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A Quasi-Experimental Research Study Examining The Impact Of Reflection On Self-Efficacy In Graduate Design Students

Christina Marie Chateauvert
Wayne State University,

QUASI-EXPERIMENTAL RESEARCH STUDY EXAMINING THE IMPACT OF REFLECTION ON SELF-EFFICACY IN GRADUATE DESIGN STUDENTS

by

CHRISTINA CHATEAUVERT

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DEDICATION

My dissertation is dedicated to my parents, Paul and Cathy Chateauvert. From the time I can remember, I received unconditional love and support. Growing up, there were inspirational quotes throughout the house letting me know that I could create my own future. As a child, you encouraged my imagination to soar. As a teenager, you encouraged me to dream big. As an adult, you encouraged me to say yes to life. You followed me on many adventures – to Olivet, to Boston, back to Michigan. We have created memories, overcome challenges, and shared a ton of laughs.

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"She designed a life she loved" – unknown

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CHAPTER 1: INTRODUCTION

Students are challenged to develop a professional identity, a common understanding of standards and beliefs associated with a particular profession, as they move from novice to experienced designers (Tracey, Hutchinson, & Quinn-Grzebyk, 2014). Traditionally design has been viewed as a linear approach, moving clearly from analysis to design to development to implementation to evaluation (ADDIE). Design thinking has redefined design as a complex and iterative process (Cross, 2011). Designers revisit their analysis and design decisions over and over again throughout the scope of a project. They are evaluating their decisions in constant context to the learners and the problem they are attempting to solve as a result of their design. This challenges novice designers to explore new ways to design and shape their professional identities in a changing industry.

Design thinking also comes with a level of uncertainty that students are not necessarily equipped to handle. Students are making new decisions, outside of their comfort zones, which will have lasting effects on their lives both personally and professionally (Evans, Forney, Guido, Florence, Patton, & Renn, 2010). Since decisions are so critical at this juncture in a student's journey, researchers recommend that academic programs support students in building their professional identities (Tracey et al., 2014; Canrinus, Helms-Lorenz, Beijaard, Buitink, & Hofman, 2011; Eliot & Turns, 2011; Luehmann, 2007). According to Ibarra (as cited in Eliot & Turns, 2011), three ways to build professional identity are through: (1) attending professional activities; (2) seeking out social networking experiences; and (3) engaging in sense-making. In each of these activities, students have the opportunity to compare their strengths and interests against the expectations of their desired profession. This assessment contributes to the level of self-efficacy, perceived beliefs in achieving professional goals.

Research shows that the level of self-efficacy students possess affects the decisions made in regard to career success (Meristo & Eisenschmidt, 2014; Bandura, 2012; Zeldin & Pajares, 2000). According to Pajares (1996), "efficacy beliefs help determine how much effort people will expend on an activity, how long they will persevere when confronting obstacles, and how resilient they will prove in the face of adverse situations" (p. 544). Typically students with a higher level of self-efficacy seek out complex problems to be solved and are persistent in overcoming challenging situations. On the other hand, students with a low level of self-efficacy view obstacles, rather, as an impediment to completing a particular task or achieving a goal (Bandura, 2012; Federici & Skaalvik, 2011; Stajkovic & Luthans, 1998; Pajares, 1996, 2003). This affects the development of a professional identity in that students with a lower sense of self-efficacy tend to restrict their career choices (Bandura, 2012; Maddux & Gosselin, 2003) whereas students with a higher sense of self-efficacy expand their career choices. Through this belief in themselves, students better prepare, educationally and emotionally, to be committed to their chosen profession (Bandura, 1993). Self-efficacy serves as a foundational piece in developing professional identity.

While the concept of reflection is not new to education, researchers suggest that students be given more space to engage in meaning-making activities (Sambrook & Willmott, 2014). In recent years, there has been an increased emphasis placed in education on self-reflection. In part, because of Donald Schön's (1983, 1987) work on reflection-*in*-action and reflection-*on*-action. Schön's view of reflection-*in*-action puts students in the "midst of action," reshaping the problem or experience, and making fresh decisions to guide next steps. Reflection-*on*-action allows students to think back on what has occurred and how that experience will shape future decisions. Taking a similar approach as Schön, David Boud, Rosemary Keogh, and David Walker (as cited in Hong & Choi, 2011; Mann, Gordon, & MacLeod, 2009) describe reflection as a way for individuals to take

a step back from their experiences, think through what has happen as it related to emotions felt, and then evaluate the situation from a new point of understanding. Reflection provides an avenue for students to explore their relationship with the changing world and start to build their perceptions of self and in the context of their professions.

Statement of Problem

Students are lacking strategies (such as reflective practices) to increase levels of self-efficacy, which in turn, has an influence on shaping and developing their professional identities. This could prove problematic in career progression and in transitioning from traditional to design thinking approaches. While there is an abundance of research being conducted individually on self-efficacy and individually on reflective practices, there is limited research addressing the relationship between the two (Osipova, Prichard, Boardman, Kiely, & Carroll, 2011; Fritson, 2008; Dunlap, 2005). This poses a problem on how best to impact the development of self-efficacy in students using reflective practices and has several implications on the way in which instruction can be designed to create deeper reflection in students within the academic setting.

Purpose of the Study

The purpose of this mix-methods quasi-experimental study was to explore the impact of using reflection as a tool to increase self-efficacy in graduate design students. The goal was to examine how various reflective writing prompts impact the level of self-efficacy and reflection of the graduate design student. The research questions that guided this study were:

Q1. What impact does reflective practice have on the self-efficacy in graduate design students?

Q2: What reflective writing prompt strategy has a greater impact on self-efficacy in graduate design students?

Q3: What type of reflective writing prompt strategy has a greater impact on the reflection level of graduate design students?

The specific outline of this mix methods quasi-experimental study was to: (a) determine the baseline self-efficacy level of graduate design students; (b) determine if there were statistically significant differences in student's self-efficacy scores pre- and post-reflection; (c) conduct two additional iterations of self-efficacy assessment (pre- and post-reflection); (d) determine which, if any, reflection writing prompt strategy provided a statistically significant difference in student self-efficacy; (e) determine which, if any, reflection writing prompt strategy provided the highest level of reflection over the course of the semester.

Theoretical Constructs

Social cognitive theory guided my research study. Students reflected on experiences they had in the past or were currently dealing with in their studies. Social cognitive theory brings the world of individual thinking together with that of the social construction of knowledge. How students are interacting with others and the experiences around them will therefore affect the meaning they are deriving from those experiences. In turn, the internalization and meaning that they create from what they observe, interact with, and read shapes their future decisions. According to Stajkvoic and Luthans (1998), social cognitive theory "influences through five basic human capabilities: (1) symbolizing, (2) forethought, (3) vicarious learning, (4) self-regulation, and (5) reflection" (p.64). For this study, the focus was on the use of reflection as an influence in students' levels of self-efficacy.

A specific aspect of social cognitive theory present in this study is Albert Bandura's (1997) work with self-efficacy. The idea of using reflection is not limited to building fundamental knowledge about a specific field of study such as design but can also serve as a way to build a

student's confidence in their professional abilities and skill sets. According to Bandura (1997), perceived self-efficacy "refers to beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (p. 3). Stajkovic and Luthans (1998) further explored self-efficacy by identifying how it related to Social Cognitive Theory. The researchers defined self-efficacy as a practitioner's confidence in his or her own abilities with an emphasis on how individuals utilize cognitive resources to complete a task successfully. The role of self-efficacy, in simpler terms, is the learner's ability to be empowered to have an impact on his or her own life (Bernadowski, Perry, & Del Greco, 2013) and demonstrate that belief through goal setting and goal attainment.

Schön's (1983, 1987) research on reflection-*in*-action, and reflection-*on*-action were also underlying guiding principle in this study. Students were asked, using various writing prompt strategies, to reflect on experiences they had in the past or experiences they were finding themselves currently facing. Social cognitive theory, self-efficacy, and reflection married the external factors students were facing with how they internalized that information to build their self-efficacy and experience growth over the course of a semester.

Epistemology

Constructivism, as an epistemology, aligned with the intent of this study. Students constructed their own meaning from past and current interactions. It isn't necessarily about the influence of others on thought development, but rather, how the individual student viewed and internalized those external interactions to create meaning (Crotty, 1998). This core aspect of constructivism creates a unique experience for each student (Richey, Klein, & Tracey, 2011). Instead of students being told what it means to have a higher sense of self-efficacy and how to create a professional identity, they achieve that understanding through their own distinctive

situations that shape the way they view the world around them. This is accomplished through encouraging students to be accountable for their learning and by providing supportive and authentic learning environments to encourage students in their construction of meaning and knowledge (Driscoll, 2005).

Assumptions

There were several assumptions that I felt might have an impact in this study. First, I was working under the assumption that all students may have had different experience levels with self-reflection. While some may have already incorporated it into their lives outside of the classroom or in their undergraduate studies, it might have been a new concept to other students as well. The second assumption was that the instructor would create a supportive environment in which students felt comfortable engaging in reflection with themselves and through the experiences with their peers. A third assumption was that students would answer the self-efficacy instrument to the best of their knowledge of themselves and participate in the duration of the semester-long study, including the submission of their reflection journals after the course had completed.

Definition and Key Terms Used in the Study

Professional Identity: Defined by Higgs (as cited in Trede, Macklin, & Bridges, 2012), professional identity "occurs when a member of a profession develops the 'attitudes, beliefs and standards, which support the practitioner role and the development of an identity as a member of the profession with a clear understanding of the responsibilities'" (p. 374).

Reflection: Various definitions of reflection and related terms have been introduced into literature and into practice. One definition of reflection focuses on promoting the use of cognitive perception in understanding individual experiences (Charon & Hermann, 2012). Another by Donaghy and Morss (as cited in Coulehan & Granek, 2012), expanding on the idea of individual

experiences by crediting reflection as the key way in which practitioners take a deep dive in understanding and appreciating experiences in the clinical setting, not only from the perspective of being a nurse or doctor, but from the patient's perspective as well. Lastly, Dewey (as cited in Mann et al., 2009) defines reflection as a way in which beliefs are either supported or challenged based on new knowledge that is drawn from evaluating past experiences.

This study was guided by the definition of Boud et al. (as cited in Hong & Choi, 2011; Mann et al., 2009). As mentioned, the researchers describe reflection as a way for individuals to take a step back from their experiences, think through what had happen as it related to emotions felt, and then evaluate the situation from a new point of understanding. In this space, reflection is about making new meanings based on redefining beliefs and internalizing interactions from past and current experiences.

Reflection-in-Action: Schön (1983, 1987) describes reflection-in-action in a way where the student pauses in the middle of an action, takes time to reflect in that space, reframes the problem or situation, and makes a decision or change going forward.

Reflection-on-Action: After a situation, experience, or project has occurred, Schön (1983, 1987) advocates using reflection-on-action to review the choices made while the experience was taking place and evaluate what changes could have been made to alter the outcome. These choices influence future decisions.

Reflection-on-Reflection: Through exploring previous answers to reflection questions, reflection-on-reflection provides students the opportunity to revisit earlier mindsets, beliefs, and assumptions about self and others. Essentially, reflection-on-reflection is reflecting on previous reflections, conducted at an earlier point in time.

Reflective Journal Writing: Reflective journal writing is a way of documenting the thought process learners have in evaluating previous experiences, challenging new knowledge, and deepening connections (Pavlovich et al., 2009).

Reflective Writing Prompts: Prompts are used as guiding strategies to stimulate reflection in students. Three types of prompts are no structure, guided questioning, and detailed questioning. Dewey (as cited by Jay & Johnson, 2002) was an advocate for no structure in reflection. He argued that the reflection process should be holistic, providing, at times, a messy avenue for learners to connect to their emotions. With guiding learning prompts, specific questions are not required but rather thought starters are provided to the students to help spark memories and emotions. At the other end of the spectrum is providing students with structured writing questions tied to topics such as previous experiences and making connections with the class content. According to Mann et al. (as cited in Lew & Schmidt, 2011), "through a more structured and closely guided process, students may become better aware of, and value their existing capability for, self-reflection, and its potential for development and application" (p. 541).

Self-Esteem: Self-esteem and self-efficacy are related topics but have clear distinctions in their definitions. Bandura (2012) refers to self-esteem as a student's general perceived self-worth whereas self-efficacy is the student's belief in his or her ability to accomplish a particular task.

Self-Efficacy: According to Bandura (1997), perceived self-efficacy "refers to beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (p. 3).

Summary

This study was intended to explore the impact of reflection as a tool on the self-efficacy of graduate design students. The overarching questions that guided this study were: (1) What impact

does reflective practice have on the self-efficacy in graduate design students? (2) What reflective writing prompt strategy has a greater impact on self-efficacy in graduate design students? and (3) What type of reflective writing prompt strategy has a greater impact on the reflection level of graduate design students? The conceptual framework that guided this study was self-efficacy as it relates social cognitive theory. The following section provides a comprehensive view of the relevant literature.

CHAPTER 2: LITERATURE REVIEW

The practice of reflection is growing in the disciplines of education, specifically pre-service teacher education, medical training, and business courses. The purpose of this literature review narrows the focus to key topics that are prevalent in the research studies, shedding insight into established practices and gaps evident in the research. Reflection, self-efficacy and the connection between the two are the three overarching themes that guided the literature review. More specifically, the research themes centered specifically on reflection include how reflection contributes to growth, the use of writing prompts to guide discussion, and the use of rubrics to assess reflective practices. For self-efficacy, the focus was on the role self-efficacy plays in student learning and techniques used to assess that self-efficacy. Lastly, the connection between the two was explored.

Reflection defined

Students are faced with new challenges in today's academic world, transitioning from their home comfort zones to meet an entire new set of responsibilities (Evans et al., 2010). Within this academic context, students are taking full class loads, attending networking activities, working, balancing family time, all while being connected 24 hours a day via email, social media, and other modern-day technology outlets. With this increase in busyness, do college students take the time to step back and reflect on the choices they are making, how their classes are going, or on how they are going to shape their future professions? These are some of the reasons that faculty incorporate reflection into their classes. (Park & Millora, 2012).

In recent years, reflection has been viewed as an essential way that students can build their knowledge base – through looking back on previous experiences, evaluating decisions currently being made, and challenging already established perspectives. Donald Schön (1983, 1987) has

been viewed as the leading authority on the practice of reflection. Through coining the term, "reflection-*in*-action," Schön's (1983, 1987) view of reflection places the learner in the "midst of action," reshaping the problem or experience, and making fresh decisions to guide next steps. This idea of using reflection to solve problems actually dates back to philosopher and educator John Dewey's work in the early 1930's (Wear et al., 2012; Denton, 2011; Hong & Choi, 2011; Mann et al., 2009). Dewey (1910) defined reflection as "active, persistent and careful considerations of any belief of or supported form of knowledge in the light of the grounds that support it and further conclusions to which it tends" (p. 6). Seeking to solve problems was the driving force for Dewey's argument in using reflective thinking (Hong & Choi, 2011). Reflection, today, isn't solely focused on solving problems though.

In the last 35 years, other scholars have contributed to the foundation of reflection as well. In the mid-1980s, David Boud, Rosemary Keogh, and David Walker (as cited in Hong & Choi, 2011; Mann et al., 2009) described reflection as a way for individuals to take a step back from their experiences, think through what had happen as it related to emotions felt (from a different perspective), and then evaluate the situation from a new point of understanding to challenge the previous mindset. In in the early 1990's, Jack Mezirow challenged individuals to critically reflect on assumptions made in relation to issues in society such as social justice and equality (Hong & Choi, 2011; Langley & Brown, 2010). In this space, reflection was about making new meanings based on redefining beliefs and personal values, not necessarily solving a problem on hand.

The work of Dewey, Schön, Boud, and Merziow have increased the awareness of reflection and as a result, has created an onset of reflective practices across industries, including education (k-12 preservice teachers education specifically) and medical. With this increased awareness, various definitions of reflection and related terms have been introduced into literature and into

practice. Charon and Hermann's definition of reflection focuses on promoting the use of cognitive perception in understanding individual experiences (2012). Another by Donaghy and Morss (as cited in Coulehan & Granek, 2012), expands on the idea of individual experiences by crediting reflection as the key way in which practitioners take a deep dive in understanding and appreciating experiences in the clinical setting, not only from the perspective of being a nurse or doctor, but from the patient's perspective as well. A summary of researchers' thoughts on reflection is shown in Table 1.

Researcher	Thoughts on Reflection
Dewey (1910)	Reflection is an "active, persistent and careful considerations of any belief of or supported form of knowledge in the light of the grounds that support it and further conclusions to which it tends" (p. 6).
Schön (1987)	"We may reflect *on* action, thinking back on what we have done in order to discover how our knowing-in-action may have contributed to an unexpected outcome…alternatively, we reflect in the midst of action without interrupting it...in cases like this, that we reflection-*in*-action" (p. 26).
Mezirow (1990, 1991)	Reflection "provides an avenue for people to inspect the assumption that they use to make meaning from the world" (as cited in Hong & Choi, 2011, p. 689).
Rogers (2001)	Reflection is seen as "a cognitive and affective process or activity that (1) requires active engagement on the part of the individual; (2) is triggered by an usual or perplexing situation or experience; (3) involves examining one's responses, beliefs and premises in light of the situation at hand; and (4) results in integration of the new understanding into one's experience" (p. 41-42).
Moon (2006)	"Reflection is applied to relatively complicated, ill-structured ideas for which there is not an obvious solution and is largely based on the further processing of knowledge and understanding that we already possess" (p. 37).
Boud, Keogh, & Walker (2009)	Reflection is a practice used by individuals to assess a particular experience from a different perspective, focusing on the emotional aspect and evaluating the experience from a new point of understanding to challenge previous mindsets (as cited in Hong & Choi, 2011; Mann et al, 2009).
Sandars (2009)	"Reflection is a metacognitive process that occurs before, during and after situations with the purpose of developing greater understanding of both the self and the situation so that future encounters with the situation are informed from previous encounters" (p. 685).
Black & Plowright (2010)	"Reflection is the process of engaging with learning and/or professional practice that provides an opportunity to critically analyse and evaluate that learning or practice. The purpose is to develop professional knowledge, understanding and practice that incorporates a deeper form of learning which is transformational in nature and is empowering, enlightening and ultimately emancipatory" (p. 246).
Charon & Hermann (2012)	"Reflection can be understood to be an active interior state that uses cognitive, affective, imaginative, and creative means to perceive, represent in language, and thereby undergo one's lived experience" (p. 6).
Donaghy and Morss (2012)	In the medical industry, reflective capacity is how practitioners "critically analyze and evaluate their experiences in order to lead to new understandings and appreciation of the way they think and operate in the clinical setting" (as cited in Coulehan & Granek, 2012, p. 9).

Table 1: Various researchers' thoughts on reflection

One of the difficulties in studying reflection is the lack of a commonly agreed-upon definition (Denton, 2011; Mann et al., 2009). This poses a key challenge in researching reflective practices. Data is open to misinterpretation in comparing and interpreting information. Mann et al. (2009) found in their literature review conducted in 2009 that many of the studies did not specifically indicate which definition of reflection was used to guide the study. This limitation continues to be an ongoing issue in studying reflection. According to Tracey et al. (2014),

> while there is a lack of a precise definition of reflection, most conceptions of the term share a common emphasis on reflection as a person and internal construction of knowledge through volitional and recursive considerations and interpretations of one's experiences or beliefs. (p. 316)

Schön's (1983, 1988) perspective on reflection-in-action and reflection-on-action is the guiding theoretical perspective used for this research study. No one definition was used as a guiding principle in the review of the literature though. Rather, it was determined that a full scope of the research available would be assessed to established themes across pre-service teacher education, medical, design, and business disciplines.

Three theorists views on learning and reflection

Despite the varied ways in which reflection is defined and used, there are three theorists who have been viewed as authorities in evolving and implementing reflection in and out of the classroom: (a) John Dewey, (b) David Kolb, and (c) Donald Schön.

John Dewey, often referred to as the *Father of Constructivists* of the 20th century, viewed reflection as a way to solve problems and lead to progressive change. Reflection provided the opportunity for individuals to share their experiences and connect with one another (Park & Millora, 2012). Dewey's focus was in transforming education through these connected experiences

by providing authentic learning environments for students to learn, reflect, and share with others. This shift put focus on the student and his or her self-interests rather than a rigid, mandated curriculum. Dewey's main concern was educating a child in a way that allowed him or her to use critical thinking and "to prepare him for the future life…to give him command of himself" (Dewey as published in Flinders & Thornton, 2009, p. 35). Dewey was an advocate for teaching reflective thinking habits in order to foster critical thinking (Pavlovich et al., 2007). Education went further than simply encouraging students to reflect. Education's goal, in Dewey's view, was to provide the supportive environment and opportunities to work with uncertainty and complex problems to develop critical and reflective thinking skills. Dewey (1910) believed there were two elements present for reflective thinking to occur. There needed to be a "state of perplexity, hesitation, doubt" and students needed to be given the opportunity to explore facts and experiment with possible solutions to the problem in order to develop, either "to corroborate or to nullify," their proposed belief (p. 9). Dewey (1910) detailed five steps educators should guide students to build their reflective thinking skills:

1. Provide or identify a "felt difficulty," oftentimes in the case of a complex problem in need of solving.

2. Through observation, start to define the difficulty. At this point, the student will suspend judgment (which Dewey viewed was essential to reflection).

3. Propose possible solutions to the problem. In this step, students will not know which solution is the optimal choice. For this reason, Dewey (1910) encouraged a "cultivation of a variety of alternative suggestions" (p. 75).

4. Explore reasoning for each solution to think through the implications. Comparison occurs at this point in the reflection process.

5. Determine the solution through, what Dewey (1910) stated, "corroboration of an idea and formation of a concluding belief" (p. 77).

To Dewey, reflection was directly linked to developing critical thinking skills and having the thought process to be able to discern whether to accept or reject beliefs.

Dewey also addressed the social aspect of education by taking into consideration a child's home life. This led to how Dewey's contributions changed the shape of the field; he changed the role of the teacher to that of a facilitator of learning and to encourage reflection and experimentation in education. According to Dewey (Flinders & Thornton, 2009), "the teacher is engaged, not simply in the training of individuals, but in the formation of a proper social life" (p. 41). Teaching students went beyond the classroom walls and focused more on the individuality of the student taking ownership of their education and creating an identity through their life experiences. There was a balance between educating students on knowledge and then giving them the opportunity to discover and further explore. Dewey contributed significantly to furthering education through looking at the social aspects of allowing students to discover what it meant to be human and to reflect on personal interests.

Similar to Dewey, David Kolb's (1984) experiential learning theory was focused on the idea of active learning. Kolb viewed learning as being grounded in direct experiences. His four-phase model details the cycle in which individuals move through in the learning process (see Figure 1).
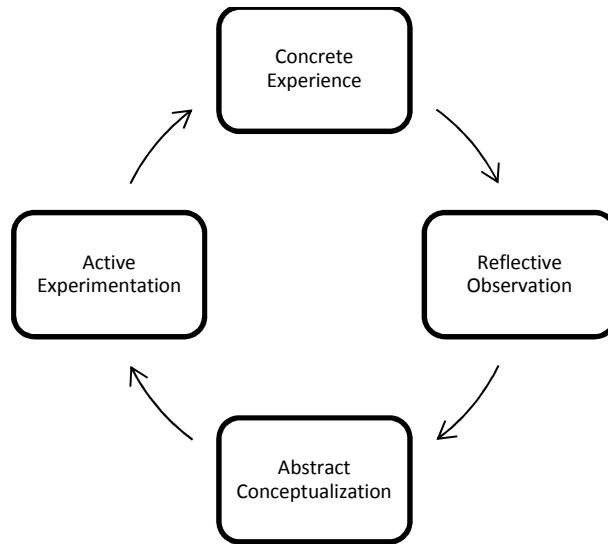
Figure 1: Four stages of Kolb's experiential learning theory

Kolb's (1984) first phase is concrete experience, where learners come into contact with direct experiences. Next the learner moves to the second phase, reflective observation. At this point the learner starts to question what the experience means to him or her specifically. In the third phase, abstract conceptualization, according to Stevens and Cooper (2009), "learners relate their reflective observations to what they already know: extant theories, preconceived notions, and embedded assumptions" (p. 24). Learners start to connect new learning with previous experiences. The last phase, active experimentation, is where the individual starts to apply what has been learned. This then feeds into developing more concrete experiences, depicting that the learning cycle is continuous and transitions from one experience into the next. Essentially, learning never ends.

While reflection is only specifically detailed in one phase of Kolb's (1984) experiential learning theory, researchers have found that reflecting throughout the entire process is beneficial to the learner (Stevens & Cooper, 2009; Hubbs & Brand, 2005). The cycle allows learners to step back and reflect at each phase. This allows them to evaluate, not only the direct experience that

initiated the learning, but also allows them to evaluate how the experiences are interconnected to previous learnings. This places a significance on using reflection as a learning tool (Moon, 2004). In practice, Kolb's theory forces the learner to change roles as he moves through the learning experience. Moon (2004), indicates "the learner changes 'from actor to observer,' and from 'specific involvement to general analytic detachment,' creating a new form of experience on which to reflect and conceptualize at each cycle" (p. 25). This type of direct experience and shifting roles is beneficial to learners regardless of situations and disciplines (Sandars, 2009). With Kolb's (1984) philosophy of linking learning directly to experience, he opened the door for individuals to use reflection as a way to progress their learning and apply fresh, redefined concepts to their worlds.

Donald Schön (1983, 1988), seen as the leading authority on reflection, also brought the world of reflection and learning together with his work on reflection-on-action and reflection-in-action. Reflection-on-action takes place after a particular event, activity, or experience. Learners revisit what occurred answering questions such as what lessons were learned and what can be done differently next time a similar experience arises. On the other hand, reflection-in-action is stopping in the middle of the process and taking time to think. Reflecting in the moment is reframing the situation, making adjustments, and then implementing changes based on those adjustments. This allows the learner to reshape the direction of the situation (Schön, 1983).

Initially Schön's (1983) development of reflection-in-action came as an immediate response to a need he identified in the educational and professional systems. From his perspective, there was an apparent gap between the competencies students were being taught in the classroom versus the competencies required to be practitioners. Learning needed to be an evolving process of shaping and reshaping perceptions of situations, which, in turn affected outcomes and solutions.

His argument was rooted in the ill-structured, complex problems found in the professional world rather than the clean and tidy problems being taught in educational environments. Students, future professionals, would need the tools, as Schön (1983) stated, to "deal well with situations of uncertainty, instability, uniqueness, and value conflict" (p. 50). In support of reflection-in-action, Stevens and Cooper (2009) indicate that Schön "appeals to professionals who teach professionals because he distinguishes between the static knowledge found in textbooks and the dynamic, adaptive knowledge that the expert uses in clinical and professional settings" (p. 26). Schön's work bridges the gap between the routine knowledge required for a profession and teaching students how to deal in the uncertainty that surfaces in a profession (Moon, 2004). The theorist's innovative approach to reflection allows learners to have a conversation with their work during the process. Rather than the traditional focus of waiting until after an event or experience has occurred, learners take action immediately. In addition, reflection-in-action teaches learners to have a sense of flexibility, an iterative mind-set, and the ability to adapt quickly; all key competencies of a successful practitioner.

Reflection's contribution to students' development

Reflective practices have been seen as transformational in the academic world as a tool to help students learn in the classroom and prepare for professional life after college. Reflection contributes to professional growth through encouraging learners to assess how the experiences they have been through, historically and presently, can shape their identity for tomorrow (Blaschke & Brindley, 2011; Langley & Brown, 2010; Behar-Horenstein, Schneider-Mitchell, & Graff, 2009). Mann et al. (2009) reinforces that reflection encourages learners to look for information to validate their own beliefs and decisions. Through the review of the literature, the following reflection practices were explored in more detail and found to be relevant in the medical field, pre-

service teaching, and in management education: (a) reshaping and challenging beliefs, (b) dealing with emotions in growth, and (c) building professional identity.

Reflection as an avenue of reshaping and challenging beliefs. Boud et al. (as cited in Hong & Choi, 2011; Mann et al., 2009) described reflection as a way in which individuals evaluate experiences from new perspectives to challenge previous mindsets. The reshaping and challenging of beliefs are two key aspects of reflection. Moon (as cited in Boud, 2001) indicated that the purpose of reflective learning journals was to develop a "questioning attitude" (p. 9). Students, in their reflective thinking practices, challenge taken-for granted assumptions. Re-evaluation occurs, forcing learners to create new opinions, feelings, and thoughts, which alters old perspectives in light of new ones (Matsuo, 2012; Sandars, 2009; Hubbs & Brand, 2005; Boud, 2001). This re-examination can lead to, what Mezirow (as cited in Hubbs & Brand, 2005) deemed "transformative learning." Sandars (2009) elaborated on transformative learning by stating, "the most powerful learning, or shift in perspective, occurs when fundamental beliefs are challenged, such as those related to the view of the self or the world" (p. 687). Learners redefine their authentic selves in light of new beliefs as a result of reflective practices.

According to Stevens and Cooper (2009), "when instructors use journal-writing techniques and incorporate the journal into their class, students have the opportunity to engage in transformational learning as well, hopefully critically examining the very foundation of their beliefs" (p. 43). This is exactly what happened to one student who was part of Scott's (2009) study of 74 entry-level full-time Masters of Business Administration (MBA) students at a moderate-sized university. The purpose of the study was to assess how students used portfolios to reflect. Three groups made up the study: one group maintained a full portfolio, one group chose not to develop a portfolio, and the third was a control group. The results of the study indicated that

reflection scores were not high for any of the groups. Scott attributes this to the lack of chances to reflect in the MBA program. On an individual level, several students did reexamine their own beliefs and reframed their thinking, taking accountability and more ownership for their decisions. One success stories details:

> I had entered the MBA program describing myself as pretty shy…I have come to see that it was an excuse—I didn't want to say anything that I would be held accountable for it…Suddenly it was clear to me that to lead in an organization (or in life) you had to stand up and be counted, take responsibility, make your mistakes, but most of all, contribute." (Scott, 2009, p. 442)

As in the case of Scott's (2009) study, the results may not be what the researcher was looking for overall but there was an unintended shift in several of the students thinking to a more accountable and positive outlook on how they can change their lives and grow.

Creating a supportive environment is vital in dealing with emotions that surface during growth. While writing about emotions can be difficult in the context of higher education, Boud & Walker (1998) find them central to reflection and learning. The authors challenge the idea of reflection being solely intellectualized and argue that it is essential that the educator create a supportive environment where expression of emotions is encouraged. Creating this supportive environment for learners to engage in reflective practices is about establishing trust and providing guidance. This may take many forms depending on the outcome of the learning and the intention of the reflection itself. One way to help learners in understanding reflection is to provide instruction on the purpose of the reflection and how it fits within the space (Hubbs & Brand, 2005). It isn't enough to simply assume that students understand what reflection is. In Blaschke and Brindley's (2011) research with Master of Distance Education and E-Learning (MDE) students, the learners

were invited to a one-week MDE orientation program where they learned about the e-portfolio and how to create one that would build on itself throughout the course. Lew and Schmidt (2011) see the education of students as key to using reflection practices in learning. Further research is required in this area. The authors recommend a study exploring the use of formal training in refection skills for learners. In addition, Lew and Schmidt (2011) propose that through providing students a "more structured and closely guided process, students may become better aware of, and value their existing capability for, self-reflection, and its potential for development and application" (p. 541).

On the other hand, there is a risk of using too much structure. According to Wear et al. (2012), "educators must consider how overly regulated exercise in reflection might inadvertently serve as tools or surveillance and regulation rather than as opportunities for revelation and transformation" (p. 603). Designing instruction that promotes reflection is a balance between determining a structure but allowing the learners the freedom to dive deep into their emotions, step back and digest what they find, and then share it through their words.

Insecurity and doubt, whether it be in relation to academic performance or building a professional identity, are emotions that may surface during the reflective process. Evaluating self-reflective practices of pre-service teachers, Shoffner's (2009) study of 18 students in their third year of study used electronic portfolios for a collaborative reflective experience. This forum gave students the opportunity to share their insecurities and vulnerabilities about teaching. One student, Hannah, wrote "we have a lot to live up to. I always have the fear in the back of my head that I won't be able to [make learning exciting and meaningful]" (p. 787). Other students shared in Hannah's worry, as a result, creating a network of support in their development. Based on the honesty of the portfolio entries, Shoffner (2009) sums it up best by validating that pre-service

teachers use reflection as a space to consider not only their professional identities but also as a place to explore emotions and concerns around classroom management as well.

Struggles are not only evident in students but also are apparent in faculty members' self-doubt about teaching as well. In a study of seven College of Dentistry faculty members and one faculty member from an affiliated college, Behar-Horenstein et al. (2009) conducted a study to determine themes in learning journals kept by the participants. Eight themes emerged from the journals (in order of frequency from most frequent to least): teaching goals, critical thinking, awareness of learners, planned instructional changes, self-doubt, teaching efficacy, external challenges, and changes made. In the space of self-doubt, 11.8 percent of the dataset fell into this category. One entry by Adrainna shows the struggles that faculty members can face as well in their professional development:

> I do not yet feel equipped or confident to deal with students who are confrontational either in the clinic or class, and I fear that it has in the past interfered with my delivery of instruction in these arenas. (Behar-Horenstein et al., 2009, p. 672)

No matter the title, student or faculty member, reflection can provide a space for struggles to be documented and assessed from a different perspective, whether that be one's own new view of the situation or if shared, from supportive peers.

Reflection's role in building professional identity. Across disciplines – education, medical, and business – there is a growing need to assist students in establishing their professional identities. Reflection is one practice that is perceived to bridge the gap between academic and professional life (Sutherland, Howard, & Markauskaite, 2010; Jindal-Snap & Holmes, 2009; Sandars, 2009; Hubbs & Brand, 2005; Rogers, 2001).

According to Luehmann (2007), identity development, while it has various definitions, has the following common characteristics:

- *Identity is socially constituted*, that is, one is recognized by self and others as a kind of person because of the interaction one has with others.

- *Identity is constantly being formed and reformed*, through the change process for one's core identities is long term and labor intensive.

- *Identity is considered by most to be multifarious*, that is, consisting of a number of interrelated ways one is recognized as a certain kind of person, participating in social communities.

- *Identity is constituted in interpretations and narration of experiences.* (p. 827)

The researcher goes on to define teacher professional identity, building on Gee's 2001 definition, as "being recognized by self or others as a certain kind of teacher" (p. 827). Professional identity is built in the daily interactions with others and in how the individual uses, as indicated by Gee (as cited by Luehmann, 2007) "various symbols, tools, and objects to enact a particular socially recognizable identity" (p. 827). What role does reflection play in building professional identity? Reflection, specifically journal writing, allows learners a safe place to analyze their experiences, reshape their views, and face their insecurities and struggles around creating their professional identities (Luehmann, 2007).

In a preliminary study of 40 instructional technology graduate students, Tracey and Hutchinson (2013) assessed student reflection responses in relation to Davis's criteria of unproductive vs. productive reflection. Unproductive reflection is surface writing without the benefit of analysis of experience, whereas productive reflection is integrating learning and analysis of experiences into one another (Davis, 2006). The findings indicated that students, with the use

of prompts and feedback, can develop an emerging designer identity. In a subsequent study, Tracey et al. (2014) explored reflective writing assignments of 17 instructional technology graduate students. In this study, the authors explored the use of reflective writing in relation to professional identity development topics. In addition, the study took a deeper dive into reflective capability and the use of an assessment rubric as a framework for future research and formative assessment. Specifically addressing the professional identity context of the study, Tracey et al. (2014) found that "the subjects in the study were able to effectively use reflective writing assignments to explore ideas that are foundational to the development of professional identity" (p. 329). In light of the research results, the authors recommended further research on the use of prompts, specifically the wording and number of prompts, in supporting reflective skill development.

Additional research supports the use of reflective writing in the development of professional identity (Sambrook & Willmott, 2014; Hall, Byszewski, Sutherland, & Stodel, 2012; Peterkin, Roberts, Kavanagh & Havey, 2012; Sutherland et al., 2010; Jasper, 1999). Jasper (1999) conducted a study involving two focus group interviews of 12 nursing students on their perceived value of reflection to their development. The nurses were students in a year-long professional course which required reflective journal writing as part of their assessments. The nurses identified that reflection helped to facilitate not only their personal growth, but their professional growth as well. In addition, writing helped the students in building their analytical and critical abilities, which have a direct effect on their nursing professions.

Two research studies also set in the medical industry by Peterkin et al. (2012) and Hall et al. (2012), set out to evaluate the use of reflection in relation to CanMEDS roles. The seven roles, created by the Royal College of Physicians and Surgeons of Canada and later adapted by the College of Family Physicians of Canada, identify key roles physicians should practice in their

professional careers: medical expert, communicator, collaborator, health advocate, manager, scholar, and professional. Peterkin et al. (2012) conducted a pilot study with 10 third-year medical students in which students wrote about the CanMEDS roles using guided prompts. The results were evaluated using LEAP, which measures reflective capacity, and Reflection Evaluation for Learners' Enhanced Competencies Tool (REFLECT), which measures students' levels of reflection. Students were also required to complete the Narrative Reflection Tool (NRT) which provides students with questions to guide deeper reflection. It was found that reflective writing not only encouraged reflection in the clinical environment, but also strengthened the learners' knowledge of the CanMEDS roles. Hall et al.'s (2012)'s study yielded similar results. Students were required to keep an electronic e-portfolio with a reflection component. Within the reflections, the authors found students sharing the challenges of working in the pre-clinical and clinical environments for each of the CanMEDS roles. There was a demonstration of both reflection and personal growth in the students' posts.

Certain professions, such as in the medical field, pre-service teaching, and design, have used reflection as a way for students to internalize the experiences going on around them. In the medical field, Wear et al. (2012) specified that reflection provides students with a solid foundation for the professional identities created at the onset of, and throughout, their careers. Tracey et al. (2014) sum up the connection to growth and reflection best when the authors indicated the "key benefit of reflection is its supportive connection to life-long learning" (p. 318).

Techniques used to guide learners in using reflective practices

Across disciplines, reflection has encouraged learners to challenge beliefs from previous experiences, develop new meanings and solutions to problems, and speculate on how those thoughts shape the future (Wear et al., 2012). Reflective journal writing is a way of documenting

the thought process learners have in evaluating previous experiences, challenging new knowledge, and deepening connections (Pavlovich et al., 2009). Using three different cases studies, Pavlovich et al. (2009), looked at the ways in which students engage in using learning journals to advance reflective thinking and to expand the students' learning experience. Pavlovich et al. (2009) found that the process of reflection across all three case studies strengthened the students' "learning toward a holistic understanding of living and purpose" (p. 56). While reflective writing, in general, has been seen as the main practice in promoting and advancing further thought among learners, the writing itself can take many different forms. Research provides three options for techniques in guiding learners in using reflective practices: (a) no structure to reflection, (b) guide learners using general prompts (semi-structured), and (c) provide detailed questions to walk learners through the reflection process (structured). Researchers also address the ways in which scaffolding can be used to evoke deeper refection in students.

No structure to reflection. Dewey (as cited by Jay & Johnson, 2002) did not consider reflection to be a structured series of steps that learners followed. He argued that the reflection process should be holistic, providing, at times, a messy avenue for learners to connect to their emotions. Rusche and Jason (2011) argue that "free" reflection provides students with the ability to develop a personal reflection style that fits their needs. Playing an active role in this development, allows students to take more ownership in their learning process. In the study of 18 pre-service teachers in their third year of study, Shoffner (2009) provided no structure to the group of students who were using a weblog to document their reflections. There was no "restrictions placed on content, length, structure, formality or frequency" (Shoffner, 2009, p. 785). Over the course of the study, 263 weblog entries were completed. This freedom in reflection allowed

students to bring up a variety of concerns around teaching including professional development, creating impact for students, and being viewed as a "good" teacher.

In addition to simply asking students to reflect, without any guidelines, there are two writing techniques that also fall under the no structure to reflection category: free writing and focused free writing. Elbow (as cited in Moon, 2006) suggested free writing be used as a way in which students write without criticizing their work. Students write for a designated period of time, 10 to 15 minutes for example, about anything and everything that surfaces in their thinking. It is in this free-flow way of writing that students develop their voice and are often surprised to find ideas that surface in the writing process (Stevens & Cooper, 2009). There is a freedom that comes from putting words and ideas on the page without the self-criticism often attached to writing. Stevens and Cooper (2009) argue that free writing, "with its lack of constraints, encourages, supports and even cheers on the production of words in whatever form" (p. 80).

Focused free writing provides a bit more structure to the free writing process but still allows the student to reflect on whatever comes up in his or her thought process. The difference is that the reflection is triggered by a particular theme, word, or learning event. The student can either select the topic or the topic can be provided to them depending upon the learning outcomes for the reflection. In this case, students will still push themselves to develop new ideas and insights but it will be focused on a particular theme (Stevens & Cooper, 2009).

Despite the limited number of research studies available using unstructured reflection techniques, researchers on reflective writing argue that it is a viable approach to sparking new ideas (Rusche & Jason, 2011; Shoffner, 2009; Moon, 2004). The argument is made that too much structure forces students to follow a recipe or provide responses to a questionnaire rather than to develop their own insights (Moon, 2004; Boud & Walker, 1998). Further research is needed in

order to validate whether unstructured reflection is a valuable approach to developing students in their thought processes connected with their growth, whether it be in a particular subject or in their professional competence.

Guiding learners using general prompts. Using prompts is the middle ground between unstructured and structured requirements for reflection. With prompts, specific questions are not required but rather thought starters are provided to the learners to help spark memories and emotions. Prompts were used by Pavlovich et al. (2009) in one of the three studies used in the research with fourth year undergraduate students attaining a management degree. Students were not given precise journal questions to answer but were rather guided to think through their influence on a management project, how they perceived effectiveness, and what they would have done differently if given the chance. No indication was made in the research if this level of guidance proved to be effective over another option.

The negative perspective of using semi-structured prompts is in the quality of the responses from students. The reflection may remain surface-level, not progressing the student in his or her growth. Hoover (as cited in Moon, 2004) realized in working with students that reflection was used as an opportunity to vent and complain rather than learn and grow. Rickards, Diez, Ehley, Guilbault, Loacker, Hart and Smith (2008) agreed that providing students with general prompts such as "reflect on" or "write about" were ineffective ways to accomplish learning or growth outcomes often associated with reflection. More pointedly, Rickards et al. (2008) indicated "it is not adequate to approach the role of reflection by simply leaving time and space for it" (p. 34). In their study on exploring the reflection framework and learning assessment of students through technology-based learning portfolios, the authors noted two key concerns in relation to reflection. Students were not prepared to undertake an extensive reflective approach of comparing and

reflecting on experiences across different courses. Secondly, the authors were concerned that the prompts that were provided did not give enough guidance to students to reach an "extensive inductive act of reflection" (p. 48).

Providing learners with structured writing techniques. At the other end of the spectrum is providing learners with structured writing techniques tied to topics such as previous experiences and making connections with the class content. According to Mann et al. (as cited in Lew & Schmidt, 2011), "through a more structured and closely guided process, students may become better aware of, and value their existing capability for, self-reflection, and its potential for development and application" (p. 541). The benefit of structured reflection is not limited to a greater awareness of reflection itself but also ensures students are reflecting on the key issues to make progress in their learning (Moon, 2006). As indicated by Aronson (2011), structured prompts can include

discussion of processes and assumptions as well as actions and thoughts; consideration of the role of associated emotions and relevant past experiences; solicitation of feedback and review of relevant literature where appropriate; explicit notion of lessons learned; and creation of a plan to improve future behavior and outcomes. (p. 3)

In the literature review, several studies provided structured questions to learners to walk them through the reflection process (Tracey et al., 2014; Tracey & Hutchinson, 2013; Lew & Schmidt, 2011; Krause & Stark, 2010; Taylor-Haslip, 2010; Pavlovich et al., 2009; Monet & Etkina, 2008).

Lew and Schmidt (2011) followed this structured view in the study of 690 first year applied science students. The aim of their research was not only to look at if reflection writing was effective in the reflection and learning process, but also to look at if students improved academic performance over time. Learners answered questions in regard to the insights gained in class, how

effective they viewed themselves in team work, and in what strategies they use to learn. Students were required to maintain the journal daily for a week. Lew and Schmidt's (2011) findings revealed that engaging continuously in journal writing did not have a measurable effect in improving academic performance.

Contrary to Lew and Schmidt's (2011) findings, Taylor-Haslip's (2010) study of 30 nursing students completing their pediatric clinical rotations found a correlation to academic success and reflection. The student nurses were required to keep a guided journal over the semester. Not only were they required to record their learning experiences, but were also assigned to research and reflect upon an area in which they needed to improve. Using Hatton and Smith's (as cited in Taylor-Haslip, 2010) criteria of assessing reflective writing based on four levels, descriptive being the least reflective and critical reflection being the most reflective, the researcher found that students who improved their level of reflection also improved their clinical performance as well. This was measured not only using Hatton and Smith's assessment but was also evident in reviewing students' academic progress toward their overall goals and through evaluating results on examinations administered during the semester.

Use of scaffolding in structured reflection. Researchers explore the use of scaffolding in relationship with reflection to identify how sequencing and building upon ideas can influence the level of reflection (Tracey et al., 2014; Lai & Calandra, 2010; Rocco, 2010; Lin, Hemlo, Kinzer, & Secules, 1999). As a course progresses, the reflective questions continue to challenge the student in their learning and development. In a study spanning two semesters, Whipp (2003) compared reflection patterns and reflection levels of students. Between the first and second semester, the researcher changed the discussion design and support to provide more scaffolding. This resulted in an improved level of reflection. Specifically, Whipp (2003) suggested "that

particularly helpful scaffolds in online discussions about field experiences are tailored and general questions from teacher educator and peers about sociopolitical and moral issues raised by field experiences and use of critical readings to analyze experiences" (p. 329).

In a different study looking at levels of proficiency and willingness to reflect in an asynchronous online discussion board by writing reflective letters, Rocco (2010) found students "appeared to talk more directly to one another, sharing experiences, ideas, thoughts about reading, in-class activities, and implications for practice" (p. 315). The goal of the study was to use scaffolding and structured reflection to deepen how students integrate reflection into the ways in which they learned. While the author concluded that there was a positive impact on reflection, the research didn't have a clear measurement to determine if the students' depth of reflection based on the letter writing technique improved.

