that occurred across the group as the workshops progressed. Phillip explains that despite their disciplinary differences, there was a usefulness to the collaborative prototyping exercises in which everyone shared common processes for seeking an actionable pathway to a solution to their identified problem:

It was in some ways looking at theirs to help them, but also in thinking of theirs, of how theirs were related to mine, there was just another way to think through what I was thinking about. So, I thought that was a useful exercise and I thought everybody seemed to have that same spirit.

As the workshop progressed, others described a growing collegiality across the group, and many expressed a comfortability in this. Kara described the insights that were revealed to her relating to her shift in perspective from the beginning of the workshop to the end:

I found it surprisingly like a low-key and comfortable and easy to…put all my ideas out there. ...it's harder for me to be in situations where I don't know people and it takes a bit more effort than it might take other people, but it wasn't actually. I think the participation [in this context] flowed pretty well and…it wasn't that hard to… be working through all these ideas with strangers.
The shared sense of purpose across disciplines resulted in Joseph’s perception that the workshop provided a “…collegial experience of talking with the other participants in the workshop was really valuable….” Finally, Sarah noted that despite the differences she noticed in the other participants’ problem statements that were associated with their specific disciplinary needs, she recognized a breakdown of barriers towards collegiality.

A thing I had noticed as we were going around on the [prototyping] posters – it was much more audience-based….because people knew that people [were] going to be standing in front of [their prototype posters]… so there were…inside joke things.

Each participant entered the workshop not knowing any other participants, but Sarah explains that by the end, she saw an opportunity for networking post-workshop, adding:

…One of the more critical faculty members who was in the room, I emailed immediately afterwards and…we're going to meet with [my colleague] who works with international graduate students to talk…it was really cool.

The researchers’ observational notes corroborated the participant’s perceived sense of collegiality that grew over time. In the first workshop, after the initial independent brainstorming of identifying students’ needs, the researcher noted: “Very few conversations; one person dominated the conversation; many prompts to get participants to talk.” The observational notes during the prototyping exercise read: “Many ideas shared; running past time allotment; Sarah and Margaret offer many ideas; Interesting conversations.”

All participants expressed interest in one another’s perspective and expressed that there was a value add to learning from their peers. Additionally, many described the existence of barriers to these conversations occurring naturally across disciplines in institutions of higher education, specifically research institutions, due in part to the physical separation of the department as well as from the difference in specific discipline “ways of knowing.”
**Discipline-specific insight.** While all participants enjoyed hearing from their cross-disciplinary peers, many found it difficult to make meaning of the materials of other participants from other disciplines. Many participants expressed interest of engaging in this design-thinking workshop with colleagues from the same discipline. Robert expressed the struggles that came with the relatability of a participant from another discipline’s work:

It was kind of cool to learn about what those challenges are in that kind of context, but it's not like those are my challenges....I was trying to think about how it relates to me, but it didn't seem like it did for the most part. Some of it did, but the stuff that did…was sort of a fairly broad umbrella.

Kara also discusses the notion of relatability of the workshop, stating that it would have been more relatable if the workshop were conducted with people of the same discipline:

It might be interesting to do…something like that with a group of people who do the same work as you because…I think reflections and experiences people have might be…a little more relatable. In some ways it helps that you have like-minded people who understand the same work, then you can really hash through…40 potential solutions to that project we're working on…

Margaret also expressed a lack of relatability between her work and others’ prototypes in the workshop, stating that, “…There wasn't an immediate sense for me like, oh, how could I do this?” She, like many others, expressed interest in others’ thinking processes and solutions-generations, but did not see necessarily see the applicability to her instructional context.

**Summary**

In all, participants enjoyed opportunities to share ideas and receive feedback from their faculty colleagues. All of the participants noted that the collaboration portion of the workshop was one of the most valued of the activities, and they were each interested in the ideas generated
from others as well as the targeted feedback. However, some participants felt as though innovation in thinking of new ideas for their individual practice was somewhat stymied due to the lack of like-discipline brainstorming.

**Conclusion**

The purpose of this study is to gain insight on the perceived experiences of seven postsecondary faculty from an R1 institution in an instructional development model framed around the tenets of design-thinking. Data were collected during two workshops as observational notes taken by the researcher, and through two, semi-structured interviews with participants after each workshop. Data analysis of individual and collective participants’ data by way of first and second cycle coding revealed common patterns of participants’ perceptions and values relating to design-thinking as an instructional development model. Of these patterns, three superordinate themes emerged, including engagement, reflexivity and collaboration, with an additional eight subordinate themes.
Chapter Five: Discussion Findings and Implications for Practice

Given the shifting landscape of higher education, including the growing diversity of student body and external market demands, many faculty express difficulty adapting to the rapidly changing needs of the institution and their students (Hendry & Dean, 2002; Kivunja, 2014; OECD, 2012; Satsope et al., 2015; SHEEO, 2016; Ward & Sylvester, 2012; Willness & Bruni-Bossio, 2017). Institutional demands on faculty at research institutions leaves little time for faculty to focus on optimizing instructional practice over research scholarship (Billing, 2011; Norman & Spohrer, 1996, OECD, 2012). Compounding these struggles includes research that suggests that current structures of instructional development in higher education are relatively ineffective at disrupting inertia in the ways in which faculty approach their praxis (Trust et al., 2017).