The use of technology is another aspect of scaffolding that is evaluated by researchers. According to Lin et al. (1999) "technology can often ensure that scaffolds to enhance reflection occur as a value-added item to other aspects of learning, and can do so in many ways that are difficult in more traditional learning environments" (p. 46). Lai and Calandra (2010) used scaffolds to structure reflection prompts for 65 pre-service teachers creating ePortfolios (see Figure 2).
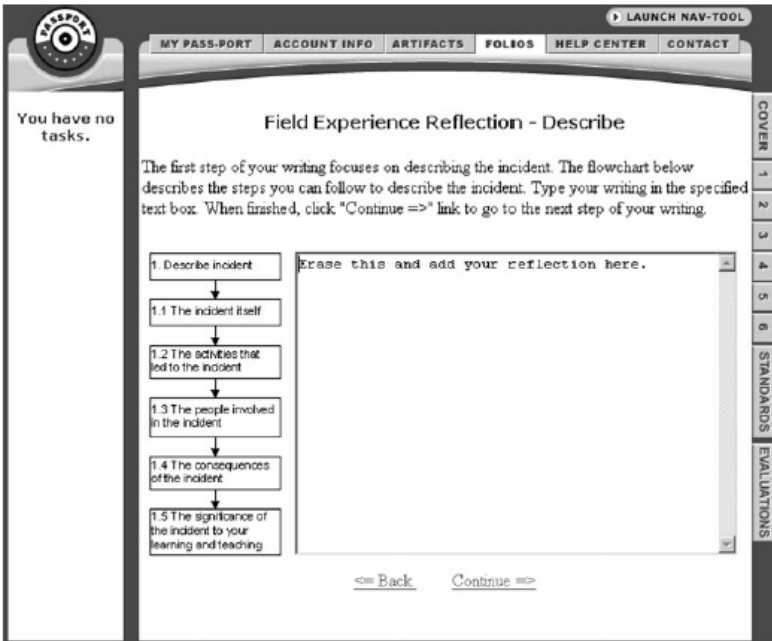
Figure 2: Example of one step in the scaffolding design (Lai & Calandra, 2010, p. 427)

The authors indicated that scaffolds were effective to students in two ways: "allowed them to notice significant aspects of their teaching experiences that they may otherwise have not recognized," and "some participants found that the transition embedded in the scaffold enriched their reflection writing experience" (Lai & Calandra, 2010, p. 431). Lin et al. (1999) argues that technology can play a key role in supporting individuals in their reflections, through guiding them through questions to become "adaptive thinkers, learners, and problem solvers" (p. 60).

Most beneficial type of reflection technique is undetermined. Pavlovich et al. (2009) completed a study comparing various prompt types used to guide management students through the reflection process. There were three learning journal approaches, each designed as a "case." The first case involved students in an undergraduate course where the goal was to develop and deepen reflective thinking. The writing prompts were structured, asking students specific detailed questions such as "analyze the learning event, issue, or situation in relation to prior knowledge, feelings, or attitudes" (p. 7). The second case was also focused on an undergraduate course but the

students used electronic journals and used a semi-structured approach to reflection. For example, students were asked to reflect on "their feelings about how the group dealt with process issues such as interpersonal conflict" (p. 10). The third case was a graduate course where students explored their learning experiences and used unstructured reflection techniques. There were no writing prompts provided unless the student ask for more guidance in which questions such as "what were the highest and lowest emotional moments in my learning activities this week?" (p. 13) were asked. While each of the findings were assessed differently, Pavlovich et al. (2009) found three general themes that emerged regardless of the type of reflection technique used:

1. The student found their writing voice, actively engaging in academic writing

2. Through allowing students to challenge and evolve beliefs, learning journals can support transformational learning

3. Some students were able to "connect with a more purposeful life" (p. 18).

Despite Pavlovich et al. (2009) using different techniques to guide the reflection of the students, there was no discussion or recommendation made to which technique would work best as a result of their findings.

In reviewing the literature, the question still remains, which format (unstructured, semi-structured or, structured) is the most beneficial in promoting reflection? Despite having the range of options in providing guidelines to learners in the reflection process, there are virtually no studies found comparing which technique would be best in eliciting responses from students. This is an apparent gap in the research.

Assessing reflection

Contrary to the lack of research in what level of guidance would be beneficial for learners in the reflection process, assessing reflection has an abundance of literature (Charon & Hermann,

2012; Coulehan & Granek, 2012; Hall et al., 2012; Wald, Borkan, Taylor, Anthony, & Reis, 2012; Blaschke & Brindley, 2011; Hong & Choi, 2011; Osipova et al., 2011; Lai & Calandra, 2010). Because reflection is such a personal element that students are sharing, there needs to be an established trust level between those who will be reviewing and those who will be providing feedback. According to Visscher-Voerman and Procee (as cited in Hong & Choi, 2011), "reflection is intangible and barely observable, which makes it difficult to assess designers' reflection capacity" (p. 703). At the same time it is important to assess reflection to ensure that the level of reflection is challenging the learner to grow. In addition, as an instructor of reflective practices, it is imperative to know that the learning environment being created is supportive and nurturing of reflection (Hong & Choi, 2011). After conducting a thorough review of the literature, two themes emerged in the literature: (a) using rubrics to assess self-reflective practices and (b) ongoing debate whether reflection should even be assessed.

Using rubrics to assess self-reflective practices. Rubrics prove to be helpful for learners and those providing feedback by giving standards or expectations on how to assess the reflective writing or content (Coulehan & Granek, 2012). In more recent years, there is an abundance of rubrics that have been created for this very purpose. With the introduction of new rubrics, there is a lack of empirical studies to validate the use of a particular rubric. Several rubrics, such as Hall et al.'s (2012) Rubric for Medical Student Self-Assessment of Competency Demonstrated via the ePortfolio, were found in the literature rather than in studies and have yet to be corroborated through research.

There are several studies, which have created rubrics to be used solely for study (Blaschke & Brindley, 2011; Osipova et al., 2011; Lai & Calandra, 2010). The assessment of reflective practices appears to be caught in silos. At this time, there isn't a "standard" rubric used across

disciplines or even within a particular discipline for that matter. Constant comparisons reviewing the literature is challenging because of the different terms used to assess reflection and because of the lack of a "standard." It is a struggle to synthesize the existing information in a cohesive format. There is, however, one key factor that is common in the use of rubrics, established levels or weighted criteria for assessment (Sandars, 2009).

The Reflection Evaluation for Learners' Enhanced Competencies Tool (REFLECT) rubric not only establishes criterion (Writing Spectrum, Presence, Description of Conflict or Disorienting Dilemma, Attending to Emotions, Analysis and Meaning Making, and Attention to Assignment) and levels to assess reflection (Habitual Action, Thoughtful Action or Introspection, Reflection, Critical Reflection), but also presents a guideline in how the instructor or peer reviewing the reflective piece should carry out the assessment. Wald et al. (2012) described the steps as:

1. Read the entire narrative

2. Zoom in and out of the details to determine which level each criterion represents

3. Zoom out to consider the overall picture and determine which level the narrative as a whole represents

4. Provide examples from the text to support decisions (p. 48)

Charon and Hermann (2012) describe the research approach behind the REFLECT rubric as putting "reflective writing within mainstream pedagogic frameworks derived from adult learning psychology and applies these concepts to medical education" (p. 5-6).

Several studies have emerged using the REFLECT rubric to assess reflection of students (Tracey et al., 2014; Peterkin et al. 2012). Tracey et al.'s (2014) study involved assessing reflection journals of novice instructional technology graduate students using the REFLECT rubric. The study explored how the REFLECT rubric could be used to provide formative assessment to

students in the future. The concept of formative and summative evaluation is a decision that educators need to make initially when designing reflective practices (Aronson, 2011; Sandars, 2009). In formative assessment, the focus is in using reflection to assist students in identifying future learning needs and in developing their abilities. Summative evaluation, on the other hand, is used for grading or assessing the reflection after a period of time. In the study conducted by Tracey et al., (2014), the authors found the REFLECT rubric to

> have important applications for instructors in the classroom environment that are worthy of further investigation to identify how best to use it to support the delivery of meaningful formative feedback, which may be of particular importance to developing reflection in students. (p. 332)

The REFLECT rubric was also found to have inter-rater agreement. In evaluating reliability, two of the three researchers were in agreement on the assessment 95 percent of the time. In spite of achieving acceptable levels of reliability, Tracey et al., (2014) recommended that the rubric have clear descriptions of each criterion rather than leaving the researcher to infer their meanings.

Hatton and Smith's (as cited in Taylor-Haslip, 2010) criteria of reflective writing provides clear descriptions for each level of reflection. Descriptive writing is the least reflective. Students simply provide responses to prompts or justify their actions. Descriptive reflective writing is an attempt to reflect based on a student's experiences and their knowledge base. Dialogic reflective writing moves reflection from an external perspective to an internal dialogue the learner has about his experiences and actions taken. In critical reflective writing, the highest of the levels, students identify how their actions and decisions have an effect on "the broader theoretical, historical, social, and political context of their experience" (Taylor-Haslip, 2010, p. 70). In the study of 20

nursing students in their pediatric clinical rotations, while there was a correlation to academic success and reflection, no students reached the critical reflective writing level.

Blaschke and Brindley (2011), in their case study research involving students in the MDE program and their use of reflection journals, used an assessment developed by the Foundation's course faculty. The design consisted of three components – presentation and communications, timeliness and frequency of posts, and technical aspects – and each was weighted based on the instructors' perspective of importance. According to Blaschke and Brindley (2011), the "use of a transparent assessment rubric allowed the students to take greater control of their learning and performance" (p. 7). Learners knew what they were going to be assessed on by the instructors which, in a sense, could be seen as establishing trust in opening up and sharing experiences with others.

The use of rubrics is not only beneficial for the instructors in assessing the reflection practices of their learners. Having the rubric as a guiding evaluation for students is also helpful. In a study of 15 upper-elementary special education teachers participating in an ongoing peer-videoing Professional Development cohort, Osipova et al. (2011) provided the students with a rating rubric. After reviewing their video, students were required to assess themselves by rating their lesson either a one for low or a four for high and had to further elaborate through reflective writing. The authors found that initially teachers referred to the rubric to evaluate what worked in their lessons. Osipova et al. (2011) noticed, "as time progressed, teachers used the language of the rubric within more descriptive comments about what worked and what they planned to do next" (p. 168). There was an apparent evolution in thought for the teachers in using the rubric to assess their own video-recorded lesson plans.

Rubrics provide several benefits to instructors, learners, and peers. Coulehan and Granek (2012) indicated:

> the content, context, and style of accurate reflective feedback are so different from most teaching in the clinical setting that even experienced clinical faculty are apt to flounder. This is where rubrics can be useful tools for both learners and teachers by directing them to the desired outcome and providing relevant examples. (p. 9)

By having an established and transparent analysis of the reflection practice, the instructor has a clear standard to assess against, the learner can reflect in essence using the rubric, and peers can build on thoughts of others in a trustworthy and supportive manner.

Ongoing debate about whether educators should assess reflection or not. As mentioned, it is imperative that the learner has a sense of trust and security in opening up their contemplations to their professors, and at times, their peers. Reflection is meant to allow students to confront uncertainty, deal with emotions from past and current experiences, and think through creating their future professional identities. One of the driving arguments in assessing reflection is how can students actually take down their walls and authentically reflect if they know they are being evaluated (Hobbs 2007; Hargreaves, 2004; Boud, 2001). For this reason, Boud (2001) allows his students to decide if they use their reflection writing to contribute to their assignments or to keep them private. The students own the use of their reflections without the pressure of being assessed. However, Boud (2001) also argues that there are appropriate reasons to assess reflection. For example, to assist students in preparing for their professional futures, especially in the medical field where keeping case notes is part of their daily work. Assessing reflection, in this case, will provide students with formative feedback that will help them be successful in their future careers. Reflective writing isn't about judging the students and their experiences, but rather, about

providing an opportunity to reevaluate experiences, reflect-in-action to reframe current choices, and influence future direction (Wear et al., 2012; Schön, 1983).

In review of the literature, it appears that the use of rubrics in assessing reflective practices contributes to the growth of the learner. This growth is a result of promoting transparency in reflection expectations and in providing reflective opportunities to engage in constructing meaning and shaping experiences.

Self-efficacy defined

The idea of using reflection is not limited to building fundamental knowledge about a specific field of study but can also serve as a way to build a student's confidence in their professional abilities and skill sets. This confidence has been coined self-efficacy, a measure of how much the learner believes in his or her ability to handle various situations and problems. According to Bandura (1997), perceived self-efficacy "refers to beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (p. 3). Stajkovic and Luthans (1998) further explored self-efficacy by identifying how it related to social cognitive theory. The researchers defined self-efficacy as a practitioner's confidence in his or her own abilities with an emphasis on how individuals utilize cognitive resources to complete a task successfully. The role of self-efficacy, in simpler terms, is the learner's ability to be empowered to have an impact on his or her own life and demonstrate that belief through goal setting and goal attainment (Bernadowski et al., 2013).

Bandura (1997) argued that perceived self-efficacy is not necessarily about skills individuals possess but rather about how to use those very skills in a variety of contexts. Theorists have researched individuals with different self-efficacy beliefs and how those beliefs impact the execution of various tasks. Bandura (as cited in Lunenburg, 2011) identified three dimensions of

self-efficacy which have an effect on a learner's attempt to complete a task and the expectations they have for the outcome: "magnitude, the level of task difficulty a person believes she can attain; strength, the conviction regarding magnitude as strong or weak; and generality, the degree to which the expectation is generalized across situations" (p. 1). Learners with a high level of self-efficacy will take on tasks that are more difficult in nature and can apply that confidence in their abilities across a variety of settings.

Taking the relationship between self-efficacy and perseverance further, Pajares (1996) stated, "efficacy beliefs help determine how much effort people will expend on an activity, how long they will persevere when confronting obstacles, and how resilient they will prove in the face of adverse situations" (p. 544). Typically individuals with a higher level of self-efficacy seek out complex problems to be solved and are persistent in overcoming challenging situations. On the other hand, individuals with a low level of self-efficacy view problems, rather, as an obstacle to completing a particular task or achieving a goal (Bandura, 2006, 2012; Federici & Skaalvik, 2011; Lunenberg, 2011; Stajkovic & Luthans, 1998; Pajares, 1996, 2003).

Self-efficacy is a testament to the level of perseverance individuals possess when faced with challenges. This is particularly impactful in educational environments where students are navigating uncertainty in order to develop a masterful understanding of their chosen study (Klassen & Usher, 2010). If a learner has a higher sense of self-efficacy, the learner is more engaged in taking an active role in his or her learning. This only further reinforces the idea of self-regulation in determining success or experiencing negative consequences as defined by the learner. According to Graham and Weiner (as cited by Klassen & Usher, 2010), "self-efficacy has proven to be a more consistent predictor of academic outcomes than have any other motivational

constructs" (p. 5). The belief in oneself to have the capability and capacity for success in a variety of contexts is seen as critical in shaping the student's academic outcomes and professional goals.

Sources of self-efficacy influence student's learning experiences

Self-efficacy can be seen as a snapshot in time, where the learner stands today, or can be viewed as a way to show change over the course of time. Students undergo a number of changes from the onset of their college careers through the transition to their professional workplaces. Within this context of constant change, the identification and uses of the sources of self-efficacy to further learning in students is a key concept that came through in the literature.

According to Bandura (1997), there are four principal sources of self-efficacy: enactive mastery experiences, vicarious experiences, verbal persuasion, and physiological and affective states. The first source, enactive mastery experiences, is often viewed as the most powerful source of self-efficacy (Klassen & Usher, 2010). Learners are affected and shaped by past experiences. Positive, successful past experiences help to build the learner's self-efficacy whereas negative experiences tend to undermine it. According to Klassen and Usher (2010), "mastery experiences are most powerful in building self-efficacy when the tasks at hand are challenging and valued" (p. 3). When students succeed in completing a difficult task, it builds the belief that they can experience success in future tasks as well. In a sense, enactive mastery builds a scaffolding approach to the development of self-efficacy by building on past experiences to strengthen self-efficacy again and again over time.

The second source, vicarious experiences, is tied to observation. According to Richey et al. (2011), "when a learner observes a model being positively reinforced for a particular behavior, he or she may vicariously experience positive reactions" (p. 61). Seeing consequences in others allows the learner to make a determination based on his or her own experience. If the standard has

been met, the learner will be self-rewarding. On the other hand, if the performance did not measure up, the learner will associate negative consequences with, and be critical of, the experience. This influences what learners internalize as positive and negative experiences, and therefore influences future behaviors and decisions.

The third source, verbal persuasion, is aligned with social persuasion. This source involves persuading learners that they can succeed, oftentimes in difficult, complex situations. This source reinforces the idea that individuals with a higher self-efficacy will most likely persevere more than others with low self-efficacy when faced with challenging tasks (Klassen & Usher, 2010). The difference is in that verbal persuasion is external to the learner. The focus is on others encouraging the learner that they can accomplish a task. In the role of education, the instructor plays a key role in developing self-efficacy from this source in the support they provide students and in the feedback offered throughout the semester.

The fourth source, physiological and affective states, is the level of confidence learners have in their abilities. Learners judge themselves based on their physiological reactions to past and current situations, which will vary for each individual. According to Klassen and Usher (2010), "a student encountering a new activity may interpret bodily states of sweating, tensing, or trembling as indicative of a lack of competence to carry out that task, and may be less likely to engage in that activity" (p. 3).

A question that has emerged in the literature is which of the four sources is the most prevalent in enacting change in self-efficacy beliefs. Stajkovic and Luthans (1998) found in their research that enactive mastery is the strongest source of change in self-efficacy beliefs. The study conducted by Morris and Usher (2011) of 12 associate and full professors from five southeastern United States universities support Stajkovic and Luthans's (1998) claim. The professors were

identified for excellence in teaching and went through two interviews each, one in person and one over the phone, to talk through experiences they had in building their self-efficacy. Enactive mastery experiences were determined as the leading source of self-efficacy information. All but one professor indicated "performance-related attainments" as their primary source of teacher self-efficacy. One participant, Lawrence, stated "just having success, that alone made me more confident and I was reasonably successful all the way through [my teaching career]" (Morris & Usher, 2011, p. 238).

Research is not only seeking to validate which self-efficacy source, as defined by Bandura, has the greatest effect on the learner's experience, but it is also attempting to develop and validate new sources from which self-efficacy stems. (Gloudemans et al., 2013; Palmer, 2006). In the medical profession, Gloudemans et al. (2013) identified a gap in the sources of self-efficacy required for nursing education, specifically around clinical practice. The first part of the study was to determine a competent source inventory that would work in assessing the sources of self-efficacy for the nurses. Gloudemans et al. (2013) used the "Sources of Self-Efficacy Inventory (SOSI) developed by Kieffer and Henson" as a foundation to develop an instrument specifically for nurses (p. 82). After going through various feedback sessions with lecturers, the inventory was customized to include five sources, rather than Bandura's four source model: Mastery Experiences, Vicarious Learning Experts, Vicarious Learning Peers, Verbal Persuasion, and Physiological Symptoms (p. 82). The inventory was sent to 230 Dutch bachelor degree students who had previous clinical experience. Not only did the findings show that the five-source model for self-efficacy information was a better fit for nursing education, it also demonstrated that vicarious experiences were the leading source for that population.

Considering the studies reviewed, there was an apparent difference in the main source of self-efficacy. With teachers, the source of self-efficacy was centered on enactive mastery experiences, meaning that success from earlier experiences built confidence for future endeavors preservice teachers would carry out in their careers (Morris & Usher, 2011; Yost, 2006). For students in the medical field, observation, especially in the early stages of their career, is essential to building a foundation of knowledge. Observation paired with the social competition of medical students lends itself to vicarious learning as a main source of self-efficacy (Gloudemans et al., 2013).

In reviewing the literature, the question still remains, which is the most prevalent source of self-efficacy? While Bandura's (1997) enactive mastery experiences is often cited in the literature as the primary source, researchers are exploring new sources for self-efficacy development to establish trends either within or across disciplines.

Assessing self-efficacy

In the research, there is an abundance of self-efficacy measurement instruments from which to choose (Gloudemans et al., 2013; Federici & Skaalvik, 2011; Dellinger et al., 2008; Chen, Gully, & Eden, 2001; Tschannen-Moran & Hoy, 2001; Bandura, 1997; Pajares, 1996; Sherer, Maddux, Mercandante, Prentice-Dunn, Jacobs, & Rogers, 1982). The issue does not become in finding an instrument, but rather in finding one that is credible and most relevant to the study at hand. According to Klassen and Usher (2010), "the use of valid measurements of self-efficacy is critical for ongoing health of the field, and examining the degree of theoretical and measurement fidelity gives current and future researchers an idea of the current condition of self-efficacy research" (p. 16). Researchers are continuing to develop new assessment scales and compare them to already validated measurements in place (Chen et al., 2001)

Self-efficacy is such a personal element to measure. Because of this, there are customized inventories available that span a wide range of disciplines and specialties within disciplines. The scale can a particular focus, be general in nature, or a combination of both. Specific Self-Efficacy (SSE) is a task-specific focus whereas General Self-Efficacy (GSE) is generally applied across a variety of situations. Eden (as cited in Chen et al., 2001) defined GSE as "one's belief in one's overall competence to effect requisite performance across a wide variety of achievement situations" (p. 63). In order to create self-efficacy scales, Bandura (1997, 2006) believed that researchers must use a combination of conceptual thinking and expertise. Additionally, a variety of interviews and surveys must be used in the development to determine what is considered a challenge in increasing self-efficacy or completing a task successfully.

In Chen et al.'s (2001) validation of a New General Self-Efficacy (NGSE) scale created by Chen and Gully in 1997, three different studies were conducted to compare the results of the NGSE to the already validated Self-Efficacy Scale (SGSE) created by Sherer et al. in 1982. In addition, the authors evaluated the relationship of the NGSE to that of GSE, SSE, self-esteem and performance through using a variety of other measures for the second and third studies. The NGSE scale consists of:

1. I will be able to achieve most of the goals that I have set for myself.

2. When facing difficult tasks, I am certain that I will accomplish them.

3. In general, I think that I can obtain outcomes that are important to me.

4. I believe I can succeed at most any endeavor to which I set my mind.

5. I will be able to successfully overcome many challenges.

6. I am confident that I can perform effectively on many different tasks.

7. Compared to other people, I can do most tasks very well.

8. Even when things are tough, I can perform quite well. (Chen, et al. p. 79)

The first study measured the self-efficacy of 316 undergraduate upper-level psychology students. In addition, content validity was conducted where two independent panels of industrial and organizational psychology and psychology students categorized the content of the NGSE, the SGSE, and the Rosenberg self-esteem assessment as GSE, self-esteem or another construct. In the second and third study, the focus was on examining the reliability and "dimensionality" of the NGSE scale and the SGSE scale, and further replicating those findings. The second study consisted of 323 undergraduate students in upper-level psychology courses and the third study focused on 54 managers attending an executive MBA program. In both studies, it was found that the NGSE had a higher predictive validity than the SGSE scale.

Not only are research studies validating new self-efficacy instruments, but they are also looking to explore the relationship between existing ones. Scherbaum, Cohen-Charash, and Kern (2006) conduced a comparison of Sherer et al.'s SGSE, Schwarzer and Jerusalem's General Perceived Self-Efficacy Scale, and Chen et al.'s NGSE. 606 students enrolled in introductory psychology courses took the three measures. The findings indicated that all three instruments were statistically significantly and positively correlated. In relation to previous findings in studies conducted by Chen et al. (2001), Sherer et al., (1982) and Scholz, Dona, Sud, and Schwarzer (2002), the reliabilities and means were consistent. According to Scherbaum et al. (2006), the NGSE had a "slight advantage over the other measures examined in this study in terms of the item discrimination, item information, and relative efficiency of the test information function" (p. 1047).

In addition to exploring the relationship across instruments, researchers are seeking to draw comparisons across varying populations as well. For example, Choi, Fuqua, and Griffen (2001)

conducted a study of 651 undergraduate students in introductory psychology courses to examine the structure of Bandura's Multidimensional Scales of Perceived Self-Efficacy (MSPSE). The authors compared the outcomes of their study with those already conducted involving middle school and high school students. In comparing the studies, Choi et al. (2001) found that the "internal structure and empirical dimensions found correspond with previous factor and component analysis of MSPSE scores from middle school students and high school students" (p. 489). Despite their findings, the authors did indicate that further research would be required in order to replicate the results across additional populations and settings.

An important consideration to keep in mind when evaluating existing scales or creating new scales is the fact that too many scales may have a negative impact on researchers (Pajares as cited in Tschannen -Moran & Hoy, 2001). In research, theorists lose the chance to establish trends within disciplines or even across disciplines. While measuring self-efficacy has an individual element to the research, it would beneficial, as a whole, if greater correlations could be determined using larger samples and solid validation procedures for the measurements followed.

Impact of reflection on self-efficacy

"The journey of discovery consists not in seeking new landscapes, but in seeing them with new eyes' (Marcel Proust)…I thought I understood what these words meant until recently when one of my pre-service teachers helped me see 'with new eyes'" (Freese, 2006, p. 100). Freese documented her two-year journey of using reflective practices with Ryan, a pre-service teacher, in his progression to becoming a more confident teacher. The story combines the worlds of reflection and self-efficacy. Despite the fact that neither reflection or self-efficacy are new to the world of education, the combination of the two are slowly becoming more evident in educating pre-service

teachers, medical students, business students, and designers (Osipova et al., 2011; Dunlap, 2005; Fritson, 2008; Phan, 2007).

One of the key themes found in the literature centered on reflective practices having an impact on building self-efficacy. In a study of 15 upper-elementary special education teachers participating in an ongoing peer-video Professional Development cohort, Osipova et al. (2011) identified themes in three categories: Novices, Community-Oriented Learners, and Researchers. Throughout the process, teachers videotaped their teaching experiences, met with a coach and other peers to view the video and receive feedback. In all three categories, while it was at different points in the video viewing process, confidence in teaching and instructional practices was gained.

Fritson (2008) conducted a pilot study of 41 psychology students from a public university assessing the impact of journaling on self-efficacy. Two classes made up the study, one group received cognitive-behavioral therapy (CBT) direct instructions and the other group did not. The findings revealed that there was no difference between the groups but in both cases, journaling may have had a positive effect on self-efficacy. Despite the positive findings, Fritson (2008) addresses the additional variables that may have impacted the increase in self-efficacy such as the design of the instructional strategies, how those instructional activities were facilitated to the participants or the course content itself.

Dunlap (2005) looked to evaluate how problem-based learning, combined with journal writing, contributed to development of professional competencies of 31 students enrolled in an undergraduate software engineering capstone course. One of the key themes over the course of the 16-week study was a change in students' confidence. Dunlap (2005) indicated, "twenty-seven students indicated that because of the course they were ready to deal with the demands of actual software development projects, even though some seemed surprised by their newfound

confidence" (p. 75). While the study's intent was not on how reflective journal writing contributed to increased confidence, the journal became a tool of measurement to see how the students progressed over the semester.

Research being conducted on self-efficacy and on reflective practices is an emerging field of study but there are virtually no studies that address both. This poses a problem to evaluate how best to impact the development of self-efficacy in learners using reflective practices and has several implications on the way in which instruction can be designed to create deeper reflection experiences in students within and beyond the classroom.

Another concept evident in the research is the focus of reflective practices being used specifically in the fields of pre-service education for emerging teachers (Bernadowski et al., 2013; Shoffner, 2009; Dellinger et al., 2008; Garcia & Roblin, 2008; Harford & MacRuaric, 2008; Postholm, 2008; Yost, 2006; Freese, 2006) and in medical services for clinical nurses and doctors (Gloudemans et al., 2013; Charon & Hermann, 2012; Coulehan & Granek, 2012; Wear et al., 2012; Langley & Brown, 2010). There is a lack of research addressing the use of reflective practices in developing novice designers, particularly focused on how to build self-efficacy through reflection during and after design experiences. To complicate the issue, there are a number of different types of reflective practices such as journal writing, online discussion boards, and facilitated collaborative reflection sessions. The research has not yet determined which kind of reflection would provide the optimal learning experience in building self-efficacy for design students.

Through evaluating the literature for reflective practices and self-efficacy, it can be determined that there is a lack of in-depth studies exploring the relationship between the two. Empirical studies are lacking looking at the core components of what makes reflection effective in building self-efficacy in educational settings. One reason for this lack of research could be

accounted for by the multitude of ways to measure self-efficacy. Whereas multiple researchers have looked at how self-efficacy can be increased (some even considered the relationship with reflective practices), no conclusions can be drawn across disciplines. There is no standardized way of measuring the shift or change in self-efficacy as it varies between emerging medical practitioners, pre-service teachers, and business students. This ties back to the problem of how best to impact the development of self-efficacy in learners using reflective practices.

The importance of reflection and self-efficacy in the learning process, as well as in professional identity development, will continue to evolve with additional studies. A student sums up the use of reflection in education best with a letter to fellow medical learners: "Dear Students: I enjoy being a student myself and continuing to learn. Sometimes we have a discovery that counts as a 'threshold moment' and we are not the same person afterward" (Wald, 2012, p. 633). Continued use of reflective practices, with any hope, can continue to provide these critical moments to students – challenging how they see themselves and how they interact with the world around them.

Summary

The purpose of my literature review was to evaluate the practice of reflection and how it potentially impacts the development of self-efficacy. The focus was on key topics prevalent and, at times, absent from the literature, revealing already existing gaps where further exploration is required. The themes that emerged were tied to reflection, self-efficacy, and the relationship between the two. For reflection, the focus was on how reflection contributes to growth, the use of writing prompts to guide discussion, and the use of rubrics to assess reflection. In relation to self-efficacy, themes emerged on self-efficacy's relationship to student learning and studies centered on the use of instruments for assessing self-efficacy. Lastly, the connection between the two was

explored. Despite the limited number of research studies addressing both reflection and self-efficacy, the key theme centered on reflective practices having an impact on building self-efficacy emerged. However, the studies do not explore how particular reflective practices, such as journal writing prompts, contributes to self-efficacy development. In addition, studies until this point have been concentrated in teacher education and medical fields. There are virtually no studies that explore the use of reflective practices in developing novice designers, particularly on how to build self-efficacy using reflection-in-action and reflection-on-action.

CHAPTER 3: METHODOLOGY

The purpose of this mixed methods quasi-experimental research study was to explore the impact of using reflection as a tool in increasing self-efficacy in graduate design students. The goal was to examine how various reflective writing prompts impact the level of self-efficacy and reflection level of graduate design students. Both qualitative and quantitative methods were used to collect data to answer:

Q1: What impact does reflective practice have on the self-efficacy in graduate design students?

Q2: What reflective writing prompt strategy has a greater impact on self-efficacy in graduate design students?

Q3: What type of reflective writing prompt strategy has a greater impact on the reflection level of graduate design students?

The methodology section is organized in the following way: (a) rationale for mixed methods quasi-experimental research, (b) participants, setting, and sampling procedures, (c) research design, (d) data collection methods. (e) trustworthiness, and (f) data analysis procedures

Rationale for Mixed Methods Quasi-Experimental Research

Mixed methods research is defined as a combination of qualitative and quantitative methods incorporated into a single study. In this type of research design, neither the qualitative or quantitative approaches alone would provide an in-depth understanding of the overall research problem (Creswell, 2014). Specifically in this study, the approach was convergent parallel mixed methods. In this particular branch of mixed methods research design, according to Creswell (2014), "the researcher converges or merges quantitative and qualitative data to provide a comprehensive analysis of the research problem" (p. 15). Over the course of two semesters,

quantitative data was collected using pre- and post-test scores as well as qualitative data regarding the depth of reflections gleaned from the reflective practice strategies. While the two methods were conducted simultaneously, both qualitative and quantitative were analyzed in relation to each other to explore relationships among the research variables.

The research study was quasi-experimental in nature for several reasons. First, as defined by Creswell (2014), "experimental research seeks to determine if a specific treatment influences an outcome" (p. 13). In this case, the specific treatment was the reflective writing prompt strategies used and the outcome was the level of self-efficacy a student had and the level of reflection they demonstrated over the course of a semester. During the semester, students' self-efficacy was assessed prior to a reflective writing prompt strategy being implemented and again after the reflective writing prompt strategy was complete. This occurred three times over the course of a semester. Secondly, the selection process of the participants also lends itself to quasi-experimental design. The study was conducted in an educational setting. Due to the structure of the class, and because the students were already pre-determined at the onset of a particular class, random assignments of subjects was not possible (Ross & Morrison, 2003). This research design allowed for a comprehensive comparison between students' self-efficacy at the beginning and end of the semester. In addition, the research design dove deeper into looking at specifically which writing prompt strategy had the greatest impact on graduate students' self-efficacy and reflection level.

Participants, Setting, and Sampling Procedures

The setting for the study was an urban higher education institution, Wayne State University (WSU), specifically the Learning Design and Technology program in the College of Education. Participants, as mentioned, were obtained using purposeful convenience sample. The study targeted students enrolled in the graduate level course, Learning Design and Technology (LDT)

6110: Design Thinking and Knowledge. This introductory course is where students learn the concepts of design including developing learner personas, establishing design outcomes, and developing and implementing instructional strategies to convey content with impact. The course learning goal is to introduce design, design thinking and design knowledge and link it to instructional design. According to the course syllabus, specific learning outcomes for the participants to accomplish during the course include the ability to:

1. Define design, instruction, instructional design, and the role of the designer.

2. Define design space and identify the activities that occur in the design space.

3. Identify design principles and similarities and differences in the design process.

4. Define and identify design precedent through activities and case studies.

5. Given the context of an authentic instructional need or opportunity, discover your end user by designing to a precise description of learners and what they wish to accomplish.

6. Given the context of an authentic instructional need or opportunity, design to reach outcomes and show achievement by always working the problem-solution relationship.

7. Given the context of an authentic instructional need or opportunity, produce an experience design prototype. (page 3)

The first half of the semester consists of teaching the concepts of design thinking to students whereas the second half introduces them to instructional design practices. The course assignments require students reflect on their past experiences, current design decisions, and thinking through their futures as designers. The course is a requirement in the College of Education's Learning Design and Technology graduate program. It is the first classes that students take during their studies.

Research Design

   The goal of this quasi-experimental research study was to examine the impact of reflection on the level of student self-efficacy. Both qualitative and quantitative data was collected and analyzed to determine the research findings. With approval from Wayne State University's Internal Review Board (IRB), the research design followed the approach below:

1. Conducted extensive literature review focusing specifically on reflective strategies and students' levels of self-efficacy. In addition, the literature review discussed the lack of research examining the use of reflection in impacting self-efficacy in students.

2. Selected reflective questions to address three reflective writing prompt strategies: reflection-on-action, reflection-in-action, and reflection-on-reflection.

3. Students provided consent on inclusion in the research study.

4. Students completed an instrument to measure their cognitive complexity as well as answer several background/demographic questions.

5. Students completed an instrument (pre-test) that measured their self-efficacy.

6. Students wrote in their reflection journal, answering the reflective writing prompts provided in their class.

7. Students completed an instrument (post-test) that again measured their self-efficacy.

Steps 5 through 7 were repeated 2 more times at different intervals during the semester, during weeks 10 and 15. Each time, the type of reflection writing prompt was different and the self-efficacy instrument was administered prior to and after the reflection writing occurs.

   Initial Meeting. Prior to the start of the semesters, I sought approval from the LDT 6110 instructors to engage with the students. My initial contact with students consisted of an email communication sent one week prior to the semester starting (see Appendix A for email and

informed consent form). I provided an overview of the participant's responsibility in completing the reflective journal and completing the pre- and post-self-efficacy instruments. This email provided details on how to agree to consent and participate in the study. The initial steps were to (a) complete and submit the consent form, (b) complete the demographic background survey, (c) complete the cognition assessment, and (d) complete the self-efficacy instrument.

The first study occurred during the winter 2016 semester. Seven students agreed to participate in the study. A second study took place during the fall 2016 semester in which 13 students agreed to participate. One student in the second study did not complete the requirements beyond submitting the initial consent form. For this reason, any reference to the student was eliminated in the results chapter. Combining the winter and fall semesters, a total of 19 students participated in the study.

Data Collection Methods

Data was collected using multiple techniques to support the qualitative and quantitative focus of this study.

Background survey questions. Participants took a background survey detailing information such as their age, working experience, academic standing, etc. By collecting demographic details, additional conditions could be identified as impacting reflection levels and self-efficacy beliefs. The information provided a comparison point in the quantitative data, and isolated factors associated with the outcomes of the self-efficacy assessment (see Appendix B for the background survey questions).

Need for cognition instrument. In order to isolate potential factors contributing to shifts in reflection levels and self-efficacy over the course of the semester, a baseline measurement was required at the onset of the semester. Cognitive complexity is viewed as a stable trait related to

self-efficacy and anchored in reflection. Because there is no control group in this study, the need of cognition instrument addresses how to handle baseline differences in relation to reflection and self-efficacy over the course of the semester. In the research, changes in reflection and self-efficacy were evaluated above and beyond participants' natural cognitive styles. Cacioppo and Petty created the scale in 1982 and it has been used to assess how individuals engage in thinking (Cacioppo, Petty, Feinstein, & Jarvis, 1996). There are two options for the scale, a 34-item instrument and an 18-item instrument. For this study, the shorter form was used. Table 2 details the statements participants answered.

#	Statement
1	I would prefer complex to simple problems.
2	I like to have the responsibility of handling a situation that requires a lot of thinking.
3	Thinking is not my idea of fun.*
4	I would rather do something that requires little thought than something that is sure to challenge my thinking abilities.*
5	I try to anticipate and avoid situations where there is likely a chance I will have to think in depth about something.*
6	I find satisfaction in deliberating hard and for long hours.
7	I only think as hard as I have to.*
8	I prefer to think about small, daily projects to long-term ones.*
9	I like tasks that require little thought once I've learned them.*
10	The idea of relying on thought to make my way to the top appeals to me.
11	I really enjoy a task that involves coming up with new solutions to problems.
12	Learning new ways to think doesn't excited me very much.*
13	I prefer my life to be filled with puzzles that I must solve.
14	The notion of thinking abstractly is appealing to me.
15	I would prefer a task that is intellectual, difficult, and important to the one that is somewhat important but does not require much thought.
16	I feel relief rather than satisfaction after completing a task that required a lot of mental effort.*
17	It's enough for me that something gets the job done; I don't care how or why it works.*
18	I usually end up deliberating about issues even when they don't affect me personally.

Table 2: Need for Cognition Scale statements
*Statements that required reverse scoring

This form of the Need for Cognition instrument has established reliability, is measured using a standard Likert-type scale, and can be completed in short period of time. Table 3 illustrates the rating description and the equivalent value. The responses range from four for very strong agreement to negative four for very strong disagreement.

Rating Description	Value
Very strong agreement	+4
Strong agreement	+3
Moderate agreement	+2
Slight agreement	+1
Neither agreement nor disagreement	0
Slight disagreement	-1
Moderate disagreement	-2
Strong disagreement	-3
Very strong disagreement	-4

Table 3: Need for Cognition Scale rating description and values

While the Cacioppo and Petty (1996) retain the copyright for the scale, they have granted open permission for its use in non-profit educational settings. Participants answered the instrument before taking the self-efficacy instrument and engaging in any reflective journal writing. The survey was administered using Survey Monkey.

Self-efficacy instrument. To measure the change in the level of perceived self-efficacy of each student, a validated self-efficacy scale called New General Self-Efficacy Scale (NGSE) designed by Chen et al. (2001) was used. The instrument is public domain and I have also acquired permission to use the instrument in this research. The NGSE scale consists of eight statements in which the learners respond using a five-point Likert Scale ranging from Strongly Agree (response rating of 5) to Strongly Disagree (response rating of 1). Table 4 details the statements participants rated themselves against.

#	Statement
1	I will be able to achieve most of the goals that I have set for myself.
2	When facing difficult tasks, I am certain that I will accomplish them.
3	In general, I think that I can obtain outcomes that are important to me.
4	I believe I can succeed at most any endeavor to which I set my mind.
5	I will be able to successfully overcome many challenges.
6	I am confident that I can perform effectively on many different tasks.
7	Compared to other people, I can do most tasks very well.
8	Even when things are touch, I can perform quite well.

Table 4: New General Self-Efficacy Scale (NGSE) statements

The instrument was administered before and after reflection question responses for weeks 1, 10, and 15 of the LDT 6110 class. Participants answered the instrument prior to writing their reflective journal responses during those weeks and then again after writing their reflective journal response. Participants were directed to answer the items using a design focus, as self-efficacy is task-specific. For example, when participants respond to the second statement, "When facing difficult tasks, I am certain that I will accomplish them," the answer was in relation to difficult tasks they have experienced in design. This information and assessment provided a pre- and post-evaluation of the responses. The survey was administered using Survey Monkey.

Participant reflective journal. Writing in a reflective journal was an existing assignment in the LDT 6110 course. This was not an added expectation for students. The writing prompts that were selected for use in this study were reflection-on-action, reflection-in-action, and reflection-on-reflection strategies. As described by Schön (1983, 1988) reflection-on-action takes place after a particular event, activity, or experience. These prompts asked students to reflect back on their previous designing experiences or interpret course teachings in relation to previous experiences. Table 5 details the selected reflective writing prompts used for reflection-on-action. The first

number indicates the week the prompt was deployed and the second number is the order in which

it was deployed in that given week. For example 1.1 means it was a question in week one of the

course and the first question asked.

#	Writing Prompts
1.1	According to Cross – "Everyone can and does design. We all design when we plan for something new to happen." Describe in detail a time when you designed something. How (if appropriate) was it – effective, efficient, creative, imaginative, and/or stimulating? Describe how it feels to design?
1.2	Describe a time when you felt totally uncertain. Try to remember how that felt and the greatest challenge you faced because of the uncertainty. What did you do to handle it? Knowing that part of being a designer is always dealing with uncertainty, how do you feel about being a designer?
3.1	Are you a Gordon Murray or a Kenneth Grange designer? Why? Which would you like to be as you ultimately develop as a designer? Why?
3.2	Describe a time when you had a sudden inspiration. What were you doing when you had this inspiration? How did you feel? Why do you think the inspiration came to you at that moment?
5.1	Cross states that: "Design intelligence involves an intense reflective interaction with representations of problems and solutions." Now that we are in week 5 of this course, how are you preparing to have constant, intense reflection in your daily design activities? What will work for you to make sure this happens?
5.2	He also states that design intelligence is NOT simply a given 'talent' or 'gift' but can be a trained and developed. How do you plan to train and develop your design intelligence?
14.1	As you reflect back on your work on your instructional design project, what role has uncertainty played in the process for you so far? How have you responded to uncertainty? Has it influenced how you move among the design spaces or other aspects of your process?
14.2	Knowing that you will be presented this week for an additional element to your final EDP, how do you feel about the uncertainty of that? How are you preparing to manage the unknown?

Table 5: Reflection-on-action writing prompt strategies

Reflection-in-action allows designers to stop in the middle of the design process and

reframe the situation to explore current decisions. As students worked to identify their goals and

outcomes of their design project for the LDT 6110 class, prompts were used to evaluate what

specifically the students wanted their learners to be able to do and how they knew that the changes

occurred. Students answered these questions in the midst of their design, specifically when completing their goals and outcomes discovery assignment. Table 6 details the selected reflective writing prompts used for reflection-in-action.

#	Writing Prompts
10.1	What changes in how learners do what they do or think should occur?
10.2	How will you know that these changes have occurred?
10.3	What activities will help facilitate these changes in thinking and what learners do?
10.4	How are you discovering your content? How can you chunk your content? How will you sequence your content?
10.5	What constraints have you encountered during your design project so far? How are you dealing with them?

Table 6: Reflection-in-action writing prompt strategies

Lastly, reflection-on-reflection is looking back at previous reflections that the students have completed. In the last week of the semester, students reflected back on earlier answers they provided in defining design, instruction, and what it means to be a designer. Through comparing what they thought earlier in the semester, with what they were thinking in the last week, this reflection allowed the students to self-assess if any changes took place. Table 7 details the selected reflective writing prompts used for reflection-on-reflection.

#	Writing Prompts
15.1	Go back to your previous responses during this semester on the "What is design?" question. What has changed in your definitions after completing this course and your [Instructional Design] ID project?
15.2	Go back to your previous responses during this semester on the "What's instruction?" question. What has changed in your definitions after completing this course and your ID project?
15.3	Go back to your previous response to 4.3 were you described your beliefs, self-awareness and precedents. What do you have now? Where are you today after 14 weeks of design thinking? What does it mean to you to be a designer? What goals do you have for yourself? What actions will you take to develop as a designer and reach those goals?

Table 7: Reflection-on-reflection writing prompt strategies

Each student kept his or her own reflection journal using Google Docs throughout the course of the semester. I emailed students in the final week of the semester asking that they share their reflection journals with me after grades had been submitted for the course.

Researcher journal. The researcher journal served as an ongoing place for me to organize my thoughts, document my ideas on how the study was evolving, and document early findings. This first-hand perspective served as a reflection journal in my process as a researcher as well (see Appendix F for the reflective prompts used as thought starters for researcher journal responses). The journal provided me insights to work through challenges and celebrate milestones in the research process.

Trustworthiness

In accordance with Lincoln and Guba's (1985), the indicators of trustworthiness followed for this study were: (a) credibility, (b) transferability, (c) dependability, and (d) confirmability.

Credibility. Two techniques used to confirm credibility are: (a) prolonged engagement and (b) triangulation.

Prolonged engagement. The study spanned the timeframe of a 15-week semester. Three intervals, at week 1, 10 and 15, served as focal points for the study. This study initially took place in winter 2016 and was repeated in the subsequent semester, fall 2016.

Triangulation: With the mixed methods approach, there were a variety of sources for the data being collected. This provided "multiple and different sources as a means of crosschecking and corroborating evident" (Rudestam & Newton, 2007, p. 114). I satisfied triangulation by using a variety of data collection methods: participant reflective journals, self-efficacy instrument results, and researcher journal (see Table 8). In addition, two additional reviewers engaged in the data analysis process; one served as a second reviewer of the journal data and one served as a tie breaker for any discrepancies between the first and second reviewer's analysis.

Research Question	Data Source	Collection Method	Analysis Method
Q1: What impact does reflective practice have on the self-efficacy in graduate design students?	• Graduate Design Students	• Literature Review • Need for Cognition Scale • New General Self-Efficacy Scale • Researcher journal	• Repeated measures for ordinal level (Friedman test in SPSS)
Q2: What reflective writing prompt strategy has a greater impact on self-efficacy in graduate design students?	• Graduate Design Students • Researcher	• New General Self-Efficacy Scale • Researcher journal	• Repeated measures for ordinal level (Friedman test and Wilcoxon T-test in SPSS)
Q3: What type of reflective writing prompt strategy has a greater impact on the reflection level of graduate design students?	• Graduate Design Students • Researcher	• Participant reflective journal • Researcher journal	• REFLECT Rubric • Constant comparison to establish patterns

Table 8: Data collection methods and analysis

Transferability. Through the use of thick descriptions detailing the research findings, educators and other researchers may or may not find the information transferable. Potentially, findings could provide insight into the design and development of reflection writing prompts centered on reflection-on-action, reflection-in-action, and reflection-on-reflection.

Dependability. My researcher journal allowed me to keep accurate record of the data collection process and research study progression. Documentation allowed me to reflect throughout the process on any potential bias I was bringing into the study. In addition, it allowed me to record initial insights and how those insights evolved over the course of the research.

Conformability: With the study being mix methods in nature, using convergent parallel method in analyzing the data, I collected and compared the qualitative and quantitative data to establish patterns and relationships among the research variables.

Data Analysis

Data analysis drew from both quantitative and qualitative techniques.

Quantitative Analysis. The background survey and the Need of Cognition Scale instrument results provided input to the baseline self-efficacy measure of the participants. The students were entering the program with different abilities and capacities for reflection therefore these measures helped to inform those baseline scores contextually.

The statistical testing that was used to analyze the self-efficacy pre- and post-test data was repeated measure for ordinal data or better known as the Friedman test. Gravetter and Wallnau (2013) define the Friedman test as being used "to evaluate the differences between three or more treatment conditions using data from a repeated-measures design" (p. 752). Using SPSS, descriptive statistics were an output for both the winter and fall semesters separately as well as the Friedman test results.

In addition to the Friedman test, the Wilcoxon T-test was conducted to compare the surveys in relation to each other within that semester's data set to identify any significant pairings. Gravetter and Wallnau (2013) indicate the "Wilcoxon test uses the signs and the ranks of the difference scores to decide whether there is a significant difference the two treatments" (p. 748). Using SPSS, the significant pairwise rank differences were identified.