Research suggests that effective professional development must be socially constructed, aligned with faculty’s praxis, and provide faculty with a sense of agency over their practice (Daniels, 2017; Dufour, 2004; Dufour, 2007; Drago-Severson, 2009; Guskey, 2002; Trust et al., 2017). While an effective and traditional model of instructional development requires sustainment over time, many practitioners in research institutions maintain too many alternative identities to devote to the sustained improvement of instructional practice (Darling-Hammond, Wei, Andree, Richardson, & Orphanos, 2009; Doppelt et al., 2009; Graham, 2007; Guskey, 2002; Stes, Coertjens, & Van Petegem, 2010; Trust, Carpenter, & Krutka, 2017; Trust, Krutka, & Carpenter, 2016; Hendry & Dean, 2002; Van Schalkwyk, Leibowitz, Herman, & Farmer, 2015). With this in mind, the design-thinking methodology provides a new paradigm for engaging innovation and creativity within a relatively short amount of time (Beaird, Geist & Lewis, 2018; Gobble, 2014; Luka, 2014; Johansson-Skoldberg, Woodilla, & Çetinkaya, 2013).
The goal of this study was to gain insight on the ways in which postsecondary faculty experience design-thinking processes when applied to an instructional development model. The following research question was used to guide the study:

**Central Research Question**

- How do postsecondary faculty members perceive design thinking as a model for instructional development?

The design-thinking framework, developed by the d.Hasso Plattner Institute for Design at Stanford (2010), served as the basis for this research that examined using the design thinking framework as a model for instructional development at the postsecondary level. This framework was chosen because of its success in promoting timely user-centric innovations in fields such as engineering, design, business and medical, and its potential applicability in addressing some of the aforementioned issues associated with effective instructional development in higher education. Through in-depth data analyses, the researcher gained insight into the ways in which postsecondary faculty experienced this model of instructional development. The purpose of this chapter is to examine the findings associated with this study, explore its relation to the design-thinking framework and discuss the implications for practice that could influence future areas of research in higher education.

**Summary of Findings**

At the completion of this study, several findings were identified. This section will examine the most notable findings of the study including:

- The relationship between quickly-paced activities and their alignment to individual’s practice is an important consideration for promoting innovative thinking during instructional development. This was evidenced as each participant identified a value add
associated with timed activities that encouraged them to think more deeply about their relevant problem in their practice.

- Collaboration and communication across disciplines helps facilitate thinking around one’s instructional practice. As identified in their responses, participants acknowledged that being able to collaborate with peers from other disciplines was most valuable to their thinking of their own practice.

- Incorporating ways for participants to obtain authentic student feedback is imperative when planning learner-centered instructional development. Participants expressed a level of discomfort in generalizing their learners’ needs without having data directly from the learner.

- Engaging in problem-based instructional development requires open goal-setting and multiple opportunities for participants to review and reflect on their identified problem(s) and solution(s). As identified in their responses, participants had a natural reflexivity toward their teaching practice that was enhanced by activities that facilitated iterative thinking.

**Discussion of Research Findings**

The following section will examine the findings of this study with the current literature on professional development and design-thinking. Each finding will include examples connecting the experiences of the participants with the literature.

**Timed Activities Around Independent Practice**

Each participant in the study commented on the benefits of being able to focus on their own problem of practice in the workshops. Additionally, participants noted that although the rapidity of the activities went against their normal style of contemplative thinking, they recognized that this rapid pace allowed them to conceptualize greater possibilities relating to
solutions without getting stuck in the problem. This was evidenced in the outcome of the fast-paced Crazy 8s activity in which six of seven participants discussed generating solutions beyond what they had previously considered. This is consistent with the literature around the design thinking framework in which quick ideations of building and testing hypotheses allows participants to consider “what might be” rather than “what is” (Beaird, Geist & Lewis, 2018; Luka, 2014).

The research of Lawson (2006) and Cross (2006) suggests that design thinking is a practice-based process that functions beyond the theoretical into the practical application of problems of practice (Elsbach & Stigliani, 2018; Johansson-Skoldberg, et. al., 2013). They posit that thinking like a designer involves a way of working through a series of abductive processes that are grounded in one’s practice (Johansson-Skoldberg, et. al., 2013). All of the participants noted a value to first brainstorming their problem of practice independently before sharing it with a group. They described the rapid iterations and solutions generations as approaching a problem in a way they never had before, thus pushing them to think in ways they had never thought before. Research around design thinking describes the goal of ideation as uncovering areas previously unexplored (d.Hasso Plattner Institute for Design at Stanford, 2010; Gobble, 2014). The rapid succession of this process maximized participants’ time and allows for individualized thinking within a group setting without relying first on consensus-building (Brown, 2009).

Furthermore, participant data around the value of connecting instructional development around their own problem of practice is consistent with the literature on effective professional development in education (Darling-Hammond et al., 2017; Guskey, 2002). The literature on professional development suggests that models that target specific pedagogical or content knowledge skills often fail due, in part, because of its lack of connection with the participants’ praxis (Darling-Hammond, Wei, Andree, Richardson, & Orphanos, 2009; Doppelt et al., 2009;
Graham, 2007; Guskey, 2002; Trust, Carpenter, & Krutka, 2017; Trust, Krutka, & Carpenter, 2016). Research conducted by Trust and colleagues (2017) and Fink (2013) support this notion in higher education, whereby their work shows that institution- and department-wide professional development workshops centered on high-yield instructional strategies rarely lead to improved practice or transformational change.

**Collaboration and Communication with Peers**

Participants unanimously expressed value in collaborating with peers across disciplines around their individual problem of practice. This was most evidenced during prototyping, in which the participants provided feedback (e.g., two items of value; one suggestion for improvement) on one another’s solutions. While many perceived that this activity might be more transformative with others in their discipline, they all stated that they gained unique insights from others of different disciplines through the sharing of ideas.

The benefits of collaboration and communication with peers in transformative thinking is consistent with the literature on professional development and design thinking. Research in instructional development states that to be effective, the educator must maintain agency over their practice but also build capacity through collaborative opportunities with peers (Darling-Hammond et al., 2009; Drago-Severson, 2009; Dufour, 2004; DuFour, 2007; Trust et al., 2017; Trust et al., 2016). In this way, professional learning is a social and constructivist action, serving to challenge one’s espoused beliefs (Daniels, 2017; Darling-Hammond et al., 2009; Doppelt et al. 2009; Dufour, 2004; Dufour, 2007; Trust et al., 2017; Trust et al., 2016; Wood, 2007).

There is also evidence in the literature that the use of design thinking challenges participants underlying assumptions and preexisting beliefs. Research conducted by d.Hasso Plattner Institute for Design at Stanford (2010) posits that for designers to meet deep innovation and creativity, it is imperative that they engage in prototyping that fosters collective meaning-
making with other designers. This is further supported by Cross (2011), who elaborates that the social process of interaction allows participants to offer their own perspectives of ‘object world,’ thus opening space to construct new meaning. In regard to practical application of design thinking tools in organizations, Elsbach & Stigliani (2018) found that open innovation among organizational members contributed to a growing culture of openness and reduced the risk-averse culture. Many of the participants in this study displayed similar behaviors by the end of the second workshop. As evidenced in their transcripts, many noted that they now recognize that they can adapt portions of their course as they move through the semester and they described feeling freer to be responsive to their students if needed during the term.

**Obtaining Authentic Student Feedback**

One of the most notable findings of this study was participants’ response to the exercises that required them to empathize with the students as a driver to their work within the workshops. All participants were veteran instructors with years of experience, and most of them stated that they felt they empathized with students naturally, yet they all noted an appreciation for a student-centered focus to the workshop. They all noted that the first exercise to identify students’ needs created large, generalized topics that they were surprised to see were the concerns of their peers in other disciplines; however, a majority of the participants expressed discomfort in generalizing students’ needs without obtaining feedback from them directly.

The literature in design thinking supports the notion of ethnographic data collection of the end users to jumpstart the ideation process. These ethnographic approaches often include direct observation, interviewing with various end users or creating an end-user journey map (d.Hasso Plattner Institute for Design at Stanford, 2010; Elsbach & Stigliani, 2018). The goal of this process is to gain authentic insight into the troubles that are experienced by the individuals experiencing the problem (d.Hasso Plattner Institute for Design at Stanford, 2010). While
generalizations are made about the end user while creating a problem statement, these are typically done with extensive data sets that have been collected from the field (d.Hasso Plattner Institute for Design at Stanford, 2010).

**Multiple Opportunities for Review**

All participants expressed an interest and value to the recursive nature of the workshops. They each described the benefit of revisiting students’ needs and the How-Might-We questions as they moved through the ideation and prototyping stages of the workshops. However, some participants felt they would have benefited more from purposeful goal-setting during the workshop rather than simply identifying a problem without a goal.

The literature on design thinking cognition expressed the importance of abductive thinking, which allows the designer to shift and transfer thinking as necessary through the ideation and prototyping phases (Brown, 2009; Cross, 2011). In this way, innovation emerges through the recursivity of revisiting and reviewing the identified problem and generated solutions (Cross, 2011). While goal-setting is a part of design thinking, it is limited to the goal of producing solutions around a high-level problem defined by the designer (Cross, 2011; d.Hasso Plattner Institute for Design at Stanford, 2010; Gobble, 2014). The purpose of broad expectation is to allow for greater levels of divergent thinking that could otherwise become entangled in pre-existing goals if they had been established before the ideation session (d.Hasso Plattner Institute for Design at Stanford, 2010; Elsbach & Stigliani, 2018; Gobble, 2014; Johansson-Skoldberg, et. al., 2013). Design thinking is, in itself, rooted in open exploration, to promote insight through blending analytic and creative thinking (Gobble, 2014). In fact, Cross (2011) hypothesized that it is the intersection of ambiguity and uncertainty that is essential in design processes to “recast” meaning around multiple object worlds (p. 20). Further, design activity is intended to be
episodic around these ambiguities, to open opportunity to explore new progressions (Cross, 2011; d.Hasso Plattner Institute for Design at Stanford, 2010; Johansson-Skoldberg et. al., 2013).