Bringing the qualitative and quantitative analysis together. Because of the nature of convergent parallel mixed methods, qualitative and quantitative data provided an analysis point of the impact of reflection on self-efficacy. Through analyzing both the statistical findings from the NGSE scale and the level of reflection as determined by the REFLECT rubric for all participants, further relationships (or lack of) between self-efficacy and the level of reflection were examined.

Qualitative Analysis. Analysis was conducted on the participant reflection journals for weeks 1, 10, and 15 for the LDT 6110 course. All references to the students' identity were removed from the data set upon receipt of the journal entry. Questions that were not in scope for the study were excluded from the data set. In addition, any feedback provided from the professor to the student was also removed. The focus of the analysis was on the students' response alone for the specific reflection prompts as outlined in Tables 5, 6, and 7.

Wald et al.'s (2012) Reflection Evaluation for Learners' Enhanced Competencies Tool (REFLECT) rubric was used to assess the level of reflection the participants attained in their reflection. The rubric established criterion in the following categories: Writing Spectrum, Presence, Description of Conflict or Disorienting Dilemma, Attending to Emotions, Analysis and Meaning Making, and Attention to Assignment. Attention to assignment is an optional minor criterion and was not included in the scope for this study. The levels of reflection using the REFLECT rubric are Habitual Action (HA), Thoughtful Action or Introspection (TA), Reflection

(R), and Critical Reflection (CR). Table 9 provides an excerpt from the RELECT rubric for Writing

Spectrum (see Appendix D for the complete rubric).

HA	TA	R	CR
Superficial descriptive writing approach (fact reporting, vague impressions) without reflection or introspection	Elaborated description writing approach and impressions without reflection	Movement beyond reporting or descriptive writing to reflecting (i.e., attempted to understand, question, or analyze the event)	Exploration and critique of assumptions, values, beliefs, and/or biases, and the consequences of action (present and future)

Table 9: RELFECT writing spectrum criterion levels

In the REFLECT rubric, there is an Axis II for Critical Reflection with additional levels focusing

on transformative reflective and learning as well as confirmatory learning. This Axis was out of

scope for this particular study.

To guide the analysis for the participants' reflection journals, the following steps, as

recommended by Wald et al. (2012), were used:

1. Read the entire narrative

2. Zoom in and out of the details to determine which level each criterion represents

3. Zoom out to consider the overall picture and determine which level the narrative as a whole

   represents

4. Provide examples from the text to support decisions (p. 48)

Two initial reviewers analyzed the reflection journal and assigned a level of reflection to

the data for each criterion. I served as the first reviewer and a graduate of the Wayne State

University Learning Design and Technology doctoral program graduate served as the second

reviewer. We met initially to discuss how to use the REFLECT rubric and went through several

examples provided by Wald et al. (2012). We also met mid-way through the review of the data to

compare a sampling of our responses. We then met for a third time the end of the analysis process to discuss any key insights, beyond what could be reflected in the ratings assigned.

A third qualitative reviewer, enrolled in the doctoral Learning Design and Technology program at Wayne State, resolved any conflicts that occurred between both the first and second reviewers. The third reviewer has significant background utilizing the REFLECT rubric and was consulted for her expertise on the topic. Discussions with the third reviewer took place consistently via email over the course of the data analysis process. All three reviewers assessed the data by question rather than by student. Secondary to the REFLECT rubric analysis, I used constant comparison to establish any patterns or themes that emerged in relation to reflection level over the course of the semester.

Summary

This mixed methods quasi-experimental study sought to examine the impact of reflection on the level of self-efficacy in graduate design students. Using an introductory design class, LDT 6110, in the College of Education at Wayne State University, both qualitative and quantitative data was collected and analyzed to provide a comprehensive view of the research. Participants completed reflection journals during the semester. The writing prompts strategies focused on reflection-on-action, reflection-in-action, and reflection-on-reflection. In addition, students completed the NGSE scale for a total of six times during the semester, before and after writing in their reflection journals during designated weeks. Analysis was conducted using the REFLECT rubric to assess the level of reflection the students attained. In addition, statistical testing was used to determine if there was an impact on the level of self-efficacy in relation to the reflective writing prompt strategy employed.

CHAPTER 4: RESULTS

This quasi-experimental research study used a mix-methods approach to explore the impact of using reflection as a tool in increasing self-efficacy in graduate design students. Incorporating both the quantitative and qualitative research methodologies, the goal was to examine how various reflection writing prompt strategies impact the level of self-efficacy and reflection of the students. This study addressed the following questions.

Q1: What impact does reflective practice have on self-efficacy in graduate design students?

Q2: What reflective writing prompt strategy has a greater impact on self-efficacy in graduate design students?

Q3: What type of reflective writing prompt strategy has a greater impact on the reflection level of graduate design students?

Organization and Presentation of Data

This chapter provides the results organized by data collection type – quantitative for the first two research questions, followed by qualitative for the third and final research question. To start, descriptions of the participant population are included as well as the results of the Needs for Cognition assessment. This data provided the demographic makeup and baseline cognitive insight of who the research participants were at the onset of the study. For the first and second research questions, quantitative results are provided. For the third research question, qualitative findings are presented using the REFLECT rubric criteria. To follow the IRB approved research protocol, participant's names and identifying information were removed and replaced by a numerical code to maintain confidentiality. The numerical format is maintained in the data results. Any reference to an individual is portrayed as a numerical code rather than identification by name. Significant findings, implications to Learning Design and Technology, as well as recommendations for future research follow in Chapter 5.

Participant Population

The setting for this study was the College of Education Department at Wayne State University. Using purposeful sampling, the study targeted students enrolled in the graduate level design course, LDT 6110: Design Thinking and Knowledge. The first study occurred during winter semester in 2016. Seven students participated in the study. Over the course of the semester, the participants provided answers to the NGSE instrument six times and submitted their final reflection journal to the researcher after the semester had ended and grades were submitted. While the data provided insights into the research question responses, the sample size limited the scope of those findings. Because of this limited sample, a second study was conducted in the fall semester in 2016 and results in 13 students willing to participate. The participants followed the same initial steps as outlined for the first study. They also completed the NGSE instrument six times over the course of the semester and submitted their final reflection journal to the researcher at the end of the semester, after grades were submitted to the university.

During the second study, one student (who was assigned the numerical code 010) submitted the consent form but did not participate in any subsequent research for the study. For this reason, the student has been eliminated from the total number of participants. Combining both the winter and fall semester research participants, the total number of participants for this study was 19 students. For the demographic information, the participants have been combined to show the overall picture of who participated in the study. For the individual research questions, the data will be shared specific to the semester in which the study took place.

Demographic information was collected from participants to develop a general understanding of who they were at the onset of the research study. Table 10 illustrates the age range of the participants with the majority being between the ages of 28 and 32 years old (36.84%).

#	Answer	%	Count
1	18-22	0.00%	0
2	23-27	10.53%	2
3	28-32	36.84%	7
4	33-37	21.05%	4
5	38-42	10.53%	2
6	43-47	5.26%	1
7	47+	15.79%	3
	Total	100%	19

Table 10: Demographics - What is your age?

Table 11 illustrates the gender of the participants who were 21.05 % male and 78.95% female.

#	Answer	%	Count
1	Male	21.05%	4
2	Female	78.95%	15
	Total	100%	19

Table 11: Demographics - What is your gender?

Table 12 displays the number of dependents the participants claimed in their federal taxes. The majority of participants had zero dependents (68.42%), with the second majority having two dependents (15.79%).

#	Answer	%	Count
1	0 dependents	68.42%	13
2	1 dependents	10.53%	2
3	2 dependents	15.79%	3
4	3 dependents	0.00%	0
5	More than 3 dependents	5.26%	1
	Total	100%	19

Table 12: Demographics - How many dependents do you claim in your federal taxes?

The background survey also addressed the employment aspects of the participants as well. Eighteen participants were employed (94.74%) and one participant was not employed (5.26%). Of those 18 participants who were employed, Table 13 illustrates that the majority of participants were employed full time (88.89%).

#	Answer	%	Count
1	Full time*	88.89%	16
2	Part time**	11.11%	2
3	Other	0.00%	0
	Total	100%	18

Table 13: Demographics: If employed, how many hours per week?
*40+ hours per week
** Less than 40 hours per week

Lastly, the background survey covered the past and current aspects of the participant's academic experience. Table 14 illustrates the total classes that the participants were enrolled for the semester in which they participated in the study. The majority of participants were enrolled in two courses total (63.16%), with the second majority only being enrolled in one course, which was Design Thinking and Knowledge (26.31%).

#	Answer	%	Count
1	1	26.31%	5
2	2	63.16%	12
3	3	10.53%	2
	Total	100%	19

Table 14: Demographics - How many total classes are you enrolled in this semester?

Of the 19 participants, 10 indicated that this was their first year in the graduate program at Wayne State University (52.63%), while the remaining 9 indicated that it wasn't their first year in the graduate program (47.37%). Table 15 represents the type of program Learning Design and Technology program participants were enrolled in. The majority of the participants were in the enrolled with the master's program for Learning Design and Technology (63.16%).

#	Answer	%	Count
1	Master's	63.16%	12
2	Doctorate	15.79%	3
3	Other	21.05%	4
	Total	100%	19

Table 15: Demographics - Which Instructional Design degree program are you enrolled in?

Of the four participants that indicated *Other* as their response (21.05%), one participant did not indicate where they were enrolled in the *Other* field. Two of the participants were enrolled in the Educational Specialist Certificate program and one was investigating if they wanted to start the Educational Specialist program.

Table 16 indicates the number of students who already had a master's degree. Ten of the participants did not already possess a master's degree (52.63%) while 9 participants did (47.37%).

#	Answer	%	Count
1	Yes	47.37%	9
2	No	52.63%	10
	Total	100%	19

Table 16: Demographics - Do you already have a master's degree?

The fields in which the nine participants already had master's degrees were:

- Communication

- Elementary Education

- Higher Education and Student Affairs

- History of Literature and Literary Criticism

- Instructional Design and E-Learning

- Medical (Physician Assistant)

- Special Education

- Sports Management

- Student Affairs Administration

The background survey provided insight into the demographics of the research participants. The data also served as a comparison point in analyzing the data results.

In addition to the background survey contributing to a baseline of the participants, the Need of Cognition Scale instrument was used to strengthen that starting point perspective as well. According to the instrument creators, Cacioppo and Petty (1982), the Need of Cognition Scale measures "the tendency for an individual to engage in and enjoy thinking" (p. 116). The participant results were reviewed to establish an understanding of how the participants engage in thinking at the onset of the study (Cacioppo et al., 1996). Participants answered the instrument directly after taking the background survey but prior to taking their first NGSE instrument. At this point in the

study, participants had not yet engaged in their reflective writing practices as well. As mentioned in chapter three, the Need of Cognition Scale asks to describe the extent to which the participants agree with each statement using a 9-point Liker-type scale (Cacioppo et al., 1996). For this study, the shorter 18-item instrument was used.

When evaluating the results for the Need for Cognition Scale, the highest score possible is 72 and the lowest score possible is -72. Scores are determined by adding up the responses for each question for an individual. Half of the statements utilize reverse scoring. In order to analyze the results, I reversed the scores for those particular statements to determine the total scores for each participant. In addition, I identified the minimum score, maximum score, and mean for each participant. The lowest score was -31 and the highest score was 52. There was a range of 83 between the two scores. The only score that was the same for three of the participants was a score of 49. Table 17 provides the individual scores for the participants who participated in the study categorized by winter and fall semesters.

Semester	Participant ID	Score	Min	Max	Mean
Winter	002	19	-3	4	1.06
Winter	003	51	0	4	2.83
Winter	004	-7	-3	3	-0.39
Winter	006	15	-4	4	0.83
Winter	014	46	-3	4	2.56
Winter	015	49	1	4	2.72
Winter	016	49	1	4	2.72
Fall	001	-2	-4	2	-0.11
Fall	005	35	1	4	1.94
Fall	007	39	-2	4	2.17
Fall	008	4	-2	2	0.22
Fall	009	49	-3	4	2.72
Fall	011	26	-4	4	1.44
Fall	012	28	-2	3	1.56
Fall	013	52	-2	4	2.89
Fall	017	-1	-4	3	-0.06
Fall	018	43	0	4	2.39
Fall	019	36	-1	4	2.00
Fall	020	-31	-4	4	-1.72

Table 17: Need for Cognition Scale results, by participant

Using descriptive statistics, Table 18 illustrates the collective results by semester. The Need for Cognition Scale mean for the winter semester was 31.71 and for the fall semester was 23.17.

Semester	N	Min	Max	Mean	*SD*
Winter	7	-7	51	31.71	21.09
Fall	12	-31	52	23.17	24.15
Combined	19	-31	52	26.32	23.43

Table 18: Need for Cognition Scale results, by semester

Individuals with higher Need for Cognition tend to be viewed as thinkers, "naturally tend to seek, acquire, think about, and reflect back on information to make sense of stimuli, relationships, and events in their world" (Cacioppo et al., 1996, p. 198). While correlations between Need for Cognition and reflection levels were not in scope for this study, the fundamental understanding of the cognition levels provided an additional perspective in contributing to the comprehensive view of the data analysis.

Quantitative Results

Over the 15-week semester of the Design Thinking and Knowledge course in the winter 2016 and fall 2016 semesters, I administered the NGSE instrument at six different intervals. The NGSE was used to measure changes in the level of perceived self-efficacy of each student. Participants were instructed to complete the NGSE with a focus on design in order to evaluate how they viewed their self-efficacy in relation to design alone.

Each student who participated in the study first completed the NGSE via Survey Monkey prior to the semester starting and writing their first reflection journal entry. The instrument was then sent again in week 2, after their reflection journal was complete. Subsequently the instrument was sent in weeks 9, 11, 15, and after the course ended. The NGSE served as a pre- and post-instrument specifically administered before and after certain reflection writing prompt strategies. Table 19 illustrates which reflective writing prompt strategy was used for each week of the course when the NGSE was deployed.

Week	Writing Prompt Strategy
1	Reflection-on-action
10	Reflection-in-action
15	Reflection-on-reflection

Table 19: Reflective writing prompt strategy timeline

The NGSE data informed results for research questions one and two of this study. Evaluating the quantitative data provided insight into the impact reflective practice and reflective writing prompt strategies have on graduate design students. This section addresses the results of the first and second research questions:

Q1. What impact does reflective practice have on self-efficacy in graduate design students?

Q2. What reflective writing prompt strategy has a greater impact on self-efficacy in graduate design students?

As mentioned, the NGSE was administrated to determine self-efficacy levels as perceived by the research participants. To analyze the data, descriptive statistics were provided as a preliminary view into the research results. The Friedman test, used to evaluate repeated-measure research design, was conducted using SPSS to determine the impact of reflective practice. Lastly, the Wilcoxon T-test was conducted to identify any significant pairwise rank differences found within the data.

Winter 2016 results. In the winter semester, seven participants participated in the study by completing NGSE instrument six times over the course the study. There was one participant (number 6) who did not complete the third survey. This was accounted for in the data set. Table 20 details the descriptive statistics for the population.

Reflection Prompt Deployed in Between Surveys	Survey	N	Min	Max	Mean	*SD*
Refection-on-Action	#1	7	3.88	5.00	4.45	0.42
	#2	7	4.00	4.75	4.45	0.27
Reflection-in-Action	#3	7	3.63	5.00	4.28	0.54
	#4	7	4.25	5.00	4.60	0.33
Reflection-on-Reflection	#5	7	3.38	5.00	4.38	0.59
	#6	7	4.00	5.00	4.61	0.40

Table 20: Winter NGSE descriptive statistics

The data was evaluated using the Friedman statistical test. Table 21 illustrates the Friedman statistical testing results. According to the Friedman results, there was a statistically significant difference in self-efficacy, $X^2(5)=11.74$, $p<.05$. However, given the low sample size of seven, significance should be considered with that context.

Statistical Description	Result
N	7
Chi-square	11.75
df	5
Asymp. Sig.	$p<.05$

Table 21: Winter NGSE Friedman statistical testing results

The Wilcoxon T-test was conducted in SPSS to determine where any differences did occur. The Wilcoxon test looked at the rank of the participants to determine any significant differences. Results, again, are considered in context with the sample of size of seven. Two significant Wilcoxon T-tests were found: survey three and one ($z=-2.03$, $p<.05$) and survey six and three ($z=-2.21$, $p<0.5$). The results indicated that survey three was lower than survey one and survey six was lower than survey three. No other significant pairwise rank differences occurred. There was no

significant pairings comparing the same reflective writing prompt strategy (between survey one and two, survey three and four, survey five and six). In the first significant pairing, it cannot be determined that the use of reflection-in-action writing prompt strategy was lower than reflection-on-action writing prompt strategy since the difference is prior to the deployment of the reflective writing prompt strategy itself. The significant differences were found for the pre-tests prior to the participants completing their reflective journals.

In the second significant pairing, it also cannot be determined that the use of the reflection-on-reflection writing prompt strategy was lower than the reflection-in-action writing prompt strategy. While the participants had completed the reflection-on-reflection journal entry, the significant pairing was prior to the participants completing their reflective journals using the reflection-in-action writing prompt. Directionally, not with significance, since survey three was lower than one and survey six was lower than three, students perceived self-efficacy levels decreased during the semester.

Fall 2016 results. In the fall semester, 12 participants participated in the study by completing NGSE instrument 6 times over the course the study. There was one participant (number 12) who did not complete the fifth survey. This was accounted for in the data set. Table 22 details the descriptive statistics for the population.

Reflection Prompt Deployed in Between Surveys	Survey	N	Min	Max	Mean	*SD*
Refection-on-Action	#1	12	4.00	5.00	4.50	0.39
	#2	12	2.88	4.88	4.06	0.53
Reflection-in-Action	#3	12	3.88	5.00	4.26	0.35
	#4	12	3.63	5.00	4.23	0.43
Reflection-on-Reflection	#5	12	3.75	5.00	4.45	0.48
	#6	12	3.00	5.00	4.35	0.61

Table 22: Fall NGSE descriptive statistics

Table 23 illustrates the Friedman statistical testing results. As found in the fall semester, there was a statistically significant difference $X^2(5)=12.02$, $p<.05$. As with the fall semester though, given the low sample size of twelve, significance should also be considered in light of the context.

Statistical Description	Result
N	12
Chi-square	12.02
df	5
Asymp. Sig.	$p<.05$

Table 23: Fall NGSE Friedman statistical testing results

The Wilcoxon T-test was also conducted in SPSS to determine where any differences did occur. As in the previous semester, results should be considered in context with the sample of size of twelve. Three significant Wilcoxon T-tests were found: survey two and one ($z=-2.53$, $p<.05$), survey four and survey one ($z=-2.20$, $p<.05$) and survey six and two ($z=-2.39$, $p<0.5$). The results indicate that survey two was lower than survey one, survey four was lower than survey one, and

survey six was lower than survey two. No other significant pairwise rank differences occurred. There was one significant pairing comparing the same reflective writing prompt strategy of reflection-on-action; survey one and survey two. With the survey two results being lower than survey one, self-efficacy decreased with that reflective writing prompt strategy of reflection-on-action.

In the second significant pairing, it cannot be determined that the use of the reflection-in-action writing prompt strategy was lower than the reflection-on-action writing prompt strategy. While the participants completed the reflection-in-action journal entry, the significant pairing was prior to the participant completing their reflection journals using the reflection-on-action writing prompt. In the third and final significant pairing, it can be determined that the reflection-on-reflection (survey six) was lower than the reflection on-action (survey two). Both surveys were completed after the reflective writing prompt strategy was deployed to the participants. As consistent with the previous winter semester, students showed the greatest perceived self-efficacy levels at the beginning of the semester, prior to participating in reflective practices. Self-efficacy was found to decrease.

Qualitative Results

In addition to participants completing the NGSE six times over the course of the semester, participants also answered reflection questions given by the instructor as part of course assignments. The reflection journals were analyzed to evaluate the impact of reflective writing prompt strategies on the reflection level of the graduate students. This section addresses the results of the third research question: What type of reflective writing prompt strategy has a greater impact on the reflection level of graduate design students?

As part of the syllabus for the course, Design Thinking and Knowledge, the same class policy in relation to completing the reflective journals were shared in both semesters:

> Reflective Journals: Reflective journals are a significant requirement of each student in the course. The guidelines for each journal assignment are the same. You will be required to thoughtfully answer guiding questions based on readings and assignments. You will create a Google document and name it with your last name, then share it with the instructor ONLY. Your journal must be completed by Sunday at 11:59pm for the prior week.

> Please make sure you are thoughtful in your journal postings. Meaningful breadth and depth of your response is expected. You will be graded on your comprehension and depth of response, NOT by the length. Each journal entry is worth 5 points for a total of 30 points. (Course Syllabus, page 4)

For the scope of this study, participants completed reflection journals in response to prompts in weeks 1, 3, 5, 10, 14, and 15, for a total of 16 questions analyzed. Three different writing prompt strategies were used: reflection-on-action (8 prompts), reflection-in-action (5 prompts), and reflection-on-reflection (3 prompts).

Besides the instruction given to participants within the course syllabus, I did not provide the participants with any instructions on how or when to complete their reflection journals. I sent students an email close to the end of the semester reminding them to share their journals with me in Google Docs, after grades were submitted for the semester. Once I received the journals, I downloaded them, saved to Microsoft Word and immediately eliminated any personal information. I also removed questions that were not in scope for this study as well as any feedback and continued discussion between instructor and student. The final record consisted of the student number, the

prompt number, the question, and the participant's response. The data was not reviewed until the end of the semester and the reflection journals were collected. Since the research questions were part of the course assignments, the writing prompts remained the same between both semesters to ensure consistency in data collection.

For the data analysis process, Wald et al.'s (2012) REFLECT rubric (see Appendix D for the complete rubric) was used to assess the level of reflection for each participant entry. As mentioned in chapter three, the rubric uses six different criterion (Writing Spectrum, Presence, Description of Conflict or Disorienting Dilemma, Attention to Emotions, Analysis and Meaning Making, and Optional minor criterion of Attention to Assignment) and four levels of reflection for each criterion to assess the depth of the participant's response. Habitual Action (HA) is on the lowest end of the scale. Thoughtful Action or Introspective (TA) follows with a higher level of elaboration, but still absent of reflection. Next is Reflection (R), which represents the introduction of analyzing an event. Critical Reflection (CR) is the highest level of reflection where the participant moves past the questioning of an event to explore and evaluate their values and beliefs.

In the levels of reflection, the Presence criterion had similarities in the rating descriptions. Table 24 is an excerpt of the Presence criterion as written by Wald et al. (2012).

HA	TA	R	CR
Sense of writer being partially present	Sense of writer being partially present	Sense of writer being largely or fully present	Sense of writer being fully present

Table 24: RELFECT rubric criterion presence levels of reflection

For this reason, I determined which rating would be used and which rating needed to be adjusted to fit a streamlined approach to analysis. The reflection levels HA and TA are the same. In order to eliminate confusion during the data analysis process, I eliminated the HA level of reflection as an option for this criterion. The reflection levels R and CR are also not mutually exclusive. I

adjusted the description for R to be: Sense of writer being largely present. This eliminated the overlap between the two levels. In addition, the rubric has additional components of the Axis II for critical reflection and optional minor criterion of Attention to Assignment. Both were not in scope for this research study.

The analysis process followed the steps that Wald et al. (2012) recommend in reviewing reflection and determining reflection levels. The first step was to read the entry completely. The second was to focus on details within that particular narrative. The third step was to consider the holistic picture. The fourth and final step was to look for examples within the text to support the level of reflection assigned. There were three data reviewers following this process. I served as the primary reviewer. The second data reviewer was a graduate of the Wayne State University Learning Design and Technology doctoral program. We both reviewed the data independently but during the same timeframe. The data was organized and reviewed by question, not by participant.

Once I received the second reviewer's analysis, I conducted a comparison of where there were disagreements in our ratings. That data where rating differences occurred was then sent to a third reviewer, a doctoral student in Wayne State University's Learning Design and Technology doctoral program. The reviewer was not provided the ratings assigned by the initial reviewers. The reviewer read the response by question, not by participant, and assigned a rating for each discrepancy. Once I received the tiebreaker ratings, I assessed the agreement of all three reviewers and made final determinations on the outstanding disagreements. The following two sections, organized by semester, provide insights into the detailed descriptions of the rating agreement, the REFLECT rubric levels of reflection, and examples of narratives for the reflection levels.

Winter 2016 results. In the winter semester, seven participants participated in the study and submitted reflection journals. Sixteen writing prompts were asked during the course. One

student did not submit week 10 of the reflection-in-action journal entries causing a reduction of 5 in the overall total of responses received. Table 25 details the number of participants who answered the reflection prompts by questions.

Question #	# Answered	# Ratings
1.1	7	35
1.2	7	35
3.1	7	35
3.2	7	35
5.1	7	35
5.2	7	35
10.1	6	30
10.2	6	30
10.3	6	30
10.4	6	30
10.5	6	30
14.1	7	35
14.2	7	35
15.1	7	35
15.2	7	35
15.3	7	35
Total	**107**	**535**

Table 25: Winter 2016 participant response totals per reflection prompt

The total number of ratings assigned for the semester was 535, with 280 being in response to reflection-on-action writing prompts, 150 being in response to reflection-in-action, and 105 being in response to reflection-on-reflection. The agreement in ratings between the two initial reviewers was 68.79%. After the third reviewer submitted the ratings, the agreement between two of three reviewers was 92.52%. The final difference in ratings between all three reviewers was resolved with the primary reviewer evaluating the overall responses in relation to the REFLECT rubric, and making a final determination on the rating.

Evaluating the disagreements between the reviewers also provided insight in where there should be additional concentrated discussion in subsequent use of the REFLECT rubric. There were a total of 167 disagreements across the five criterions between the two initial reviewers. The third reviewer evaluated only the reflection journals where there was a disagreement. This resulted

in resolution of 127 ratings, leaving the disagreements between the three reviewers at 40 total. Table 26 illustrates the rating disagreements per criterion between the initial reviewers (first set of data) and then including the third reviewer as the tiebreaker (second set of data).

Criterion	Initial Reviewer Disagreements 31.21% of disagreements (n=535 ratings)		Third Reviewer Disagreements 7.48% of disagreements (n=167 ratings)	
	#	%	#	%
Writing Spectrum	32	19.16%	4	10.00%
Presence	28	16.77%	6	15.00%
Conflict	34	20.36%	8	20.00%
Emotions	34	20.36%	15	37.50%
Meaning Making	39	23.35%	7	17.50%
Totals	167	N/A	40	N/A

Table 26: Winter 2016 reviewer disagreements

The criterion that had the most disagreements between the two initial reviewers was Analysis and Meaning Making with 23.35% (39). The criterion with the second most differences was a tie between Description of Conflict or Disorienting Dilemma and Attending to Emotions with 20.36% (34 each). The differences were followed by Writing Spectrum with 19.16% (32) and Presence last with 16.77% (28).

The differences between all three reviewers were a total of 40 disagreements across the five criterions. The criterion that had the most disagreements between all of the reviewers was Attention to Emotions with 37.50% (15). This was followed by: Description of Conflict or Disorienting Dilemma with 20.00% (8), Analysis and Meaning Making with 17.50% (7), Presence with 15.00% (6), and Writing Spectrum with the least number of differences with 10.00% (4).

Reflection-on-action writing prompt strategy REFLECT results for winter. After evaluating and resolving the difference in ratings, the focus shifted in the RELFECT ratings results. As aligned with the research question, I organized the data segmented by writing prompt strategy to determine which had the greater impact on graduate design students. Table 27 illustrates the reflection-on-action writing prompt results as organized by criterion and level of reflection. Participants competed the writing prompts in weeks 1, 3, 5, and 14 and 280 ratings were assigned. Evaluating the totals for the reflection-on-action prompt strategy, 115 (41.07%) were coded reflection, followed by TA (30.00%), CR (16.07%), and HA (12.86%).

Criterion	Level	Q1.1	Q1.2	Q3.1	Q3.2	Q5.1	Q5.2	Q14.1	Q14.2	Total	%
N	-	7	7	7	7	7	7	7	7	-	-
Writing Spectrum	HA	1	0	1	1	0	3	0	2	8	14.29%
	TA	3	2	2	2	2	0	1	2	14	25.00%
	R	2	4	2	4	4	3	6	3	28	50.00%
	CR	1	1	2	0	1	1	0	0	6	10.71%
Presence	HA[a]										
	TA	1	0	3	2	2	3	1	3	15	26.79%
	R[b]	4	3	1	2	2	1	2	4	19	33.93%
	CR	2	4	3	3	3	3	4	0	22	39.28%
Conflict	HA	0	0	0	1	0	3	0	2	6	10.71%
	TA	2	2	5	2	4	0	5	3	23	41.07%
	R	4	5	1	4	2	4	2	2	24	42.86%
	CR	1	0	1	0	1	0	0	0	3	5.36%
Emotions	HA	0	0	1	2	2	5	0	3	13	23.21%
	TA	5	2	3	4	3	0	3	3	23	41.07%
	R	0	3	1	1	1	1	3	1	11	19.64%
	CR	2	2	2	0	1	1	1	0	9	16.07%
Meaning	HA	2	0	1	1	0	3	0	2	9	16.07%
	TA	1	1	0	1	2	0	1	3	9	16.07%
	R	3	5	5	5	4	3	6	2	33	58.93%
	CR	1	1	1	0	1	1	0	0	5	8.93%
Total	HA	3	0	3	5	2	14	0	9	36	12.86%
	TA	12	7	13	11	13	3	11	14	84	30.00%
	R	13	20	10	16	13	12	19	12	115	41.07%
	CR	7	8	9	3	7	6	5	0	45	16.07%

Table 27: Winter 2016 REFLECT ratings for reflection-on-action responses
[a]Reflection level descriptions for HA and TA are the same; TA was used as the lowest level of reflection.
[b]Reflection levels descriptions for R and CR are not mutually exclusive; adjusted the description for R to be Sense of writer being largely present and CR was Sense of writer being fully present.

As recommended in the steps by Wald et al. (2012) in assessing the reflection levels using the REFLECT rubric, the reviewers also indicated areas that supported the selection of a particular reflection level. As part of the data analysis process, themes were identified to help determine the characteristics associated with the various levels of reflection. Table 28 provides descriptions of

the themes identified through reviewing the journals entries for reflection-on-action writing prompts responses.

Lower Levels of Reflection (HA, TA)	Higher Levels of Reflection (R, CR)
• Described experiences; fact-based accounts • Describes the act of reflecting but does not expand on how internalizes reflection • Saw growth as being external to self	• Addressed how experiences have impacted their choices and/or decisions • Reflected on uncertainty or uncomfortable situations led to growth in those moments • Saw growth as a combination of using external resources and internal experiences; self-assessment was present

Table 28: Winter 2016 reflection-on-action response themes

Level of detail in experience descriptions. An initial theme that became evident in reading the reflection journal entries was the level of description used by the participants. There were varying levels in how participants approached this perspective. Closely related to the criterion of Writing Spectrum, participants who were coded as HA or TA, provided factual descriptions of their experiences but did not describe how that experience impacted or challenged their views. For example, in answering the question for week three, "Are you a Gordon Murray or a Kenneth Grange designer? Why? Which would you like to be as you ultimately develop as a designer? Why?" (Q3.1) Participant 14 responded:

> I would describe myself as more of a Gordon Murray designer who views regulations as necessary to innovation. For me that has been in the past budget constraints when designing RA training. That has limited our options in terms of activities and resources, so me to creative with what we can do…

While the participant described the circumstances that led her to select Gordon Murray, the response was limited in the exploration of emotions and analysis of meaning making. Reflection levels across the criterion for this response were either HA or TA.

A higher level of reflection was coded for responses that not only described the event or experience but also clearly identified the impact on the participant as a result of the experience. Participant 15 provided the following answer to the same question:

> I think that I am more of a Kenneth Grange designer honestly because I can relate more to his design process. Many of the things that were described in the Cross book, showed how Grange took something and re-designed it to make it more user friendly or to be more effective or efficient. I can often think of ways that I would be able to make something more user friendly, but I do not think that I would be as willing to start from square one in designing a product. If I think about it from an instructional standpoint, though, I do think that I would be 100% willing, ready, and able to design instruction from the ground up, as opposed to improving on something. I do think that ultimately I would want to be like Murray in that he was very willing to scrap what he was working on and start a fresh design if the constraints or regulations changed. I can imagine that a lot of designers become emotionally attached to their ideas (as Cross explains in his book), which would make people not want to do this. I have learned through the reading, and through experience, that this is sometimes necessary to do when trying to solve a problem. I often find that if I am stuck on something, if I walk away from it for a day then I have a fresh and different perspective when I come back to it. I think that this would hold true for design. Even though it does not seem like Murray will let something sit for long, he is willing and eager to find different innovative solutions.

The reflection levels coded for this response were either R or CR for each of the criterion. The participant's description provided examples of why she related to Grange but also discussed the impact of that connection on her current and future thought processes. There is a sense of the writer being fully present in the description and a recognition of the insights gleaned from Grange's work as a designer.

Another theme that emerged was the participants' descriptions of reflection itself. At times, the description would be grounded in a particular action the participant was taking rather than a process they were engaging within. For example, week five's reflection prompt asked participants to detail how they were preparing for constant, intense reflection (Q5.1). Participant 4 answered by listing various actions that she was taking to prepare for reflection:

Design is similar to a contact sport-design demands that I bring all of my senses to my projects, and that I apply the very best of my thinking, feeling and doing for the task at hand. When an idea comes up I write it down, or send myself an email. I love design and do inherently possess design intelligence, excluding mathematical skills. Also, Cross spoke about metaphors as an integral part of ID-looking for the hidden treasure in each project. I believe there is a psychological "rush" when finding these treasures, at least for me. It feels really good to design and make new discoveries that work.

Four out of five of the criterions were coded at TA as the reflection level, with Attending to Emotions being coded as R. The response was descriptive but provided little impact in moving beyond reporting of actions.

In contrast, Participant 15 identified previous reflection experiences known to work for her and then discussed how she planned to incorporate them into ongoing practice:

When I first started to teach, I got into a really good habit of sitting down for 5 minutes after each school day and reflecting on the lessons that I taught that day. I actually would pull out my lesson plans and make notes about what went well and what could have used some improving. I can honestly say that I never went back to look through these notes, but just the simple act of forcing myself to spend a few minutes reflecting each day helped me grow as a teacher...Knowing how I am, I know that I will go straight back to spending a little bit of time writing down notes and reflections pertaining to my daily design projects. Even if I just take notes about my thinking or where I found inspiration, taking the time to write about my thinking trains my brain to actually do the thinking. I have always found that I am a very reflective person, but I have always found that writing these things out helps to focus my thoughts, but also helps me to move past anything that I may be stuck on. One way that I do this is that I always have a little notebook with me. My mom is the exact same way in that she always needs to write things down so every year for Christmas she gives me little notebooks that can fit in my purse and Sharpie pens. I think that getting back into the habit of simple, yet daily, written self reflections will help to continue this.

Critical Reflection (CR) was given as the reflection level rating for each criterion because of the depth in response, the exploration of experiences, and the meaning making the participant drew from her previous experiences. She also tied reflection to her personal context with the drawing inspiration from her mom.

Uncertainty and the impact on reflection. Uncertainty is one of the key characteristics of design. Through the participants discussing their uncertain moments or having to make

uncomfortable decisions led to higher levels of reflection. Some participants shared the experiences of having a new job and their journey in understanding what that meant for their futures. Others shared their insecurities about design. Participants reflected on how to utilize those challenging moments as drivers to growth and professional development. Excerpts from entries that were coded with higher levels of reflection are shared below. In the first week of the semester, participants were asked: "Describe a time when you felt totally uncertain. Try to remember how that felt and the greatest challenge you faced because of the uncertainty. What did you do to handle it? Knowing that part of being a designer is always dealing with uncertainty, how do you feel about being a designer?" (Q1.2)

> Participant 3: In November I changed positions in the library. I moved from a creative and busy position at night to a quite and very structured position in the cataloging department during the day. For at least a month after starting the position, I constantly questioned the sanity of my choice. This position challenged me because I had to learn so much. I wanted to give up…Then the week before Christmas I happened to talk with two co-workers about what I was feeling. They both said that it really takes a great deal of time to feel comfortable in the position. They also assured me that some of what I was feeling was the way my boss explained things (overly complicated). This made me relax more and as a result my brain function was much better. Slowly I am feeling more comfortable with my choice…When I begin to be derisive in my inner commentary of my designs I have to remind myself that it almost always works out better when I push my inner judge aside, relax and trust my instincts.

In week three, participants were asked to: "Describe a time when you had a sudden inspiration. What were you doing when you had this inspiration? How did you feel? Why do you think the inspiration came to you at that moment?" (Q3.2)

> Participant 2: My moment of sudden inspiration came this fall, when I was looking at a new school year and an entirely new schedule of classes to teach. At the time I was feeling incredibly frustrated and mad, I felt that I had been the result of people playing favorites and I was handed a mixed lot to do something with, just what that was I was not sure. I did not like this and was feeling pretty upset at the moment. How was I going to pull this off? With no time to prepare, no resources, I felt like I was being set up to fail. Then it hit me, I realized that if I worked a new avenue and redesigned my classes through a new medium, I would not need all of the, "traditional" methods to teach. I knew I had to do my research, find a way for all of this to work and to effectively get this plan laid out and to my students

and I only had a few weeks to do it. Needless to say, I did pull it off and quite successfully. It worked out better than I had planned and continues to blossom. I believe that this inspiration came at this moment out of my mindset. I do not like to fail, it is likely my make up as someone who has always tried to overachieve. I believe my ability to regroup and take a new approach allowed for me to be inspired…

Participant 3: We were redesigning the layout of the workroom in my department, the Instructional Media Center. We were having difficulty trying to figure out how to make all of the existing pieces of furniture fit into the space and still make the space easy to navigate…We were frustrated and were ready to just start eliminating some of the creative furniture we were planning to add that would improve our efficiency. I stood up and walked into the workroom and asked myself what we were missing. I started walking around the room looking up and down and thinking about how we were planning to use the space…This opened up many more possibilities, including taking out a section of the shelving we really didn't need.

I felt valued as a team member that I came up with a viable solution to the problem at hand. I think I was inspired for two reasons. First, I stepped back instead of trying to shoehorn a solution. Second, I asked myself questions as I walked in the space with the problem.

In week 14 participants were asked to reflect on their instructional design project and think though the role uncertainty played in the process. In addition, they were asked: "How have you responded to uncertainty? Has it influenced how you move among the design spaces or other aspects of your process?" (Q14.1)

Participant 15: I think that the uncertainty of not knowing if I was working in the right direction, or coming up with ideas that would fulfill the needs and requirements of the assignment has been the only piece of uncertainty. The work that I do on a daily basis in starting to design and come up with an initial training program for my office is kind of a long these same lines, so I honestly feel like this class, and the level of not really knowing, has helped me become more confident in starting to design at work. I has been tasked with the job of creating a training program for a new colleague (if they ever find someone to hire), and even though my boss and I have discussed what he and I both think this should look like, I am left to weed through those ideas and come up with something. I know when we come back together, there will be a lot that we will decide to change, but the same level of uncertainty is what I have been dealing with on a daily basis. I've realized that I do have good ideas, that I need to trust myself, and just keep plugging along through the process.

There was professional growth as a designer with each of the challenges that the participants reflected on from their past or from their experience within the class project. Reflection levels were

coded higher because of the attention to emotions, questioning decisions and even achieving transformational change in some cases.

On the other hand, participants who felt they were already well equipped to deal with uncertainty and/or uncomfortable situations reflection levels were lower. In this particular example, Participant 16 assumed she had already had a good understanding of working with uncertainty. Answering the same week 14 prompt about the uncertainty in the design project, Participant 16 responded:

> Uncertainty doesn't seem to be an issue for me. I have plenty of experience in uncertain situations, both one-time and ongoing. Because of these experiences, I tend to look at things always from someone else's view – because I'm uncertain as to how they will react. I'm very much motivated by how people respond to my ideas, actions, etc., so I make it my business to read people and know what they're thinking. Even if they are trying to hide their reaction, I'm usually able to discern and respond appropriately. So, I guess my response is that it has made me hyper-sensitive to the reactions of potential end-users. This, in turn, has a great impact on my design process by always orienting me to the desired reaction of the end-user.

The participant may have been well equipped in dealing with uncertainty but by assessing her response alone, the TA reflection level was assigned for all five criterions. There was little to no attention given to emotions or meaning making as well as evaluating previous assumptions or beliefs.

Growth in professional development was an additional theme identified through the analysis of the reflection journals. Participants who saw their development as external to themselves had lower reflection levels coded as opposed to those who learned from a combination of challenges from external and internal experiences. Looking at a comparative example, when prompted in week five to answer, "How do you plan to train and develop your design intelligence?" (Q5.2), Participant 3 responded, "I look for in-services that will challenge my perceptions and make me a better educator. I will be sitting in on a virtual conference on Monday and Tuesday of

this week… It is called Transforming the Teaching and Learning Environment." The reflection

level coded for this response was HA across the criterion with the exception of Presence, which

was TA. The description lacked depth in the response. The participant's perspective on learning

in this experience was solely external and didn't take her own design intelligences into

consideration.

>Looking at a contrasting perspective, Participant 4 responded to the same prompt:

>In order to go from novice to expert or even a visionary comes from a love of ID and practice - a lot of practice. For example, for my first year teaching was at Lawrence Tech University. My M.A. is in Communication, however I was offered a position teaching two back-to-back very early morning English Composition classes (these were the least favored slots). I was literally thrown into a new field to teach out of my comfort zone, and I was responsible for designing my own instruction I reached out to other professors (experts and novices) for their syllabuses and best practices, viewed YouTube, Google and even called some of the professors of whom I found through their online assignments…I constantly seek feedback, I'm always reading and looking for new ways to teach, be an instructional designer…I have coordinated once per semester, professor get-togethers so we can collaborate what works for our student demographic…In short, I am planning and training by hands-on experience, and feedback. Lots and lots of feedback, mostly from students - since at the end of the day, it is the students who are the end users.

The reflection level responses for this participant's response was CR for the presence criterion and

R for the remaining four criterions. As outlined in the REFLECT rubric, the writer was fully

present, moved beyond just describing the event, and provided recognition to her emotions.

The themes for responses for the reflection-on-action writing prompt strategy were the

level of depth in describing experiences and including how those experiences impacted the

participant. Secondly writing about uncertainty and challenges helped drive deeper levels of

reflection and growth in participants. Thirdly, looking at a combination of external resources and

tying those experiences into internal perceptions contributed to higher reflection levels as well.

Reflection-in-action writing prompt strategy REFLECT results for winter.

Reflection-in-action is where participants are in the midst of their design work, in this case, their

design assignment for the semester. During the design process, they are asked to complete reflective writing prompts focused on the design decisions they are making at the time. Table 29 illustrates the reflection-in-action writing prompt results. Participants competed the writing prompts in week 10, when the students were focusing on their content, outcomes and assessments, and activities for their final projects. One hundred and fifty ratings were assigned. Looking at the totals for the reflection-in-action prompt strategy, 66 (44.00%) were coded HA, followed by TA (43.33%), R (12.00%), and CR (0.67%).

Criterion	Level	Q10.1	Q10.2	Q10.3	Q10.4	Q10.5	Total	%
N	-	6	6	6	6	6	-	-
Writing Spectrum	HA	6	4	1	3	1	15	50.00%
	TA	0	2	4	1	4	11	36.67%
	R	0	0	1	2	1	4	13.33%
	CR	0	0	0	0	0	0	0.00%
Presence	HA[a]							
	TA	6	5	5	3	3	22	73.33%
	R[b]	0	1	1	3	2	7	23.33%
	CR	0	0	0	0	1	1	3.33%
Conflict	HA	4	4	1	3	0	12	40.00%
	TA	2	2	4	3	5	16	53.33%
	R	0	0	1	0	1	2	6.67%
	CR	0	0	0	0	0	0	0.00%
Emotions	HA	6	4	4	6	4	24	80.00%
	TA	0	2	2	0	2	6	20.00%
	R	0	0	0	0	0	0	0.00%
	CR	0	0	0	0	0	0	0.00%
Meaning	HA	5	4	1	4	1	15	50.00%
	TA	1	2	3	0	4	10	33.33%
	R	0	0	2	2	1	5	16.67%
	CR	0	0	0	0	0	0	0.00%
Total	HA	21	16	7	16	6	66	44.00%
	TA	9	13	18	7	18	65	43.33%
	R	0	1	5	7	5	18	12.00%
	CR	0	0	0	0	1	1	0.67%

Table 29: Winter 2016 REFLECT ratings for reflection-in-action responses

The reflection level (ratings R and CR) results for reflection-in-action were lower than the reflection-on-action response levels. Reflection-in-action R level was 29.07% lower than reflection-on-action, followed by CR which was 15.40% lower than reflection-on-action.

As with the reflection-on-action responses, the reviewers evaluated the content of the responses indicating which contextual elements supported the reflection level codes. Table 30 provides themes that were evident for both the lower levels and higher levels of reflection.

Lower Levels of Reflection (HA, TA)	Higher Levels of Reflection (R, CR)
• Described experiences from an external focus	• Addressed how to work within and overcome constraints

Table 30: Winter 2016 reflection-in-action response themes

External focus on experiences. The focus of reflection-in-action appeared to be mainly on the learners rather than the internal thought processes in making design decisions. This lower level of reflection is evident in Participant 4's responses for each of the reflection prompts. Table 31 provides an overview of each prompt and response.

Prompt	Response – Participant 4
10. 1 What changes in how learners do what they do or think should occur?	The students should be able to develop some insight and practical application into the stages that group projects go through.
10.2 How will you know that these changes have occurred?	Positive team collaboration. 1. Peer group feedback. 2. Quality of the outcomes, i.e.group work activities.
10. 3 What activities will help facilitate these changes in thinking and what learners do?	Actual hands-on activities, role play, problem solving, class discussion of the findings.
10.4 How are you discovering your content? How can you chunk your content? How will you sequence your content?	The internet, google and google scholar, a few books on my shelves and I am practicing in my current classroom environments. How will you chunk and sequence your content? 20 - 30 minute projects. Start out with a lecturette 4-5 minutes, then have an activity relevant to the lecturette.
10.5 What constraints have you encountered during your design project so far? How are you dealing with them?	The uncertainty of knowing I do not specifically know out how much time to allocate so the activities will be meaningful and How to REALLY assess the outcomes, especially since the outcomes are in part abstract. How are you dealing with them? I have to make an educated guess and understand that the activities are trial and error. I would like to believe, based on my experience thus far, that I have made good design choices, however, I will not know for sure until I put the activities in action, see how the groups respond to each other after the activities, and receive feedback from my students.

Table 31: Participant 4's responses to reflection-in-action writing prompts

For prompts 10.1 through 10.4, the reflection level across the REFLECT rubric criterion was HA

with the exception of Presence which was TA. For prompt 10.5, TA was the selected reflection

level for the criterion with the exception of Presence, which received an R. The participant

addressed how they were handling and overcoming uncertainty in her project. This example is

illustrative of the level of unsubstantial responses received for the reflection-in-action writing prompts.

There were, however, a few examples offering a deeper level of reflection perspective for the specific prompts of 10.3 and 10.4. Table 32 details the responses from Participant 6.