**Research Findings and Design Thinking as Instructional Development**

The overarching goal of this study was to examine experiences of postsecondary faculty around a new model for instructional development that encouraged divergent thinking in a timely manner that was abductively constructed by the participants. This model for instructional development was based on the design thinking conceptual framework that introduces five processes (e.g., empathy, definition, ideation, prototyping, testing) for encouraging innovative and creative solutions to problems.

Many of the design thinking protocols align with the research on effective instructional development, including the notion that the problem being explored must be identified by the designer (Cross, 2011; d.Hasso Plattner Institute for Design at Stanford, 2010; Johansson-Skoldberg et. al., 2013). This aligns with research on instructional development from Darling-Hammond and colleagues (2009) and DuFour (2004; 2007) that suggests that professional development must not belie the work of the practitioner if transformational change is to occur. Perhaps the largest difference between the tenets of design thinking and Darling-Hammond’s work on instructional development is that the former promotes abductive thinking of what may be based on observational data that is inherently human-centered and recursive movement between problem and solution generation (Cross, 2011). In this way, design thinking promotes a flexibility within the designer to episodically revisit and refine the problems and solutions based on open possibilities (Brown, 2009; Cross, 2011). Participants expressed enjoyment and value in being able to experiment with a problem they were experiencing in their practice, and they felt added value came from a proactive approach to meeting students’ needs. Additionally,
participants described an appreciation for the activities that encouraged thinking towards any possible solution rather than trying to generate solutions based on current feasibility.

Another design thinking protocol from the literature that aligns well with the research on instructional development is the social construction of knowledge that is generated from conversations with peers, or other designers. In regard to instructional development, Doppelt and colleagues (2009) suggested that implementing a framework for collaborative practice and collegial inquiry around curriculum reform could lead to transformative change. Within this recommendation, Doppelt and colleague (2009) posit that teacher-learners gain generative knowledge from sharing personal experiences from their classroom with other teacher-learners. The design thinking framework aligns with this concept whereby it fosters individuals working on their independent problems of practice within a collegial group of practitioners who offer varying perspectives around solutions (Brown, 2009; Cross, 2011). Perhaps the strength of design thinking in the context of instructional development, is the concept that collegial inquiry is focused around solutions generation and rapid prototyping, which encourages designers to engage in deeply creative thought around a problem (Cross, 2011).

Further, because of the nature of the design thinking framework, instructors are able to maintain ‘parallel lines of thought’ around experiential problems, inviting ambiguity and recursive thinking towards multiple solutions that can be prototyped and tested in practice (Cross, 2011). In this study, participants perceived reflexive thinking in rapid prototyping as beneficial to the depths of their own thinking around their identified problem of practice. Additionally, many participants expressed an appreciation for not being “locked in” to a singular problem, and they stated that the freedom to adjust their problem or borrow from another participant’s problem was helpful to their own thinking. Finally, despite the fact that the participants hailed from different instructional disciplines, a sense of collegiality stemmed from
the collaboration that occurred in the workshops and many participants explained they expect to sustain these new relationships beyond the workshop. This was attributed by the participants to the fact that even though their problems and solutions were different, they were all focused on the same goal, which was to generate solutions around a problem of practice.

**Implications**

This study provides insight in a growing body of literature around the role of design thinking in organizational learning and in educational planning. Ongoing research in design thinking in education have been limited in its application to instructional development, specifically in the postsecondary education. This study serves as a contribution to this growing body of literature, and as a result, there are several implications and recommendations for future practice and research that were yielded by this study.

**Recommendations for Future Practice**

The results of this study support the notion that the application of the design thinking framework has potential uses in service fields such as education. The prevailing findings provide insight for future practice on implementing design thinking as a model for instructional development in higher education. This section of the chapter offers four recommendations for practice that are supported by the findings of this study.

The first recommendation relates to the need for institutions of higher education to embed design thinking protocols around iteration and problem-solution generation into instructional development programming. These principles should allow for faculty generation of problems around the individual’s instructional practice and should be deliberately implemented. For example, instructional development programming should respect the recursive design thinking processes from the empathy through the prototyping stages to encourage innovative and creative thinking around one’s practice. This depth of innovative thinking was evidenced in the
participants of this study only after a series of groundwork activities centered around building empathy and defining the problem. These activities scaffolded participant’s brainstorming towards the generation of multiple solutions during the ideation and prototyping phases. Participants corroborated this observation in their interviews in which many claimed that the solutions they generated during the activities were a result of focusing on the precursory activities.

The second recommendation for future practice relates to the need to incorporate systems that support faculty’s collection of authentic ethnographic data from students prior to engaging in the instructional development around design thinking. Participants expressed a discomfort around generalizing students’ wants and needs and they also recognized that course evaluation feedback is not a good indicator for students’ needs given their experiences with low response rate. To maintain a commitment to authenticity, facilitators can encourage faculty participants to enter the workshop with formative student data, both qualitative and quantitative, that will inform the empathy activities in a design thinking instructional development workshop. This can include student learning data, reflections, survey data, or attendance data.

The third recommendation for future practice relates to the importance of maintaining stringency in the timed design thinking activities associated with design thinking instructional development while also encouraging openness in the goal-setting. Participants of this study exhibited a natural tendency to establish a goal prior to engaging in the workshop activities, which goes against the literature related to the ways in which one generates deeply innovative solutions to problems. Rather than generate a solution around a preconceived goal, workshop participants should establish the more ambiguous goal of generating multiple solutions to a singular problem. To assist with this request, an outside facilitator should serve as mediator of thinking to establish the purpose of open thinking and encourage workshop participants to stay
focused on solving the problem without predetermined goals. As evidenced in the findings of this study, participants’ most innovative thinking came when they were encouraged to generate solutions beyond what is current conceivable. Participants agreed that without an outside facilitator encouraging this type of thinking within restricted time frame, they would have experienced stuck thinking by contemplating the problem and this would have limited their solutions generation.

A final recommendation for future practice relates to the importance of inviting a diverse body of faculty participation across a singular academic area when implementing design thinking instructional development. Participants valued diverse perspective in the workshops, but also recognized the limitations resulting from collaborative feedback due to the specific ways of knowing evidence in each discipline. There was a collective desire by participants to experience this workshop with others from the same academic area. In consideration of this data, it is recommended that instructional development workshopping recruit faculty broadly from general academic areas, such as life sciences, medical sciences, humanities, etc., rather than focusing on a singular discipline, such as physics or English, or disregarding disciplines altogether.

**Recommendations for Future Research**

As previously noted, this study contributes to a growing body of literature around the implementation of design thinking protocols outside of design fields. As there is little research focused on the implementation of an instructional development model framed around design thinking in higher education, this qualitative study provides new insight into the ways that faculty experience this style of instructional development. With that in mind, there are areas of future research that can be examined to further contribute to the body of literature.

First, this study focused on qualitative measures surrounding the design thinking methodology for instructional development as a way to gain insight on the ways in which faculty
experienced this model as a whole. Given the findings of this study, more qualitative research should be conducted that focuses on specific academic areas looking to innovate their curriculum. Additionally, as this study was wholly focused on faculty from one, R1 institution, more qualitative studies could be conducted at different institutions, including those that are classified as a teaching institution.

Another recommendation for future research is to investigate ways in which faculty participants leverage student data to inform their participation in design thinking instructional development workshops. In this way, future studies can qualitatively examine the data sets that faculty deem most helpful in allowing them to identify a problem statement. This has potential to inform a body of literature around faculty’s desire to maintain authenticity during their design-thinking work.

A final recommendation for future research is to engage a longitudinal, mixed-methods study to gauge the effectiveness of design thinking instructional development programming on faculty’s practice. By engaging a mixed-methods study, the researcher can investigate correlative data between the faculty’s attitudes and values around this model of workshopping and the impact it has on their instructional practice as evidenced by quantitative data points such as student learning, course evaluations, attendance, and enrollment.

**Conclusion**

This qualitative, phenomenological study aimed at gaining insight on the ways in which postsecondary faculty experienced design thinking as model for instructional development in higher education. Design thinking was used as a conceptual framework for this study, and the tenets of effective instructional development, as drawn from large body of literature, was used to supplement the direction of this study. Faculty participants generally expressed a sense of enjoyment around their participation in this style workshop, and four themes emerged from the
data analysis: the importance of rigorously timed activities that encourage participants to identify and contemplate their own problems of practice; the importance of encouraging peer collaboration around prototyped solutions to problems of practice; the importance of incorporating authentic student feedback into the design of the workshop; and the importance of implementing multiple opportunities for participants to review and revise their thinking around their problems and solutions.

As a result of the findings, four recommendations for practice were suggested. First, the researcher recommends that faculty developers maintain integrity and intentionality to the tenets of design thinking when implementing them into instructional development. Second, the researcher recommends that faculty developers encourage faculty participants to engage in authentic forms of ethnographic data collection of their students prior to entering design thinking instructional development workshops. Third, the researcher recommends that an outside facilitator in the design thinking instructional development workshops encourage participants to sustain a broad goal of ideating solutions around an identified problem rather than attempting to define a goal prior to the definition of the problem. Finally, the researcher recommends that design thinking instructional development workshops are segregated by broad academic areas (e.g., life sciences, physical sciences, humanities, etc.).

The results of this study have potential for future research in the area of design thinking instructional development. The researcher recommends that future qualitative studies be centered on design thinking instructional development in which the faculty participants hail from the same general academic area. Additionally, future researchers should also look at the ways in which faculty experience design thinking instructional development from schools outside of an R1 institution. A third recommendation includes the potential for qualitative research that focuses on faculty’s perception of the types of student data that may have value in informing
their identification of a problem statement. Finally, to investigate the effectiveness of this model on faculty’s instructional practice, the researcher recommends a mixed-methods study that investigates correlative data between the faculty’s perceptions of efficacy and quantifiable course data, including evidence of student learning, course evaluation, course persistence and course enrollments.
References


https://doi.org/10.1016/j.ijnurstu.2005.11.026


Drago-Severson, E. (2016). Use a variety of practices to connect with all. *Journal of Staff Development, 37*(1), 38-42.