Prompt	Response – Participant 6
10. 3 What activities will help facilitate these changes in thinking and what learners do?	I would really like to see a hands on learning activity with actual pumps and supplies. It is hard to explain to someone the specifics of insulin pumps especially if they do not have a medical background. An activity based on what the supplies are and how they are packaged will be a good visual to help learners understand. I think the first few activities (intro lecture, hands on pump and supply background activity, how supplies are ordered activity) lead up to the main activity that we are using to change learner thinking and learner performance. Ultimately we want efficient employees who make minimal mistakes who are able to understand the customers needs. The fourth activity of teaching the learners proper phone and order procedures is the most important. But this activity will not be effective if we do not build up to it with the first three activities.
10.4 How are you discovering your content? How can you chunk your content? How will you sequence your content?	Developing this design project has put my fuzzy idea of this project into focus. The key realization I had this week was that activities 1-3 are very important in order for activity 4 to be effective. Activity 4 is where critical thinking skills will be developed. I initially thought that each activity was equally important. I had to take a step back a think about what are the expectations of the learners. Truly the goal was not that they knew what diabetes and insulin pumps were or what supplies were required. These were important, but the goal was to have efficient employees who make minimal mistakes. The emphasis will be placed on activity 4 - the telephone process and flowcharts.

Table 32: Participant 6's responses to select reflection-in-action writing prompts

While neither of these responses resulted in R across all five criterion, they did illustrate the balance of how to make design decisions and consider the learners at the same time. For 10.3, R was the reflection level coded across the criterion with the exception of Attention to Emotions

which was coded TA. For 10.4, R was the reflection level coded for Writing Spectrum, Presence, and Analysis and Meaning Making. For Description of Conflict, TA was the code given and Attention to Emotions received an HA.

Addressing and overcoming constraints. The last reflection prompt for this particular strategy was, "What constraints have you encountered during your design project so far? How are you dealing with them?" (Q10.5). The lower level of reflection did not address how to work through constraints whereas the higher level of reflection describes how to overcome them or take a different perspective on the project despite them. Participant 14 describes how she dealt with the constraint of not only being the designer for the project but personally impacted by being a member of the group she was designing for.

> My biggest constraint has been that I am personally a member of the group that I have picked to address the problem in and that has created difficulties for me as I try to address issues within the structure of the group without feeling personally impacted. I have been dealing with this by re-framing my thoughts as opportunities for improvement rather than failures of the group previously. Additionally, as this is new work to me, I have felt challenged by not understanding the entire process. I naturally like to work when I understand the entire process that I am going to go through so I understand how each thing that I am working on fits together with the previous and next steps. I am also trying to re-frame this challenge by stretching myself out of comfort zone to start the process of becoming an instructional designer.

Reflection (R) was the level of reflection coded for the criterion with the exception of Presence, which was, coded CR and Attending to Emotions which was coded TA. Re-framing was an effective way for the participant to stop mid-action and identify a different perspective on the challenge.

The predominant themes for responses using the reflection-in-action writing prompt were the lack of descriptions showcasing how the participants made their design decisions. On the other hand, the ability to re-frame constraints to be opportunities for change were also addressed. Overall

the reflection-in-action writing prompt responses failed to meet high levels of reflection according to the criterion as outlined in the RELFECT rubric.

Reflection-on-reflection writing prompt strategy REFLECT results for winter. Reflection-on-reflection is the process in which participant look at earlier journal responses and then reflect on those early responses. For this study, participants were given prompts to answer during week four of the course. The prompts were:

1. What is design?

2. What is instruction?

3. What it takes to be a designer:

    a. Beliefs (what you currently know about design from education/experience)

    b. Self-awareness (what is your current professional identity, and how does that impact…, how does your character affect decisions)

    c. Precedents (how do your past experiences in life build on and affect your work)

These prompts and responses were out of scope of this study. However, they were provided to the reviewers to provide context if they needed it. From discussions with the reviewers, they did not reference the week four reflection entries. Table 33 illustrates the reflection-on-reflection writing prompt results. Participants competed the writing prompts in week 15 and 105 ratings were assigned. Evaluation of the reflection-on-reflection prompt strategy resulted in 37 (35.24%) coded HA, followed by TA (32.38%), R (24.76% and CR (7.62%).

Criterion	Level	Q15.1	Q15.2	Q15.3	Total	%
N	-	7	7	7	-	-
Writing Spectrum	HA	3	4	1	8	38.10%
	TA	2	2	2	6	28.57%
	R	1	1	4	6	28.57%
	CR	1	0	0	1	4.76%
Presence	HA[a]					
	TA	5	6	2	13	61.90%
	R[b]	0	1	1	2	9.52%
	CR	2	0	4	6	28.57%
Conflict	HA	3	5	1	9	42.86%
	TA	2	1	2	5	23.81%
	R	2	1	4	7	33.33%
	CR	0	0	0	0	0.00%
Emotions	HA	6	6	2	14	66.67%
	TA	1	1	3	5	23.81%
	R	0	0	2	2	9.52%
	CR	0	0	0	0	0.00%
Meaning	HA	2	4	0	6	28.57%
	TA	1	1	3	5	23.81%
	R	3	2	4	9	42.86%
	CR	1	0	0	1	4.76%
Total	HA	14	19	4	37	35.24%
	TA	11	11	12	34	32.38%
	R	6	5	15	26	24.76%
	CR	4	0	4	8	7.62%

Table 33: Winter 2016 REFLECT ratings reflection-on-reflection responses
[a]Reflection level descriptions for HA and TA are the same; TA was used as the lowest level of reflection.
[b]Reflection levels descriptions for R and CR are not mutually exclusive; adjusted the description for R to be *Sense of writer being largely present* and CR was *Sense of writer being fully present*.

The reflection level (ratings R and CR) results for reflection-on-reflection were higher than the reflection-in action levels. However, they were lower than the reflection-on-action response levels. Reflection-on-reflection R level was 12.76% higher than reflection-in-action, followed by CR which was 6.95% higher than reflection-in-action. Reflection-on-reflection R level was 16.31% lower than reflection-on-action, followed by CR which was 8.45% lower than reflection-on-action.

As the reviewers read the journals, themes for the reflection-on-reflection writing prompt strategy were identified. Table 34 details the identified themes for both the lower levels and higher levels of reflection.

Lower Levels of Reflection (HA, TA)	Higher Levels of Reflection (R, CR)
• Maintained similar or same view of design and instruction from week 4 to week 14	• Challenged self to think differently about definitions from week 4 to week 14 • Analyzed week 4 responses and identified gaps or changes

Table 34: Winter 2016 reflection-on-reflection response themes

View of design, instruction, and self. Lower levels of reflection were associated with participants who didn't re-frame their definition of design, instruction, and themselves as designers in the 10-week time frame. For example, when answering the prompt, "Go back to your previous responses during this semester on the 'What is design?' question. What has changed in your definitions after completing this course and your ID project?" (Q15.1), Participant 6 briefly indicated: "I would say my definition of design hasn't necessarily changed rather it improved. I have a much clearer understanding of design and it's role in our world." There was no elaboration on what she meant by the "clearer understanding" and details of how it fits into our world. The REFLECT rubric codes for this particular response was HA for the majority of the criterion with the exception of TA for Presence and Attention to Emotions.

In contrast, Participant 2 thought through the difference learned over the semester. In answering the same prompt, she shared:

> I initially thought that design was implementation and style. I thought it was the how-to portion that was translated electronically. I had no idea what design really was prior to this class or just how many different way design is around our world. After learning about Dubai, I could never walk into a bathroom again without thinking of what kind of constraints there were in creating a cleaning process! I have been out and attempted to complete a task or follow some loose directions and stopped and thought to myself, "This is terrible design, I could improve this by…" and then I start to visualize how I could improve on it. I think of my daily delivery and how I can improve on that for my students. I've even gone so far as to address my future endeavors such as professional learning for

staff through the ID outlook and I see myself improving and being mindful in ways I never was before.

Critical Reflection (CR) was given for the following criterion: Writing Spectrum, Presence, and Analysis or Meaning Making. For Description of Conflict, R was given and for Attending to Emotions HA was given. There was a lack of recognition of emotions within the response. Overall the ability to evaluate external experiences internally allowed the participant to challenge her assumptions of design. This transformed her thinking of current design but will continue to transform her thinking as she continues in her design identify development.

The theme of challenging one owns perspective is evident in another participant's response to the prompt:

Go back to your previous response to 4.3 were you described your beliefs, self-awareness and precedents. What do you have now? Where are you today after 14 weeks of design thinking? What does it mean to you to be a designer? What goals do you have for yourself? What actions will you take to develop as a designer and reach those goals? (Q15.3)

Participant 2 responded:

After looking back on, I could see and sense my uncertainty in my response. I think that now I have developed additional awareness as a designer. It is a sense that becomes instinctual as you begin to look at the world differently. I feel like this is much like riding a bike, once you've learned it you never unlearn it. It is a certain sense of awareness to design thinking. To me it is also very humbling as a designer, because you have to have empathy to learners and also to clients. I feel that much of this is being able to bridge these two parties and create outcomes, even though you may not have a the content knowledge to support it initially, you have the design mindset to achieve it. I have new goals for myself, much of my prior plan has changed and I can say that this is very relative to my design paradigm of thinking. I want to pursue further design classes and instruction and see what happens from there. I have a plan, I have constraints, but I have confidence that this will come into fruition. Understanding that the only certain thing between my end goals and now is change, keeps me on the path to success.

The response was coded as R for three of the criterion, with the exception of CR for Presence and TA for Attending to Emotions. The participant was able to challenge own perceptions and recognize growth in self.

Identifying gaps and changes in definitions and self. Another theme that emerged in relation to reflection-on-reflection was the review of the participants' initial definitions and their ability to make changes based on what they had learned. I want to first provide an example when this didn't happen. When Participant 4 responded to the prompt to review the previous definition of instruction and identify what would have changed now that the course was ending (Q14.2), she shared a brief response that didn't capture depth in reflection: "Instruction is about speaking the language of your customer and synthesizing with my own touch." The reflection level coded for this response was HA across the criterion with the exception of TA for Presence.

On the other hand, Participant 2 answered the same prompt in the following manner:

> When I look back to my initial response, it seems very basic to me. I even go so far as to cite text in order to define instruction, design, textbook concepts. I think that is what we do as learners, we try to find how we can define instruction, we try to define and contain a concept which is abstract in nature. Instruction is a holistic approach to an outcome, to me it is a process. Instruction takes into account all that we need to do in order to ensure the learners achieve the desired outcomes. It's more than just a step by step powerpoint, but the temperature and location of the room. It is the details that are the basis of the process, the embedded inner workings of the project.

The participant identified that she relied on the textbook to guide her initial definitions, an external view. In the course of the semester, she had shifted the definition setting internally to what instruction specifically meant to her. The response received R as the code across all five criterions.

Lastly, another participant addressed a change in her when reflecting on her own design process over the course of the semester. Participant 6 responded to the prompt asking her to evaluate her design beliefs, self-awareness, and precedents now that the semester was ending. Her response added to her Week four response.

> One major change I would make to my list from 4.3 would be to say "Designers *should* collaborate *and seek feedback*" instead of my original "Designers often collaborate…In the past I didn't think much about the way we do a lot of things…But now I see that there are many ways to improve and redesign. For example, I was in the grocery store and checked out at the self checkout because the other lines were very long. The self check out ended

up taking much longer because the machine kept calling the attendant. I wanted to use paper bags but the standard is plastic bags. If you take the paper bags from the stack at the terminal and place them in the bagging area the machine thinks you put an item to purchase there without scanning it. There are other specifics about self check out that don't run smoothly also but this got me thinking (for way too much time!) about how this self checkout area could be re-designed so that it flowed better and the attendant was not called for small errors. So I think my way of thinking has changed over the past 14 weeks…

The response was coded R for Writing Spectrum, Description of Conflict, and Analysis and Meaning Making. It was coded CR for Presence and TA for Attending to emotions. Through the participant's response, it is evident that she not only made the shift within the context of the class but her shift in thinking stretches across domains.

The themes that presented themselves for reflection-on-reflection responses were the ability to challenge oneself in thinking differently about design and being able to analyze earlier responses in light of new findings. The two contributed to the shift in designer thinking but also in the depth of reflection participants could attain during the course.

Reflection writing prompt strategy comparison for winter. After the journal entries were coded, disagreements resolved, and analysis completed, a cross comparison of reflection levels as organized by reflection prompt strategy was conducted. Figure 3 illustrates the differences in reflection levels across the three writing prompt strategies: reflection-on-action, reflection-in-action, and reflection-on-reflection.

Figure 3: Winter reflection levels for writing prompt strategies

By completing the cross-reflective prompt strategy comparison, I was able to answer the third research question, What type of reflective writing prompt strategy has a greater impact on the reflection level of graduate design students? For the winter 2016 semester, reflection-on-action was the writing prompt strategy that had the greater impact on the reflection level of graduate students with 16.05% of responses coded as CR. Participant journal entries for reflection-on-action achieved more critical reflection levels responses than either of the other types of writing prompt strategies. Assessing the lower end of the reflection levels, reflection-in-action resulted in 44.00% of responses coded as HA. Reflection-in-action writing prompt strategy resulted as the lowest level of reflection.

Fall 2016 results. In the fall semester, 12 participants participated in the study but one did not submit the reflection journal. A total of 11 participants completed the reflection journal component of the study. Sixteen writing prompts were asked over the course. Several assignments

were not included in the participant journal. Table 35 illustrates the number of participants who answered the reflection prompts by question.

Question #	# Answered	# Ratings
1.1	11	55
1.2	11	55
3.1	4	20
3.2	11	55
5.1	11	55
5.2	11	55
10.1	7	35
10.2	7	35
10.3	6	30
10.4	7	35
10.5	7	35
14.1	11	55
14.2	11	55
15.1	11	55
15.2	11	55
15.3	11	55
Total	**148**	**740**

Table 35: Fall 2016 participant response totals per reflection prompt

The total number of ratings assigned for the semester was 740, with 405 being in response to reflection-on-action writing prompts, 170 being in response to reflection-in-action, and 165 being in response to reflection-on-reflection. The agreement in ratings between the two initial reviewers was 69.19%. After the third reviewer submitted the ratings, the agreement between two of three reviewers was 93.11%. The final difference in ratings between all three reviewers was once again resolved with the primary reviewer evaluating the overall responses in relation to the REFLECT rubric, and making a final determination on the rating.

As with the winter semester, I also evaluated the fall semester's disagreements to see if a pattern was established. There were a total of 228 disagreements across the five criterions between the initial two reviewers. The third reviewer evaluated the journal entries of the disagreements only and resolved 177 rating conflicts, resulting in 51 disagreements between the three reviewers.

Table 36 illustrates the rating disagreements per criterion between the initial reviewers (first set of data) and then including the third reviewer as the tiebreaker (second set of data).

Criterion	Initial Reviewer Disagreements 30.81% of disagreements (n=740 ratings)		Third Reviewer Disagreements 6.89% of disagreements (n=228 ratings)	
	#	%	#	%
Writing Spectrum	48	21.05%	7	13.73%
Presence	42	18.42%	10	19.61%
Conflict	50	21.93%	14	27.45%
Emotions	50	21.93%	16	31.37%
Meaning Making	38	16.67%	4	7.83%
Totals	228	N/A	51	N/A

Table 36: Fall 2016 reviewer disagreements

The criterion that had the most disagreements between the two initial reviewers was a tie between Description of Conflict or Disorienting Dilemma and Attending to Emotions and Attending to Emotions with 21.93% (50 each). The differences were followed by Writing Spectrum with 21.05% (48), Presence with 18.42% (42) and lastly with Analysis and Meaning Making with 16.67% (38). There were a total of 51 disagreements across the five criterions between all three reviewers. The criterion that had the most disagreements between all of the reviewers was Attending to Emotions with 31.37% (16). This was followed by: Description of Conflict or Disorienting Dilemma with 27.45% (14), Presence with 19.61% (10), Writing Spectrum with 13.73% (7) and Analysis and Meaning Making with the least number of differences with 7.84% (4). Again, no pattern was established in the differences in REFLECT ratings.

Following the same data analysis and review process from winter 2016, the REFLECT ratings results are detailed below organized by the writing prompt strategy to evaluate which had the greater impact on reflection levels.

Reflection-on-action writing prompt strategy REFLECT results for fall. Table 37 illustrates the reflection-on-action writing prompt results. Participants competed the writing prompts in weeks one, two, three, five, and fourteen and 405 ratings were assigned. Evaluating the totals for the reflection-on-action writing prompt strategy, 147 (36.30%) were coded reflection, followed by TA (25.43%), CR (22.96%), and HA (15.31%).

Criterion	Level	Q1.1	Q1.2	Q3.1	Q3.2	Q5.1	Q5.2	Q14.1	Q14.2	Total	%
N	-	11	11	4	11	11	11	11	11	-	-
Writing Spectrum	HA	1	2	1	2	1	1	1	4	13	16.05%
	TA	5	0	0	4	3	5	3	2	22	27.16%
	R	4	8	2	2	7	4	4	3	34	41.98%
	CR	1	1	1	3	0	1	3	2	12	14.81%
Presence	HA[a]										
	TA	3	2	1	2	3	2	2	5	20	24.69%
	R[b]	6	3	0	3	3	5	3	2	25	30.86%
	CR	2	6	3	6	5	4	6	4	36	44.44%
Conflict	HA	1	1	0	1	1	1	0	3	8	9.88%
	TA	4	2	1	1	3	2	4	3	20	24.69%
	R	4	6	2	6	5	7	5	3	38	46.91%
	CR	2	2	1	3	2	1	2	2	15	18.52%
Emotions	HA	4	2	1	3	5	5	4	5	29	35.80%
	TA	3	2	1	0	3	4	2	2	17	20.99%
	R	3	4	1	4	3	1	0	3	19	23.46%
	CR	1	3	1	4	0	1	5	1	16	19.75%
Meaning	HA	1	1	1	2	2	1	1	3	12	14.81%
	TA	4	2	0	4	2	5	4	3	24	29.63%
	R	4	7	2	2	7	4	2	3	31	38.27%
	CR	2	1	1	3	0	1	4	2	14	17.28%
Total	HA	7	6	3	8	9	8	6	15	62	15.31%
	TA	19	8	3	11	14	18	15	15	103	25.43%
	R	21	28	7	17	25	21	14	14	147	36.30%
	CR	8	13	7	19	7	8	20	11	93	22.96%

Table 37: Fall 2016 REFLECT ratings reflection-on-action responses
[a]Reflection level descriptions for HA and TA are the same; TA was used as the lowest level of reflection.
[b]Reflection levels descriptions for R and CR are not mutually exclusive; adjusted the description for R to be *Sense of writer being largely present* and CR was *Sense of writer being fully present*.

As with the previous semester's reflection journal response data, I identified themes that determined the characteristics associated with the various reflection levels. Table 38 provides descriptions of the themes identified.

Lower Levels of Reflection (HA, TA)	Higher Levels of Reflection (R, CR)
• Described experiences; fact-based accounts or step-by-step process • Saw growth as being external to self	• Addressed how experiences have impacted their choices and/or decisions • Reflected on uncertainty or the feeling of "something missing" • Saw growth in relation to how own experience impacted others and impact on self

Table 38: Winter 2016 reflection-on-action response themes

Level of detail in experience descriptions. Similar to the previous semester's reflection journal responses, for those entries that were coded with lower levels of reflection (HA or TA), the focus was on describing the experience in facts or writing through the step-by-step process alone. On the other hand, when the participants would expand on the description or steps, connecting the experience back to what they learned about themselves in the process, the reflection levels were higher (R, CR). In answering the question, "Are you a Gordon Murray or a Kenneth Grange designer? Why? Which would you like to be as you ultimately develop as a designer? Why?" (Q3.1), participant one responded:

> I believe in Kenneth Grange and I have some of his design abilities and aspirations. This is because his designs are not only based on the style of the product but also does a reassessment of the role and use that the product is supposed to serve. He also takes into account the pleasure received from using his designs, something I also take into consideration when trying to come up with a design….

While the participant described the connection, the response didn't expand on that connection the participant made between Grange and herself. Reflection levels across the criterion were coded either HA or TA.

Participant 13, answering the same question, also identified a connection with Grange. In her writing, she expanded on what led her to that connection and what surprised her about what she learned as a result of it as seen in the following excerpt.

Of course both Murray and Grange are highly motivated, hard-working designers. While I have always admired Kenneth Grange's work, in the beginning, I just didn't see too many similarities between us…The more I read about Grange, the more I realized how wrong I was. Kenneth Grange's background and beginnings are so closely related to learning by doing. At first I thought that this was what separated us as designers. Upon reflecting on this idea, I realized that while I am not particularly talented with arts and crafts, whether I cook, solve a math problem or a design challenge I work things out by trying. Learning by doing can at time take very different forms, from simply beginning cooking, to taking a piece of paper to start solving a math problem, or putting together a storyboard to brainstorm a design project. While my prototype might not be made out of wood, I always need to put together a course, for example, to see if the design I came up with covers the needs of the project or client. Needless to say, I was truly surprising to discover that Kenneth Grange and I have the "learning by doing" in common.

Three additional paragraphs were written by Participant 13, providing additional examples of her thought process to answer this particular question. The reflection level coded across the criterion was CR, as the participant shared she not only questioned the way she thought but also drew new conclusions as a result of that questioning.

Another theme that emerged from the reflection journal entries was the use of detailing steps to describe an experience. This limited view simply focused on the actions being taken rather than the emotions or meaning that could surface as a result of those experiences. For example, Participant 5 answered the question, "Describe a time when you designed something. How (if appropriate) was it – effective, efficient, creative, imaginative, and/or stimulating? Describe how it feels to design?" (Q1.1) with a step-by-step process:

Before I began writing, I needed to understand what aspects of the system users struggled with the most. I reviewed help desk tickets and spoke with users from several clinics. Then I began to outline the class keeping in mind…Once I was done writing the content, I realized I had 10 hours of content and only 8 hours to teach it in so I had to get creative. I began working with another instructional designer on an eLearning module the super users could take prior to coming to the class. Using my basic storyboard in PowerPoint she was able to turn into a very interactive eLearning module that is now used by super users in all areas of UMHS.

The reflection levels coded for this response varied and each of the four levels of reflection were represented. For Writing Spectrum, Description of Conflict, and Attending to Emotions, the

reflection levels were coded either TA or HA. For Presence and Analysis and Meaning Making, the reflection levels were coded CR and R, respectfully. The journal entry was an elaborate description of the process taken but lacked an analysis of emotions associated with the process.

In contract, Participant 7's response went beyond a description of the event and showcased her process in confronting her own uncertainty:

> Since the beginning of the school year is fresh in my mind, an example of a time when I designed something was when I made a "new student packet". My school contains a battered women's shelter in its boundaries and we are constantly getting new students, most of the time without any warning…After several stressful mornings last school year, of new students coming into my classroom, I decided it was time to create a better plan…This design has been unbelievably helpful when I am greeted by a new student in my classroom. It allows me to focus my time on the student, rather than preparing his or her materials. I am able to better transition the students into their new classroom. I find I am able to help students feel more comfortable in a very overwhelming situation. Before designing this packet, I feared coming into the classroom each morning because I thought I would be getting a new student. After creating the packet, I am now more a comfortable, prepared, and an effective teacher. I have found it to be so beneficial that I have passed my idea along to my fellow colleagues and several have adopted it to their classrooms.

The reflection levels for this response were R for each criterion with the exception of CR for Description of Conflict. The participant identified a problem that, by solving, would help not only the other teachers but the students as well. She moved beyond reporting the processing connecting the experience to her emotions and viewing the challenge from various perspectives.

Uncertainty and the impact on reflection. Uncertainty was another consistent theme between the winter and fall semester's data analysis. The higher reflection levels were associated with participant descriptions of how they were dealing with uncertainty. Specifically in the case of Participant 13, she felt as if she was missing something in her design as detailed in her response to the question: "Describe a time when you designed something…Describe how it feels to design?" (Q1.1):

> I was so excited that I finished the course 48 hours before the time of the interview. But to my surprise, the more I looked at the final product, the more I felt like something was

missing from the design. No matter how hard I tried to convince myself that the course was exactly what I wanted, seeing the final product made me realize that I was actually looking for fairly different design…In spite of thinking that I had the perfect design, it turned out that the final product was not what I envisioned. Initially I thought I lost so much time and effort designing the course in that format. But then I realized that the first version of the course was actually my first step of the design, that helped me clarify what I wanted, and gave me additional insight on how to move on from there…

The participant's reflection level was coded CR across the criterion because of the depth in her description, her exploration of herself as a designer and the change made as a result of what she learned. This participant carried her level of detail and exploration of meaning to subsequent responses in her reflection journal. Evaluating her response to the next question, "Describe a time when you felt totally uncertain…What did you do to handle it? Knowing that part of being a designer is always dealing with uncertainty, how do you feel about being a designer?" (Q1.2), Participant 13 articulated how reflecting on her own experience shaped her understanding of design. The following excerpt is the end of a passage after she detailed an experience designing a workshop titled "Engaging students with Blackboard."

> As a designer I always experience highs and lows. One moment it might be the high of a great idea that strikes unexpectedly, followed by the low of discovering that this idea might not be perceived as such by others. Most times, that requires going back to the drawing board. But I believe that it is this constant challenge what makes being a designer so interesting. Reflecting on my own creative process, and understanding that freak out moments are normal part of my design process has also proved to be very helpful. I have learned that I ought to have the courage to fail, to allow myself to walk away from fear, and fully embrace creativity.

The participant's response was coded R for Writing Spectrum, Presence, and Analysis and Meaning Making; CR for Description of Conflict, and TA for Attending to Emotions. In this entry, there was an attempt made to understand the experience and develop meaning derived from that experience but there recognition, not exploration, of emotions. In both of these excerpts from Participant 13's reflection journal, it is apparent that feeling uncertain led to growth opportunities or higher levels of reflection as coded by the data reviewers.

Growth in relation to impact, on self and others, was another theme identified through the analysis of the reflection journals. Participants were asked in week three of the course, "Describe a time of sudden inspiration. What were you doing when you had this inspiration? How did you feel? Why do you think the inspiration came to you at that moment?" (Q3.2). Participant 7's response described how she transformed her view of her "most challenging student last year" based on one experience.

> John came to Kindergarten in September with a few behavioral problems, but nothing too extreme and all very manageable…Winter break came and went and when John came back to his classroom, he was a different person. His behaviors had become so extreme, completing unmanageable, and honestly very dangerous. John would throw scissors at his classmates, swear at the top of his lungs in school, run into traffic, try and stab himself with pencils. It was one of the most stressful times of my life and honestly made me question my teaching career. Myself, the principal, and the school social worker tried every trick we had but nothing could seem to work. The behaviors continued to escalate. Then one day, when we had to call John's mom to come remove him from the classroom, it hit me. This was the moment I was inspired. John's mom came running (literally running) into my classroom full of 21 Kindergarteners yelling at John at the top of her lungs. Swearing at him, telling him he could never do anything right, she was embarrassed she was his mother. Then she hit him across the back of the head and pull him to the car by his hair. I was mortified, shocked, honestly heart broken. But it finally made sense to me. I wasn't doing John any good by punishing him, yelling at him, taking away his recess, isolating him from his friends. He needed me, an adult who would love him and an adult he could trust….Now John's behaviors obviously didn't change immediately and it was an exhausting work in progress but I did see progress…John changed me as a person. He not only made me a better teacher but a better person as well.

The reflection level coded across all criterions was CR because of the transformative impact that the experience had not only on the participant but on the student as well. Growth occurred the participant internalized the experience, evaluated it's meaning, and changed her approach.

The concept of perceiving development as an internal versus external approach had an effect on reflection levels as well. The participants who experienced growth through a combination of external learning and then internalizing what that experience specifically meant to them experienced higher reflection levels as assessed by the reviewers. In contrast, those participants

who solely identified learning as external to them received lower reflection levels. Looking at a comparative example, Participant 12, when prompted in week five to answer, "How do you plan to train and develop your design intelligence" (Q5.2), responded "My plan to train and develop my talents is to work closely with someone who will give me feedback on how I am doing. Without this sort of intense feedback, I will not know where I can improve on my talents." The reflection level coded for this response was HA across the criterion with the exception of Presence, which was TA. The participant's response did not address how she would interact with that feedback to strengthen her design intelligence.

Looking at a contrasting perspective, Participant 13 responded to the same prompt:

Just like a teacher can choose to use multiple points of entry to teach a course, each of us is the teacher of our own lifelong designer journey, that encompasses training our design intelligence. I realize that is not sufficient to be able to solve a problem. Reflecting on what went well, and helped me reach a solution, the solution itself, as well as reflecting on the things that could be improved helps me as a designer develop and establish my own process. Even after I reach a solution I ask myself: was the solution I reached the best solution possible, and what makes this solution superior to others? Are there any circumstantial factors that influenced the solution and how are these factors making this solution unique? Just like Cross stated, this process is leading to a combination of doing and thinking or reflecting on your process, and eventually it will help build a template for success.

Observation is also crucial. What do successful instructional designers do? What worked in the instructional design solution one provided, and what did not work, or could be change? Through observation and reflection I learned that with every single one of the challenging design projects I took on, I reach a point at which I freak out (sometimes, actually if I am truly honest, many times repeatedly). Learning that freak outs are normal part of the design process, helps me stick to the project and continue to work hard, knowing that I will eventually get there. I might finish by hating the first draft, but at least, that initial draft will help me get some clarity. (excerpt)

Critical Reflection (CR) was the reflection level coded for this response for each of the criterion. As identified in the REFLECT rubric, the participant was fully present, explored her emotions, and developed meaning through reflection. This response shifted the focus of growth from

external, something that occurs outside of the participant; to exploring the relationship between internalizing those external experiences to impact change.

The themes for reflection-on-action prompt strategy were the ability to move beyond step-by-step responses into descriptions of how experiences impacted change. Secondly, writing about uncertainty challenged thought processes of participant. Thirdly, looking at impact on self and others as a driver for growth helped to not only question current beliefs, but shape future experiences as well.

Reflection-in-action writing prompt strategy REFLECT results for fall. Participants were asked to reflect while making decisions about their design assignments. Table 39 illustrates the reflection-in-action writing prompt results. Participants competed the writing prompts in week 10 and 170 ratings were assigned. Looking at the totals for the reflection-in-action prompt strategy, 73 (42.94%) were coded TA, followed by HA (40.00%), R (15.29%), and CR (1.76%).

Criterion	Level	Q10.1	Q10.2	Q10.3	Q10.4	Q10.5	Total	%
N	-	7	7	6	7	7	-	-
Writing Spectrum	HA	2	6	3	4	0	15	44.11%
	TA	4	1	3	2	2	12	35.29%
	R	1	0	0	1	4	6	17.65%
	CR	0	0	0	0	1	1	2.94%
Presence	HA[a]							
	TA	6	7	6	5	1	25	73.53%
	R[b]	1	0	0	2	4	7	20.59%
	CR	0	0	0	0	2	2	5.88%
Conflict	HA	1	6	3	4	0	14	41.18%
	TA	6	1	3	2	3	15	44.11%
	R	0	0	0	1	4	5	14.71%
	CR	0	0	0	0	0	0	0.00%
Emotions	HA	4	6	4	6	4	24	70.59%
	TA	3	1	2	1	2	9	26.47%
	R	0	0	0	0	1	1	2.94%
	CR	0	0	0	0	0	0	0.00%
Meaning	HA	2	6	3	4	0	15	44.11%
	TA	5	1	2	2	2	12	35.29%
	R	0	0	1	1	5	7	20.59%
	CR	0	0	0	0	0	0	0.00%
Total	HA	9	24	13	18	4	68	40.00%
	TA	24	11	16	12	10	73	42.94%
	R	2	0	1	5	18	26	15.29%
	CR	0	0	0	0	3	3	1.76%

Table 39: Fall 2016 REFLECT ratings reflection-in-action responses
[a]Reflection level descriptions for HA and TA are the same; TA was used as the lowest level of reflection.
[b]Reflection levels descriptions for R and CR are not mutually exclusive; adjusted the description for R to be *Sense of writer being largely present* and CR was *Sense of writer being fully present*.

The reflection level (ratings R and CR) results for reflection-in-action were lower than the reflection-on-reflection levels. Reflection-in-action CR was 21.20% lower than reflection-on-action, following by R which was 21.20% lower than reflection-on-action.

As with the reflection-on-action response analysis, themes were identified to provide contextual elements in support of the reflection levels as coded by the reviewers. Table 40 details the themes for the reflection-in-action writing prompt strategy.

Lower Levels of Reflection (HA, TA)	Higher Levels of Reflection (R, CR)
• Described experiences from an external focus; Provided list of items with limited explanation	• Addressed how to work within and overcome constraints

Table 40: Fall 2016 reflection-in-action response themes

External focus on experiences. The consistent theme in the participant responses were answering the writing prompts with an external focus on the learners they were designing for rather than capturing their design decision-making process. The external view is evident in Participant 11's response for each of the reflection prompts. Table 41 provides an overview of each prompt and response.

Prompt	Response – Participant 11
10. 1 What changes in how learners do what they do or think should occur?	Participants in this course will learn that having negative opinions about their employees often have the unintended consequences of low performance of those employees. Learning how to think more positively and expecting the best out of everyone will increase performance and morale. A change in attitude may need to occur, more awareness of the messages they're sending to employees.
10.2 How will you know that these changes have occurred?	● Field observations ● Returned assignments where participants give feedback about how a method worked for them ● Increased sales and service performance of employees ● Survey of employees prior to training on employment satisfaction ● Reported increase in employment satisfaction surveys by employees
10. 3 What activities will help facilitate these changes in thinking and what learners do?	Role plays will help. Especially powerful will be to task participants to bring with them a problem they're currently facing to the classroom to share. through what they learn they will come away with some appropriate leadership responses to get the best possible results.
10.4 How are you discovering your content? How can you chunk your content? How will you sequence your content?	Google searches, articles about related topics.
10.5 What constraints have you encountered during your design project so far? How are you dealing with them?	The first constraint I've encountered is time. This assignment was to design a 2 hour learning event? The topics that need to be covered in order for learners to fully understand what I'm asking them to do extends that time out beyond 2 hours. I think a potential answer to this constraint is to give them the facts, sort of what they need to learn about being a Pygmalion leader, then send them out into the field to test the methods to see how they work. One assessment I plan to use is keeping a journal. I will provide a handbook with the key takeaways with plenty of writing/note taking space. Their post training assignment will be to try some methods and record the outcomes and send it to me/the instructor within a certain time frame.

Table 41: Participant 11's responses to reflection-in-action writing prompts

For each of the prompts 10. 1 through 10.5, the reflection levels across the REFLECT rubric criterion was coded either HA or TA. There was no R or CR present in the assessment. The participant did not reflect on design designs being made, provided no exploration of emotions, and had little analysis or meaning making. Even when prompted to elaborate on constraints, the perspective was on the external impact learners.

There was only one example offering a deeper level of reflection for the specific prompt 10.4. Participant 13 shared the following response:

> I printed copies of all my end users, and went through all of their descriptions, as they are my audience. With my audience in mind, I asked myself: what would I like the participants to know, do, and value by end of the workshop? These simple questions served as guiding questions that allowed me to look for content for each one of these chunks, a combination of facts (know), actions (do), and values (value)...

The participant then went on to explain how she was using conversations with faculty members to understanding their perspective and experience with transfer students. In addition, she reached out to transfer students themselves to identify their challenges. Reflection (R) was the level identified for each of the criterion with the exception of Attention to Emotions which received an HA. The combination of literature and field research contributed to a higher level of reflection.

Addressing and overcoming constraints. The last reflection-in-action writing prompt strategy (Q15.3) was looking for participants to identify constraints they have encountered during their design project and how they dealt with them. The participants who described how they overcame the challenges tended to have a higher level of reflection as outlined by the REFLECT rubric. Participant 19 described how she dealt with the constraint but also reflected on an experience from her past to help shape her current perspective.

> The biggest constraint I have encountered is limiting my content into a two hour training. Student-centered instruction for ESL students could easily be a yearlong training. There is so much to teach and a lot of support I can give to teachers who are new to teaching using a student-centered approach. Limiting my content was incredibly difficult for me. I had to

prioritize what was most important to teach as an introduction to student-centered learning…At [removed school's name] in Gujarat, India I observed that many of the teachers (9th-12th grade) based their lessons on traditional teaching methods such as lecturing or reading the textbook. The students are taught in English. However, English is their second language and the vast majority of students struggle in their English reading, writing, speaking, and listening skills. I believe that the students need to be practicing their English skills in all subjects instead of just English class. I think the students would greatly benefit if teachers facilitated lessons that were student centered and there was a better ratio to "teacher talk" and "student talk" I would like to provide teachers training in employing student centered activities aimed for ESL students…

Critical Reflection (CR) was the level of reflection coded for the Writing Spectrum and Presence criterion. Reflection (R) was given for Description of Conflict and Analysis and Meaning Making. Habitual Action (HA) was given for Attending to Emotions. By bringing in her prior experience, the participant was able to identify why the time constraint was an important consideration in light of everything the teachers had to learn. It allowed her to prioritize her focus to make her design decisions.

The themes for using the reflection-in-action writing prompt strategy were the lack of descriptions in how participants were making their design decisions. The focus was on the learners rather than their decision making process in action. The second theme, addressing and overcoming constraints, allowed participants to draw on past experiences to help shape current decisions. As with the winter semester, reflection-in-action writing prompt responses were on the lower end of the reflection criterion as defined by the REFLECT rubric.

Reflection-on-reflection prompt strategy REFLECT results for fall. Participants answered questions in week four of the study on what is design, what is instruction, and what does it take to be a designer in relation to beliefs, self-awareness, and precedents. At the end of the semester, participants were asked to revisit those earlier responses in light of what they had learned over the course of the semester. Once again, the responses from week four were out of scope for this study but responses were provided to reviewers for context. Table 42 illustrates the reflection-

on-reflection writing prompt results. Participants competed the writing prompts in week 15 and

165 ratings were assigned. Evaluation of the reflection-on-reflection prompt strategy results in 50

(30.30%) coded R, followed by TA (29.70%), HA (28.48%), and CR (11.52%).

Criterion	Level	Q15.1	Q15.2	Q15.3	Total	%
N	-	11	11	11	-	-
Writing Spectrum	HA	2	5	2	9	27.27%
	TA	6	1	2	9	27.27%
	R	2	5	5	12	36.36%
	CR	1	0	2	3	9.09%
Presence	HA[a]					
	TA	8	7	2	17	51.52%
	R[b]	2	2	2	6	18.18%
	CR	1	2	7	10	30.30%
Conflict	HA	1	5	2	8	24.24%
	TA	8	3	2	13	39.39%
	R	2	3	6	11	33.33%
	CR	0	0	1	1	3.03%
Emotions	HA	10	9	3	22	66.67%
	TA	1	1	3	5	15.15%
	R	0	1	3	4	12.12%
	CR	0	0	2	2	6.06%
Meaning	HA	1	5	2	8	24.24%
	TA	4	1	0	5	15.15%
	R	5	5	7	17	51.52%
	CR	1	0	2	3	9.09%
Total	HA	14	24	9	47	28.48%
	TA	27	13	9	49	29.70%
	R	11	16	23	50	30.30%
	CR	3	2	14	19	11.52%

Table 42: Fall 2016 REFLECT ratings reflection-on-reflection responses
[a]Reflection level descriptions for HA and TA are the same; TA was used as the lowest level of reflection.
[b]Reflection levels descriptions for R and CR are not mutually exclusive; adjusted the description for R to be *Sense of writer being largely present* and CR was *Sense of writer being fully present*.

The reflection level (ratings R and CR) results for reflection-on-reflection writing prompt strategy

were higher than the reflection-in-action levels. However, they were lower than the reflection-on-

action levels. Reflection-on-reflection R level was 15.01% higher than reflection-in-action, followed by CR which was 9.76% higher than reflection-in-action. Reflection-on-reflection R level was 6.00% lower than reflection-on-action, followed by CR which was 11.44% lower than reflection-on-action.

As with the other writing prompt strategies, themes for reflection-on-reflection were identified. Table 43 identifies the themes for both the lower and higher levels of reflection as defined by the REFLECT rubric.

Lower Levels of Reflection (HA, TA)	Higher Levels of Reflection (R, CR)
• Maintained similar or same view of design and instruction from week 4 to week 14 • Descriptions were focused on the process rather than shifts in thinking; mindsets	• Challenged self to think differently about definitions from week 4 to week 14 • Analyzed week 4 responses and identified gaps or changes

Table 43: Fall 2016 reflection-on-reflection response themes

View of design, instruction, and self. Lower levels of reflection were associated with participants who did not believe their view or definition of design, instruction, or how they had changed over the course of the semester. Excerpts from entries coded with lower levels of reflection are shared below. In response to "Go back to your previous responses during this semester on the 'What's instruction?' question. What has changed in your definition after completing this course and your ID project?" (Q15.2) the following participants indicated their definition hadn't changed.

> Participant 1: I don't believe my views on instruction have changed since the beginning of the course. I still believe that instruction is a basic tool that gives guidance to users/designers on how to design a particular product in the different stages that will instruct the designer/user to a finalized product…

> Participant 7: Just like my definition of design, I think my initial definition of instruction is spot on but just barely touches the surface of what instruction truly is. Instruction has so many components to it that are similar to design. It is crucial to be aware of your end users, what your goals are, what you want to accomplish, how you want to accomplish that, and how you will check to make sure that was accomplished…

In both responses, the reflection level coded was HA across the criterion with the exception of TA for Presence. The participants did not expand or add to their definition in light of what they learned over the semester. Even if no changed occur, their responses did not meet the REFECT rubric criteria for exploring emotions, questioning beliefs, and having a sense of being present.

In addition, Participant 19 thought though what she needed to change in her definition of instruction. In answering the same prompt, she wrote:

> Something I would add to my definition of instruction is always keeping the end-users in mind. To create the end-user identities before going into the content, outcome, assessments, and activities was immensely helpful because it helped me to narrow down my instruction. Student-centered learning can easily be a one day training or an on going training. To limit it to a 2 hour training, I really had to keep going back to see the needs of my end-users and decide what was most important to teach. My previous definition of instruction focused on the outcomes and activities part of instruction. However, all of that is rooted with the end user in mind.

Reflection (R) was given for the criterion of Writing Spectrum, Description of Conflict, and Analysis and Meaning Making. Critical Reflection was coded for Presence and HA for Attending to Emotions. There was a lack of recognition of emotions within the response. Overall, the participant shifted her thinking to focus on the end user as a critical element in instruction whereas she had eliminated their role from her initial view. This reflection point assisted the participant in seeing how her thinking had evolved as a result of the semester's teachings.

Identifying gaps and changes in definitions and self. Related to the first theme for the reflection-on-reflection prompt strategy, this theme addresses the ability for participants to add to their definitions after gaining new perspective. Participants who identified gaps in their definitions of either design, instruction, or themselves as designers, received higher reflection levels. When participants did not see a change in perspective, their reflection levels were typically lower. For

example, Participant 8's response to the prompt about what it takes to be a designer (Q15.3) responded:

> I really do not think that much has changed about my 4.3 assignment. I'm still all of those things. As a designer, I've found myself to like this new title. I have goals on becoming better professionally and I believe truly that this course has helped me along. I plan to continue working on my techniques so that my future curricula are better enhanced.

This participant's response was coded as HA across the criterion with the exception of Presence which received a TA. While she wrote about having goals, there was not a discussion on what that meant to her or what those goals were. This led to a lack of meaning making and presence in the participant's response.

On the other hand, the participants who identified gaps, not only in the definitions but also in their own areas of improvement, were coded at higher reflection levels. In response to the same prompt as "What it takes to be a designer?", excerpt from entries that were coded with higher reflection levels are shared below.

> Participant 1: During these 14 weeks, this has not been an easy process but the benefit of these 14 weeks has been that I am able to learn new things to improve my way of designing and being provided with feedback from my peers and instructor. To be a designer, to me, means that I am able to share my different ideas with other people in order to create something useful to help people in the future or currently. Design has shaped my thinking process and gives me better ideas and helped me to discover successful examples, which impacts my designing process. The goals I set for myself is to constantly improve my thinking process and develop better skills to create and focusing on my reading in order to help with the thinking process in my development. I also want to work with a group to design so that I am able to share my ideas and gain new ideas from the peers in my group, in which I will be able to achieve my goals.

> Participant 7: After 14 weeks of design thinking, I am in such a different place than I was when I began. I never saw myself as a designer. Not at all. Now, at the end of this course, I can proudly say I am a designer! I design for myself, my students, my family, and others. I am constantly designing. Designing, to me, means seeing a challenge and improving it. Designers get the jobs done….

> Participant 18: Being a designer means dealing with and almost embracing uncertainty. Being comfortable with uncertainty is what makes many of the designers we studied so great. Throughout this course I have become increasingly comfortable with uncertainty

and have added to my tool box ways to deal with uncertainty. Being a designer also means producing a quality product. Especially in ID, this product can have many forms and iterations, but it is most important to produce a product that is deemed quality by the learner first.

Participant 19: For self-awareness, I would add that part of design is embracing the ability to change. In our EDP, it was an interesting challenge to have to change one of the activities. I found that difficult, because each of my activities took a lot of thought and energy to design and were intentional. To have to scrap one activity altogether felt like I was deleting something that contributed to the overall training. However, it is common for clients to want changes. In fact, when I was volunteering for the Oakland Literacy Council creating an elearning course, there were times the clients asked for drastic changes and I had to go along with it even if I disagreed. Therefore, I need to learn to be flexible to meet the needs of the client.

The responses for the four examples were coded as R or CR for each of the criterion. It is evident that the participants have explored and critiqued their assumptions on what it meant to be a designer in light of the new information they learned during the course.

The themes that presented themselves for the reflection-on-reflection writing prompt strategy were to challenge own views on design, instruction, and what it means to be a designer. The second was to evaluate previous mindsets in light of new information to evolve.

Reflection writing prompt strategy comparison for fall. A cross comparison of reflection levels were evaluated as an output to answer the third research question: What type of reflective writing prompt strategy has a greater impact on the reflection level of graduate design students? Figure 4 illustrates the reflection levels across the three types of reflective writing prompt strategies.
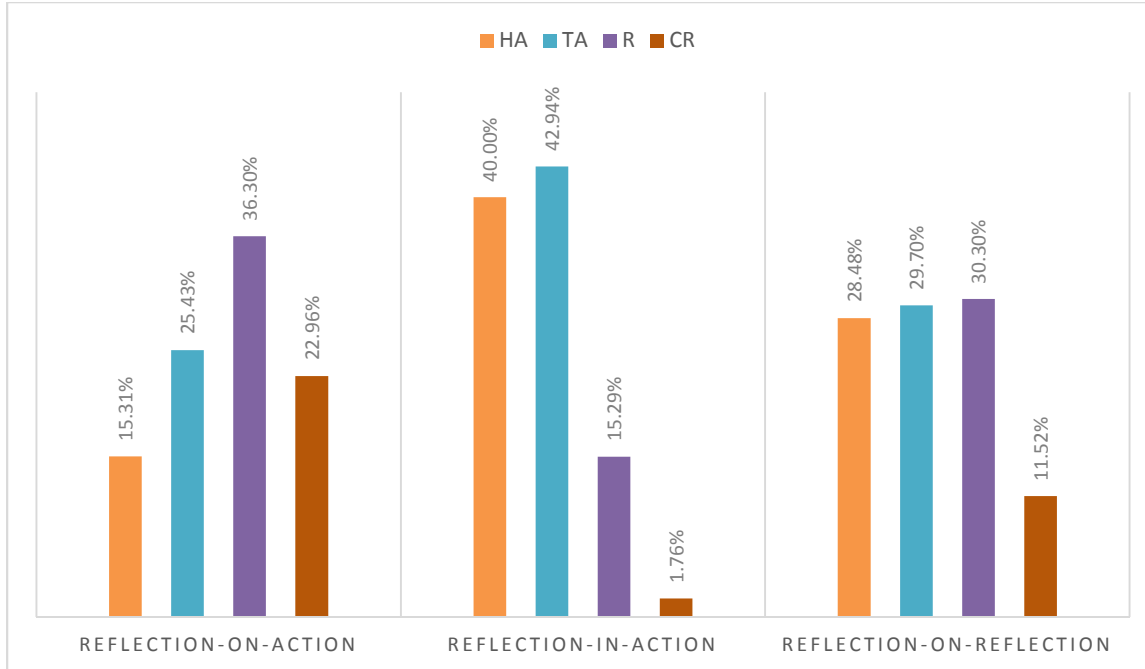
Figure 4: Fall reflection levels for writing prompt strategies

For the fall 2016 semester, reflection-on-action was the writing prompt strategy that had the greater impact on the reflection level of graduate students with 22.96% of the responses coded as CR. Participant journal entries using reflection-on-action writing prompt strategies achieved more Critical Reflection level responses than either of the other types of writing prompt strategies. Assessing the lower end of the reflection levels, reflection-in-action resulted in 40.00% of responses coded as HA. Reflection-in-action writing prompt strategy resulted as the lowest level of reflection.