[http://dx.doi.org/10.1080/13603124.2015.1066868](http://dx.doi.org/10.1080/13603124.2015.1066868)


https://data.nysed.gov/reportcard.php?instid=800000055804&year=2014&createreport=1&enrollment=1&avgrclasssize=1&freelunch=1&attendance=1&suspensions=1&teacherquality=1&teacherturnover=1&staffcounts=1&38ELA=1&secondELA=1


Roth, B. (1973). Design process and creativity. Retrieved from:
https://static1.squarespace.com/static/57c6b79629687fde090a0fdd/t/590133396a4963a462c680cd/1493250903831/Design+Process+and+Creativity+B+Roth+Small.pdf


https://doi.org/10.1007/s11135-013-9835-3


Appendix A

Initial Recruitment Email

Northeastern University, College of Professional Studies

Name of Investigators: Dr. Quannah Parker-McGowan, Principal Investigator; Melissa Kane, Student

Title of Project: Postsecondary Faculty Experiences with Design Thinking as a Framework for Instructional Development

Invitation to Participate in Research

Dear [name],

This email is being sent to you because I believe you could be a potential participant in my research study of the experiences and perceptions of faculty who engage in design-thinking faculty development workshops. The study will take place at [location] and will include two 60-minute workshops and two 45-minute interviews, totaling approximately 3.5 hours. The workshops are designed to support participants’ creative problem-solving through a design-thinking lens as it relates to their instructional practice. In each workshop, participants will engage in independent and group activities to identify areas of their course(s) that can strengthen the student learning experience. Participants’ ideations will be supported and scaffolded through each workshop, and participants can expect to walk away from the second workshop with a self-created deliverable that can be implemented in their course(s).

I am looking for full-time and visiting professors with active teaching assignments and with at least one year of overall teaching experience. If you do not meet these requirements but would be willing to forward me the names of faculty members who do, that would be greatly appreciated.

If you decide to take part in this study, I will ask you answer a series of questions about your experiences and beliefs around the two instructional workshops that are part of this study. Your participation is confidential and voluntary. There are no direct benefits to you for participating in the study. However, your answers may help us to learn more about the role of creative problem-solving as a framework for supporting faculty professional development.

If you have are interested in participating in this study, please reply to this email or call Melissa Kane directly at [phone number]. Thank you for your consideration in this project.

Best,
Melissa Kane
Appendix B

Second Recruitment Email

Northeastern University, College of Professional Studies

Name of Investigators: Dr. Quannah Parker-McGowan, Principal Investigator; Melissa Kane, Student

Title of Project: Postsecondary Faculty Experiences with Design Thinking as a Framework for Instructional Development

Invitation to Participate in Research

Dear [name],

I am following up with you as I believe you would be a valuable participant in a study I’m conducting for my doctoral thesis. I wonder if you might be interested in volunteering. It will involve participation in two 60-minute workshops and two 45-minute interviews over the next few weeks. You will not need to prepare anything for participation in these workshops and they will be held in a room central to campus.

The workshops are designed to support participants’ creative problem-solving through a design-thinking lens as it relates to their instructional practice. In each workshop, participants will engage in independent and group activities to identify areas of their course(s) that can strengthen the student learning experience. Participants’ ideations will be supported and scaffolded through each workshop, and participants can expect to walk away from the second workshop with a self-created deliverable that can be implemented in their course(s).

Each interview can be conducted in a place and time of your choosing.

Please reply directly to this email if you are interested in participating in this study or if you have any questions relating to this study. Thank you for your consideration in this project.

Best,
Melissa Kane
Appendix C

Outline for Workshops

Design-Thinking Instructional Development Workshop 1:
60 minutes // February 18, 2019 // [location]

Set purpose (10m):
- **Introduction:** “Assume beginner’s mindset”- Provide overview of creativity, genius and age; Encourage partner drawings to get participants out of “stuck” thinking; Explain implications for workshops [e.g., how-to work]; Establish that this will be scaffolded and that we will do a baseline today that will be serve as foundation to dive deeper next workshop

Build Empathy & Define (15m):
- **Build empathy with analogies** - participants identify areas of their course/teaching that is important, interesting and/or problematic. They will compare this experience to another area (e.g., learning protocols at the doctor’s office).
- **Engage with extreme users** - facilitator prompts participants to generalize “extreme” users: highest achievers, lowest achievers. List what qualities these extreme users typically possess, and use these qualities to brainstorm new ideas (e.g., what could resonate with the user)
- **Saturate and group** - Using Post-it Notes, participants synthesize their findings from empathy work to build an empathy map.
- **Point of View “Madlib”** - Individually, participants create a problem statement filling in the following: [USER] needs [USER’S NEEDS] because [SURPRISING INSIGHT]

Closure (5m)
- **Two-minute Takeaway Challenge** - participants will be tasked with writing down a task to challenge themselves between Workshop #1 and Workshop #2 [e.g., observe students during class; test prototype; add to prototype; etc.]
Design-Thinking Instructional Development Workshop 2:
60 minutes // February 25, 2019 // [location]

Set purpose (2-3 m):
- **Introduction:** “Assume beginner’s mindset”- Provide overview of creativity, genius and age; Encourage partner drawings to get participants out of “stuck” thinking; Explain implications for workshops; Establish that this will be scaffolded and that we will do a baseline today that will be serve as foundation to dive deeper next workshop.

Ideate (15m)
- **HMW Group Brainstorm** - Independently, participants review problem statement (POV Madlib) and the ideates solution-generation, “How might we...” questions.
- **Crazy 8s** – in 1-minute[timed] spurts, participants are encouraged to ideate eight solutions around their HMW question, not worrying about feasibility or viability.