Summary

The purpose of this mix-methods quasi-experimental research study was to explore the impact of using reflection as a tool in increasing self-efficacy in graduate design students. This chapter presented the data results from the various data collection tools used: (a) background questionnaire, (b) cognitive assessment, (c) self-efficacy instruments and (d) participant reflection journal entries. In order to capture evidence of the reflection levels identified, themes were shared

for each type of writing prompt strategy: reflection-on-action, reflection-in-action, and reflection-on-reflection. Described here are the data summary organized by research question.

Question 1 asked what impact did reflective practice have on self-efficacy in graduate design students. For both the winter and fall semesters, statistical testing results showed that self-efficacy was impacted over the course of the semester. However, due to the low sample size, significance cannot be claimed.

Question 2 asked what reflective writing prompt strategy has a greater impact on self-efficacy in graduate design students. For the winter semester, there were no significant pairings comparing the same reflective writing prompt strategy (between survey one and two, survey three and four, survey five and six). For the fall semester, there was one significant pairing comparing the same reflective writing prompt strategy of reflection-on-action; survey one and survey two. With the survey two results being lower than survey one, self-efficacy decreased with that reflective writing prompt strategy of reflection-on-action.

Question 3 asked what type of reflective writing prompt strategy had a greater impact on the reflection level of graduate design students. In both semesters, reflection-on-action was the writing prompt strategy that had the greater positive impact on the reflection level of graduate students whereas reflection-in-action writing prompt strategy resulted as the lowest level of reflection, having a greater negative impact.

Significant findings, implications to Learning Design and Technology, as well as recommendations for future research follow in Chapter 5.

CHAPTER 5: DISCUSSION AND CONCLUSION

Introduction

The purpose of this mix-methods quasi-experimental study sought to explore the impact of using reflection as a tool to increase self-efficacy in graduate design students. The goal was to examine how various reflective writing prompts impacted the level of self-efficacy and reflection of the graduate design student. The study addressed the following questions:

Q1. What impact does reflective practice have on the self-efficacy in graduate design students?

Q2: What reflective writing prompt strategy has a greater impact on self-efficacy in graduate design students?

Q3: What type of reflective writing prompt strategy has a greater impact on the reflection level of graduate design students?

Using purposeful convenience sampling, the study targeted students in the graduate level course Design Thinking and Knowledge taught at Wayne State University in the College of Education Department. A total of 20 students participated in the study, 7 in the winter 2016 semester and 13 in the fall 2016 semester. During the 15-week study, participants answered a self-efficacy scale with a focus on design six times and completed a series of reflection journal entries based on prompts using the strategies of reflection-on-action, reflection-in-action, and reflection-on-reflection.

In Chapter 4, I provided the results to the research questions. The data for the first two questions were collected using the NGSE instrument, deployed six times over the course of the semester. The Freidman and the Wilcoxon T-test were used to determine the impact on students.

Results from the third question were provided via analysis of the REFLECT rubric to assess participant reflection levels for each type of writing prompt strategy.

The purpose of this chapter is to discuss the results in relation to the exploration of self-efficacy and reflection as well as discuss themes as identified in the analysis. In addition, implications Learning Design and Technology are shared. I also describe the limitations of this research study and conclude with recommendations for future research.

Discussion of Results

A gap in the literature is evident in exploring the relationship between self-efficacy and reflection as a tool to impact self-efficacy. This study looked to further evaluate self-efficacy in the light of reflection. The study results in relation to self-efficacy did have variances when assessed against the literature. Studies show that reflection positively impacts self-efficacy in driving individuals to feel more confident in their abilities, enhance their knowledge base, and refine their professional identity (Osipova et al., 2011; Dunlap 2005). This study results in relation to reflection did align with the literature themes of reflection as an avenue of reshaping and challenging beliefs. The findings also brought new understandings to the forefront when selecting writing prompt strategies that would result in the highest level of reflection, as determined by the RELFECT rubric. Using structured reflection-on-action writing prompts, participants were able to explore past experiences in light of present-day knowledge and beliefs. The following discussion, organized by research question, describes the key findings.

Research Question 1: What impact does reflective practice have on self-efficacy in graduate design students? Social cognitive theory guided this research study. As guided by Bandura (1977), the specific lens of focus used, was the use of reflection to influence students' levels of self-efficacy. Literature indicates when reflective thinking practices occur, assumptions

are challenged and beliefs are redefined (Matsuo, 2012; Hubb & Brand, 2005; Boud, 2001). Re-evaluation occurs where the students develop new perspectives, which impacts their sense of self and professional identity. Often moving to a more authentic self than before. It is critical to note that while the statistical testing did reveal significance, the sample size of 19 was too low to authoritatively claim significance. With that addressed, directionally self-efficacy levels decreased during the 15-week semesters.

While there is a limited number of research studies looking at both self-efficacy and reflection's relationship, the studies reviewed reported a positive impact on students using reflection to build skills and their own confidence in their particular fields (Tavil, 2014; Osipova et al., 2011; Friston, 2008; Dunlap 2005) or in the reserve, self-efficacy being antecedent to reflective practices (Phan, 2014). Initially, I was surprised by my study's findings and the overall directional decrease in self-efficacy amongst the students. Upon further review of the studies already conducted, I uncovered more differences than similarities in the context, timing, and methods of assessment when compared to my study. Table 44 describes the studies that addressed self-efficacy and reflection.

Researcher:	Phan (2014)
Context:	The study spanned a two-year period, with 269 first year university students enrolled in liberal arts, science, and education degrees. The study was conducted to determine the effects of prior performance, self-efficacy, and reflection on each other and on academic achievement. Study started second semester of student's first year.
Similarities:	• Part of the participant population was enrolled in education courses. • When answering the assessments, participants were directed to situate their answers in relation Educational Psychology. I asked participants to answer the NGSE with a focus on design.
Differences:	• Length of study covered a two-year period and multiple semesters. • The study was solely quantitative. • Two questionnaires were used for data collection and deployed five times over the course of the study: (a) Motivated Strategies and Learning Questionnaire and (b) Reflective Thinking Questionnaire.
Key Finding:	Phan (2014) concluded that, "educators could…utilize enactive learning experiences as a major source of information to cultivate positive academic self-efficacy beliefs or engagement in higher order levels of reflective thinking" (p. 98).
Researcher:	Tavil (2014)
Context:	This study was conducted during 2011-2012 as part of a year-long practicum course with 40 pre-service English Language Teachers in their senior year of a four-year program. The study's purpose was to determine the effectiveness of reflection using e-journals on self-efficacy.
Similarities:	• The study utilized both quantitative and qualitative data collection practices. Specifically this study identified the frequently of recurring problems the pre-service teachers mentioned in their e-journals. • For statistical testing, also utilized Wilcoxon T-test. • Research journals were only shared electronically with the teacher educator and not with other participants. • Journal entries (280 in total) were read by multiple reviewers who also met to compare coding.
Differences:	• The study utilized a control group, which consisted of half of the 40 participants. • The English for Foreign Language (EFL) Teacher Efficacy Scale was used for the data instrument and was deployed twice to participants; once prior to the practicum starting and once again at the end of the practicum. • At the beginning of the course, three hours of class time was devoted to communicating e-journal writing information and expectations to the students. • The researcher interviewed participants in four focus groups as another data collection point.
Key Finding:	"The findings of this study indicate that writing reflective e-journals throughout the practicum period heightened the self-efficacy level of the pre-service teachers" (p. 14).
Researcher:	Osipova et al. (2011)
Context:	The one-year pilot study of 15 upper-elementary special education teachers from California, Florida, and Colorado (who were students in a word study and fluency PhD) sought to explore the use of video as a self-reflection tool contributing to professional development. The study took place in a second year of a larger professional development initiative.
Similarities:	• The study utilized both quantitative and qualitative data collection practices. Specifically teacher self-reflections, comments from coaches, interview transcripts, and researcher ratings of their observations were included. • Self-reflection comments shared by the participants were read by multiple reviewers.
Differences:	• Study focused on reflection practices; did not directly measure self-efficacy of participants. • Participants were observed by coaches and videotaped conducting lessons on word study and reading fluency six times throughout the year. • Participants were provided several forms to fill out assessing their teaching and to guide their reflections. They also received a rubric to help guide the reflection ratings.
Key Finding:	From the initial video to the mid-point, self-reflection scores slightly dropped. Osipova et al. (2011) indicated, "many teachers were taking a more critical approach to their reflections" (p. 164). From the mid-point to the final reflections, participants were more aligned with their coaches assessments and their self-ratings increased. Ultimately, "teachers did grow their ability to reflect, but teachers varied in the paths to deepen reflection" (p. 168).

Table 44: Comparison of reflection and self-efficacy studies related to research question one

Researcher:	Shoffner (2009)
Context:	Eighteen pre-service teachers in their third year of study participated in this 10-month study which took place in 2003-2004. The study was conducted to explore affective domains through reflection using individual weblogs and discussion forums.
Similarities:	• Participants submitted reflections electronically and were provided formal prompts to answer as part of that process. • Explored the affective domain of the participants; similar to the emotion criterion of the REFLECT rubric.
Differences:	• Study focused on reflection practices; did not directly measure self-efficacy of participants. The data set consisted of 126 reflections. • Participants submitted online journals but then also engaged in online group discussions (three to four students in each group, aligned with their major or minor area). The group discusses were viewed as informal and unstructured.
Key Finding:	Pre-service teachers used reflection to discover their professional identities and to explore concerns around classroom management. It was also discussed that using an electronic space to engage in reflection also supported both the individual and collaborative discussion aspects of reflection.
Researcher:	Friston (2008)
Context:	The pilot study spanned one semester in timing and involved 41 psychology students to determine the impact reflection, specifically journaling, had on students' self-efficacy and locus of control.
Similarities:	• Participants completed weekly journals. • The study took place over the course of one semester. • Research journals were only shared with the professor and not with other participants.
Differences:	• Two questionnaires were used for data collection and deployed three times over the course of the semester: pre-, mid-, and post-course: (a) Self-Efficacy Questionnaire and (b) Locus of Control Scale • Additional data collection included the Perception of Professor Form completed at the mid-point and end of the semester and the Course/Professors Evaluation Form completed at the end of the semester. • The study was solely quantitative. • Participants were spilt into two courses, with the only difference being that one course received 10 minutes cognitive-behavioral techniques with the journal assignment.
Key Finding:	"The results indicate that all students showed significant improvement in self-efficacy, regardless of the type of journaling they engaged in" (p. 79).
Researcher:	Dunlap (2005)
Context:	The 16-week study of 31 undergraduate software engineering capstone course students, which occurs at the end of the science degree program, evaluated the use of problem-based learning (PBL) combined with journal writing contribution to the development of professional competencies. The capstone course is the last course the students take in the program but was their first exposure to PBL.
Similarities:	• The study utilized both quantitative and qualitative data collection practices. Specifically participants completed guided journal entries and responded to a self-efficacy instrument. The study utilized the General Perceived Self-Efficacy Scale (which is different than my study) but uses similar statements such as: "I am confident that I could deal efficiently with unexpected events" and "I can usually handle whatever comes by way" (p. 73). • Used purposive sampling to determine participants for the study. • Research journals were only shared with the professor and not with other participants. • Guided journal prompts were sent weekly to students. Questions focused on participant preparedness to move into their field: "What did you learn about your ability to work as a software development professional over the last three weeks?" and "Compared to three weeks ago, how confident are you that you can deal with the demands of real software projects?" (p. 73).
Differences:	• The self-efficacy instrument was deployed at the beginning and at the end of the PBL experience. • The guided journal entries analyzed were: second through fourth journal, last journal of the semester. • PBL was used as the variable in the study to explore the impact on self-efficacy.
Key Finding:	"The guided journal responses reflected dramatic changes in student confidence…from the start of the course to the end of the course" (p. 74). The self-efficacy instrument results also indicated a "significant positive change in student perceptions of personal ability and preparedness for the software development profession" (p. 77).

Table 44: Comparison of reflection and self-efficacy studies related to research question one cont.

While the studies indicate that self-efficacy increased among students, none of the studies were conducted at the onset of a program. The studies took place later in the student's academic journey. Studies ranged from the student's second year to their final year in college. In addition, several of the studies focused on reflection and the indirect connection to self-efficacy, and did not specifically measure self-efficacy change over the course of the study. It was in the interpretation of the reflection results that led researchers to draw conclusions on how reflection contributed to increased confidence and development of professional competencies. Lastly, the studies also used different variables, such as problem based learning, cognitive-behavioral strategies, and collaborative reflection, to explore the relationship of reflection and self-efficacy. My study employed reflection writing prompts strategies – reflection-on-action, reflection-in-action, reflection-on-reflection – as the variable in exploring reflection and the impact on self-efficacy. Upon further reflection and review, it is apparent that the various studies in the literature would lead to different outcomes in relation to self-efficacy.

What led to this decrease in self-efficacy as experienced in my study? When students are challenged to reevaluate their mindsets, beliefs, and assumptions, doubt and insecurity can surface. There is fear of failure or not living up to expectations, whether self-imposed or as an expectation from others (Shoffner, 2009). The expertise that students thought they were bringing into the program is challenged based on the new ways to design. For example, design has traditionally been taught in a linear fashion moving from needs assessment to design to development and so on. With the introduction of design thinking, there is a level of uncertainty and messiness that now accompanies design. There are different mindsets that perhaps the students were not well-equipped to address at the onset of the program. They are exposed to new concepts, especially in the first seven weeks of the LDT 6110: Design Thinking and Knowledge course. Combining the new

mindsets with the introduction of innovative ways to design can cause a student to question what it means to become a designer and how they view themselves in that role. Ultimately, self-efficacy did decrease as reported by students, causing them to question their confidence in design.

Research Question 2: What reflective writing prompt strategy has a greater impact on self-efficacy in graduate design students? Similar to the outcome for the first research question, self-efficacy directionally decreased over the course of the semester. Using the Wilcoxon T-test, there was significance found in five pairings. Table 45 details the significant pairs organized by semester.

Semester	Significant Pairs
Winter	Survey 3 was lower than Survey 1
	Survey 6 was lower than Survey 3
Fall	Survey 2 was lower than Survey 1
	Survey 4 was lower than Survey 1
	Survey 6 was lower than Survey 2

Table 45: Significant pairings based on Wilcoxon T-test results

Participants showed the greatest self-efficacy levels at the beginning of the semester, prior to participating in reflective practices. The NGSE was deployed before and after each reflection writing prompt strategy was used. Based on the statistical testing, a specific writing prompt strategy could not be determined as having the greater impact on self-efficacy with one exception. In the fall semester, Survey 2 was reported as lower than Survey 1, meaning that self-efficacy statistically decreased when then writing prompt strategy of reflection-on-action was used. The decrease may be attributed to the writing prompts deployed in week one. The writing prompts were:

Q1.1: According to Cross – "Everyone can and does design. We all design when we plan for something new to happen." Describe in detail a time when you designed something. How (if appropriate) was it – effective, efficient, creative, imaginative, and/or stimulating? Describe how it feels to design?

Q1.2: Describe a time when you felt totally uncertain. Try to remember how that felt and the greatest challenge you faced because of the uncertainty. What did you do to handle it? Knowing that part of being a designer is always dealing with uncertainty, how do you feel about being a designer?

Asking participants to reflect on previous design experiences and times in which they felt uncertain may have affected the learner's perception of their abilities.

Not only are students confronted with new concepts and ways to think about design, but now they are being asked to share their vulnerability in the first week of the course. For this reason, it is vital to create a supportive environment for students to feel safe in expressing that vulnerability. There are various ways to achieve the sense of security and provide a supportive environment for reflection. In Tavil's (2014) study, which assessed the effectiveness of using reflective e-journals on self-efficacy with 40 pre-service English Language Teachers, students attended a three hour session devoted to providing information on the purpose and expectations of using the reflective journals. Shoffner (2009) took another approach with the 18 pre-service teacher study, exploring the use of discussion forums in conjunction with reflective weblogs to provide a network for students to learn from and connect with each other. The collaborative reflective experience allowed space for the students to develop their professional identities but also to explore their concerns. Another technique is providing students with the rubric prior to the reflection experience. In Blaschke and Brindley's (2011) case study involving students in the MDE program, the rubric being used to assess reflection was provided to participants. This practice not only established trust but also provided transparency to the purpose of the reflection. By employing these techniques with students, it could potentially offset that feeling of unease that may lead to decreased self-efficacy.

Bandura's (1997) fourth source of self-efficacy, physiological and affective states, also has an effect on self-efficacy levels. Bandura as cited by Alt (2015), defines it as "people assess how

confident they feel by interpreting their own emotional and psychical state as they contemplate an action" (p. 52). Klassen and Usher (2010) found that physiological reactions to past and current situations could vary for each individual but could also contribute to a learner's competence to execute a task. As a result, the learner may not want to engage or be "less likely to engage in that activity" (p. 3). Reflecting on a negative or uncertain experience may be a determent in achieving a positive impact on self-efficacy. Osipova et al. (2011) conducted a study with 15 upper-elementary special education teachers to explore the use of videos as a self-reflection tool for professional development. During the mid-point of the study, teachers rated themselves lower and were more critical of their reflections. For example, one participant wrote, "I do not think anything really worked today. The kids did not seem to remember skills we have worked on." (p. 164-165). Reflective comments were lacking specifics. In the onset of the study, participants wrote about challenges and how they were planning to overcome those struggles in future lessons. At the mid-point, the reflections became terse and less about writing through how participants were going to overcome obstacles. By the end of the study though, the participants shifted again to providing robust descriptions of their experiences.

The desire to engage or not engage in a task was also addressed in the literature and research studies. Students with higher levels of self-efficacy tend to seek out complex problems whereas students with lower levels of self-efficacy view problems as obstacles (Bandura, 2012; Federici & Skaalvik, 2011; Stajkovic & Luthans, 1998; Pajares, 1996, 2003). The Need for Cognition Scale provided an input into the study. Even though cognition as a variable was outside of the formal scope of the study, a finding did surface. Students with above-median cognitive complexity showed no significant differences in self-efficacy after engaging in reflective practices. Those with below-median cognitive complexity decreased in their self-efficacy after reflecting. In

other words, the participants who leaned more towards preferring things to be simple went down in their self-efficacy after engaging in reflection. These individuals typically do not seek out ill-structured or complex problems. The reflective experiences may have provided them a challenge to think deeply about either past or present situations. This finding, however, does not mean that by simply adding cognitive strategies to a course design, self-efficacy will automatically increase.

Friston (2008) set out to explore the impact of journaling on self-efficacy involving 41 psychology students. Participants were spilt into two instances of the same course with the only difference being the introduction of cognitive behavioral strategies in one of the courses. Each week students were provided with 10 minutes of cognitive behavioral therapy instruction to accompany their reflection journal assignments. This continued over the course of the semester. According to Friston (2008), "the results indicate that all students show significant improvement in self-efficacy, regardless of the type of journaling they engaged in" (p. 79). The researcher predicted self-efficacy would be higher in the population that received the cognitive behavioral instruction but the findings did not support that hypothesis. Further exploration is needed in the area of cognitive theory to isolate the impact on reflection and self-efficacy.

Research Question 3: What type of reflective writing prompt strategy has a greater impact on the reflection level of graduate design students? The theoretical constructs of Schön's (1983, 1987) research on reflection-in-action and reflection-on-action were underlying guiding principles in this study. Reflection-on-reflection was added as a third writing prompt strategy used during the study. The third and final research question sought to explore which of the reflection writing prompt strategies resulted in the greater impact on reflection levels. Reflection-on-action is the writing prompt strategy that produced the highest levels of reflection in both semesters. Participants were asked to reflect about past experiences in relation to design,

uncertainty, and inspiration. They reflected on an action already taken in the past and then examined what that experience meant with their present knowledge set. They were also challenged to look at those experiences with the lens of a designer to see what new perspectives could be learned and applied as they moved forward in the field. Reflection-on-reflection was ranked second for highest reflection level. The writing strategy allows participants to revisit earlier reflection prompts already answered to change or build to those answers. Reflection-in-action was ranked third, having the lowest levels of reflection. Participants struggled with capturing their reflection process while in the midst of action. They consistently answered the reflection prompts as external to themselves. The focus was centered on the participants of their instruction, as opposed to the design decisions they were currently making.

Taking a look across all three types of reflection writing prompt strategies, themes emerged that either supported the literature review or addressed gaps found in the literature.

Theme 1: Reflection is an avenue for reshaping and challenging beliefs. Through evaluating the data, it became evident that learners who discussed how they responded to uncertainty, challenged beliefs, and transformed the way they thought about design emerged with higher levels of reflection. As identified in the REFLECT rubric (Wald et al, 2012), the description for CR in the Writing Spectrum criterion is, "exploration and critique of assumptions, values, beliefs, and/or biases, and the consequences of action (present and future)" (p. 48). Regardless of reflection writing prompt strategy – reflection-on-action, reflection-in-action, reflection-on-reflection – the theme spanned across all three and both semesters. Participant 16's response to "Describe a time when you felt totally uncertain. Try to remember how that felt and the greatest challenge you faced because of the uncertainty. What did you do to handle it? Knowing that part

of being a designer is always dealing with uncertainty, how do you feel about being a designer?"

(Q1.2) illustrates the concept that addressing uncertainty drove to higher levels of reflection:

> Would it be too general to say that *Uncertainty* could be the title of my life story? I think anyone can relate to the uncertainty of adapting to and adjusting any of life's challenges…The most uncertain time in my life would have to be the entire time I was in undergrad, majoring in music. The thought of specializing in a field (I hesitate to use career here - one of the many reasons for the feeling of uncertainty) that basically said, "if you're not the best, you're nothing," was a source of immense anxiety. Add to that the requirement that I stood in front of a literal jury of my peers once a month, completely exposed - as all music does to musicians - and you have a recipe for understandable second guessing, self doubt, and worthless feelings. I found it hard to believe I would be a good enough musician to be able to make in the world, let alone find the energy to actually begin the process by practicing….
>
> Thankfully, it was also my peers (along with my family), who were the most supportive and biggest champions of my success. Even in my failures (and eventual career change), the most important people in my life saw my choice to pursue music as a no-brainer and supported me through the long practice sessions, late rehearsal and strange hours. They reminded me that I am my own worst critic - I have, and always will be, the most critical person when it comes to my decisions because of the "what ifs."
>
> I will say that, although still I get some anxiety over the thought of standing in front of my peers to perform Mozart's clarinet concerto because of the uncertainty of how it will be received, the experience taught me to make any "uncertain" experience mine. If I know I approached a problem or situation with my best - with excellence, as we call it on our worship design team - I can be confident and proud of the product, even if it isn't always received with enthusiasm.

Reflection levels for these participants were coded reflection or higher across the five criterions: Writing Spectrum, Presence, and Description of Conflict, Attending to Emotions, and Analysis and Meaning Making. The participant confronted her uncertainties, reached out for help from a support network, and challenged her own beliefs. She utilized a mix of external resources but leveraged how to internalize, leading to transformation. Re-evaluation of beliefs requires learners to create new opinions, feelings, and thoughts (Matsuo, 2012; Sandars, 2009; Hubbs & Brand, 2005; Boud, 2001). Consistent with the literature, participants emerged with new perspectives when they challenged mindsets.

Theme 2: Providing learners with reflection-on-action structured prompts led to higher levels of reflection. As outlined in the literature review, there are several styles of writing prompts designers can chose to use: (a) no structure to reflection, (b) guide learners using general prompts (semi-structured), and (c) provide detailed questions to walk learners through the reflection process (structured). This study used structured reflection prompts to guide the learners in answering specific questions about their past and present. Researchers found it beneficial to provide learners with structure to enhance their awareness of reflection itself but also to assist in progressing learning (Sandars, Van Oss, & McGeary, 2016; Lew &Schmidt, 2011; Aronson, 2011; Taylor-Haslips, 2010).

For this particular study, the structured prompts used for reflection-on-action introduced the mindsets of design thinking to the participants. Through participant reflections on past experiences with uncertainty and inspiration, as well as making connections to designers they were reading about in class, students began to see those characteristics in themselves. Based on the self-efficacy scores decreasing, the recognition may not have been a comforting journey but it did provide the opportunity to question existing beliefs and assumptions about design.

In contrast, the prompts used for reflection-in-action resulted in the lowest reflection scores. The prompts focused on the learning outcomes, activities, and constraints of the project instead of asking the participants to share their internal thought processes. It may have been a challenge for participants to interrupt their natural flow of thinking while in the midst of the design to stop and write about it. Reframing is also a key aspect for reflection-in-action. Designers take a step back from what they are working on, look at the problem, and change directions based on an insight or new information received. This reframing is also difficult to document for students if they are writing about the experience at a later time. A way to overcome this challenge is to share

specific instructions to students on capturing reflecting-in-action experiences. The ability to recognize the reframing moments proves to be beneficial beyond the classroom experience as students transition into the professional world.

Theme 3: REFLECT criterion of Attending to Emotions received the lowers levels of reflection. After reviewing both semesters of data, I evaluated the individual criterions and discovered the Attending to Emotions received the lowest levels of reflection (HA) regardless of which reflection writing prompt strategy was deployed. Figure 5 details the results for the winter semester, organized by the criterions.
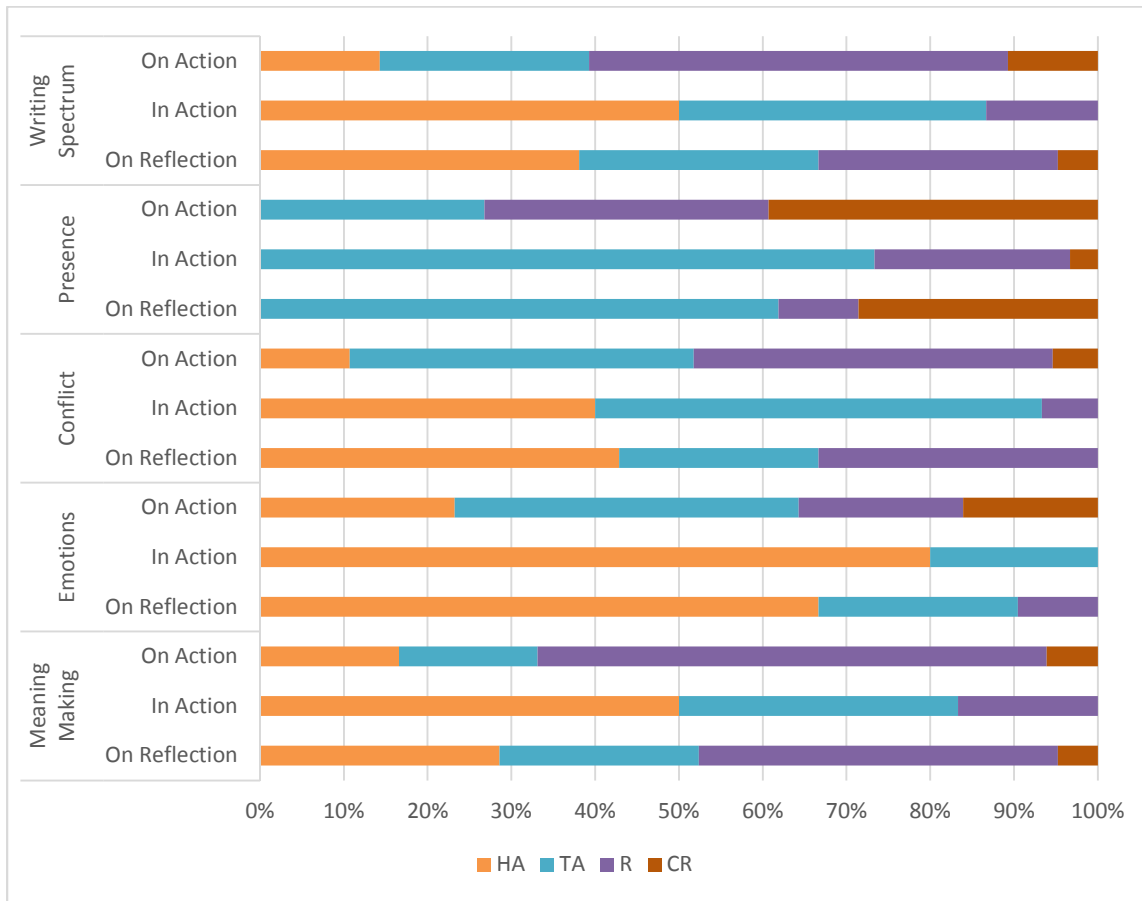
Figure 5: Winter reflection levels for writing prompt strategies, organized by criterion

For the criterion of Attending to Emotions, reflection-on-action resulted in 23.21% coded as Habitual Action; reflection-in-action resulted in 80.00%, and reflection on-reflection resulted in 66.67%. Figure 6 details the results for the fall semester, also organized by the criterions.
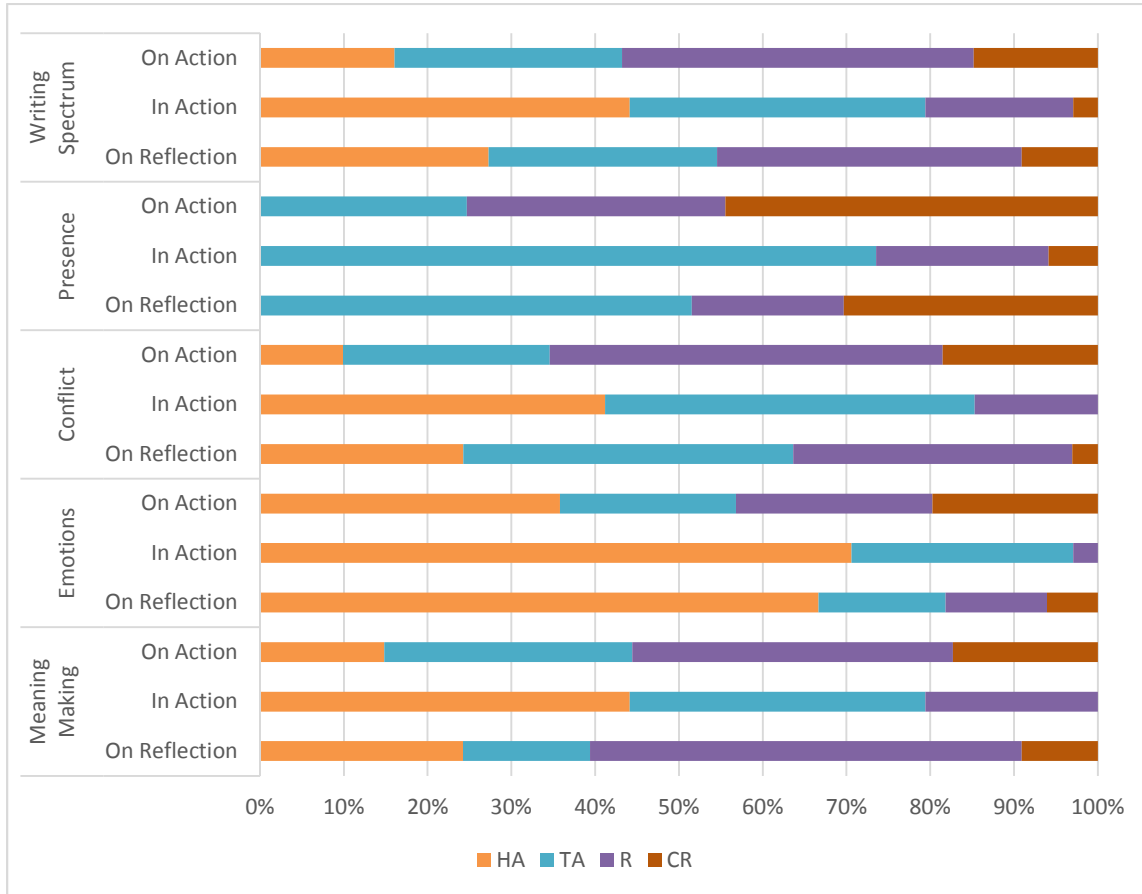
Figure 6: Fall reflection levels for writing prompt strategies, organized by criterion

For the criterion of Attending to Emotions, reflection-on-action resulted in 35.80% coded as Habitual Action; reflection-in-action resulted in 70.59%, and reflection on-reflection resulted in 66.67%. This is supported by Tracey et al.'s (2014) study of 17 instructional technology graduate students where the emotion criterion was also ranked the lowest reflection level, as defined by the REFLECT rubric. While I can't isolate the key reasons why emotion as a reflection point was low in this study, several factors may have contributed to the lower reflection levels in this setting:

being uncomfortable reflecting, being assessed or graded on their reflection, or not feeling supported via online learning.

The exploration of emotions and their relationship with reflection and self-efficacy was also apparent in a study recently conducted by Petko, Egger, and Cantieni (2017), assessing the use of weblogs in teacher education internships and how they tied to reflection, self-efficacy, and reducing stress. One hundred and seventy-six primary and kindergarten teachers participated in the four-week study. Participants were broken up into five different groups:

1. Writing prompts with an emotional focus

2. Writing prompts with a problem-based focus

3. Writing prompts with an emotional focus and received peer feedback

4. Writing prompts with a problem-based focus and received peer feedback

5. Control group

Participants also received three hours of training on reducing stress and reflective writing. For those involved in the experimental groups, this was their first time writing a weblog along with their internship experience. Findings determined that there were no significant changes in stress levels or in reflection results. For self-efficacy, participants' feelings of being in control improved with the problem-focused weblogs and even more with the problem-focused weblogs that had the feedback component. On the other hand, the emotion-focused weblogs did not improve self-efficacy. Petko et al. (2017) indicate, "it might be plausible that reflection and feedback on actual problem-solving through weblogs can support the impression of performance accomplishments, which might be more present in problem-focused weblogs than emotion-focused weblogs" (p. 83). The group that responded to emotion-focused questions did not experience an increase in self-efficacy but the problem-focused group did.

The value of emotions in design is emerging as a topic of interest amongst researchers. Through a systematic literature review related to designers' emotions and their practices, Hutchinson and Tracey (in press) identified five initial themes:

1. That emotions are present in all phases of design (although they vary in frequency and character)

2. That emotions are particularly influential during ideation

3. That emotions may serve as a source of feedback for designers

4. That emotions may serve a regulatory function for designers

5. That they may serve as a source of motivation for designers (p. 20)

It is vital that the exploration of designer experiences in relation to emotions, internally and in relation to the world around them, be a continued topic of research. The future research directions by Hutchinson and Tracey (in press) provide insight into the questions that will help further the body of work related to designer emotion. For example, "What role do emotions play in professional identify for designers – what does it feel like to be a designer and how do emotions shape the way designers experience their professional selves? (p. 23). Once educators know more about the role of emotion, an additional question becomes, how do educators help students connect to and share their emotions in order to build self-efficacy and professional identity?

Implications for Learning Design and Technology

Learning design historically has been viewed as a linear process, moving through specific steps to identify and design instruction for learners. With the introduction of design thinking to the instructional design field, there are design characteristics that challenge the comfort level of students. Design thinking mindsets include being comfortable with uncertainty and ambiguity,

revisiting earlier design decisions in light of new information, and collaborating with others early and often in the process. Combine these mindset shifts with the stress of being a new graduate student and learners may not be equipped to handle the challenge with confidence. This ultimately affects the way in which they view themselves as designers and starts to form their professional identity. This study was important to explore the use of reflection as a tool to increase self-efficacy in students in order to assist in that transition. My hope was that faculty could gain a better understanding on role of reflection on students and their self-efficacy.

The findings of this study provide implications to those in the learning design and technology fields, not just faculty members, but instructional designers and students alike. The most notable implications being: (a) use reflective practices to challenge assumptions and beliefs even though self-efficacy is impacted and (b) provide a supportive environment for students to reflect.

Use reflective practices to challenge assumptions and beliefs even though self-efficacy is impacted. As seen in this study, perceived self-efficacy decreased as students confronted new ways of thinking, revisited prior experiences, and challenged assumptions. On the other hand, reflection is what causes the reshaping and challenging of beliefs. It is in that critical reflection space where students reach new levels of understanding about the emerging world around them. Design can be unstructured and messy. Design can evoke emotions that students have not felt before. Providing students with the reflection tools to confront those challenges and frustrations is fundamental to their success in the long-term as a designer. In the short term, self-efficacy development may not be a priority at the same time as reflection if it continues to be at odds. In this study, the writing prompt strategy reflection-on-action had the highest level of reflection but also resulted in a decrease of self-efficacy scores.

There are several ways to engage students in reflection – from free writing to structured writing prompts. Researchers do not agree on what is the best structure. Dewey (as cited by Jay & Johnson, 2002) argued that the reflection process should be unstructured, messy, and allow the learners to connect to their emotions. At the other end of the spectrum, providing learners with structured writing prompts is believed to guide them through the learning process (Moon, 2006). Using structured techniques like reflection-on-action, reflection-in-action, and reflection-on-reflection can provide the organization students need to take their reflection to a higher level. Reflection-on-action proved successful in this study for inviting participants to think about previous experiences and interpret them with new perspectives.

Another facet of writing prompt strategy is the structure of the question itself. There were several instances in this study where the writing prompts, especially for reflection-in-action writing strategy, attempted to keep the focus on the designers and their thinking but the participants answered with the focus on their learners. For example, in week 10, the prompt "How are you discovering your content? How can you chunk your content? How will you sequence your content?" The prompts should guide students to reflect on or in an experience or situation, asking them to tell us their story as they moves through their thought processes.

Provide a supportive environment for students to reflect. Students will experience discomfort and frustrations on the reflection and self-efficacy development journey. For this reason, it is essential for faculty to provide a supportive environment for students to share and explore those very emotions. There is a level of trust that needs to be built between the student and instructor. One way to start creating that trust is to provide guidance. Instructors cannot assume that students know how to reflect or are comfortable reflecting. By providing guidance, the instructor assures that the student understands the reflection purpose and where it fits into the

context of the course (Tavil, 2014; Balschkey & Brindley, 2011; Lew & Schmidt, 2011; Hubbs & Brand, 2005). Guidance can be in the form of a short information session to address what is reflection (as defined in the specific context), what is the expectation for the reflection assignments, and how students will be assessed or graded. Sharing the rubric early allows students to focus on the assignment instead of wondering how they will be assessed.

Another opportunity instructors have in designing their courses is to set up a collective or collaborative reflection experience. This particular study focused on a private exchange of electronic reflection journals between the student and the instructor. However, research indicates that it is beneficial for students to share their reflections with peers to gather feedback and to grow their network (Tavil, 2014; Shoffner, 2009; Osipova et al., 2011). Collective reflective experiences can take several forms: shared electronic file, discussion boards, and peer groups meetings. Regardless of the technique, students going through similar challenges can not only learn from each other, but can also lean on each other from a social support aspect.

Limitations of the Study

This study intended to examine the shift in self-efficacy in graduate design students as well as their level of reflection experienced using each of three reflective writing prompt strategies. There were two limitations identified.

Participant barriers to reflection. While I understood that each student had different experience levels with reflection, I did not capture their biases or perceived barriers to reflection at the onset of the study. It would have been beneficial to know if lower reflection levels were potentially impacted by a lack of:

- Time to reflect at a deep level: Were participants allowing themselves adequate time to reflect and possibility revisit the reflection prior to the assigned due date?

- Motivation or commitment for the reflection process: What were participants' prior experiences with reflection? How did those experiences shape beliefs around reflection?

- Understanding reflection expectations or assignments: Were the reflection assignments descriptions clear? Would the participants have benefited from time spent in class reviewing reflective practices and expectations?

- Trust in reflective online environment: Would students have benefited from meeting with the instructor prior to the first reflection being due to establish an initial connection point and start to build trust?

Capturing the additional context of participants' reflection experience may have provided an opportunity to offset barriers that students were experiencing at the onset of the study.

Number of participants. Recruiting of participants started December 2015 and August 2016, prior to the start of each semester. For the winter 2016 semester, I received seven responses indicating that they would participate in the study. Because of the low sample, the decision was made to run the study a subsequent time in the fall. Thirteen students agreed to participate, with the exception of one who completed the consent form but not the initial assessments. The combined total for both semesters was 19 students. Statistical significance was placed in context as a directional indication as the sample was too small to make definitive conclusions.

To offset the low sample size, I used reflection journal entries to add context and depth to the study. The data analysis process was rather extensive utilizing the REFLECT rubric to provide consistency across the analysis. Two reviewers also participated in the initial review with a third serving as a tiebreaker. The journals and use of the REFLECT rubric added a dimension that brought the holistic picture of reflection and self-efficacy into focus.

Significance to Learning Design and Technology

The rationale behind this study emerged during the review of literature. There is a gap in the literature in relation to studies focusing on both self-efficacy and reflection (Osipova et al., 2011; Fritson, 2008; Dunlap, 2005). Exploring the relationship between the two proves to be beneficial to faculty members and instructional designers in supporting students in the development of their self-efficacy and reflective practices.

This study adds to the emerging field of self-reflective strategies. A concept evident in the research is the focus of reflective practices being used specifically in the fields of preservice education for emerging teachers (Bernadowski et al., 2013; Shoffner, 2009; Dellinger, Bobbett, Olivier, & Ellett, 2008; Garcia & Roblin, 2008; Harford & MacRuaric, 2008; Postholm, 2008; Yost, 2006; Freese, 2006) and in medical services for clinical nurses and doctors (Gloudemans, Schalk, Reynaert, & Braeken, 2013; Charon & Hermann, 2012; Coulehan & Granek, 2012; Wear, Zarconi, Garden, & Jones, 2012; Langley & Brown, 2010). There has been a lack of research addressing the use of reflective practices in developing designers, particularly focused on how to build self-efficacy through reflection. To complicate the issue, there are a number of different types of reflective practices such as journal writing, online discussion boards, and facilitated collaborative reflection sessions. Studies have indicated that there are potential differences in the outcome using various reflection strategies but there is also a difference depending on which writing prompts are given to the students (Lew & Schmidt; 2011; Lai & Calandra, 2010; Pavlovich, Collins, & Jones, 2009; Shoffner, 2009; Monet & Etkina, 2008). In spite of the existing research, there is still further opportunity to study the effectiveness of reflective writing prompts (Tracey et al., 2014) in relation to self-efficacy development. The research has not yet determined which kind of reflection strategy writing prompt would provide the optimal experience in building self-

efficacy and promoting deeper reflection in graduate design students. This study set out to shed light specifically on that aspect.

Recommendations for Future Research

Reflection, self-efficacy, and professional identity are interrelated components but are mainly studied in silos. There are few studies that explore the relationship of reflection on self-efficacy. This study resulted in self-efficacy decreasing. On the other hand, reflection-on-action was identified as the reflection writing prompt strategy that produced the highest levels of reflection in graduate design students. While this study does add to the emerging field of self-reflective strategies, it is only a start to the discussion. Based on the findings from this study and the continued exploration of the literature, the following studies are recommended.

Different assessment technique for reflection-in-action. I would encourage further research in exploring techniques for assessing reflection-in-action while it is taking place. There is value for designers in reviewing and evaluating their own reflection-in-action process. According to Tracey and Baaki (2014), "reflection-in-action during design can assist the instructional designer to acknowledge uncertainty, identify the ill-structuredness of the design problems, and embrace the complexity inherent in the design solution" (p. 11). While the REFLECT rubric lent itself nicely to assessing the reflection-on-action and reflection-on-reflection writing prompt strategies, a further study to assess the optimal way to capture reflection-in-action would be beneficial to the field. For example, establishing and testing a think aloud protocol would allow designers to stay engaged in the midst of reflection and re-framing while someone else documents the experience through observing and listening to the think aloud experience.

Role cognitions plays in relation to self-efficacy and reflection. Further research could consider the role cognition plays in self-efficacy and reflection. Surfacing as a finding, but out of

scope for this study, there was a directional relationship between individuals' cognitive complexity and their perceived self-efficacy. Participants with lower cognitive complexity experienced a decrease in their self-efficacy whereas participants with higher cognitive complexity showed no significant difference in self-efficacy. As an output of the recommended study, a design-based research study would be interesting to learn how reflection writing prompts could be adjusted to meet the students' cognitive complexity level. Educators and instructional designers would find the outcome valuable in making decisions regarding course design to assist those with a lower cognitive complexity move to a higher level of self-efficacy.

Facilitate students' connection to their emotions. As indicated in this study, Attending to Emotions was the criterion that resulted in the lowest level of reflection across reflective writing prompt strategies and regardless of semester. Participants have struggled with connecting to their emotions in other studies as well (Tracey et al., 2014). There are many factors that could contribute to lower levels of emotions. It is especially significant with the introduction of design thinking practices to the world of instructional design. Students are operating in uncertainty and will need to gain more comfortable with that space as they move into their professional careers. According to Hutchinson and Tracey (in press),

> it will be particularly important to understand how designers respond to and are influenced by emotional implications of uncertainty as a feature of the design space that may swell or recede (but is always present to some degree) as designers cycle through design interactions. (p. 21)

Studies related to emotion that would further the field include: (a) Which reflective practices, collective or individual, have a greater impact on emotion? and (b) Which source of self-efficacy is impacted most by emotions or the absence of emotions?

Summary and Conclusion

Students are not only faced with challenges in an every changing world but also lack the strategies to increase levels of self-efficacy. This mix-methods quasi-experimental study attempted to explore the impact of using reflection as a tool to increase self-efficacy in graduate design students. Exploration occurred and self-efficacy directionally decreased over the course of the semester, possibly confronted with new mindsets causing doubt and insecurity to surface (Shoffner, 2009).

The study also set out to examine how various reflective writing prompts impacted the level of reflection of graduate design students. Reflection provided an avenue for students to examine their connection in that ever changing world and start to build their perceptions of self and in the context of their professions. As analyzed by the REFLECT rubric, results indicated that the reflection-on-action writing strategy produced the highest level of reflection in graduate design students. Some participants challenged their beliefs in light of new perspectives, resulting in changed perceptions and growth. Others maintained a consistent view of their definitions of design, instruction, and themselves as a designer. Those who challenged their current thinking reached higher levels of reflection.