Prototype (15m)
- **Prototype to Decide** - Users begin designing prototypes (e.g., assignments, tasks, projects) relating to findings from independent brainstorm. These prototypes should be low-res outlines but that follow the problem statement/end goals. Prototypes can be concept maps, drawings, outlines, etc. Participants outline as much as they can in 20 minutes.

Feedback (15m):
- **Feedback Capture Grid** - in a gallery-walk style, participants move around the room with Post-it Notes, and provide feedback on one another’s initial prototype using the quadrants (e.g., positives/likes; wishes; questions; inspiration).
  - Participants then take the feedback back to their prototype and apply notes as necessary

Closure (5m)
- **[Independent] Brainstorm** - Participants will have an opportunity to make modifications or changes to their prototype
- **Report out** - Participants will be encouraged to share out their plan for implementation of their prototype.
Appendix D

Informed Consent Document

Northeastern University, College of Professional Studies

Name of Investigators: Dr. Quannah Parker-McGowan, Principal Investigator; Melissa Kane, Student

Title of Project: Postsecondary Faculty Experiences with Design Thinking as a Framework for Instructional Development

Informed Consent to Participate in a Research Study

I am inviting you to participate in a research study. This form will tell you about the study, but I will explain it to you first. You may ask me any questions that you have. When you are ready to decide, you may tell the researcher if you want to participate or not. You do not have to participate if you don’t want to. If you decide to participate, I will ask you to sign this statement and will give you a copy to keep for your records.

Why am I being asked to take part in this study?

Based on your experiences as an active, higher education instructor, you have been identified as a good candidate to participate in the instructional development workshops associated with this study. Your perspective based on your experience with these workshops will inform the study to see how design-thinking processes work with instructional development.

Why is this research study being done?

The purpose of this study is to better understand how instructors interact with the design-thinking process as a framework for instructional development in higher education.

What will I be asked to do?

If you decide to participate in this study, I will ask you to attend two workshops with other participants of the study where you will work together to redesign areas of your course(s) that
you identify in need of improvement. You will also participate in two (2) semi-structured interviews that will be conducted in a one-on-one setting with me. In each interview, you will be asked questions about your experiences and engagement with two faculty development workshops designed around creative problem-solving (e.g., design thinking processes).

Where will this take place and how much of my time will it take?

In total, you participation in this study will take approximately 5 hours of your time. This time will be divided between two (2) 60-minute workshops that will occur spaced out by two weeks of each other, and two (2) 45-minute interviews. The first interview will be conducted before the workshops, the second will be conducted after the first workshop, and the third interview will be conducted after the second workshop. Approximately one month after your last interview, you will be asked to review the coded data to verify that I have accurately represented your responses.

Will there be any risk or discomfort to me?

While efforts will be taken to protect your anonymity and identifiable information such as your name will be changed, there is still a possibility that your identity could be recognized.

Will I benefit by being in this study?

There is no direct benefit to you for participating in this study. However, the information gained from this study could benefit teaching and learning centers in other institutions of higher education as they develop new programming around instructional development.

Who will see the information about me?

Your participation in this study will be confidential, and only I will know your true identity. Data will be stored electronically in a system that requires two-factor authentication to access. Data will be destroyed one year after the study is completed.

What will happen if I suffer any harm from this study?
No special accommodations or compensation will be provided for participating in this study or if you suffer any harm as a result of the study.

**Can I stop my participation in this study?**

Your participation in this study is entirely voluntary. You do not have to participate in this study, and you are free to refuse to answer any interview question. If agree to participate but wish to quit before it is over for any reason, you may do so and there will be no repercussion.

**Who can I contact if I have questions or problems?**

If you have any questions about this study, you may contact the Melissa Kane, the person mainly responsible for the research, at kane.me@husky.neu.edu or 401-863-7395. You may also contact Dr. Quannah Parker-McGowan, the Principal Investigator, at q.parker-mcgowan@northeastern.edu.

**Who can I contact about my rights as a participant?**

If you have any questions about your rights in this study, you may contact Nan C. Regina, Director, Human Subject Research Protection, Mail Stop: 560-177, 360 Huntington Avenue, Northeastern University, Boston, MA 02114. Tel: 617-373-4588. Email: n.regina@neu.edu.

You are welcome to contact me anonymously if you wish.

**Will I be paid for my participation?**

You will be given a $15 electronic gift certificate to Amazon upon completion of the final interview.

**Will it cost me anything to participate in this study?**

There will be no cost to you for participating in this study.

**Is there anything else I need to know?**

To participate in this study, you must be categorized as a faculty member with at least one year of teaching experience.
I agree to take part in this research.

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Appendix E
Interview Protocol

Date: [date]

Institution: [institution]

Interviewee: [interviewee]

Interviewer: Melissa Kane, graduate student at Northeastern University

Research Question: How do postsecondary faculty members perceive design thinking as a model for professional development?

Introduction

Thank you, (participant name), for participating in this interview. You have been selected to speak with me today because, as a faculty member at this institution, you have been identified as a great candidate to participate in the workshops associated with this study, and your insight relating to your experiences in these workshops will be invaluable. My research focuses on a framework for instructional development that is grounded in design thinking processes. Through the study, I hope to gain a better understanding of how faculty experience and perceive facilitated creative problem-solving processes as a framework for instructional development.