In both instances, insights were uncovered to contribute to the body of literature in relation to reflection and self-efficacy. Guided by social cognitive theory and constructivism, the preceding chapters provided a comprehensive view of the collection, analysis, and results of both quantitative and qualitative data sets over a course of two semesters. The study itself provided an opportunity to develop new meanings based on evaluating change in self-efficacy, reflection, and the relationship between the two.

APPENDIX A

Email Letter of Consent

Dear [Student Name]:

My name is Christina Chateauvert and I am a PhD candidate at Wayne State University. I have recently received approval of my dissertation proposal – A Quasi-Experimental Research Study Examining the Impact of Reflection on Self-Efficacy in Graduate Design Students. I am writing to ask you to consider participating in my research study to examine self-efficacy through reflection.

In this research study, I am looking at the development of self-efficacy of instructional designers and the use of reflection. Reflection provides an avenue for students to explore their relationship with the changing world and to start to build on their perceptions of self and in the context of their professionals; their professional identity. This study examines how instructional design graduate students can use reflective practices to develop self-efficacy, particularly within the reflection-on-action, reflection-in-action, and reflection-on-reflection framework.

If you agree to take part in this research study, you will be asked to:
- Sign and complete the attached research informed consent form.
- Complete a background/demographic online survey questionnaire, which will take approximately 5 minutes.
- Complete an 18-item cognitive online questionnaire, which will take approximately 10 minutes.
- Throughout the course of the semester, complete a six 8-item online questionnaire relating to self-efficacy, which will take approximately 10 minutes each time.
- Upon completion of the course and **after final grades have been submitted**, you will provide the researcher access to your online digital journal.
- The instructor will download and save your online reflection journals removing ALL identifying information that connects you to your responses.
- Once the journals are analyzed with three months, the journal word documents will be destroyed.

The rationale behind this proposed study emerged during the review of literature. There is a gap in the literature in relation to studies focusing on both self-efficacy and reflection. Your help in exploring the relationship between the two can prove beneficial to faculty members and instructional designers in supporting students in the development of their self-efficacy and in designing reflective practices.

Thank you for you considering my request.

Christina Chateauvert

Research Informed Consent Form

Title of Study: A Quasi-Experimental Research Study Examining the Impact of Reflection on Self-Efficacy in Graduate Design Students

Principal Investigator (PI):   Christina Chateauvert
        Wayne State University – College of Education
        Instructional Technology
        586.413.3776
        christinachateau@gmail.com

Purpose
You are being asked to participant in a research study to explore the impact of using reflection as a tool to increase self-efficacy in graduate design students. The goal is to examine how various reflective writing prompts impact the level of self-efficacy and reflection level of the graduate design students. The study will address the following research questions:
Q1. What impact does reflective practice have on the self-efficacy in graduate design students?
Q2: What reflective writing prompt strategy has a greater impact on self-efficacy in graduate design students?
Q3: What type of reflective writing prompt strategy has a greater impact on the reflection level of graduate design students?

This study is being conducted at Wayne State University. Please read this form and ask any questions you may have before agreeing to be in the study.

Study Procedures
If you agree to take part in this research study, you will be asked to:
- Meet with me (either in person, via phone, or online) for approximately15 minutes to launch the study.
- Complete a background/demographic online survey questionnaire, which will take approximately 5 minutes.
- Complete an 18-item cognitive online questionnaire, which will take approximately 10 minutes.
- Complete an 8-item online questionnaire relating to self-efficacy, which will take approximately 10 minutes each time.
- Respond to reflection questions assigned in class.
- Complete an 8-time online questionnaire relating to self-efficacy.
- Activities 4 through 6 will be repeated during week 9 and week 15 over the course of the semester as well.

Benefits
As a participant in this research study, there may be no direct benefit for you; however, information from this study may benefit other people now or in the future.

Risks
There are no known risks at this time to participation in this study.

Costs
Participation in this study will be of no cost to you.

Compensation
You will not be paid for taking part in this study.

Confidentiality
All information collected about you during the course of this study will be kept confidential to the extent permitted by law. You will be identified in the research records by a code name or number. Information that identifies you personally will not be released without your written permission. However, the study sponsor, the Institutional Review Board (IRB) at Wayne State University, or federal agencies with appropriate regulatory oversight [e.g., Food and Drug Administration (FDA), Office for Human Research Protections (OHRP), Office of Civil Rights (OCR), etc.) may review your records.
When the results of this research are published or discussed in conferences, no information will be included that would reveal your identity.

Voluntary Participation/Withdrawal
Taking part in this study is voluntary. You have the right to choose not to take part in this study. You are free to only answer questions that you want to answer. You are free to withdraw from participation in this study at any time. Your decisions will not change any present or future relationship with Wayne State University or its affiliates, or other services you are entitled to receive.

The data that you provide may be collected and used by Survey Monkey or Google Forms as per its privacy agreement. Additionally, participation in this research is for residents of the United States over the age of 18; if you are not a resident of the United States and/or under the age of 18, please do not complete this survey.

Questions
If you have any questions about this study now or in the future, you may contact Christina Chateauvert or one of her research team members at the following phone number 586.413.3776. If you have questions or concerns about your rights as a research participant, the Chair of the Institutional Review Board can be contacted at (313) 577-1628. If you are unable to contact the research staff, or if you want to talk to someone other than the research staff, you may also call (313) 577-1628 to ask questions or voice concerns or complaints.

Consent to Participate in a Research Study

To voluntarily agree to take part in this study, you must sign on the line below. If you choose to take part in this study you may withdraw at any time. You are not giving up any of your legal rights by signing this form. Your signature below indicates that you have read, or had read to you, this entire consent form, including the risks and benefits, and have had all of your questions answered. You will be given a copy of this consent form.

_____   _____
Signature of participant   Date

_____   _____
Printed name of participant   Time

_____   _____
Signature of person obtaining consent   Date

_____   _____
Printed name of person obtaining consent   Time

Use of Direct Quotes

In this study, I may use direct quotes from participants. By signing below, you recognize and allow me to use direct quotes, while keeping your identity confidential.

_____   _____
Participant Signature   Date

APPENDIX B

Background Survey Questions

Question	Answer Options
What is your age?	18-22 23-27 28-32 33-37 38-42 43-47 47+
What is your gender?	Male Female
How many dependents do you claim in your federal taxes?	0 1 2 3 More than 3
Are you currently employed?	Yes No
If yes, how many hours per week?	Full time (40+ hours per week) Part time (less than 40 hours per week) Not working
How many total classes are you enrolled in this semester?	
Is this your first year in the graduate program at Wayne State University?	Yes No
Which Instructional Technology degree program are you enrolled in?	Masters Doctoral
Do you already have a master's degree?	Yes No
If yes, in what field?	

APPENDIX C

Researcher Journal Reflection Prompts

During the study:

- Describe the phase or event of the research study in details.

- What was significant about this phase or event?

- How did it tie into your overall research study?

- What underlying issues or challenges appeared?

- How will you deal with or overcome these issues going forward?

- What insights have you made so far?

- How are you discovering them?

- How will influence future research decisions?

- Provide any additional thoughts that surfaced during this phase or event.

End of the study:

- What was your favorite part of the study?

- What do you feel is your strength?

- What would you have done differently?

- What do you want to learn more about?

- How has this shaped you as a researcher?

- What actions will you take to continue to develop as a researcher?

APPENDIX D

REFLECT Rubric (Wald et al., 2012)

	Level				Axis II for critical reflection	
Criterion	**Habitual action (Nonreflective)**	**Thoughtful action or introspection**	**Reflection**	**Critical reflection**	**Transformative reflection and learning**	**Confirmatory learning**
Writing spectrum	Superficial descriptive writing approach (fact reporting, vague impressions) without reflection or introspection	Elaborated descriptive writing approach and impressions without reflection	Movement beyond reporting or descriptive writing to reflecting (i.e., attempting to understand, question, or analyze the event)	Exploration and critique of assumptions, values, beliefs, and/or biases, and the consequences of action (present and future)	Frames of reference or meaning structures are transformed. Requires critical reflection Integration of new learning into one's identity, informing future perceptions, emotions, attitudes, insights, meanings, and actions. Conveys a clear sense of a breakthrough	Frames of reference or meaning structures are confirmed. Requires critical reflection
Presence	Sense of writer being partially present	Sense of writer being partially present	Sense of writer being largely or fully present	Sense of writer being fully present		
Description of conflict or disorienting dilemma	No description of the disorienting dilemma, conflict, challenge, or issue of concern	Absent or weak description of the disorienting dilemma, conflict, challenge, or issue of concern	Description of the disorienting dilemma, conflict, challenge, or issue of concern	Full description of the disorienting dilemma, conflict, challenge, or issue of concern that includes multiple perspectives, exploring alternative explanations, and challenging assumptions		
Attending to emotions	Little or no recognition or attention to emotions	Recognition but no exploration or attention to emotions	Recognition, exploration, and attention to emotions	Recognition, exploration, attention to emotions, and gain of emotional insight		
Analysis and meaning making	No analysis or meaning making	Little or unclear analysis or meaning making	Some analysis and meaning making	Comprehensive analysis and meaning making		
Optional minor criterion: Attention to assignment (when relevant)	Poorly addresses the assignment question and does not provide a compelling rationale for choosing an alternative	Partial or unclear addressing of assignment question; does not provide a compelling rationale for choosing an alternative	Clearly answers the assignment question or, if relevant, provides a compelling rationale for choosing an alternative	Clearly answers the assignment question or, if relevant provides a compelling rationale for choosing an alternative		

Presence Criterion: The reflection levels HA and TA are the same; TA was used as the lowest level of reflection.

Presence Criterion: The reflection levels R and CR are also not mutually exclusive. I adjusted the description for R to be: Sense of writer being largely present. This eliminated the overlap between the two levels.

Note: Axis II for critical reflection and Attention to assignment criterion were not in scope for this research study.

APPENDIX E

Winter 2016 NGSE Scores

Question	ID	Survey #1	Survey #2	Survey #3	Survey #4	Survey #5	Survey #6
1	002	5	4	5	5	5	5
1	003	4	4	4	5	4	5
1	004	4	5	4	4	3	5
1	006	5	5		5	5	5
1	014	5	4	4	5	4	4
1	015	4	4	4	5	5	5
1	016	5	4	4	4	4	5
2	002	5	5	5	5	5	5
2	003	4	4	4	5	4	4
2	004	2	4	3	3	3	3
2	006	5	5		5	5	5
2	014	4	4	4	4	4	4
2	015	4	4	4	5	5	5
2	016	4	5	4	4	4	4
3	002	5	5	5	5	5	5
3	003	5	4	4	5	5	5
3	004	4	4	4	5	4	5
3	006	5	5		5	5	5
3	014	5	4	4	4	4	4
3	015	5	5	4	5	5	5
3	016	4	5	4	4	4	4
4	002	5	5	5	5	5	5
4	003	4	5	4	5	4	5
4	004	3	5	3	5	3	3
4	006	5	5		5	5	5
4	014	4	4	3	4	4	4
4	015	5	5	5	5	5	5
4	016	5	5	5	5	5	5
5	002	5	5	5	5	5	5
5	003	4	4	4	5	5	5
5	004	4	4	4	4	3	5
5	006	5	5		5	5	5
5	014	4	4	4	4	4	4
5	015	4	5	5	5	5	5
5	016	4	4	4	4	4	4
6	002	5	5	5	5	5	5
6	003	5	5	4	4	5	4
6	004	5	4	4	5	3	5
6	006	5	5		5	5	5

Question	ID	Survey #1	Survey #2	Survey #3	Survey #4	Survey #5	Survey #6
6	014	4	4	4	5	4	4
6	015	4	5	4	5	5	5
6	016	5	4	5	4	5	5
7	002	5	4	5	5	5	5
7	003	4	4	4	4	3	4
7	004	5	5	4	5	5	5
7	006	5	4		5	5	5
7	014	4	4	4	4	4	4
7	015	4	4	4	4	4	5
7	016	5	5	5	5	4	5
8	002	5	5	5	5	5	5
8	003	4	5	3	4	4	4
8	004	4	3	3	4	3	3
8	006	5	4		5	5	5
8	014	4	4	4	4	4	4
8	015	4	4	4	4	4	5
8	016	4	4	4	4	4	4

APPENDIX F

Fall 2016 NGSE Scores

Question	ID	Survey #1	Survey #2	Survey #3	Survey #4	Survey #5	Survey #6
1	001	5	5	4	4	5	5
1	005	5	4	4	4	4	4
1	007	5	4	4	5	4	4
1	008	4	3	4	4	5	3
1	009	4	4	4	5	4	4
1	011	5	4	4	4	5	5
1	012	5	5	5	5		5
1	013	5	4	5	4	5	5
1	017	5	4	4	4	5	5
1	018	5	4	5	5	5	5
1	019	4	4	5	4	5	4
1	020	5	5	4	4	4	5
2	001	4	4	4	4	4	4
2	005	5	4	4	4	4	4
2	007	5	4	4	5	4	4
2	008	4	3	4	4	5	3
2	009	4	4	4	4	4	4
2	011	4	4	4	4	5	5
2	012	5	4	4	5		5
2	013	4	4	4	4	4	4
2	017	5	4	4	4	4	5
2	018	5	4	5	5	5	5
2	019	4	3	4	3	4	4
2	020	4	5	5	4	4	4
3	001	5	5	5	4	4	5
3	005	5	4	4	4	4	4
3	007	5	4	4	4	4	4
3	008	4	3	4	4	5	3
3	009	4	4	4	4	4	4
3	011	5	4	5	5	5	5
3	012	5	5	5	5		5
3	013	4	4	4	5	4	4
3	017	5	4	4	5	5	5
3	018	5	5	5	5	5	5
3	019	4	4	4	3	4	4
3	020	5	5	5	5	5	5
4	001	4	4	4	4	4	4
4	005	5	4	4	4	4	4
4	007	4	4	4	4	4	4

Question	ID	Survey #1	Survey #2	Survey #3	Survey #4	Survey #5	Survey #6
4	008	4	3	4	4	5	3
4	009	4	4	4	4	4	4
4	011	5	4	5	5	5	5
4	012	5	5	4	5		5
4	013	4	5	5	4	4	5
4	017	5	4	4	4	5	5
4	018	5	5	5	5	5	5
4	019	4	4	3	3	4	4
4	020	5	4	4	4	4	5
5	001	4	4	4	4	4	4
5	005	4	4	4	4	4	4
5	007	5	4	4	4	4	4
5	008	4	3	4	4	5	3
5	009	4	4	4	4	4	4
5	011	4	4	4	4	5	5
5	012	5	5	5	5		5
5	013	4	4	5	4	4	5
5	017	5	4	5	4	5	5
5	018	5	5	5	5	5	5
5	019	4	4	4	4	4	4
5	020	5	5	4	4	4	4
6	001	4	4	3	3	3	4
6	005	5	4	4	4	4	4
6	007	5	4	4	4	4	4
6	008	4	3	4	4	5	3
6	009	4	4	4	4	4	4
6	011	5	4	5	4	5	5
6	012	5	5	5	5		5
6	013	4	4	4	4	5	4
6	017	5	5	5	5	5	5
6	018	5	4	5	5	5	5
6	019	4	2	5	4	5	4
6	020	4	4	4	4	4	4
7	001	4	3	3	3	3	4
7	005	5	4	4	4	4	4
7	007	4	4	4	4	4	4
7	008	4	2	4	4	5	3
7	009	4	4	4	4	4	4
7	011	4	4	4	3	5	5
7	012	4	5	5	5		5
7	013	4	4	4	5	4	5
7	017	4	5	5	5	5	5
7	018	5	5	5	5	5	5

Question	ID	Survey #1	Survey #2	Survey #3	Survey #4	Survey #5	Survey #6
7	019	4	3	4	4	5	4
7	020	4	4	3	4	4	4
8	001	5	4	4	4	3	4
8	005	5	4	4	4	4	4
8	007	5	4	4	4	4	4
8	008	4	3	4	4	5	3
8	009	4	4	4	4	4	4
8	011	5	4	4	4	5	5
8	012	5	5	5	5		5
8	013	4	4	4	4	4	5
8	017	5	4	5	5	5	5
8	018	5	5	5	5	5	5
8	019	4	3	5	4	5	4
8	020	4	4	3	4	4	4

APPENDIX G

Winter 2016 Reflection Journal Entries

Question 1.1: According to Cross – "Everyone can and does design. We all design when we plan for something new to happen." Describe in detail a time when you designed something. How (if appropriate) was it – effective, efficient, creative, imaginative, and/or stimulating? Describe how it feels to design?

[Participant 2] I completely agree with this quote and can think of a personal experience recently where this rings true. As a teacher, most are aware of the shortcomings and budget cuts which come along with the territory. We've run out of money for paper, copiers, we do not have enough computers, etc., etc.. I was faced with the problem of creating a class for my students but not having the resources needed to effectively complete this task. I decided to design a hybrid course section for all of my classes. I am by no means a tech savvy person, I am frankly intimidated by technology. I decided to use Google Classroom, which no one else had done yet in our district. I found it was easy to use and apply, which gave me confidence to continue to grow this idea. I became a hands on designer with this tool; I discovered the Google apps, I dug deeper to make a more dynamic class for my students. I went from a paper-pen-lecture class to a system where students had greater autonomy and the ability to manage their time my classroom was dynamic. They could find links to resources that I would not have had the ability to present in the, "traditional" classroom. I was inspired by this and decided to facilitate this district-wide. I am still learning but it has been greatly empowering to impact others positively and to remove barriers through this new approach. I found this experience to change my mindset entirely. Problems become challenges now, how can I help this person do that, what can we do different and utilize outside of the box thinking to promote positive changes.

[Participant 3] I seem to always find myself designing something. A poster, a sign, a kitchen, a LibGuide, etc. I enjoy the process of collaborating on design too. To riff on what someone else starts and watching an idea blossom if quite fun. The marketing committee decided to hold a contest called *Project Library: Upcycled Art Challenge*. It is a play on Project Runway. I volunteered to create the logo and signs. I looked at the logo for that show as a basis to create something recognizable yet unique to our event.

Using similar fonts and the positive/negative space I effectively created a logo that one can associate with the TV show. At first I had the Upcycled Art Challenge to the right of the first line, creating a long banner like logo. The book was at the end on the right (and it was reversed), but it didn't feel balanced. I also spoke to some people on the committee for feedback. That was when someone suggested placing the "Upcycled Art Challenge" on the second line [removed image of logo]. It seems like an obvious answer, yet I was stuck looking at it another way and didn't see the solution on my own. Then I kept rearranging the pieces until it all felt right. I don't know how else to describe it.

The design process is very much like a rollercoaster. When I'm frustrated it can be easy for me to be hard on myself and critical of my talent. I kind of have to talk myself off the ledge and remind myself that it is a part of the process and I need to push through and come up with a

solution. I miss design when it is not an active part of my life. I relish the challenge of designing. It feeds me in a way that nothing else does.

[Participant 4] I have designed three kitchen renovations in three different homes. I loved planning every detail, from the architectural layouts, picking out cabinets and flooring and even designing where the electrical outlets should be. These designs were all of the above- effective, efficient, creative, imaginative and/or stimulating. Designing a home is literally complicated and messy-dust everywhere. By the third renovation I moved out of my home. The most frustrating design is the poor efficiency where the heating vents went. They are located under a cabinet and do not circulate well. I reflected on each renovation and really counted on the expertise if the contractor to address my uncertainty, which overall they did. I never systemically applied any formal process such As ADDIE in any area of my designs. ADDIE seems logical and something to think about going forward.

[Participant 6] The course I teach in our PA program is a procedures course. It is a broad and general three semester course where students learn a variety of procedures based on our accreditation standards. The first few years I taught this course I replicated what had historically been done. One particular objective in this course dealt with learning all of the basic surgical instruments. The first two years I taught it the way it had always been taught, by giving an elementary I realized that looking at pictures is not the same as feeling the actual instruments in your hands. I was able to purchase a teaching toolbox that contained examples of the most common surgical instruments. I composed a lecture describing what each instrument is used for and included pictures of each instrument being used. Students were also able to handle each instrument. I developed a practical exam that was taken at the end of the semester. I laid each instrument out on a table. Each instrument had several questions. For instance, I laid out three different scalpels. I asked what number each scalpel was as well as which scalpel was the most commonly used to drain an abscess. I also asked students to use their telephones to take a picture of their hand holding certain instruments the proper way. When they turned their test in, I looked at each picture and marked on their exam if they were correct. I believe this design of presenting the material and testing the students was far more effective than distributing a powerpoint of pictures and administering a matching exam. This new way of teaching surgical instrumentation was creative and imaginative. It is exhausting and time consuming to design this project but ultimately satisfying and rewarding to implement a successful design.

[Participant 14] When I worked in Residence Life, part of my job description was to plan for (design) Resident Advisor training each summer and winter. The summer training process is a very intensive two week time period in which the professional staff attempts to give the student-staff, both new and returning the tools and knowledge they need to do their job effectively and correctly. The process I undertook for designing this training was really a year long process. Essentially as soon as summer training ended, I would collect the evaluations that had been done of that training and start reviewing what could be done better for the following summer. As we went through the selection process in February and built our staff's for the following year we were taking notes of areas of weakness and strengths that should be addressed in the training during the summer. I also solicited feedback from my colleagues, my bosses and the student staff members who had previously participated in the training process to determine what improvements and changes could be made. On top of the standard topics for inclusion (what

does it mean to be an RA, staff meetings, discussion of protocol, etc.) there were also issues facing campus that needed to be included and addressed. I always felt that that more feedback and buy-in I got from the returning student staff, the stronger the process would be. There were decisions to be made regarding the schedule, the order of the training sessions, even the food. The process was always at times stressful, invigorating, thought-provoking and caused me to reflect on what we as a department were doing and whether we were providing our student staff with the tools to succeed. I always felt the pressure of making sure we were being cognizant of the abilities of our professional and student staff to manage an intense time, so building in times that served as breaks was important. To me, the design of the training was what allowed it to succeed or fail and I took that responsibility very seriously.

[Participant 15] Having been a teacher, I spent a lot of time designing ways for my students to engage, participate, and demonstrate understanding of whatever topic we were studying. For a master's class, I had to design a reading intervention specifically for one student from start to finish based solely on three assessments. At the time, I was not teaching reading to my class (we leveled the elementary students according to reading ability, and my group was the novice readers which meant my third grade students were not with me), but I decided to do the project with one of my homeroom students.

I knew that I had to do assessments for the project, but I also wanted to truly see how his phonemic awareness was developing. After having done the assessments, I thought that I had learned enough to be able to design an intervention that would specifically target the areas where he was struggling. I spent a few weeks going through the different steps that the course outlined for me, and then it was time to actually do the intervention. As I was going through this process, I started to feel as though there was no way that I would be able to successfully design an intervention based on such little background about the specific needs of my student.

Sitting down with this student for the first session made it very clear to me that I did not know nearly enough about him as a reader to be able to design an effective intervention. I should have known better, as an experienced teacher, that anything that I put together for this student would have to be fluid and that trying to "solve the problem" from start to finish with such little assessment was setting myself up for disaster. Unfortunately, the project stated that we needed to complete all of the previously submitted interventions with student artifacts, so it was not able to be a fluid project.

The entire thing was incredibly frustrating because I realized early on, that the project layout, and the design process, did not reflect how I normally taught my students. I would have an idea about what I would want to do, but then that would always morph into something different as I started working with my students. I was unable to do that with this specific intervention that I designed. Not only did I feel like I wasted my time creating something that was not effective at all, but I felt like I could have done something far more effective for my student. It did provide time for us to work one on one together, but had it been a fluid intervention, he would have potentially gained a lot more from the experience.

[Participant 16] I come from a creative background; my bachelors degree is in Music. I've been creating things for as long as I can remember, be it music, art or simple crafts (I'm frequently

"commissioned" to design and create various themed decorative wreaths and other art projects). More recently, I'm blending my music background with my aptitude for design as a worship leader at a church for which I direct music. The last few years have been ones where change in worship delivery and design have become regular requests from leaders in the church. The goal of worship redesign has not been to bring seemingly "archaic" church traditions to the 21st century, but to bring meaning back to the worship experience.

To begin the process, a team evaluated their worship experience and invited other parishioners to share their thoughts - where they were connecting and where they were feeling lost or disconnected. We discovered many things through this time: transitions caused distractions, many parts of worship no longer had meaning or historical context as backdrops, excellence was not a goal, and we placed a large burden of the responsibilities on one or two leaders. We used this knowledge to craft an experience to honor church tradition, as well as adjust/provide context to unfamiliar traditions. We also began rehearsing transitions and parts of worship in order to create a culture of excellence - not a "it was good enough for church" excellence, but a "we just created a meaningful experience for ALL worshipers" excellence. As a team, we each took on different transitional responsibilities, so as not to place all the responsibilities on the pastor.

The process has been ongoing, as design usually is; we make time to evaluate worship every few months or so to make sure we are creating a place for worship that reaches the traditionalists, the families, and the younger crowd. We also purposely differentiate worship for the way individuals engage. The ongoing evaluation of and re-design of worship has been thrilling. It has allowed us to step outside the box for "special" services like Ash Wednesday, Maundy Thursday, Easter, Christmas, etc., to truly make a space where parishioners connect to the meaning of each time of year. We are crafting experiences where one can stand in awe of the babe sent by God to save the lives of many. It's amazing to watch even the gruffest of old men tear up in the realization of such a sacrifice, simply because a team of designers desired to get to the heart of the worship experience.

Question 1.2: Describe a time when you felt totally uncertain. Try to remember how that felt and the greatest challenge you faced because of the uncertainty. What did you do to handle it? Knowing that part of being a designer is always dealing with uncertainty, how do you feel about being a designer?

[Participant 2] My career is my joy and my passion, but in recent years it has been the one space in my life which has left me the most uncertain. Cuts, budget cuts, and the likes often keep us wondering will there be a class for me next year? I find myself having to reinvent the wheel, often. Challenges that go along with this territory vary from will I be able to meet the needs of my students; will they get the best that I can offer, to will I be able to afford my home with yet another pay cut, will I have time for a second job, will I ever be able to go back to school and continue to learn and grow? First and foremost, I believe in mindset, growth mindset and looking at what problems I have as roadblocks or bumps, not permanent stops. I have lived in the uncertain now for a few years, I played it safe and waited it out. The past year I felt it was time to make a change, to pursue that degree and to move forward through this space. I am excited about design because it seems to be contradictory to my prior beliefs, it offers progressive thought.

When designing you are working for improvement in every sense, it is change in its most natural state.

[Participant 3] In November I changed positions in the library. I moved from a creative and busy position at night to a quite and very structured position in the cataloging department during the day. For at least a month after starting the position, I constantly questioned the sanity of my choice. This position challenged me because I had to learn so much. I wanted to give up. I'm older and I wasn't sure that my memory could hold everything that was coming my way. I've dug in and done all I can to learn the areas where I have weaknesses. Then the week before christmas I happened to talk with two co-workers about what I was feeling. They both said that it really takes a great deal of time to feel comfortable in the position. They also assured me that some of what I was feeling was the way my boss explained things (overly complicated). This made me relax more and as a result my brain function was much better. Slowly I am feeling more comfortable with my choice.Now that we suddenly have 3 children living with us I'm pretty sure the universe knew what was in store and nudged me in this direction. I go to court on Thursday for permanent custody of [removed names of children]. I think my life will be much more filled with uncertainty as I become responsible for three young lives.

Uncertainty comes for me at two times in the design process. The first is at the very beginning, when staring at the proverbial blank page. The second comes about a third of the way into the design process when I second guess myself, or judge myself. My husband calls this my inner judge. When I begin to be derisive in my inner commentary of my designs I have to remind myself that it almost always works out better when I push my inner judge aside, relax and trust my instincts.

[Participant 4] Last year in three month's time, I designed a wedding for [removed daughter and son-in-law names] my daughter and now son-in-law. In my Jewish Orthodox faith, weddings take place as soon as possible after the engagement. I was more uncertain than certain about nearly every facet of designing this event, except their union. Having an intuitive sense that she was marrying the right young man gave me some grounding.
The greatest challenge I faced was wanting to choke like- a –chicken [removed groom's name] mother and husband. My husband died suddenly October 2014, so I had limited people who could truly understand the challenges of designing this wedding from the needs of my family and our ideas and budget. And, combining this endeavor with a new family of whom I had next to no interaction was difficult.

One of the things I did to alleviate much of the planning was I hired an event planner, more as buffer between the families. The event planner did try to upgrade my designs, however I was pretty true to my budget. This was a very big help. Overall, the wedding was fabulous. One of my core designs was to exude joy. This was contagious and the feedback was a "very joyful occasion." I really like designing. I currently design several communal projects, and am forever designing and re-designing different areas in my home, as mentioned in question #2.

[Participant 6] I currently have a situation that initially made me feel totally uncertain. My PA program is expanding. We have asked for increased enrollment from our accreditors. The university has agreed to build a new wing in our current building to house the PA program. I

was tasked to work with our university's facilities department and an outside architect firm to design the space. My first reaction to this was that I had no idea how to design our classrooms and lab spaces and I wanted to collaborate with the faculty as a whole. However, I was asked to work independently with facilities and the architects. I felt completely uncertain on many levels. I was being asked to design a space where all faculty could effectively teach their courses. The first step I took was to research spaces at other PA programs. I was able to visit WSU's PA program and EMU's PA program to get a sense of other ways to design PA program space. I was looking for alternative models to what we already had in our college. I spoke with my faculty about what they would want in a space and then put this all together in a report to share with the architects. We collaborated for several months and together developed a state of the art PA space. I became more confident and less uncertain with every meeting. This has been a good learning experience and makes me excited to be a designer. I learned that uncertainty is not a bad thing. In fact, uncertainty helped this project into a state of the art facility and gave me the confidence to not be afraid to try new things.

[Participant 14] I felt uncertain at the end of 2014 when I lost my job due an illness I was dealing with. I was uncertain when I would feel healthy again and therefore employable, but also would I find a job again in higher education, utilizing my skills and abilities in the metro Detroit area that I love so much. I felt partly depressed, partly energized due to the changes, and fully supported by my friends and family who probably knew better than I that I would end up where I needed to be. In order to handle the situation, I was doing the things that my doctors advised me to do to handle my health problems, I was actively applying to any and all jobs that came close to meeting the criteria I had for employment and I was also allowing myself to reasonably enjoy my life by spending time with those closest to me. I resolved that I would make the best of the circumstances and would do what I could to address what was in my control and attempt to not obsess about that which I could not control. I am happy to say that by February 2015, my health issues had been resolved and I had been hired to work at Wayne State as [removed title of role]. Had I not gone through the experiences I did, I wouldn't appreciate what I have now in terms of stability in my professional and personal life.

In regards to that fact that uncertainty is a fundamental part of being a designer, that to me is a part of any job I have ever had or most aspects of my life. There is always going to be parameters within which you are attempting to solve a problem or change a process, but there are always going to be unknown factors. I will likely go back to what I wrote above, I will strive to focus on those elements which I can control, knowing that there are some that I can't control. This will not be a perfect system and knowing myself there will be moments of stress, but I have found in my moments and times of stress, I can do amazingly productive things.

[Participant 15] A time recently that I felt totally uncertain was when I made the decision to leave teaching and move into the business world. I knew that I did not want to teach anymore, but I didn't know exactly what I wanted to do. After a casual conversation about my frustration turned into job interviews and a job offer, I had to tell my principal that I was leaving the school. He told me that I was a natural teacher and that I was making a huge mistake, while all of my friends and family members were supportive of my decision. I felt totally lost in my decision, but I know in life that there are no real wrong decisions. If you make one decision and it doesn't turn out the way that you want, you can always make another. Knowing myself, I knew that if I let

the opportunity pass, that I would always question my choice.

That choice was almost two years ago, and I have not looked back once. Even though I was incredibly scared that I was potentially making the wrong choice, I am glad that I followed through with what I thought was best for me.

I think that you have to be willing to be flexible to be able to be a designer. What you start out thinking will be the best solution, may not have anything to do with the final product, and that is totally okay. I wanted to be a teacher my entire life, and at age 30, I am no longer in a classroom, and that is okay too. Everything in life is about give and take and compromise, and I think design is exactly that way. I think that keeps things exciting!

[Participant 16] Would it be too general to say that *Uncertainty* could be the title of my life story? I think anyone can relate to the uncertainty of adapting to and adjusting any of life's challenges. To identify a time when I truly felt uncertain is daunting, to say the least. And, quite frankly, requiring me to be a bit on the vulnerable side (thankfully this is a closed journal!).

The most uncertain time in my life would have to be the entire time I was in undergrad, majoring in music. The thought of specializing in a field (I hesitate to use career here - one of the many reasons for the feeling of uncertainty) that basically said, "if you're not the best, you're nothing," was a source of immense anxiety. Add to that the requirement that I stood in front of a literal jury of my peers once a month, completely exposed - as all music does to musicians - and you have a recipe for understandable second guessing, self doubt, and worthless feelings. I found it hard to believe I would be a good enough musician to be able to make in the world, let alone find the energy to actually begin the process by practicing.

Thankfully, it was also my peers (along with my family), who were the most supportive and biggest champions of my success. Even in my failures (and eventual career change), the most important people in my life saw my choice to pursue music as a no-brainer and supported me through the long practice sessions, late rehearsal and strange hours. They reminded me that I am my own worst critic - I have, and always will be, the most critical person when it comes to my decisions because of the "what ifs."

I will say that, although still I get some anxiety over the thought of standing in front of my peers to perform Mozart's clarinet concerto because of the uncertainty of how it will be received, the experience taught me to make any "uncertain" experience mine. If I know I approached a problem or situation with my best - with excellence, as we call it on our worship design team - I can be confident and proud of the product, even if it isn't always received with enthusiasm.

Question 3.1: Are you a Gordon Murray or a Kenneth Grange designer? Why? Which would you like to be as you ultimately develop as a designer? Why?

[Participant 2] It is difficult for me to choose one of these designers as I see myself in both of their styles. If I had to think of who would be my ultimate developer it would likely be Kenneth Grange. I feel that Grange desires to design beginning with the end in mind. Much like the

sewing machine project, he looked at it, used the machine and figured out very quickly what the user would encounter and how that would affect and impact his design. I believe his, "design to please" would likely be similar to my own approach. His ability to modify and improve an existing design parallels my motivations. When I think of what he did with the high speed train where he met the client's needs and gave them an even better product that they had never envisioned, would likely be similar to my design style. I have tendencies which are similar to Murray, such as the pressure under fire and I like his analogy to design deadlines and regulations in terms of warfare, but in the end I would be more of a Grange fit.

[Participant 3] I believe I'm more like Kenneth Grange. I'm good at taking a step back and seeing the whole picture. I can look at a process and see where the pinch points may be and offer creative solutions. I have learned that I find personal satisfaction when something I do or create becomes useful in helping others. I recently changed jobs at my library. I was working nights in a service oriented position as a tech. A day position opened up as an assistant in the cataloging department. While I do a good job and complete my work, I'm finding less personal satisfaction.

I wish I could be more like Gordon Murray in the way he takes creative risks. I feel that I have so many people depending on me that I cannot afford to take the risks. With the risks there will be a greater chance of failure and thus may lose my ability to provide for the family. I've seen what has happened as my husband has taken risks. We have survived them, but because of them our credit has been affected.

[Participant 4] I am more of Kenneth Grange designer. The little that I know about design thinking seems to intuitively line up with Grange's characteristics and methods. I can relate to his way of design thinking that product usability in distinctive, practical ways is his priority. Also, I agree with Grange's style that designing things should be a pleasurable experience and that he looks at the whole project. Lastly, I am mostly a kinesthetic learner. I learn best and believe that learning and teaching comes from mostly from "doing" and modeling-same as the Abby Carlin binder to guide the hands-on learning experience.

As I develop as a designer, as Grange writes, I would like to develop how to recognize the before, during and after processes of design and how they affect each other. In other words I would like to better understand the difference between fundamental evaluation and assessment and how to prioritize these parts of any design project. I knew that the Abby Carlin new workers needed to actually work on the machines, to learn best, but I shifted the priority to safety - I let my jaded experience residing in the back of my mind, focus on safety take precedence rather than function, which clouded my creativity.

[Participant 6] I think I am a Gordon Murray designer. When I read about his accomplishments and how he progressed through his design projects I feel inspired. I think we share similar characteristics of being competitive and driven and not afraid of failure, knowing that sometimes we cannot progress until we fail. I believe that he is designing for performance. When I am designing the course I teach (diagnostic and therapeutic procedures) and I am looking for ways for my students to master procedures on simulation and then quickly be proficient on live patients. I strive for my students to have mastered their procedure skills during their didactic year so that when they are doing their rotations in the healthcare setting their preceptors can

concentrate on teaching higher level skills that cannot be mastered on simulation. I think Kenneth Grange is a designer of functionality as well as cosmetic design (how a product looks). As a PA and an educator I prefer to work with students to help them perform rather than focusing on the simulators and how to make them more functional. I believe that I ultimately would like to build my designing skills to be more like Gordon Murray. It will help me be more student centered and focus on their successes by designing my course and simulation to make them more proficient as opposed to making the simulation more functional.

[Participant 14] I would describe myself as more of a Gordon Murray designer who views regulations as necessary to innovation. For me that has been in the past budget constraints when designing RA training. That has limited our options in terms of activities and resources, so that had led to me to being creative with what we can do. I have also attempted to use his principle of designing RA training like it was first time rather than my Nth to open myself to new ideas. I would like to grow to be a designer that embraces all of Murray's design principles as a designer that is able to "get an oven and bake them" when looking at problems and their potential solutions.

[Participant 15] I think that I am more of a Kenneth Grange designer honestly because I can relate more to his design process. Many of the things that were described in the Cross book, showed how Grange took something and re-designed it to make it more user friendly or to be more effective or efficient. I can often think of ways that I would be able to make something more user friendly, but I do not think that I would be as willing to start from square one in designing a product. If I think about it from an instructional standpoint, though, I do think that I would be 100% willing, ready, and able to design instruction from the ground up, as opposed to improving on something. I do think that ultimately I would want to be like Murray in that he was very willing to scrap what he was working on and start a fresh design if the constraints or regulations changed. I can imagine that a lot of designers become emotionally attached to their ideas (as Cross explains in his book), which would make people not want to do this. I have learned through the reading, and through experience, that this is sometimes necessary to do when trying to solve a problem. I often find that if I am stuck on something, if I walk away from it for a day then i have a fresh and different perspective when I come back to it. I think that this would hold true for design. Even though it does not seem like Murray will let something sit for long, he is willing and eager to find different innovative solutions.

[Participant 16] As mentioned in the last point, above, I most resonate with Grange's style of design thinking. Of course, there's a great deal to be said for following the rules of design. However, if we as designers are truly being empathetic to the eventual consumer of our "product," we should not be afraid to create outside the scope of the design specifications - especially if we can justify our design to the company. There's an element of artistry in this approach to design because, on one hand you use your empathy and creativity to appeal to the masses in your design; on the other, you cannot be afraid of rejection or related failure for not following the rules of design.

Ultimately, there are benefits to both designers' train (ha!) of thought. Gordon's competitiveness drove his 'first principles' approach. While I am perfectly content in developing a Grange-inspired approach to design, a good designer would be remiss in neglecting to develop a 'first

principles' approach to their design thinking toolbox. There are and will be many opportunities to re-think how something should be done in a world where people are no longer surprised by innovation. I'll never have the opportunity to 'wow' someone if I don't develop a back-to-the-basics approach.

Question 3.2: Describe a time when you had a sudden inspiration. What were you doing when you had this inspiration? How did you feel? Why do you think the inspiration came to you at that moment?

[Participant 2] My moment of sudden inspiration came this fall, when I was looking at a new school year and an entirely new schedule of classes to teach. At the time I was feeling incredibly frustrated and mad, I felt that I had been the result of people playing favorites and I was handed a mixed lot to do something with, just what that was I was not sure. I did not like this and was feeling pretty upset at the moment. How was I going to pull this off? With no time to prepare, no resources, I felt like I was being set up to fail. Then it hit me, I realized that if I worked a new avenue and redesigned my classes through a new medium, I would not need all of the, "traditional" methods to teach. I knew I had to do my research, find a way for all of this to work and to effectively get this plan laid out and to my students and I only had a few weeks to do it. Needless to say, I did pull it off and quite successfully. It worked out better than I had planned and continues to blossom. I believe that this inspiration came at this moment out of my mindset. I do not like to fail, it is likely my make up as someone who has always tried to overachieve. I believe my ability to regroup and take a new approach allowed for me to be inspired. As previously mentioned, I am a persevering person and competitive, I did not want to be beat at my own race. This is not the first time that this has happened in my life and likely not the last

[Participant 3] We were redesigning the layout of the workroom in my department, the Instructional Media Center. We were having difficulty trying to figure out how to make all of the existing pieces of furniture fit into the space and still make the space easy to navigate. I had measured the room and drew it to scale and created scale paper pieces to represent the furniture in the room. Everyone just assumed that the large shelving units had to stay where they had been located since anyone in the department had been working there. We were frustrated and were ready to just start eliminating some of the creative furniture we were planning to add that would improve our efficiency. I stood up and walked into the workroom and asked myself what we were missing. I started walking around the room looking up and down and thinking about how we were planning to use the space. I stopped and looked at the shelving units. A screw caught my eye. I realized that they were not one piece, but several sections. I popped out the bottom shelf using the screwdriver and saw that they were connected to each other, but did not look like they were attached to the floor. Plus there was carpet underneath. With these clues I walked back to our meeting and suggested we consider moving the shelves too. This opened up many more possibilities, including taking out a section of the shelving we really didn't need.

I felt valued as a team member that I came up with a viable solution to the problem at hand. I think I was inspired for two reasons. First, I stepped back instead of trying to shoehorn a solution. Second, I asked myself questions as I walked in the space with the problem.

[Participant 4] Just this week I had a sudden inspiration. I was sitting in my bathroom thinking how much I wanted to take a shower, but could not because I just had a non-water friendly cast put on my foot and leg-going all the way up my calf. Yikes! So while I knew I needed to either find a way to get to the medical supply store, or order on Amazon a waterproof cover for my cast, I literally thought about design. How can I design something so I could take a shower without waterlogging the cast? I think I had this moment when I did because I am in the midst of learning about design, and NEEDED a product sooner than later; I had the inspiration and now needed to figure out how to solve this problem. I attempted to think how Grange and Dorst would come up with a solution.

In short, my daughter and me used a plastic tablecloth (The kind you get at Party City for the eight foot tables), a kitchen garbage bag with a drawstring, and medical tape to design a waterproof cast cover. Mission accomplished! A shower and a dry cast.

[Participant 6] It is no secret to those that know me that I absolutely love Christmas and I am sentimental. I have ornaments from the places we've traveled, from when I was young, from when my children were little as well as ones that were passed down to me. My favorite ornaments are the glass ornaments passed down from my great grandparents. They are colorful and delicate. Each year more and more of these ornaments are breaking. How to preserve and display these ornaments has been on my mind for a long time. I looked for a display box where the bulb did not touch any of the walls. I searched the internet for storage solutions and did not find anything suitable. I tried hanging them on individual stands but they still would break. The bulbs do not break when they are hanging, they usually break in the process of transfer or in storage. Last year as I was gazing at my Christmas tree one evening I had a sudden thought of hanging each ornament in a baseball display box by fixing the hook to the ceiling of the box. I am sure finding a solution to my vintage Christmas bulb problem was on my mind more that usual that day because my mother had called me and said that while putting her Christmas tree up two of the last three vintage bulbs she had had broken. That weekend my husband and I went to Michael's to see what type of display boxes were available. The baseball display box was too small for my most treasured bulbs. We decided on a clear acrylic doll display case. We bought several, took them home, drilled tiny holes in the top and hung the ornaments. This actually worked! The display cases look good sitting on my mantel and none have broken in the past two years. Below is a picture of two of the cases [removed picture of cases].

[Participant 14] I had an inspiration this week driving to work regarding the potential topics of a conference proposal with my co-workers. We are all academic advisors working in our 1st year on the job. We have been talking about doing a presentation at an upcoming state conference about being advisors in the first year. We had only talking generally about topics so I was thinking through items that we could discuss so I had a thought that we could do a presentation on building trust in the advising relationship. I think that I had this inspiration because I was doing something that is rote (driving, although you need to concentrate, while commuting is somewhat brainless). This has been when at times I have had those "inspirational" moments in the past. That is why I think I had this one, I was able to let my brain work on this topic and not focus on something else I was doing.

[Participant 15] When I was in college, I would often find myself cleaning, going for a run, or cooking while I was trying to think of project topics or ways to approach a situation. I cannot honestly think of the exact piece of inspiration that hit me, what I was doing, or when this happened, but I know that I often thought of the thesis to a paper, or the overall conclusion of a project while doing things totally unrelated. I think that I often get stuck on one idea and if I don't give myself time away to get my mind off that idea, that I cannot move past it. I do remember one time I had a huge project to do for one of my teaching classes where I had to design a literacy unit from start to finish (even though I never had to teach it). I could pick any book to design the unit around, but it had to include certain types of activities. I love children's literature so this seemed like a daunting task for me, so I put the project off until the last minute. After a run around campus, I came back to my computer and somehow was able to produce this huge unit of study. I do not have any recollection of what the unit was about or even what book it was based on, but I remember that it just became clear while I was on my run.

[Participant 16] One of the most poignant times I can recall an experience of sudden inspiration was in my master's program. I was having a restless night in bed. All of a sudden it hit me: the topic of a major project for Introduction to Higher Education. Our task was to design and justify a program for higher education students that would encourage success and retention. It occurred to me that I should be thinking about what I struggled with as a college student – what could have prevented me from being successful? For many students – myself included – financial issues are a major barrier to completing a college degree. The result was a one-hour workshop to teach students about the best way to manage your day-to-day living and school expenses and how to avoid too much debt. I was so excited about the project I jumped right out of bed and, four hours later, had found most of the research I needed to justify my project. Who needs sleep when there's a program to design, right?

I think the reason the idea came to me because I had recently read an article for class about the immense amount of debt college students are incurring without full knowledge of how it would impact their financial future. I may have also recently been introduced to my own sticker shock, too. The key here is that I was reading current literature about the population with whom I would be working and empathizing with the plight of this generation. For me to get an "aha!" moment in the future, I think it will be extremely important to stay current on the trends in instructional technology AND the population I serve.

Question 5.1: Cross states that: "Design intelligence involves an intense reflective interaction with representations of problems and solutions." Now that we are in week 5 of this course, how are you preparing to have constant, intense reflection in your daily design activities? What will work for you to make sure this happens?

[Participant 2] I have become more and more aware of my design awareness. I still feel as though I am learning and absorbing so many new ideas and understandings of the design world. I feel that this reflection make me a better designer; I read the chapters, reflect on the journals and feedback and am consciously awared of how I approach design activities. Having read the most recent chapter in the Cross book regarding designers growth, the difference between an experienced versus a new designers view makes me alter how I view the solutions I can create for challenges which I face. In order to make this happen I am constantly re-evaluating and

reflecting in a metacognitive manner; integrating what I am learning with my scope and vision. I would view myself as a Rapid Prototype model, I am constantly analyzing and coming back as a stakeholder, client and problem solver. I feel that I am my own work in process.