Your responses are important to this study. To make sure I capture everything you say, I would like to audio tape our conversation today. Do I have your permission to record this interview? I will also be taking written notes based on my observations. I can assure you that all responses will be confidential and only a pseudonym will be used when quoting from the transcripts. I will be the only one privy to the tapes which will be eventually destroyed after they are transcribed.

In total, this interview process should last approximately two, 45-minute sessions. During this time, I have several questions that I would like to cover. If time runs short, it may be necessary to interrupt you in order to push ahead and complete this line of questioning. Do you have any questions at this time?

Interview #1:

Teaching Background:

1. Please describe your education and professional background.
2. How long have you taught in higher education?
3. What discipline areas do you teach?
4. How do you describe yourself as a scholarly researcher?
5. How do you describe yourself as a teacher?

**Experiences with Past Professional Development:**

1. How have you previously experienced professional development as a postsecondary instructor?
2. Thinking of professional development workshops in general, how would you rate their effectiveness on your teaching practice on a scale of 1-10 with 1 being they didn’t help at all and 10 being that they were transformative?
   a. Prompts: Explain why? What characteristics of the professional development workshops made them a ____?
3. In what ways, if any, have past professional development workshops impacted your assumptions or beliefs about teaching and/or student learning?

*I would like to hear about your perspective and experiences regarding the creative problem-solving workshops you participated in for this study. To do this, I am going to ask you some questions about the key experiences you encountered and your beliefs around them. If you mention other people, please use do not mention names. Please note that the people mentioned in your interview, including yourself, will be given a pseudonym to protect their and your identity.*

**Experience with Design Thinking Faculty Instructional Development**

1. Please describe your overall experience within this problem-based approach to instructional development.
   a. Prompts: How does it compare to previous experiences?
2. What challenges or obstacles did you face in defining your student personas before engaging in creative problem-solving?
3. Describe how you experienced the quick pace of identifying problems and brainstorming solutions.
4. In what ways, if any, did collaboration with your colleagues during the workshop influence your experience?
   a. Prompt: How would you rate the benefits of this collaboration? Why?
5. What, if anything, in this experience came easily to you?
   a. Prompt: Why?
6. How would you describe your satisfaction or dissatisfaction with these workshops?

**Interview #2**

**Perceptions of Design Thinking Faculty Instructional Development**
1. How do you feel you adapted to this format of instructional development?
   a. Prompt: Why do you feel this way?
2. What meaning do you make of this experience?
3. What insights have you gained about yourself or your professional identity?
4. How do you feel this format of instructional development compares to other professional development workshops you have attended in the past?
5. What do you perceive is a benefit, if any, of instructional development framed through the lens of design thinking?
   a. Prompt: Can you qualify your answer?
6. How do you feel these workshops made you think about your teaching practice?
   a. Prompt: Do you feel this made any impact on your thinking? How? Why?
7. What, if anything, did you learn about yourself as an instructor as a result of your participation in this workshop?

**Reflection and Debriefing**

1. As you reflect on your overall experiences associated with this study, did your beliefs or perceptions of this model for instructional development change over time? How?
2. As you think over what you have shared with me today, is there anything that stands out as important or influential in your experiences or beliefs about the design-thinking workshops?
3. Is there any additional information you would like to add about your experiences or beliefs regarding these workshops?

**Closing**

_I thank you for your participation in this study. I will stop recording our conversation now and will send you a $15 electronic gift card to Amazon as compensation for your time. In approximately one month, I will follow up with you to share with you my findings and to make sure that I have accurately represented your views._
Appendix F
Observational Protocol

Name of Observed (Pseudonym):

Date of Observation:

Name of Observer: Melissa Kane

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Appendix G

Written Debriefing Form

Thank you for participating in this study! We hope you enjoyed the experience. This form provides background about our research to help you learn more about why we are doing this study. Please feel free to ask any questions or to comment on any aspect of the study.

You have just participated in a research study conducted by Quannah Parker-McGowan, Principal Investigator, and Melissa Kane, student from Northeastern University.

You were told that the purpose of this study was to better understand how instructors interact with the design-thinking process as a framework for instructional development in higher education.

At this point, we expect to begin data analysis of all the data we collected. In approximately one month, we will share with you the transcripts of your interview as well as the interpretation of the data. We hope you will support our research by keeping your knowledge of this study confidential.

As you know, your participation in this study is voluntary. If you so wish, you may withdraw after reading this debriefing form, at which point all records of your participation will be destroyed. You will not be penalized if you withdraw.

You may keep a copy of this debriefing for your records. Contact information for the researcher is on your copy of the consent form which you may keep for your records.

If you have questions now about the research, please ask. If you have questions later, please e-mail Quannah Parker McGowan, Principal Investigator or Melissa Kane, student researcher, at . If you wish to discuss your rights as the participant of this study, please contact: Nan C. Regina, Director, Human Subject Research Protection, Mail Stop: 560-177, 360 Huntington Avenue, Northeastern University, Boston, MA 02115. Tel: 617.373.4588, Email: n.regina@neu.edu. You may call anonymously if you wish.