[Participant 3] For me it is important to have a sketchbook with me as it allows me to think and play with ideas. I have been using my ipad to do this. I use an app called GoodNotes and I have a stylus that allows me to create with great detail. It provides me with peace of mind to know that i have a backup of my work. I also use my ipad for research. I can paste in links in with my notes. Later I can follow my links to look at inspirations or do follow-up work. Another tool I use is from the Wayne State Library. The library subscribes to BrowZine. Using this ipad or google app you can access many of the journals that the library subscribes. I can go through the lists and create virtual shelves for different topics in which I wish to stay abreast. Then when I have some free time I go to the virtual shelves and see if any of the journals on them have new issues available. I browse the table of contents and read articles of interest. I use my 30 minute ride in the car for reflection daily . I keep the radio turned off and I can let my brain wander to items of importance for the day. Creating my creative habits ensure I will keep up with these practices. Twyla Tharp wrote an excellent book called *The Creative Habit*. In it she talks about daily rituals that are the foundation on which a person can be creative. Just like a football player or dancer must exercise their muscles to stay in top form, so too must a designer. For me I participate in the challenges of marketing at our library. I volunteer for projects that will push me to solve design challenges. I also just submitted a proposal and was accepted to present at a state conference. I will be presenting an introductory session on information visualization in mid March.

[Participant 4] Design is similar to a contact sport-design demands that I bring all of my senses to my projects, and that I apply the very best of my thinking, feeling and doing for the task at hand. When an idea comes up I write it down, or send myself an email. I love design and do inherently possess design intelligence, excluding mathematical skills. Also, Cross spoke about metaphors as an integral part of ID-looking for the hidden treasure in each project. I believe there is a psychological "rush" when finding these treasures, at least for me. It feels really good to design and make new discoveries that work.

[Participant 6] This course is preparing me to have constant, intense reflection. More specifically the journal exercises and case studies presented have helped me to start developing my reflecting skills. The first few weeks of journally were very difficult for me. I was not used to this kind of thought process. In medicine, we manage our patients within the constraints of what is universally accepted and evidence based. While medicine is not always an exact science and there are usually several ways to manage a patient's health there is often little room for creativity in day to day activities. Journaling each week and taking the time to think outside the box has helped me to improve my reflecting skills. I try to now extrapolate what I am reading to examples in my everyday life. I also try to answer the questions at the end of our reading assignments in addition to our journal questions. Continuing to consistently read the assignments each day throughout the week will help with retention of material and ultimately with reflection. I try to make this happen by scheduling specific time with specific course tasks

in my calendar. I am diligent in this task because if it's not written down I often get distracted with other things.

[Participant 14] At a conference I attended this week, in as session that was discussing using analytics for improving student success, it was suggested that using design thinking to re-invent processes is extremely important. It was thrilling to me to hear "design thinking" which is what this course is all about be discussed at my student success conference. I bring this up in this question specifically because it tells me that I need to start reflecting on my processes using a design lens in my daily activities, as they are also design activities not just my "work". This is especially true as I think about how to work with new students and how to best present information to students in a way that they are likely to absorb. In order to make sure this happens, I will put some notes in my calendar to make sure I am reflecting on my activities on a daily basis.

[Participant 15] When I first started to teach, I got into a really good habit of sitting down for 5 minutes after each school day and reflecting on the lessons that I taught that day. I actually would pull out my lesson plans and make notes about what went well and what could have used some improving. I can honestly say that I never went back to look through these notes, but just the simple act of forcing myself to spend a few minutes reflecting each day helped me grow as a teacher. After my first year in a classroom, I stopped doing this as much as the reflection process became ingrained in me. Part of the reason that I loved having a little bit of a drive home was because it gave me the time I needed to reflect.

When I started my job outside of the classroom, there was less self-reflection needed, but I still found myself writing everything down. This was completely necessary for me to learn, remember, and document everything that I was doing on a daily basis. I still find, two years later, that I refer back to these notes and documentations from my first few months with the company.

Knowing how I am, I know that I will go straight back to spending a little bit of time writing down notes and reflections pertaining to my daily design projects. Even if I just take notes about my thinking or where I found inspiration, taking the time to write about my thinking trains my brain to actually do the thinking.

I have always found that I am a very reflective person, but I have always found that writing these things out helps to focus my thoughts, but also helps me to move past anything that I may be stuck on. One way that I do this is that I always have a little notebook with me. My mom is the exact same way in that she always needs to write things down so every year for Christmas she gives me little notebooks that can fit in my purse and Sharpie pens. I think that getting back into the habit of simple, yet daily, written self reflections will help to continue this.

[Participant 16] As I've mentioned before, I have the opportunity to design church worship on a regular basis. It's funny that you ask this question, as this is something our Worship Design Committee has taken deliberate steps toward improving over the last year. One thing we've found helpful - and that I plan to use in my own reflection - is celebrating wins before moving to the critical reflection. Once we've identified what worked, we move on to asking pointed questions: What didn't work? Why? What could have been done differently? How?

We do this reflection before we start our regular meetings each month, as well as ask our congregants throughout the month to provide their own reflections. As a matter of fact, since we are in a major transition period in one of our services currently, the pastor simply took a moment this morning to allow the entire service reflect on what works for them during worship. It was a strangely gratifying experience, even if some of the comments made me pause to think, "is that how they really see it?"

Personally, I use to be in the practice of journaling on a regular basis. I have thoroughly enjoyed these last few weeks of journaling for this class, even if they were prompted by required questions. I think, going forward, it will be important for me to continue the practice of journaling in order for me to truly reflect - and to track my thought process through the times of reflection. Some of my best ideas come when reflecting - I'd hate to forget them because I didn't write it down!

Question 5.2: He also states that design intelligence is NOT simply a given 'talent' or 'gift' but can be a trained and developed. How do you plan to train and develop your design intelligence?

[Participant 2] This response blends and somewhat overlaps my question one response.. I believe that being cognitive of my choices and how I approach my tasks help me to train my intelligence and to focus on my growth. It is humbling to read Cross and Spector and to reflect on what makes me, "tick" as an emerging designer. As a teacher myself, I have seen amazing talent come across my life, which never amounted to more than a flickering flame because they were overly confident and not at all coachable. I believe we all hold certain abilities which through training and education we can further develop through mindful application of training. I wrote my Master's thesis on Gardner's Theory of Multiple Intelligence and through my special education training have done extensive research on strengths and weaknesses. I often allow myself to stay aware of what my own growth factors are, and this intelligence is no different. I am a staunch believer in mindset, I thrive on learning and fresh materials, new perspectives, constructive criticism, goal setting and self-assessment. I believe this will help me to train and develop my design intelligence through continued exposure and the growth that allows for.

[Participant 3] I look for inservices that will challenge my perceptions and make me a better educator. I will be sitting in on a virtual conference on Monday and Tuesday of this week. The conference is being presented by The Pennsylvania State System of Higher Education. It is called Transforming the Teaching and Learning Environment.

[Participant 4] In order to go from novice to expert or even a visionary comes from a love of ID and practice - a lot of practice. For example, for my first year teaching was at [removed university name]. My M.A. is in Communication, however I was offered a position teaching two back-to-back very early morning English Composition classes (these were the least favored slots). I was literally thrown into a new field to teach out of my comfort zone, and I was responsible for designing my own instruction I reached out to other professors (experts and novices) for their syllabuses and best practices, viewed YouTube, Google and even called some of the professors of whom I found through their online assignments. One class at a time totally

filled with uncertainty, I taught the class by framing, designing and pretty much experimenting with each assignment. The first semester as a neophyte I must have worked 18 hour days because I was all over the place and quite frankly did not have any sources such as ADDIE for a guide.. I wanted to please, teach, and be creative, and with this philosophy I've had successes and plenty of errors. I wanted to be a master (and still do) . I constantly seek feedback, I'm always reading and looking for new ways to to teach, be an instructional designer. Also, more importantly I see the students develop great writing skills. In addition, I have coordinated once per semester, professor get-togethers so we can collaborate what works for our student demographic. I am still teaching the class, however, I am designing 3- 4 hours per day, adjusting the ID to meet the needs of a very bright group of young budding professionals, who took the class as a requirement, rather than a love of English and writing. In short, I am planning and training by hands-on experience, and feedback. Lots and lots of feedback, mostly from students - since at the end of the day, it is the students who are the end users.

[Participant 6] Cross gave an example and explained that the right hemisphere of the brain deals with spatial and constructional tasks, perception and emotions. This is why everyone can be a designer because design is a natural part of our cognitive ability. I am happy to learn this and to know that I can train and develop my design intelligence. I plan to train and develop my design intelligence by using the skills I am taught and the design references presented in this course to apply to my current professional life. For example, in Spector Chapter 11 when the diffusion of innovation model was introduced I could reflect back on my own experiences and see this model in place. Using the information I am learning when I begin design projects will improve my design intelligence. As I go along in the program and consistently use the tools I have learned my design intelligence will continue to grow.

[Participant 14] I plan to develop my design intelligence by using all opportunities to make improvements to various processes in my life as design opportunities. A simple example is my work with Detroit Spartans, an MSU alumni organization. As we work on different things throughout the year (a program, a database, a procedure) I will work to keep the design principles I am learning in the forefront of my mind.

[Participant 15] I learn from the people I surround myself with. Right now my boss and his wife do all of the marketing and the design for our website and any type of printed work that we mail or give to clients (or prospective clients). I know that as I move into my new role in the company, I will learn a lot from them about visual design from them. I do also find myself doing a ton of research online and have always been pretty good at finding my own "idea mentors" online. This was something that I did as a teacher, and I can only imagine that I will continue to do. I hope to someday move into a company where I would be able to work with a design team where we would be able to collaborate and work together on projects. I have always worked really well with and found inspiration from other people. In my dream of working on a team, I would want to be the least experienced so that I would have design mentors around me. I learn through example and always want to have people around who inspire and challenge me to grow my own skills.

[Participant 16] This observation on Cross's part is a little hard for me to swallow, as I come from a creative background and know - from experience - that there is an element of talent that

drives the careers and eventual success of many people in various fields. That being said, there's definitely something behind the "practice makes perfect" motto. I don't mean to say that you need to create, create, create until something sticks. Instead, I think it's more important to continue to broaden one's horizons by exploring the world through various lenses. Especially in instructional design, take the time to go to museums and zoos, do some traveling, take a MOOC, or learn about other cultures by engaging with their people. In each of these opportunities, there are opportunities to see how instructive interfaces are designed to improve our lives; informative posters and short videos at the museum or zoo, road signs in our travels, online course set up and content selection, etc. Only through continued new experiences can I train to understand the people I will eventually design for and get to know the needs my design(s) can meet.

Question 10.1: What changes in how learners do what they do or think should occur?

[Participant 2] The purpose of my instruction is to assist the learners in achieving a growth mindset. My learners are tired and worn thin, many are but they have been through some serious setbacks and this is made to improve and grow their learning. This instruction is designed to assist them in that growth, to be more self confident and self-reliant. I want my learners to feel the shift from uncertainty to growth through these modules,this should improve their ability and performance.

[Participant 3] Upon completion learner should be educated enough in the concepts of passive heating & cooling, water management and the heating & cooling of the interior of the home to discuss plans with a contractor so the homeowner can feel confident in their decisions with the contractor. An educated homeowner will less likely be taken advantage of by a less than honest contractor.

[Participant 4] The students should be able to develop some insight and practical application into the stages that group projects go through.

[Participant 6] The learners should now have a basic knowledge of both Type I and Type II diabetes plus an intimate knowledge of the needs of people with insulin pumps and continuous glucose monitors. This background knowledge will allow them to ask appropriate questions of customers and potentially catch any potential errors when refilling orders from customers. In case they do not immediately think of problems that may occur with the order, the flowsheets should be a fail safe. The learners should have a change in thinking and a change in how they perform.

[Participant 14] Those who take this training should understand how to create a mission statement as well as change in thinking about how they look at the bigger picture for the organization. This organization has been living very year to year and therefore evolves without a plan in mind. Hopefully this training will help them to understand that even as the people who are involved change, the focus of the organization should be mostly pre-determined and therefore a mission statement will create a touchpoint for new and old members to focus and align their activities with.

[Participant 15] The learners will start to be able to see their everyday lives in a different way. They will be able to identify ways to reduce their waste, identify ways to recycle, will develop and maintain active compost, and will discover ways to live in a more environmentally conscientious way. After they become more competent, they will be able to shape their ways that will work for their family.

[Participant 16] No response

Question 10.2: How will you know that these changes have occurred?
[Participant 2] I am contemplating adding three feedback assessments to the instruction. I would like to place a short form feedback asking my learners about what they know prior to the instruction, at the end of instruction and then revisit the learners and release feedback about three months after instruction. I would then be able to monitor what changes I would make in the future to refine my instruction and improve the learner's experience.

[Participant 3] When the energy auditor delivers the audit results and the plan of action the homeowner will be able to discuss the plan with the auditor and understand the terminology the auditor uses.

[Participant 4] Positive team collaboration.
Peer group feedback.
Quality of the outcomes, i.e.group work activities.

[Participant 6] We should see changes throughout the training with the activities and formative assessments. This is a complicated subject. The summative evaluation will let us see if the training actually transferred.

[Participant 14] I will know at the end of the training if they have begun to learn how to write a mission statement based on their ability to start the process as addressed in the last activity of the training. I am not sure that I will be able to know about the second part of the changes in thinking as the instructor of the training; however as a member of the group I should be able to see that change as the members of the group decide to make decision based on the long term and the mission statement; not what just should happen in the next two months.

[Participant 15] As the learners complete the instruction, they will have created various plans to build and maintain their compost and also have a plan of what different recycling activities they will do. They will create various places throughout their house to help them create an organization that will help maintain what they have learned.

[Participant 16] No response

Question 10.3: What activities will help facilitate these changes in thinking and what learners do?

[Participant 2] I believe the instruction the learners receive and the additional take away materials will help the learners. The hands on activities will also build empathy in the learners. This instruction needs to be equated to the clients which the learners will be working with. This is why it is important for the instruction to be as authentic as possible, to fully identify with the needs of the learners clients (outcomes). If this occurs, the growth mindset is engaged and the training transfers from a negative or a compliant phase to a growth activity.

[Participant 3] I think the combination of visuals, reading, voiceover and videos will help educate the learner. It will be important to reinforce that there is science behind the recommendations. This will give the homeowner confidence that what they are learning isn't just something that the company made up.

[Participant 4] Actual hands-on activities, role play, problem solving, class discussion of the findings.

[Participant 6] I would really like to see a hands on learning activity with actual pumps and supplies. It is hard to explain to someone the specifics of insulin pumps especially if they do not have a medical background. An activity based on what the supplies are and how they are packaged will be a good visual to help learners understand. I think the first few activities (intro lecture, hands on pump and supply background activity, how supplies are ordered activity) lead up to the main activity that we are using to change learner thinking and learner performance. Ultimately we want efficient employees who make minimal mistakes who are able to understand the customers needs. The fourth activity of teaching the learners proper phone and order procedures is the most important. But this activity will not be effective if we do not build up to it with the first three activities.

[Participant 14] I think a lot of my activities will need to involve give and take and feedback from all the participants of the training as they will be working on designing something that is not solely for them but rather is for the entire organization that they are all a part of. If the activities were done only individually the outcomes would be individualize and that would not meet the ultimate goal of the training.

[Participant 15] I think the activity that will help the most will be sorting the bag of garbage that the family brings in. We will be sorting this into a few different piles (composting, recyclable, donatable, and also a pile that could be replaced by things that don't have to be thrown away). This will be totally relevant to all of the learners because this is their own trash that they would have otherwise thrown away. These are things that the family uses so the activity won't be a hypothetical one. This will also help them start to think through what type of organization they would need in their house to be able to facilitate separating their "trash" into similar piles on a regular basis.

[Participant 16] No response

Question 10.4: How are you discovering your content? How can you chunk your content? How will you sequence your content?

[Participant 2] I have practiced the content myself and hope to engage learners prior to the final project. I am learning as I am developing this content. I am also learning the importance of timing, most importantly NOT wasting time fo learners. In order of this to instruction to remain dynamic, I have to be aware of how to maximize learning and honoring the time which the learners are sacrificing.

[Participant 3] I already knew the bassics of the content. I have needed to refresh my memory because I have been out of the business. I check in with my husband who is a trained energy auditor for feedback. I spend a lot of time searching for images on google. I have also been looking through youtube for videos that I might use. Nothing quite meets my needs. I think I'm going to have to make some. Oh, boy! I think I already have a good division of the content broken into short chunks.

[Participant 4] The internet, google and google scholar, a few books on my shelves and I am practicing in my current classroom environments.

How will you chunk and sequence your content? 20 - 30 minute projects. Start out with a lecturette 4-5 minutes, then have an activity relevant to the lecturette.

[Participant 6] Developing this design project has put my fuzzy idea of this project into focus. The key realization I had this week was that activities 1-3 are very important in order for activity 4 to be effective. Activity 4 is where critical thinking skills will be developed. I initially thought that each activity was equally important. I had to take a step back a think about what are the expectations of the learners. Truly the goal was not that they knew what diabetes and insulin pumps were or what supplies were required. These were important, but the goal was to have efficient employees who make minimal mistakes. The emphasis will be placed on activity 4 - the telephone process and flowcharts.

[Participant 14] I am discovering my content by using the resources available on the internet and relying on my own knowledge of the organization. I am chunking my content by thinking about the natural development of the components of a mission statement. So I am thinking about this in a sequential narrative. This also allows for building of knowledge as the training progresses and also if the time allotted doesn't allow for completion to not leave them in an odd place.

[Participant 15] I think that the content all kind of flows from where does our trash go, to what can we do with it instead of throwing it away. After the family has been able to sort through their trash into different categories, then we will take one category at a time. We will talk about composting relating to the food waste, reducing waste for things that can't be composted, and finding other uses for things or projects that can be done.

[Participant 16] No response

Question 10.5: What constraints have you encountered during your design project so far? How are you dealing with them?

[Participant 2] Constraints that I find are ensuring that the learners can demonstrate the instruction, I want to take this beyond just rote style learning. Timing has become a constraint, how to fill the gaps and to bring it all together. I feel that the overall condition of my learners and the very real issues (negative feedback and mindset) are real constraints.

[Participant 3] 1. I have had to relearn some of the concepts.
2. I'm not sure I have understood what I'm providing at this current step. Am I suppose to give the details now or just how I plan to teach the learner. Then the next step is the details?
3. Too much vs too little information covered. I think this may be too much, but what do I cut?
4. I really thought I would find good videos and I haven't.

[Participant 4] The uncertainty of knowing I do not specifically know out how much time to allocate so the activities will be meaningful and How to REALLY assess the outcomes, especially since the outcomes are in part abstract.

How are you dealing with them? I have to make an educated guess and understand that the activities are trial and error. I would like to believe, based on my experience thus far, that I have made good design choices, however, I will not know for sure until I put the activities in action, see how the groups respond to each other after the activities, and receive feedback from my students.

[Participant 6] One major constraint is the learners. It will be hard work for them to critically think about each order. It is easy for someone like me who wears a pump and a cgm to not have to think when talking about diabetes, insulin pumps, cgms, or supplies. It takes time and effort to learn these skills. We will need buy in from the learners to make this successful.

[Participant 14] My biggest constraint has been that I am personally a member of the group that I have picked to address the problem in and that has created difficulties for me as I try to address issues within the structure of the group without feeling personally impacted. I have been dealing with this by re-framing my thoughts as opportunities for improvement rather than failures of the group previously. Additionally, as this is new work to me, I have felt challenged by not understanding the entire process. I naturally like to work when I understand the entire process that I am going to go through so I understand how each thing that I am working on fits together with the previous and next steps. I am also trying to re-frame this challenge by stretching myself out of comfort zone to start the process of becoming an instructional designer.

[Participant 15] One of the constraints in my design project is that the ultimate goal or assessment is reducing waste over time, building and maintaining a compost pile over time, and spending time finding other uses for "trash." These things all take a lot of time, so the assessment piece of the design is going to have to be the plans to accomplish these things. Also, since there are kids involved, it needs to be simple enough for the whole family to participate.

[Participant 16] No response

Question 14.1: As you reflect back on your work on your instructional design project, what role has uncertainty played in the process for you so far? How have you responded to uncertainty? Has it influenced how you move among the design spaces or other aspects of your process?

[Participant 2] I feel that this class has taught me a large amount amount uncertainty and myself in those positions. As we began the project,even with your instruction and thorough explanations, I felt very uncertain. I had an idea in my mind but then still found myself reaching for the concrete. That is when I learned that you have to be confident in yourself and face that uncertainty. My response to uncertainty was to apply what I felt both as a designer and a learner. I believe that moving through that vision in the design process has allowed me to grow exponentially. I try to make sure that I move through this process aware of all possible conditions to deliver the best instruction.

[Participant 3] Sometimes the biggest uncertainty was not knowing what was exactly expected from [removed instructor's name]. I wish there had been a discussion board available in our blackboard. Sometimes when I faced uncertainty I felt frustration. Sometimes I would get up and walk away. Sometimes I would work on another part of my design project. Both had their advantages. By working on another of the design I sometimes found a solution or an idea. Sometimes when I walked away it was hard to get back into the mindset. For me slipping in and out of different design spaces was useful. I think it allowed me to use different parts of my brain and freed up others to cogitate on the problems.

[Participant 4] Uncertainty has the potential - in this project and others - to unravel one's sensibilities, especially in an online environment, void of non-verbal cues. I personally was less uncertain when I saw your videos and had conversations. Without that personal interaction I wondered - was uncertain about whether I was on task . I really value feedback and interaction as it helps to work with uncertainty. Uncertainty is not a bad thing, I just think it can be managed by communicating not only with oneself, but others as well. I also think uncertainty has an element of shock value. For example, the final project with the added dimension of changing my final project was near complete. I was given a dose of low grade shock and the need to recalibrate (e. Knowing now this constraint is part of the design process, I can now know that this is a BIG part of design. Also, that uncertainty should not be taken too personally, but rather as an opportunity to learn new things. I believe this can be done , 1) after the shock/news comes our way, and 2)that to be in this business to leave one's ego at the door, and embrace the uncertainty as an opportunity to please customers and learn new skills, both in the name of design and emotional health.

[Participant 6] Uncertainty plays a big role in my instructional design project. First, I had to figure out what exactly it was we were supposed to be doing. This part of uncertainty is there throughout the whole process. I am thankful that I was in a design group and was able to bounce ideas off my group and that my group worked well together. Then there is the uncertainty of if the customer [removed instructor's name] would like my project or feel it met her expectations. I think that uncertainty is probably always there when you are designing for someone. The difference right now is that I am in a class and if I am not on the right track or did something wrong I get constructive feedback and redirected. There are high stakes with real customers.

What I have learned is that I need to look at different sources (Delft Design, my peer projects, youtube, and other examples provided) to get a sense of what I like and what direction I want to go with my project design.

[Participant 14] Uncertainty played a large role in my instructional design product as we were working on the different aspects of the project, I didn't really understand how they all fit together. At the beginning of the project I didn't really respond well to uncertainty as I kind of shut down my thought process and did the minimum. As this is a new way of thinking about things for me, I felt frustrated in my lack of understanding and rather than seeking help as I should have done. I have learned that as I explore this new world of instructional design I will need to be comfortable asking for help and being comfortable with taking some risks in my thought processes.

[Participant 15] I think that the uncertainty of not knowing if I was working in the right direction, or coming up with ideas that would fulfill the needs and requirements of the assignment has been the only piece of uncertainty. The work that I do on a daily basis in starting to design and come up with an initial training program for my office is kind of a long these same lines, so I honestly feel like this class, and the level of not really knowing, has helped me become more confident in starting to design at work. I has been tasked with the job of creating a training program for a new colleague (if they ever find someone to hire), and even though my boss and I have discussed what he and I both think this should look like, I am left to weed through those ideas and come up with something. I know when we come back together, there will be a lot that we will decide to change, but the same level of uncertainty is what I have been dealing with on a daily basis. I've realized that I do have good ideas, that I need to trust myself, and just keep plugging along through the process.

[Participant 16] Uncertainty doesn't seem to be an issue for me. I have plenty of experience in uncertain situations, both one-time and ongoing. Because of these experiences, I tend to look at things always from someone else's view – because I'm uncertain as to how they will react. I'm very much motivated by how people respond to my ideas, actions, etc., so I make it my business to read people and know what they're thinking. Even if they are trying to hide their reaction, I'm usually able to discern and respond appropriately. So, I guess my response is that it has made me hyper-sensitive to the reactions of potential end-users. This, in turn, has a great impact on my design process by always orienting me to the desired reaction of the end-user.

Question 14.2: Knowing that you will be presented this week for an additional element to your final EDP, how do you feel about the uncertainty of that? How are you preparing to manage the unknown?

[Participant 2] I think that the additional element is exciting! It keeps us on our toes and prepared to move even further through the process. People change their minds and want to change instruction, needs change, this is where designers have to rely on their skills and flexibility to succeed. In terms of preparing to manage the unknown, this is where I thrive. As an educator, I change instruction daily, almost hourly, sometimes to the minute. I am the client and designer on a daily basis, my needs change every day, demands and constraints are the world which I know. I

think that I have a relatively good understanding and flexibility in the unknown, it is not for everyone, but it has worked for me. Not to say it is always easy, and most certainly can be frustrating, but each person thrives in certain conditions and I find success in those situations.

[Participant 3] I felt too focused on working on the design to worry much about what change in the design might occur. Once the change was revealed I did panic a bit. But every time I felt myself do that I just reminded myself that there was too much to do to focus on one little change. I figured I could keep working on everything else and make sure all parts were complete before I focused on the change.

[Participant 4] I knew it would be big, but I just waited to see what it was. How are you preparing to manage the unknown? In design to keep in mind to expect the unexpected. Also, I think that really good fact-finding and an understanding of the customers likes and dislikes MAY help to minimize uncertainty.

[Participant 6] Just when I thought I had everything under control we get thrown an additional element! I guess one should never get too comfortable! I am writing this after I found out the additional element.   I will take re-designing a portion of my EDP addition in stride. I will look critically at my project and choose my least favorite activity and re-design it. This is probably a good opportunity to take a look back at the project and tweek it. I was quite comfortable with my project going into this week, but I know in the back of my mind there is always room for improvement. So this additional element will force me to go back and consciously look through my whole project.

[Participant 14] I dealt with this uncertainty the same way that I dealt with not knowing what questions might be on an exam, I attempted to guess what might be the additional element. I leaned on my knowledge of what we had been asked to do so far and what was the most likely change or constraint that might be put on us. I prepare to manage the unknown by gathering as much knowledge as I have and then understanding that I won't know everything and will have to expand my knowledge in every class that I take in the program.

[Participant 15] The idea of having to change one element/activity does not overwhelm or stress me out in the slightest. When I was teaching I was constantly having to think on my feet and change things at the last minute depending on so many different variables. I would have an amazing lesson planned, but then realize at the last minute that it just wasn't going to work and have to create something on the fly. I did a lot of work with Bloom's Taxonomy so being able to approach something from a different perspective is something I have had to do for years.

[Participant 16] Well, since this part is already done, I feel great! But really, I was a bit concerned, but knew it would be manageable, considering our time constraints. Once I saw what our additional element was, I was relieved. I wanted to change one of my assessments, anyway!

Question 15.1: Go back to your previous responses during this semester on the "What is design?" question. What has changed in your definitions after completing this course and your [Instructional Design] ID project?

[Participant 2] I initially thought that design was implementation and style. I thought it was the how-to portion that was translated electronically. I had no idea what design really was prior to this class or just how many different way design is around our world. After learning about Dubai, I could never walk into a bathroom again without thinking of what kind of constraints there were in creating a cleaning process! I have been out and attempted to complete a task or follow some loose directions and stopped and thought to myself, "This is terrible design, I could improve this by…" and then I start to visualize how I could improve on it. I think of my daily delivery and how I can improve on that for my students. I've even gone so far as to address my future endeavors such as professional learning for staff through the ID outlook and I see myself improving and being mindful in ways I never was before.

[Participant 3] I stand by my original answers in week 4:
It is taking the concept or idea for something and fleshing it out and nurturing it. Teasing it into something solid. Design is looking at a problem from all possible angles and creating a solution that successfully meets the needs of the end user.
 Good design creates ease & comfort with a product, whether it is in learning or an object someone will use.
To design is to have vision to foresee the use of something that no one has yet found useful.

I would like to add to my descriptions of design. Design is a process where you are constantly questioning and evaluating what you have created. It means hitting the wall of frustration and pushing past it. Design is constantly asking questions of yourself and your client to refine your end product.

[Participant 4] Design is global with many moving parts. Ideas

[Participant 6] I would say my definition of design hasn't necessarily changed rather it improved. I have a much clearer understanding of design and it's role in our world.

[Participant 14] My definition has changed to include the intentionality of the design process. It is an intensive process that requires reflection and specific thought processes. Instead of being a linear process, design can be a very circular process where making one change in the process creates changes to many of the other parts. Additionally the process should include evaluation and assessment throughout the process rather than singularly in the end.

[Participant 15] My ideas about what design is have not really changed, but I do think that I would add that design is a creative and collaborative process that takes time. If I were asked to design something and have it done tomorrow, I feel like at this point, that would be nearly impossible to produce a final product. There needs to be time for the ideas to grow and the design to be tested, thought through, and the design needs some space to morph into it's final stages. This is something that I knew before, but I don't think that I would have been able to verbalize it.

[Participant 16] I'm going to refer back to my week 4 answer here – I'm actually quite impressed at my understanding of the process of design so early in the semester. Initially I focused so much of my energy on the product of design, the aesthetically pleasing goal. In week 4 I was already beginning to understand the value of the design process. As I said above, the process – or space – in which we design is so important to the end product. It was a lesson I very much needed to learn because I thought I was already really good at design. I might be. But there will come a time when I do not know or understand the context of how my end user will be affected by a design I create and have the potential to really mess things up – if I hadn't learned to embrace the design process early in my career.

Question 15.2: Go back to your previous responses during this semester on the "What's instruction?" question. What has changed in your definitions after completing this course and your ID project?

[Participant 2] When I look back to my initial response, it seems very basic to me. I even go so far as to cite text in order to define instruction, design, textbook concepts. I think that is what we do as learners, we try to find how we can define instruction, we try to define and contain a concept which is abstract in nature. Instruction is a holistic approach to an outcome, to me it is a process. Instruction takes into account all that we need to do in order to ensure the learners achieve the desired outcomes. It's more than just a step by step powerpoint, but the temperature and location of the room. It is the details that are the basis of the process, the embedded inner workings of the project.

[Participant 3] I never answered the question, "What is instruction?"

I have always felt strongly that when I teach I need to find something that my learners are passionate about and use that in my instruction. I believe my degree in education has been helpful in forming my definitions and beliefs about reaching my learner when planning my instructional design.

Good instruction guides the learner by creating a bridge between the information they know and the information they seek to know.

[Participant 4] Instruction is about speaking the language of your customer and synthesizing with my own touch.

[Participant 6] After completing this course and my project I think my definition of instruction changed to include specific examples of how instruction occurs and the types of instruction and how to make instruction successful. Early in the semester my view on instruction was very basic. It essentially was to show someone how to do something. I am happy that I have had the past 14 weeks to think about what it really means to design and what it really means to develop instruction and why it's important to consider our end user when developing instruction. I have become more thoughtful about this process.

[Participant 14] I still believe the instruction facilitates an observable change in someone's skills, but the biggest change to my definition is the involvement of the learner in the process. Although I knew it from my own experience as a student, I for some reason didn't include that in my definition of instruction. Good instruction requires the buy-in of your end users, if they don't engage, they won't develop the new skills you are looking to teach them.

[Participant 15] "Instruction is the way in which someone learns something. Often this involves someone who is more knowledgeable teaching someone who is less knowledgeable. Instruction can happen in a formal setting (like a training or in a classroom), or in a very informal setting (like an older kid teaching a younger kid how to do tricks on a skateboard). I do think that sometimes the best type of instruction is when people become their own instructors. They have access to their information and teach themselves whatever it is that they want or need to know."

I don't think that much has changed with my ideas about instruction. With my teaching history, I have had a pretty good understanding of instruction and all of the different components that are involved in instruction.

[Participant 16] The only thing that has changed in my definition of instruction is more of an emphasis on the *how* of information dissemination. It's not all about trying to get a learner to absorb valuable knowledge. It's about engaging them in valuable activities, reflections and assessments to ensure transferability of one learned skill to other areas of their lives.

Question 15.3: Go back to your previous response to 4.3 were you described your beliefs, self-awareness and precedents. What do you have now? Where are you today after 14 weeks of design thinking? What does it mean to you to be a designer? What goals do you have for yourself? What actions will you take to develop as a designer and reach those goals?

[Participant 2] After looking back on, I could see and sense my uncertainty in my response. I think that now I have developed additional awareness as a designer. It is a sense that becomes instinctual as you begin to look at the world differently. I feel like this is much like riding a bike, once you've learned it you never unlearn it. It is a certain sense of awareness to design thinking. To me it is also very humbling as a designer, because you have to have empathy to learners and also to clients. I feel that much of this is being able to bridge these two parties and create outcomes, even though you may not have a the content knowledge to support it initially, you have the design mindset to achieve it. I have new goals for myself, much of my prior plan has changed and I can say that this is very relative to my design paradigm of thinking. I want to pursue further design classes and instruction and see what happens from there. I have a plan, I have constraints, but I have confidence that this will come into fruition. Understanding that the only certain thing between my end goals and now is change, keeps me on the path to success.

[Participant 3] The first time I answered this question you stated you wanted my beliefs as if what I wrote was not my beliefs. I was frustrated by your questioning if they were my beliefs. They came from me and they are my beliefs about design. But in going back and looking at what

you wrote I see that you wanted me to use me and my and I. So going back after I have stepped away is a good reminder that it is easy to misinterpret something that is written.

[Participant 4] What additional ones do you have now? Pay close attention to the needs of the end user, rather than assuming my ideas will be accepted as their ideas.

Where are you today after 14 weeks of design thinking? Pay attention to all of the details, expect uncertainty, write down ideas as they come from wherever. What does it mean to you to be a designer? Practice design in everything I do. Keeps my brain sharp and saves time and money. I'm thinking about my homemade shower bandage and my prototype filled with a variety of ways to learn how important Storming is Also I rearranged my Passover set up the house design this year based on the design ideas I learned here. I have a new son-in-law and saw him as my new-end user. What goals do you have for yourself? Learn more online resources to use such as Google Power Point. Apply design in small increments, i.e, class assignments.

What actions will you take to develop as a designer and reach those goals? I meet with my colleagues and share teaching techniques. Use the internet to look for for other like-minded people's ideas.. Lastly, I need to seek more feedback from my students RIGHT AFTER the assignments. What works / or not, and why?

[Participant 6] One major change I would make to my list from 4.3 would be to say "Designers *should* collaborate *and seek feedback*" instead of my original "Designers often collaborate." I think over the past 14 weeks I have learned to say why do we do this this way and is there a better way to do this and even to be creative and say wouldn't it be great if we could do *this*. In the past I didn't think much about the way we do a lot of things. Even if I didn't particularly like the way I had to do something I accepted that I had to do it that way because that's just the way it's done. But now I see that there are many ways to improve and redesign. For example, I was in the grocery store and checked out at the self checkout because the other lines were very long. The self check out ended up taking much longer because the machine kept calling the attendant. I wanted to use paper bags but the standard is plastic bags. If you take the paper bags from the stack at the terminal and place them in the bagging area the machine thinks you put an item to purchase there without scanning it. There are other specifics about self check out that don't run smoothly also but this got me thinking (for way too much time!) about how this self checkout area could be re-designed so that it flowed better and the attendant was not called for small errors. So I think my way of thinking has changed over the past 14 weeks. My first semester has been hard work, but also a lot of fun and very interesting. My goal, as I stated above, is to keep an open mind about opportunities that will arise as I go through the IT program.

[Participant 14] I believe that I am learning a new way of thinking for design, but is a process I am going to have to continue to engage in. I think I am very young designer and that as I work on this I will improve. In my own personal history, I am slow to trust my skill set and it can take time for me to feel comfortable in what I am doing. Having completed two distinct academic degrees (Accounting and Student Affairs), I know I can learn new skills and apply them to varying degrees of success, but that takes time.

To me, it means that I will review process and procedures to seek out improvement for the users.

If you think about the videos that we watched this semester, you see that the process of design isn't always about complete revolution but improvements for those who regularly use the item or space whether is a piece of jewelry or a area of a city. My goal is to work to feel more comfortable with the design process and how to think about it. In reality, I have been using this time in the course to think about the processes for the group that my EDP is for. My EDP is just the first part of many improvements that i believe can be made to our processes as it would make things clearer for everyone involved. I hope to also use my new design knowledge in my work and improve the processes for the students I work with.

[Participant 15] Looking back through my answers, I know that today I am a lot more confident in my identity as a designer. Just a few weeks ago my boss came to me and asked what I thought would work for training a new employee, and I was confident in exactly what I thought the process should look like. I think that this would not have been the case before this semester started, as I was not 100% sure how my teaching experience would be able to translate to this field.

My professional identity is starting to become a little bit more clear since I answered the 4.3 questions as well. By the end of April I will be the Director of Training for my company. This is super exciting for me, but also a little bit daunting since I will essentially be the entire training department. I will be continuing to do the same things that I have been doing (which is designing a training program for new team members, training our new clients on using the software, and will start to work on creating online learning resources for our clients). There is something about a much different title that makes the shift that much more official, though.

Right now I work for a very small company so becoming the "Director of Training" in my current company means something way different than I imagine it would mean at a larger company. My goal is to get as much experience as I can in my new role, but then take that knowledge to a larger company where I can work on a team of designers in order to have that aspect of collaboration. I think that I will be able to learn a lot working through different problems on my own, but I have learned in this class that collaborating while designing is incredibly valuable.

[Participant 16]
I can't say that my beliefs, precedents and self-awareness has changed too much, aside from the already mentioned items. After 14 weeks of design thinking...I'm excited about the opportunities this program/career has for me. And I'm torn between what I do and love now and what could be in the future. I love being a designer. I'm still working on the loving the process part, but I like recognizing a need and being empowered to do something about it. In the past, I saw a need and didn't know how to start to address it - now I can turn to the design process. It's my goal to continue to recognize these needs. For example, as an advisor, there are multiple programs and interventions that need re-designing - how can I use what I've learned to improve my current end-users, the student? My first step is to actually assess these programs...anecdotally, they don't work, but do the numbers say so, too? Meanwhile, I'm going to get to know my end-users and do some research on interventions that are working to improve student success.

APPENDIX H

Fall 2016 Reflection Journal Entries

Question 1.1 - According to Cross – "Everyone can and does design. We all design when we plan for something new to happen." Describe in detail a time when you designed something. How (if appropriate) was it – effective, efficient, creative, imaginative, and/or stimulating? Describe how it feels to design?

[Participant 1] One may say that the modern world is divided between the designers and marketers. The first group makes commodities while the second group ensures people they need to buy new things. The design is a process of creating something new or adding new features to the already existing items. Usually, the design has two goals: to make something more beautiful or stylish and to make something more convenient. A good design should propose the best and unique solution to satisfy the need.

[Participant 5] Last year I was asked to design a training class for nurses and medical assistants in the outpatient clinics of the University of Michigan Health System (UMHS). These "super users" would receive additional classroom training on our electronic medical record system known as MiChart. They had all been using the system for at least a year but now would need to know how to support other users in their clinics including physicians.

Before I began writing, I needed to understand what aspects of the system users struggled with the most. I reviewed help desk tickets and spoke with users from several clinics. Then I began to outline the class keeping in mind, If I were in their position, what would I want to know.

Once I was done writing the content, I realized I had 10 hours of content and only 8 hours to teach it in so I had to get creative. I began working with another instructional designer on an eLearning module the super users could take prior to coming to the class.

Using my basic storyboard in PowerPoint she was able to turn into a very interactive eLearning module that is now used by super users in all areas of UMHS.

Software training usually doesn't give me much opportunity to be creative but this eLearning did. We were able to create several scenarios describing different types of users (the complainers, the experts, and the victims). I got a chance to do some acting by reading several of the scenes. Many users commented that the scenarios were their favorite part of the eLearning and helped them really relate to the different types of users and understand how to help them in a positive non-confrontational way.

In the past year we made a few modifications based on the feedback from those that have completed the training including giving them more tools in the form of specialized tip sheets on how to assist users with the most common issues. Over 150 people have completed this training and it has had a tremendous impact on our end user satisfaction and utilization of MiChart which has also improved our patient care which is always our most important objective.

[Participant 7] Since the beginning of the school year is fresh in my mind, an example of a time when I designed something was when I made a "new student packet". My school contains a battered women's shelter in it's boundaries and we are constantly getting new students, most of the time without any warning. There is nothing more stressful for a Kindergarten teacher than having a brand new kid, who has never been in a school before, enter in your classroom when the bell rings. Not only do you have twenty five other five year olds who need your assistance, but you also have one student who is in a brand new situation, probably very overwhelmed and scared themselves. After several stressful mornings last school year, of new students coming into my classroom, I decided it was time to create a better plan.

This new student packet contains everything a new student would need as well as everything the students who have been in the classroom the whole year have received (monthly calendars, newsletters, supplies, folders, academic books, etc.). Each packet is extremely organized with labels, dates, and a table of contents. At the end of each month, I go through these packets and remove any materials a new student would no longer need.

This design has been unbelievably helpful when I am greeted by a new student in my classroom. It allows me to focus my time on the student, rather than preparing his or her materials. I am able to better transition the students into their new classroom. I find I am able to help students feel more comfortable in a very overwhelming situation. Before designing this packet, I feared coming into the classroom each morning because I thought I would be getting a new student. After creating the packet, I am now more a comfortable, prepared, and an effective teacher. I have found it to be so beneficial that I have passed my idea along to my fellow colleagues and several have adopted it to their classrooms.

[Participant 8] Designing is not an easy process, though as an onlooker, this may appear different. Approximately fifteen years ago, I spent my free time putting together web pages for my friends. This was perhaps about the time that myspace became popular. However, my group of friends and I were still using free web hosting sites. There were multiple online galleries that we used to visit that provided free web design templates: all you had to do was upload the images, multimedia files, and scripting languages onto a server and input your information if you were familiar with the coding. The process was very tedious and sometimes arduous. It was difficult because the majority of us wanted our pages to be easy to look at, navigate, and still have the information that were pertinent to the individual's purpose. The majority of us were a part of an online community called Hogwarts Online: so some of us wanted class web pages with a bunch of web pages and links, images, videos, etc.

The design was appropriate per the individual that wanted the product. I think that much of what I had created was successful and to what the person had wanted. It helped that I was able to communicate with the individual to get an idea of what he/she needed. From there, I was able to work on my own, and if I needed to: collaborate with others that have more experience, or other skills that could help me with my specialized situations.

[Participant 9] As a high school social studies teacher, I am continuously designing and modifying lesson plans for my students. When designing lessons my objective is to maximize engagement and learning and I expect my students to demonstrate the effectiveness (or lack

thereof) of the lesson and their learning through various assessments. Accordingly, my personal experiences along with the research I've come across in education suggests that learning is often maximized when students have the opportunity to experience academic concepts firsthand. Accordingly, I often attempt to accomplish this in a social studies classroom through simulations. One of my most successful lessons centers on the experience of European immigrants arriving at Ellis Island at the turn of the 19th century. The lesson begins with students receiving a role card that details the circumstances that have caused their character to immigrate. Students are then required to "immigrate" to the United States while putting themselves in the shoes of their fictional role. While waiting to be "processed" students are required mingle with other passengers (their classmates) that are traveling to the United States. The goal of this phase of the simulation is to familiarize students with the diverse motives of immigration to the United States at the turn of the 19th century. Students then go through a physical examination and legal interview before they are admitted "entrance" to the United States. I think this phase of the simulation highlights one of the many creative/imaginative elements of this lesson. In order to familiarize students with the experience of entering a foreign land, I choose four students that speak an unfamiliar foreign language (I work in a diverse district that affords me this luxury) to serve as the staff of Ellis Island. All instructions and questions during the medical examination and legal interview are in said students' native tongue. To add, this phase not only allows students to better experience what many immigrants went through entering the country, but it allows me to utilize the diversity of my classroom in order to maximize learning outcomes. Once the simulation has been completed I lead students through a debriefing activity that requires them to think critically about the similarities of their experiences and those of European immigrants at the turn of the 19th century. From there, the lesson transitions into a more traditional interactive lecture that allows me to detail the motives and experiences of European immigrants at the 19th century at greater length. I know that this design has been successful because not only are students greatly engaged in the simulation, but the follow-up assessments consistently demonstrate a strong mastery of the corresponding content. Lessons like this are challenging to design, but the look of excitement and engagement on my students' faces and their strong assessment scores make the experience more than worthwhile. Lastly, the trial and error process of lesson design provides great insight for future design projects.

[Participant 11] Last semester, I designed an e-learning course titled, "Mortgages 101: A Course for Front-Line Employees of Financial Institutions". As the title suggests, this course is designed to fill a knowledge gap about mortgages possessed by most front-line employees. It was effective by explaining main topics like types of mortgages, key terms, payment calculations and closing costs. Also making the course effective was the inclusion of knowledge checks in the middle and at the end so the user can determine what they learned. It was efficient in the content that was included on each slide. For example, you won't find any lengthy bulleted lists in my course. It is creative because it includes pictures for each topic, the design of each slide looks like a wood floor at the bottom and the pictures are framed to look like pictures on the wall of a house. Also adding to the creativity is the story about [removed name] who is purchasing her first house. Her purchase helps explain the terms of mortgage loans, especially payments. The use of pictures and videos helps the course stimulate auditory/visual learners, so it is stimulating to users who learn that way as well as those who learn by reading and/or doing something, i.e. the knowledge checks.

Through the process of designing this course I felt stimulated. I was motivated to keep going and excited to see the "finished" product. I put quotations around "finished" because I think a designer will always look at a product they designed and at least think "what if I did this or that". I felt proud of the course and look forward to my next assignment to create instructional materials.

[Participant 12] The last time I designed something was for work. I was tasked by [removed name] to design a new graduation track for transfer students into the Honors College. After explaining what he wanted, I first began my research by looking at other Honors Colleges across the state to see what kind of transfer programs and opportunities are being offered. After reviewing what Honors Colleges at Oakland University, University of Michigan, Michigan State University, Grand Valley State University offered transfer students, I began a review of our own curriculum to see what the best fit would be. My initial thought was to have something that was more extensive than Departmental Honors, which is typically 12-24 credits (major depending), which includes a Honors Seminar, and Senior Project, and University Honors, which is 36 credits and an Honors seminar and senior thesis. Upon review, I designed an 18 credit graduation track that included 9 credits of Honors electives, the service-learning course, Honors seminar and thesis course. My rationale for having it only 18 credits was that it was the minimum amount of credits to qualify as a minor degree, which would go on a student's transcript as a co-minor, if approved. [Removed name] liked the proposal and submitted it to the Honors College Advisory Board, who unanimously approved it.

For me, it was creative and stimulating because it allowed me to use my research skills in order to compare programs across the state in order to see how our program could stand out to students. My research concluded that there was not a specific Honors graduation track for transfer students that allowed them to earn a separate distinction. It felt good to design something that could potentially enhance a student's education here at [removed university name] and attract more highly-qualified transfer students to [removed university name].

[Participant 13] Designing an Online Course (for a job interview)
When I first looked at the journal questions for this week, I considered writing about a workshop that I designed recently. But as I started reading the first chapter of Design Thinking, I came across Richard MacCormac's words: "I don't think you can design anything just by absorbing information and then hoping to synthesize it into a solution." (Cross, Nigel. Design Thinking: Understanding How Designers Think and Work. Berg Publishers, Oxford, U.K., 2011, p.14) MacCormac's words made me reflect on a time when I thought the solution to designing an online course was to simply put all the information together, in a format that I considered to be the most appropriate. This happened two years ago, as I decided to design an online course in Blackboard, to showcase during a job interview.

Before starting the design process, I thought about all my options, considered what I wanted to convey through my design, and decided to organize the course materials using content folders instead of learning modules throughout my course. I carefully selected the content included in each content folder, and with the Universal Design for Learning (UDL) framework in mind, I incorporated text and audio files, images, links, and YouTube videos. Then I industriously

worked to design each content folder, and completed the course, happy that I found the perfect design solution.

I was so excited that I finished the course 48 hours before the time of the interview. But to my surprise, the more I looked at the final product, the more I felt like something was missing from the design. No matter how hard I tried to convince myself that the course was exactly what I wanted, seeing the final product made me realize that I was actually looking for fairly different design.

In the first chapter of "Design Thinking", Cross mentions that "Richard MacCormac spoke of defining the problem through attempting solutions" (p.14). I realize now that, intuitively, this is exactly what I did. In spite of thinking that I had the perfect design, it turned out that the final product was not what I envisioned. Initially I thought I lost so much time and effort designing the course in that format. But then I realized that the first version of the course was actually my first step of the design, that helped me clarify what I wanted, and gave me additional insight on how to move on from there. Through this experience, I learned that design is an iterative process, and that I need to follow my intuition and start designing. I used the 48 hours I had left before the interview to redesign the course. I reused a lot of the original content, but I decided to organize the course in a different manner, and to include learning modules, as having a table of content for each module would make the course both easier to navigate and more academic

Two years later, after many other successful course designs, I still go through this process at times. What changed? Now I call every single one of my new designs a pilot. I try it out to see how it works, and go from there. There is no formula, or easy answer when it comes to design. Experience also plays an important role, and what I learned is that it is important to design without fear, as fear inhibits creativity, and a designer needs to be able to trust his/ her intuition.

[Participant 17] Journal not submitted

[Participant 18] I was a college football coach for 7 years before I began my current career as an academic advisor. I worked on the defensive side of the ball. The football season consisted of a certain amount of games each year. There was one game per week during the season. Each week it was my job to design a defense that would stop the offense of the opponent. This design was known as the defensive game plan.

The design was a very labor intensive and time sensitive project. These two factors caused the design approach to follow a consistent process from week to week. The games were usually played on Saturdays, so after the game ended it was immediately time to start preparing for the next opponent. This began on Sunday morning at 6am. Game film of the opponents was downloaded from a mutually agreed upon video service. Once the game films were in our possession it was time to study the opponent. Each play was assigned specific data for later analysis. There were about 15 data points per play. These data points were agreed upon by the coaches. Each game tape consisted of roughly 75-100 plays. This whole process was called breaking down the film and depending on the amount of film you broke down was a 6-8 hour process. Each play was watched multiple times and then the proper data was assigned to it. It was also important to make sure that the data entry was accurate.

Once the data was in the system it was time to run statistical reports. This was a fun piece of the design and allowed room for creativity. There were some statistical reports that were done consistently and for every opponent, but there were other reports that were run based off of hunches or subtleties you may have noticed while watching the film. Maybe you coached against a certain coach or team in the past. Either way this was a way to test the validity of your design early. If the film study didn't back it up it didn't necessarily disqualify the design, but you didn't want spend a majority of the time preparing for something that wasn't going to happen. You were uncertain about what the opponent was going to do and the film study was a way to hedge your bets against what you thought the opponent would do. Great coaches understand the uncertainty and have a great vision of what the opponent is going to do. Great coaches are great designers.

After the film was watched time and time again and the data analyzed it was time to design the plays that would stop your opponent. This was done through a modeling process on a whiteboard, paper pad, or anything else you could use to draw on. This is popularly referred to as "Chalk Talk". The process involved drawing a play by the offense and then designing a play for your defense to defeat it. It also meant reviewing your playbook to see if the design already existed or if there was a similar design that you could change slightly. This process was very collaborative and involved many members of the coaching staff. It was also very intense and many arguments occurred during this process. This process was tough because there is no such thing as a perfect play. No magical call that would stop the other team. It is important to remember the opponent also has your film and is engaging in a similar design process to defeat you. The uncertainty and the "what ifs" would creep into the room because there is no perfect play and every play has its strengths and weaknesses. A set of play calls was decided on. Sometimes those plays were already a part of your playbook and other times they were new. The important thing to remember was that you had one week to teach these plays to the players. Human performance was an essential piece of this design, so we wanted to avoid asking our players to learn too many new plays in a short amount of time.

After the plays were chosen it was time to design how you would implement them in meetings and practice. It was an important design practice to watch the opponent's film with your players. It was also important to share key pieces of the statistical analysis with them during these meetings. Then you would show the players the plays you were going to implement. This wasn't done all at once, but was done over the course of the week. Let say for general purposes we as coaches felt the opponent was going to do A, B, and C against you and you designed plays D, E, and F to defeat them. The following would be a general week of preparation. The process was much more complex, but this should show how the roll out process went.

Monday-   Players watch film of opponent doing A with their coach. Then play D is introduced and taught.
Tuesday-   Play D is executed in a practice. Players then watch themselves on film executing play D and gets feedback from coaches. Players then watch film of opponent doing B. Then play E is introduced and taught. Coaches evaluate play D and make any adjustments.
Wednesday- Corrections to play D are taught then Play E is executed at practice. Players then watch themselves on film executing play E and get feedback from coaches. Players then watch

film of opponent doing C. Then play F is introduced and taught. Coaches evaluate play E and make any adjustments.

Thursday-   Corrections to play E are taught then play F is executed at practice. Players then watch themselves on film executing play F and get feedback from coaches. Coaches evaluate play F and make any adjustments.

Friday-   Coaches make the decision to keep plays D, E, and F or drop one if they feel it is not going to work. Players are given any last minute feedback.

Saturday-   Game is played.

When the game was played the design was put to the test and the outcome of the game determined the effectiveness of your design.

The process I just described doesn't appear to be very creative or imaginative, but it was. The human element or player is what made it creative.It is important to understand a play is just a theory. A play is a coach telling his players theoretically where they need to be to have success. The human element played a large part in the planning process. Designing how you would use each player in certain situations was the key to being imaginative. Just like there was no perfect play there was also no perfect player. They all had their own strengths and weaknesses. The same could be said about the opponent. Their players also had their strengths and weaknesses. You had to be creative in the way you meshed the two together.

Sometimes you had to come up with funky or nontraditional plays to put your players in the right position. Also in coaching creativity was synonymous with the term bold. Sometimes you had to make bold play calls that went against the grain or popular thought. If your play worked in that situation then your design was a success and you were an innovator. If the play failed then your design was a failure and you lacked imagination.

This type of design was highly stimulating because it involved so much collaboration, collaboration between coaches, between players, and between the coaches and players. The success of the design was shared collectively with the team, fans and community. It could also be stimulating in a negative way if the design didn't succeed. Those feelings were also shared collectively.

The competitive nature associated with the design was also stimulating. Essentially you were trying to make a better design than your opponent and you were given instant gratification for your design successes. Some designs take years or decades to come to fruition and even then their awesomeness may not be realized. In coaching you had one week, so the highs and lows were very stimulating.

[Participant 19] As a teacher and recently a volunteer instructional designer, when I think of design, I immediately think of lesson planning or developing a training course on Adobe Captivate 9. My most recent experience was creating a training course for potential tutors for the [removed organization's name]. When designing I worked with the limited knowledge I had on multimedia design principles and the objectives I created. It was effective as we had tutors test the course and received mostly positive feedback. I also used the criticism to tweak certain slides to make it more effective. Some of the things I had to change were slides that had too much

information on them or were positioned in a way that was visual straining.

To measure the effectiveness of the program I included knowledge check activities throughout the course as well as a multiple choice quiz at the end of the course. The tutors that tested the program did well on the activities and the quiz. Another way I know the 45 minute course was effective is it replaced a 4 hour training that used to take place while still covering the same amount of objectives.

To make it creative and stimulating, we used assets to represent our tutors and tutees. I think the most stimulating slides were the ones that included case studies and then application of knowledge to those case studies. For example, one of the objectives was to identify kinesthetic, visual, and auditory learning styles. After that, learners had to identify a student's learning style based on what they read in a case study and which activities would be most appropriate for that student. I think the fact that all the case studies were realistic and allowed learners to use information in application form, made the course stimulating overall.

Being my first design project in Adobe Captivate, it felt really thrilling to be able to design and learn many of the features in Captivate. I think the best part is to see the vision becoming a reality through design and knowing it helped solve a issue the organization was facing in an effective manner.

[Participant 20] Design can be an expensive taste but being creative can allow you to design something so beautiful for basically nothing. It all started when I got promoted to kindergarten position :), I knew something great must be done in order to have a successful school year. How was I going to make my classroom welcoming and get the students wanting the to read? The feeling of creating this life sized tree in the middle of my classroom felt so rewarding and amazing, I actually fell as if it is a real life tree and have caught myself sitting underneath the tree a few times. I've never in my life have received so many compliments on my classroom and how amazing the design of my room looks, every child that has entered my room has gone straight to my reading tree and grabbed a book and started to read. on this design has been well worth every minute, seeing the faces on my students have well exceeded my expectations. Not only was I creative when designing this life sized tree in my classroom, I am now able to decorate the tree differently during the holidays and different seasons. When students sit underneath the tree they are able to use their imagination just like I used mine when designing it. It is so amazing how creativity can turn design into such an amazing thing, never in my life would I of thought I can design something like this. After this experience I have a different feel and attitude for design, before my friends were so into designing their houses and I always use to get so annoyed because I never thought it really made a difference everything looked the same to me. I am glad I was able to create this beautiful design because it has given me a new perspective on design :). It makes me feel totally different now I get so happy thinking of design now, I know want to redesign my whole bedroom now.

Since I talked about my design so much I thought maybe you would like to see :)

Question 1.2: Describe a time when you felt totally uncertain. Try to remember how that felt and the greatest challenge you faced because of the uncertainty. What did you do to handle it? Knowing that part of being a designer is always dealing with uncertainty, how do you feel about being a designer?

[Participant 1] I had launched a website for my students to share extra readings and materials concerning the subjects. To choose the best background, font and color scheme I had to visit hundreds different sites comparing them. The other problem was to arrange everything logically, so the students could find all the files in no time. When creating website I used my creativity and imagination, although I had limitations because of the technical constraints.

[Participant 5] To answer this question, I started making a list of times when I felt totally uncertain and realized I am an "uncertainty junkie"! I have changed not only jobs but entire industries multiple times.

Right out of high school I started working in a local district court. I continued working in multiple courts in multiple positions for 13 years and ended my court career as a Deputy Court Administrator. In that position I managed 35 employees and got my first taste of training when we changed computer systems. At that time most of them had never used a PC, windows, or even a mouse. I came up with a plan and had them play solitaire and use Paint to get over their fear and make it fun. Once they were comfortable with using the mouse and switching windows I was able to train them on the software.

The court system can be a depressing place to work, day after day of hearing how horrible people can be to each other, I needed a change. I had a cousin in the mortgage business and her bank was hiring. I knew nothing about mortgages, other than the fact that I had a large one of my own and better figure out quickly how to be successful at it. It was terrifying but exciting to jump into something completely new. It wasn't easy but failure wasn't an option.

At that time the bank had no official training program for new loan officers so I learned by shadowing experienced loan officers, reading everything about mortgages I could get my hands on, and trial and error. It took several months and a very patient manager but within a year I was to the point I needed to be.

After several years of being a loan officer, the bank asked me if I would be interested in helping to create a training program for new loan officers. I had never actually written training content, but thought it would be an exciting challenge and could use my own personal experience as a reference. Then the bank informed me they also needed a trainer, so I would need to do that too. I hadn't actually done "classroom" training yet but again thought it would be interesting. Because they wanted to get started right away, I began gathering content and creating an outline each night and teaching it the next day. It was truly Instructional Design and training by fire!

I had to ask for a lot of feedback from those that attended the training. I asked how it compared to other training they had at previous banks, what they liked, what they didn't like and adjust accordingly. Some of the feedback was hard to take, my ego got bruised but I had to take it to

make the class what it needed to be. It eventually turned into the corporate training program in place today at [removed organization's name].

My next career leap wasn't by choice but was filled with uncertainty. Cutbacks at the bank led to positions being eliminated and I was unemployed for two years. This unplanned extended vacation taught me a lot about uncertainty. Interview after interview, rejection letter or no word at all, thinking I was going to lose my home taught me to dig deep and just keep moving forward and to not give up.

Finally, one day I saw a job posting for a trainer position at [removed organization's name] in Detroit. I thought well, I don't know anything about the medical field but I know how to train so why not.

I got the position but it was a temporary position with no benefits. It was like starting my career all over again, but it was my only option. I admit I was scared to death to drive downtown, but again, it was my only option. I got the position and 3 months later was teaching physicians and surgeons. I had to use the "fake it till you make it" mindset as training doctors can be very intimidating. Eventually I found my comfort zone and really enjoyed training and after a year was offered a permanent position as a trainer.

My last career jump came when I heard about a training position opening at [removed organization's name]. While I was in the interview, I showed them several training documents I had created and they asked me if I had ever considered being an Instructional Designer. My response was "not really", but I'd be interested in trying. A week later the Instructional Designer job was mine and the rest as they say is history. Again jumped into a position I really knew nothing about, learned by seeing what others did, what works and what doesn't. So being a "uncertainty junkie" I think has prepared me well for the uncertainty of being an Instructional Designer. You have to learn to adjust quickly, not take feedback personally, and always keep in mind what is in the best interest of your customer/learner.

[Participant 7] I recently felt uncertain over this past summer when deciding my plans for the upcoming school year. I had the option of remaining in my current classroom and school district or applying elsewhere. The reason I was so uncertain as to which choice I would prefer, is because both options have several positive and negative components. For example, in my current position I am currently in one of the lowest paying school district in the state of Michigan but have an unbelievable principal at my school and truly love the grade I am teaching. If I were to obtain a new position, I would have a large pay increase and could possibly have a great principal/grade level but it is uncertain.

During this summer, I felt a great deal of stress. It seemed almost impossible for me to make a final decision on if I would stay in my current position or begin the application process. I felt as though I was constantly thinking about it and it often kept me up at night. Finally, I decided to sit down and make a pros and cons lists for my options. After creating this list, I spoke with my parents, fellow colleagues, friends, and other teachers I know. Each person I spoke with gave me great advice and after speaking them and going over my list, several times, I was able to make the decision to stay in my current position.

Since uncertainty is a part of almost every aspect in life, I am not surprised it is part of being a designer. However, I don't believe that makes it any easier. Cross speaks of designers problem solving by incorporating their "personal set of guiding principles" and I believe that is an effective way to decrease uncertainty as a designer. Since I find that I have a very strong set of principles in my life, I should be able to deal with uncertainty as I continue to design in the future.

[Participant 8] I believe wholeheartedly that designers are always uncertain about what they are to put together next and therefore very similar to freelance artists. Not many designers and artists fully know what project is to come next for them. In a sense, designers must be able to have a greater sense of withitness: the ability to be able to switch gears and think on their feet in order to adapt to their ever-changing environment.

I think as a current librarian and often designing programs for my patrons, I am very familiar with this feeling. It's one of overwhelmingness: how you aren't sure about the topic, or the materials, the concepts and ideas you're trying to make sense of so that it may or may not fit with your patrons. Since becoming a librarian, I've learned that not all patrons will be pleased with my programs. Some will express this openly, while others will do the same passively. Two things that I've learned in order to cope with this: 1) try different things with patrons, and if it was not valued, find something else for next time, and 2) find out what your patrons like and dislike through social media, or simply by asking them. I use the newly obtained knowledge to come up with my programs.

I don't have an issue with being a designer so long as I have the tools, and peers to be successful.

[Participant 9] During the middle of the 2015-2016 school year, I was given the opportunity to teach advanced placement US history because of an unforeseen retirement. Accordingly, I took the position with a bit of apprehension (taking on a college-level course in the middle of the school year was far from ideal). To elaborate, I was completely unfamiliar with the AP exam and how to appropriately teach an AP course. With that being said, the feeling of uncertainty was nothing new to me as an educator. Over the course of the past seven years, I've been required to teach numerous courses of which I've had no prior experience with. Because I was so familiar with uncertainty, I approached the class with a sense of confidence and enthusiasm that others may not have had. To prepare myself to teach the course to the best of my abilities I took a two-pronged approach. First, I began to study the AP exam and corresponding curriculum in order to familiarize and eventually master the format. I sought out every resource that I could to bridge the knowledge gaps that existed in January. Secondly, I gauged my new students' perceptions about what did and didn't work with their prior instructor and my current instruction. I genuinely think that one of our greatest tools in education and service, in general, is those we serve. If we sincerely listen to our clients for feedback, we can gain great insight into how we can improve our product. Accordingly, I began to slash routines and procedures that were well-intended, but unsuccessful during the first semester (e.g. student-lead presentations). For the remainder of the year, I sought feedback as I successfully transitioned into the role of an AP teacher.

Additionally, I began to incorporate the elements of the AP exam into the class in order to best prepare my students for the AP exam. As the year came to a close I was extremely anxious to see if my hard work had a positive impact. To my delight, a significant portion of my students scored very well on the AP exam and many of them were sure to communicate to me that my efforts were a major factor in their success. Lastly, the uncertainty associated with design is something I am accustomed to. After my first few years of teaching, I was hopeful that I would be able to develop a routine teaching that would eliminate the constant planning and revising that characterized my rookie years. However, what has become apparent to me is that those that are genuinely interested in providing a high-quality education in the 21st century must be willing to continuously adapt and improve their craft. In other words, our work is never done. I have embraced this reality and this is why I feel comfortable as a designer.

[Participant 11] I feel very uncertain about my choice to pursue this program. This is an endeavor I thought had passed me by after having two children. It wasn't until I became a trainer that I realised that being a trainer is what I am meant to do in my professional life. While in the training department I noticed a gap in my own performance which was with instructional design. That is why I enrolled in this program. The greatest challenges I face with this uncertainty are the questions I keep asking myself. For example, "will the cost of this degree be worth it upon completion?" "Will I find a job that meets my expectations?" "Are my expectations realistic?" "Do I really have what it takes to be exceptional?" etc, etc. I am trying to handle my uncertainty by becoming more informed about what is required to be considered a great adult educator/instructional designer, looking at job postings to understand what employers are looking for and telling myself that I will find a great job upon completing this program. :) After completing the reading assignment, it was comforting to know that the uncertainty I felt constantly while I was a trainer/instructional designer was normal. It gave me confidence that the uncertainty I felt didn't necessarily mean that I didn't know what I was doing. About being a designer, sometimes I question the level of creativity I possess but I think that will come with more education and time. Other than that, I love this line of work. In fact, this is what I've felt most comfortable doing, professionally speaking so I at least have the passion it takes to be a great designer.

[Participant 12] The last time that I felt uncertain was deciding if we needed to take my daughter to an out-of-state feeding clinic for eight weeks this summer. She had been getting treatment, and progressing, at the outpatient feeding clinic at the [remove organization's name] since January. Because she was progressing and eating and drinking new foods, albeit slowly, we were not sure if we wanted pick up and move to Baltimore, MD, for two months. I felt that it would be a good thing for her because she needed more intensive treatment than the once a week she was getting at [removed organization's name]. Once we made the decision to go, we are very grateful that she did because she has progressed at a faster pace than we even anticipated.

My wife and I handled the situation by speaking with her outpatient therapist and the therapist at the feeding clinic in Baltimore to get their opinions on the progress our daughter made. They both informed us that while the outpatient therapy was working, it was in their opinion that the feeding clinic in Baltimore would further provide her with the skills to overcome her disorder in a shorter amount of time because they would be working with her three meals a day, five-days-a-week for two months instead of the once a week treatment she was getting at [removed

organization's name].

As a designer, uncertainty does not phase me because it is a natural part of design process. Uncertainty affords you the opportunity to step back, reflect on what you are doing, and re-work your design/decision in order to have a better outcome, solution, or product. Without reflection, you could get tunnel-vision and miss out on opportunities to rework/rethink your product/decision from a different angle.

[Participant 13] Designing a Workshop ("Using Groups to Engage Students in Blackboard")
For a few semesters I have been facilitating a workshop on how to engage students in Blackboard. The workshop focuses on the differences and similarities between the Discussion board, Blogs, Journals, and Wikis in Blackboard. Every time I presented this workshop the participants wanted to also learn more about how to engage students using groups in Blackboard. Because of that, I decided to design a workshop dedicated to engaging students through Blackboard.

My greatest challenge was figuring out a way in which I could design a workshop that would be complementary to both my "Engaging Students through Blackboard" workshop, but also to the curriculum that our department offers. At the time I started designing the groups workshop ("Using Groups to Engage Students in Blackboard workshop"), I knew exactly what content and pedagogical strategies I wanted to include, to make it a continuation of the "Engaging Students through Blackboard" workshop. The real challenge was fitting this workshop in our department's curriculum.

After I designed the workshop, I found out that another one of my colleagues was going to facilitate a pedagogical workshop on groups, and was going to talk about some of the same pedagogical strategies that I was planning to incorporate. This made me feel really uncertain about how I could redesign the workshop to still make it complementary to my "Engaging students with Blackboard" workshop, but in the same time to avoid creating an identical workshop to the one my colleague was going to present.

And to make things even more complicated, I was running out of time, as I had only a few days to deliver the finished product. Part of me wanted to freak out, but I decided to consult with our team's curriculum designer instead, as I knew a fresh pair of eyes would be very helpful. (We had prior conversations about the workshop, but due to other priorities, these discussions were not detailed enough for either of us to realize that I was moving in the wrong direction.) As expected, our meeting was very productive, and it became clear right away that another way in which I could frame the groups workshop would be in the form of best practices for groups communication. Switching the focus of the workshop to groups communication would have made the workshop fit perfectly in our department's curriculum. However, with this change in mind, it felt like the workshop about groups was not the exact match for the "Engaging students with Blackboard" workshop. Something was still missing. This made me think that I could change the "Engaging students with Blackboard" workshop to briefly include groups. After all, small groups provide a way of engaging students through Blackboard. And then the next step would be groups communication. The solution to this challenge was completely different from what I could see initially, so being flexible, and open to suggestions was crucial to this entire

process. There were times when I simply wanted to drop the whole project, but I am so glad that I stuck to it.

As a designer I always experience highs and lows. One moment it might be the high of a great idea that strikes unexpectedly, followed by the low of discovering that this idea might not be perceived as such by others. Most times, that requires going back to the drawing board. But I believe that it is this constant challenge what makes being a designer so interesting. Reflecting on my own creative process, and understanding that freak out moments are normal part of my design process has also proved to be very helpful. I have learned that I ought to have the courage to fail, to allow myself to walk away from fear, and fully embrace creativity.

[Participant 17] Journal not submitted

[Participant 18] In the above example I talked about being a football coach. I mentioned some of the uncertainty that came with the design process. I mentioned the collaborative aspect of the design process. The collaboration also led to a feeling of total uncertainty. The design process was so fluid. Players got injured, the weather could be a factor, maybe your design wasn't good enough, your job and livelihood depended on the success of your design.

After reading the literature for the week I believe there are certain traits we have that make us good designers. Empathy is an attribute that is mentioned regularly. Empathy is a trait that can allow us to be a good designer. It helps us ease the uncertainty because we understand many of the environmental factors that affect our designs. Empathy gives us the ability to look into future and accurately gauge reactions to our designs. In coaching this is the ability to gauge the confidence or ability of your players to execute a play. Uncertainty can also cause a deficit in our empathy. The stress and anxiety caused by uncertainty can make us ignore environmental cues and lower our empathy. I deal with this stress and anxiety with balance. When stress and anxiety associated with the uncertainty of your design start to creep in many of us have a knee jerk reaction. These reactions throw us out of balance. Sometimes these reactions can be involuntary. The stress can cause lack of sleep, bad diet, spending too much time focusing on one piece of the design or ignoring some of the collaborative pieces.

I deal with this stress by trying to actively identify the things that make me balanced. I try to fight my natural reaction to cut off the environment around me and I try to keep my regiment consistent. When I say regiment I am referring to the things I do when I am not working of a specific design. I know that everything we do is a design, so maybe I mean don't let the uncertainty of one design affect the certainty that exists in your other designs.

I feel great about being a designer because I embrace uncertainty. This has to do with the way I was raised and my past experiences. I also feel my confidence as a designer will only increase because I am studying it more closely. The literature mentioned how hard it is to study great designers because they have trouble describing their metacognition when it comes to design. As I continue my journey as a designer I will actively try to study myself and make myself more aware of how I design, so I can continually improve.

[Participant 19] Being a teacher, I do see myself also as a designer and am always dealing with uncertainty. To be honest, I need to improve in accepting the fact that uncertainty is always going to be part of the job as a lot of times uncertainty gives me anxiety as I like having a plan in place and being confident in the plan. During my times of uncertainty, I reached out to peers with more experience and sought out resources to allow myself to feel more certain. For example, my first year at the school I knew that teachers were supposed to teach under a "Reading Apprenticeship Framework." However, I wasn't trained in it at the beginning of the year so was very uncertain on how the framework looks like in class. To calm the uncertainty I spend a lot of the first month of school observing teachers who were much more experienced in teaching with that approach. This allowed me to feel more confident teaching under the framework before I received the training for it. I think as designers, it's important we are proactive when we feel uncertain to do something about that uncertainty.

[Participant 20] A time I felt totally uncertain is going back once again to when I found out I was being moved to Kindergarten. I'll never forget the feeling I felt rushing through my head and shivers going down my body when my principal told me I was being moved grades. I thought how is this even possible; I knew absolutely nothing about the grade or content. I also had to switch rooms a month before school started and had absolutely no one to help me get through this, all that was running through my head was how am I going to pull this off :/. The feeling of not knowing was not fun and very scary. I am the type of person that likes to plan and make sure I know exactly what I am doing, when I am uncertain about something I get very nervous and frustrated. I was able to handle this situation by having very long nights researching different kindergarten techniques, classroom designs and resources, there is nothing the internet can not help you figure out. I also, studied the different class standards which helped me to design and create different themes and lessons for my students. Before facing this challenge I never in my life pictured or looked at myself as a designer, although I know everything we do has some sort design. The situation I have encountered allowed me to discover a different level of designing making me realize I am a designer. You are able to create or master anything you put your mind and heart into, it just takes time and dealing through uncertainty. When being a designer you tend to run into uncertainty quite a lot just takes that extra push to get through it.

Question 3.1: Are you a Gordon Murray or a Kenneth Grange designer? Why? Which would you like to be as you ultimately develop as a designer? Why?

[Participant 1] I believe in Kenneth Grange and I have some of his design abilities and aspirations. This is because his designs are not only based on the style of the product but also does a reassessment of the role and use that the product is supposed to serve. He also takes into account the pleasure received from using his designs, something I also take into consideration when trying to come up with a design. Grange is also a motivating factor due to his designs which are more centered on the user as he tries to eliminate any problems that his products can have.

[Participant 5] I believe it's something I've always done; I just didn't *know* I was designing. I have made changes in every job I have ever had. Always asking "but why do we do it this way" or "wouldn't it be better if we did it like this?" You said this week we should pick which

designer we identify with the most and I definitely see myself more like Kenneth Grange. I really like his common sense approach to things. I could really relate to him getting upset by the waiter bringing two hot dishes and only one having wooden handles on them. I would have thought …"now why don't all their dishes have wooden handles!"

I also really like his philosophy of using a product before trying to redesign it. I do that in my current position. I will look at the instructions our users have and if I can't follow it and figure out what it's telling me to do quickly, I rewrite it. Our doctors don't have time to read and reread how to do something on the computer. They need to know how to do it immediately by looking at the material. I'm a big fan of numbered screenshots. That way users see what they are supposed to click or press and in what order. When he talked about "worrying about it until you get an idea" that really hit home with me as well. I will worry and lose sleep about a problem until I can come up with at least one idea of how to solve it which usually leads to another and another, much like how he designs.

[Participant 7] I want to be a designer for many reasons. First off, keeping everything the same, exactly how it is is BORING! I love improving things and making things better. Why not make something more beneficial for you or others? I want to be a designer because being innovative is contagious and I hope that my colleagues and even my students will be able to see my passion and design themselves. I want to be a designer because some of my favorite people in the world were/are designers. Specifically, my grandma [removed name] designed little characters through her knitting. She put her whole heart into this and I still love her creations to this day. She used to donate her knitting to children and young adults in hospitals.

I believe I possess many of the same characteristics as Murray and Grange do that would make me an excellent designer:
1. Like both designers, I am highly motivated towards my job and my success at teaching. I wake up excited to go into my classroom each morning and have to give myself a time limit of how late I can stay each day (or else I would probably spend the night there). I am so enthusiastic about my profession and I believe that is so evident in the lessons and activities I design in my classroom. I would hope that when another adult is in my classroom, they can feel my motivation to teach just simply by watching me.
2. Like Grange, I "learn by doing". I am constantly reflecting on the lessons that I teach. During my lessons, I am writing down things I will do differently next time and after school each day, I look at what lessons went great and what lessons did not turn out as well as I would have liked. I believe this characteristic would lead to become the best designer I could be because I am always improving on my own work.
3. Also like Grange, I always say yes. Although that can sometimes lead me down the wrong path, I have found that this is a good characteristic of a designer. I am leader of our [removed group's name] group at my school, I am also in charge of collecting school wide data each month, I am on two other committees, etc. etc. etc. I feel like I could go on and on about how many extracurricular activities I do at my school. Whenever there is that awkward silence after the principal asks who would like to do something, I find my hand shooting up. This leads me to have a lot of responsibilities at school and I am often a person people can come to when they have questions.
4. Like many of the designers discussed in chapter 4, I have been motivated to become a teacher

since youth. I loved going to school when I was younger and I was surrounded by great teachers growing up. Having been around such a positive experience as a child, I have been motivated to become a teacher and design the lessons I do.

5. Finally, and I believe the most important characteristic, is that I truly am a lifelong learner. I think that is crucial in become a designer because you are never done designing. Even when you have a finished product, you can look at what you can do differently the next time. Also, I love learning from other designers in the field of teaching. Watching others who are passionate about teaching, makes me more passionate about teaching.

Overall, I think it's difficult to say which designer I am more like. They both possess great characteristic of designers and I feel like I am similar to both. However, if I had to pick I think I would say I am more like Kenneth Grange. His passion for design is similar to mine and I think that we are both "doers" and learn each and every time we design.

[Participant 8] No response

[Participant 9] No response

[Participant 11] No response

[Participant 12] No response

[Participant 13] In the beginning of the week, after first reflecting on this question, I surprised myself thinking that my personality is definitely more like Gordon Murray's, thus making my designer's identity more similar to his as well. Gordon's emphasis on working from the "first principle" resonated with me from the beginning, as I share the same idea as where design should start from. Also, writing little notes and scrabbles, at time small drawings, are things that help me, just like Murray, understand the problem and work towards figuring out a solution.

Of course both Murray and Grange are highly motivated, hard-working designers. While I have always admired Kenneth Grange's work, in the beginning, I just didn't see too many similarities between us. Thankfully, as a designer I am committed to keeping an open eye, and determined not to prematurely jump to conclusions. The more I read about Grange, the more I realized how wrong I was. Kenneth Grange's background and beginnings are so closely related to learning by doing. At first I thought that this was what separated us as designers. Upon reflecting on this idea, I realized that while I am not particularly talented with arts and crafts, whether I cook, solve a math problem or a design challenge I work things out by trying. Learning by doing can at time take very different forms, from simply beginning cooking, to taking a piece of paper to start solving a math problem, or putting together a storyboard to brainstorm a design project. While my prototype might not be made out of wood, I always need to put together a course, for example, to see if the design I came up with covers the needs of the project or client. Needless to say, I was truly surprising to discover that Kenneth Grange and I have the "learning by doing" in common. Understanding this, made me curious to see if there were any other characteristics that we might have in common.

I chuckled reading about Kenneth Grange's "can do attitude". It sounds exactly like me. No matter how many projects I might be working on, I seem to find a way to either accept or assign more work to myself. At times, this means, staying home and working on a project, instead of joining friends for a night out. Other times taking on so many projects makes me nervous about finishing everything in time to reach the deadline. It was refreshing to read that sometimes even a designer like Kenneth Grande can feel very nervous, due to the design risks he took, or because of the high level of responsibility the project involves. Knowing that I am not the only one feeling nervous sometimes, helped me understand that feeling nervous and freak out moments are normal part of the design process.

In spite of being convinced that, as a designer, I am more like Gordon Murray, it was interesting to realize that I have features that resemble both Gordon Murray and Kenneth Grande - especially when it comes to motivation and work attitude. And since they are both incredible designers, I can only hope that, in time, as I continue to grow and further discover my designer identity, I will share even more of their qualities.

[Participant 17] Journal not submitted

[Participant 18] No response

[Participant 19] No response

[Participant 20] No response

Question 3.2: Describe a time when you had a sudden inspiration. What were you doing when you had this inspiration? How did you feel? Why do you think the inspiration came to you at that moment?

[Participant 1] I received an inspiration when I went for a walk during one of my visits to one of the new cities back home. The inspiration emanated from a sculpture that I saw which had an embodiment of an emotional human being trying in one way to plead to the audience to take notice of it. It inspired to create a unique piece of art in drawing the same night. I believe the inspiration came from the sculpture due to its uniqueness and simplicity.

[Participant 5] Back in May I saw an ad for a 6 week New You CrossFit boot camp challenge. They said they were looking for women of all ages that were not currently working out but wanted to make a change. At the time I was at least 30lbs overweight and couldn't run more than a block even if my life depended on it. But I knew I should do something. I had tried diets and walking but nothing really seemed to change. I thought maybe this was the "kick in the pants" I needed. So before I knew it, I clicked on the link, filled out the application and had an interview scheduled the very next day.

Sitting on my couch wasting time watching TV and being on Facebook feeling bad about myself. I hadn't planned on looking for any kind of exercise program, it just happened to show up in my newsfeed.

How did you feel?
I was so excited and scared I could barely sleep that night but somehow I knew this is exactly what I had needed for a very long time. I didn't know if I could even do it being so out of shape and [removed years old] but I thought what is the worst thing that could happen? I go and hate it? So what! I hurt myself and wind up in my Emergency Department? So what I love the doctors in my ED. So I went. I sat in my car for a good 15 minutes before making myself walk in the door. That day changed my life. I did the boot camp for about 3 months and have now moved to another workout program. I made a bunch of new friends that are all amazing women that inspire me everyday to keep working out. I'm in better shape than I have been in for a good 15 years. I have more energy than I know what to do with and felt so great about myself I decided to start another longtime goal of mine…getting my Master's Degree!

Why do you think the inspiration came to you at that moment? It was divine intervention! Something just told me to do it.

[Participant 7] This probably gets annoying hearing me talking about teaching so much but my sudden inspiration was when working with my most challenging student last year. Lets call him John. John came to Kindergarten in September with a few behavioral problems, but nothing too extreme and all very manageable. I thought John and I were building a solid relationship and he could trust me and enjoyed coming into our classroom each day. Winter break came and went and when John came back to his classroom, he was a different person. His behaviors had become so extreme, completing unmanageable, and honestly very dangerous. John would throw scissors at his classmates, swear at the top of his lungs in school, run into traffic, try and stab himself with pencils. It was one of the most stressful times of my life and honestly made me question my teaching career. Myself, the principal, and the school social worker tried every trick we had but nothing could seem to work. The behaviors continued to escalate.

Then one day, when we had to call John's mom to come remove him from the classroom, it hit me. This was the moment I was inspired. John's mom came running (literally running) into my classroom full of 21 Kindergarteners yelling at John at the top of her lungs. Swearing at him, telling him he could never do anything right, she was embarrassed she was his mother. Then she hit him across the back of the head and pull him to the car by his hair. I was mortified, shocked, honestly heart broken. But it finally made sense to me. I wasn't doing John any good by punishing him, yelling at him, taking away his recess, isolating him from his friends. He needed me, an adult who would love him and an adult he could trust.

The next day when John came back to my classroom, I was a new person to him. He became my right hand man. He literally held my hand most of the day, would do little tasks for me throughout the day (like sharpen pencils) which he knew was helping me, and he had lunch with me for the remainder of the school. Lunch was the big turning point for us. John and I sat alone for 30 minutes every day of school and talked. We would talk about anything… cars, video

games, whatever he wanted. I showed John affection and love by praising him when he was doing great, giving SO MANY hugs, and just listening to him when he needed it most.

Now John's behaviors obviously didn't change immediately and it was an exhausting work in progress but I did see progress. John's behaviors decreased with severity everyday. The process (while it was happening) was tough on me to be honest but when I started seeing the change in John it made it so worth it. I felt like I achieved something amazing. I felt better about what happened with John than I did was another student who increased 6 reading levels in a year. John changed me as a person. He not only made me a better teacher but a better person as well. Sob story over :)

[Participant 8] I had an inspiration for a program when I was out shopping with my child. We were in the toys section of a local grocery chain and I came across some card games. I decided to purchase *Sushi Go!*, *Pizza Party*, and *Play It Forward*. From there, I was able to construct an Anime Program where we also learned about Japan and the history of comics. I made a program about different Pizza Chains from around the world and used *Pizza Party* as a way to end the program. *Play It Forward* is a deck of cards with different sorts of missions (in categories of Engage, Surprise, Grow, Care, and Create). The missions are to be completed and then passed on to a different individual. This card game ended up being a daily mission game for my teens as they come to the library.

I never purchase anything that I wouldn't enjoy on my own. I think this is very critical when it comes to designing anything, and especially so for program creation. I was very excited to have across the card and dice games above. And I think that my excitement was passed on to my audience as they always enjoy what I have to offer. They look forward to my future programs as a result.

I am always looking for new ideas. I found that it was harder for me to sit and think about what program I want to do. Therefore, I keep my job at the back of my mind when I am out and about.

[Participant 9] One of the things that I've discovered about my own design process over the course of the years is that I can't force it. Some of my best insight has come at the least expected times (e.g. in the shower or driving to work). To give you a tangible example, I was attempting to teach the concept of production possibilities and trade-offs through a hands-on simulation. In the process I searched the internet for lesson plans; however, all of the lesson plans required materials I didn't have readily available. I decided to let the concept marinate while I went to the gym. My typical warm up at the gym consists of pushups and situps and it was during this particular warm up that I had a lightbulb moment. The concept of tradeoffs requires students to conceptualize that our planet has finite resources and consequently human must make choices regarding how to use these resources. My warm up inspired me to illustrate this point by using muscle power as the finite resource. It is physically impossible to do a push-up and sit-up simultaneously, you must make a choice, a choice which requires a trade (giving up the opportunity to do the other activity). Accordingly, I led students through three rounds of exercise to illustrate this concept. In the first round, students were required to do as many push-ups as they could in 20 seconds. This 20-second interval was representative of a year of production when all resources (muscle power) are allocated to push ups. The same process was

followed in the second round and applied to push ups. The third round split time between push ups and sit ups. After partaking in this simulation, students were required to graph their experience, resulting in a production possibilities curve like so (replace guns and butter with push-ups and sit-ups and change the numerical values).
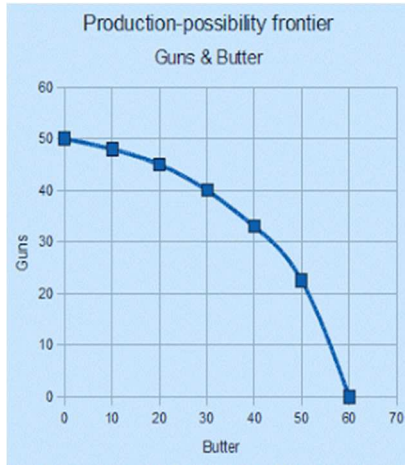
As for why my inspiration came at this moment, I think it was the byproduct of circumstance. The perfect set of conditions coupled with my open-mindedness allowed me to see an opportunity in what was a common routine of mine.

[Participant 11] I was working on an assignment to refresh our training course for our vault training. It was a project that was on the back burner for quite a while and I was uncomfortable with it. It was instructor-led and mostly lecture...no, it was ALL lecture. Boring. I knew I wanted to breathe life into it, get the participants involved, I just didn't know how. Then after a meeting with senior management, I decided to do a pre-training shadowing exercise. I created a list of must-see items which the coach at the branch would check off prior to the trainees coming to training. When shadowing, the participant would record questions they had after the observation period. That was the impetus to the rest of the redesign. The activities, etc, just started coming to me. I'm not really great at multi-tasking but with this I had to do it to ensure I would remember everything I wanted to do and why. It was invigorating and exciting. I was so proud of what I came up with. I remember sitting at my desk just dazing off when I started thinking about the game to use for the review material. "Get them up and moving" was the primary thought I had and ideas came to mind from there. Instead of concentrating on the material, I started concentrating on the concept of getting them up and moving and it sort of cleared up the mental block that had been plaguing me. Here is a table of some of the major enhancements I put together:

Activity	Content	Reason
Group discussion as a class	Their shadowing experiences	So they could learn from each other
"Burning Questions" flip chart	Used during group discussion; recorded questions participants had after shadowing	Participants could hold me accountable to ensure they left class knowing their questions were answered
"Still Standing" game using beach ball with categories of questions	Used to review material participants should already know.	So we could review this material in some other way than an instructor reading it from a manual which is what happened prior
Hands on activities - individual and with partners	Vault procedures	Again, trying to find some way to make the content interesting plus many people learn by doing.
End of class teach back	Participants were broken up into small groups and given a set of the questions they contributed at the beginning of class and they were asked to prepare short training presentations to the class	A great way to make sure people learned something is to ask them to teach it.

[Participant 12] When I was a sophomore in college I was asked to be a mentor for some of the junior high and high school students at the church I was attending. Part of this was creating events to help grow the middle school and high school population outreach programs. I was thinking of cost effective ways it could be done, and as I was mowing my lawn it suddenly hit me: To offer free pizza and pop to middle school and high school students on the days they get out before lunch. The church I was attending was located across from [removed school's name], and once a month they would have ½ school days. The program became an instant success because we opened up our game room as a safe place for children to hang out in the afternoon. By the time the program ended, we averaged more than 150 students each time.

I felt proud because it was an easy outreach program that we could do for the middle school and high school students. We actually had a couple of the students come back for the evening meetings because of the pizza program. I think it came to me when I was mowing the lawn because I took a break from thinking about it and was focused on something else. I probably saw a pizza delivery truck drive by, which gave me the idea.

[Participant 13] Some years ago, after I spent some time with my friends' kids, I got the crazy idea of writing a children's book. The kids and I shared a love for books, but also for pets, dogs

especially. So it came as no surprise that our favorite things to do were either reading a book or listening to a story, especially one involving dogs. And since the kids didn't have any (real) pets, they wanted to know if I had any pets growing up. This is how I came up with the story of [removed name] had an unexpected effect on me. Seeing the kids' reaction to the story, made me wonder: how would other children feel about my story? Could I bring the same smile or the same pleasure of discovery to other children as well? I guess I had to put it down on paper to find out.

In that moment of inspiration I felt excited, and happy. I also had a sense of impatience, as I could hardly wait to see the story take shape in writing. But once I completed the story, I wanted more. I needed illustrations to bring the story to life, as my targeted audience was composed of young children that haven't learned how to read just yet.

I remembered this extremely talented student I had during my first year of teaching, and decided to reach out to her. After a brief Skype conversation, she started drafting the illustrations for the book. Her artwork brought the book to a whole new level, and the story of [removed name] went from a fun oral story, that my favorite kids enjoyed, to a printed book with lovely illustrations (for now only a home edition, not a publishing house one). The kids' love for stories inspired me to compose and then write this story. I doubt this book would have been written, without having this perfect little audience.

[Participant 17] Journal not submitted

[Participant 18] I was studying to become a teacher. I was in a class where we had to design a lesson about Shakespeare. I dislike Shakespeare, although I did play Grumio in a theatre in the round production of Taming of the Shrew. Also being I was going to be a math teacher I felt uninspired and melancholy about the whole scenario.   Nonetheless I had done some research about Shakespeare and his writing style. I was studying for math class and I was completely burned out on math. When I flipped the page a print out of a Shakespeare that I had stuffed in my book appeared. I started to see patterns in the structure of his writing. Not so much content. I was inspired to link his writing style and patterns to construct polynomial expressions. With this new inspiration I felt motivated. I was able to right a lesson plan that allowed for students to take a abstract concept or what they perceived as abstract and turn it into a quantifiable measurement. This lesson also crossed disciplines, so I felt it would be a unique lesson. I am not sure why I was inspired in that moment, but I think when you inundate yourself with facts about something and move on to something else your brain has time to catch up and organize information in a way that fits your personality. When I thought I was working on math I think my brain was processing the Shakespeare project in the background. Inspiration is a confidence thing sometimes. We have to be confident and trust that our brains think is a certain way and that it will organize information appropriately. Sometimes I think the world moves too fast for our brains to do this and a lot of inspiration is lost along the way. This can cause people to lose confidence and in turn lose moments of reflection and inspiration.

[Participant 19] A time when I had a sudden inspiration was working in India. At the time I was struggling with student plagiarism with the writing assignments students were completing. Even after discussions and giving out zeroes, it seemed like a constant issue due to the school culture. At the same time I was losing classroom time due to a math teacher who sometimes needed to

teach during my class periods. At the time I had the inspiration, I was feeling frustrated when mapping out my weekly lesson plans. I didn't have much classroom time to teach the speaking, listening, reading, and writing standards of the curriculum. As I examined my weekly lessons, I noticed that I used a lot of class time for different speaking activities and smaller reading lessons. When I did writing instruction and lessons, I often had to make the writing portion of it homework due to little class time. I kept reexamining the lessons, looking for any classroom activities that could be done at home and would be difficult to plagiarize with. I kept disregarding the speaking activities thinking that it would be impossible to do outside the classroom. However, after much frustration I realized that I could have students record their conversations. Most of my students lived near each other and hung out with one another after school anyways. By having them record their conversations, I could give more classroom time dedicated to writing time. When I finally had the idea, even though it seems really simple, I was really overjoyed that I was able to make homework assignments more meaningful for the students and something they wouldn't just copy off the internet. Students actually enjoyed their homework assignments as it was something they already liked doing and they could rerecord to work on their fluency and pronunciation. I think the inspiration just came due to frustration and knowing I had to rearrange what I taught in class and what I expected them to do at home. I think it took a long time, because overlooked any speaking activities as something that could only be done in the classroom.

[Participant 20] At a young age, I had a passion for teaching. In my early teens, I recreated my second grade classroom in the basement of my home. I invited neighborhood kids to come to my 'classroom' and that day when the neighbors came over I was inspired to become a teacher; I knew I would one day be teaching in my own classroom. I felt amazing teaching the kids and being an inspiration on the younger children felt amazing. I've had other inspiration moments but since this one became a reality nothing has felt better. Working with kindergarten students makes me realize that following my dream and inspiration of wanting to become a teacher was the best decision I ever made in my life. When walking into my classroom all my worries and problems disappear, seeing the smile and happiness in my students make me very thank for the inspiration I had growing up. I believe the reason I had the inspiration to become a teacher is because my mom would fill our basement up with different learning materials. My mother would also always tell me how she wanted to become a teacher growing up but her father never let her go to college. My mother was born in Iraq and when moving to the United States her father was very strict on her and didn't allow her to leave the house much. She would always tell me you're going to be a teacher since I was never allowed to, the day my neighbors came over and played school I went up and told my mom that I am going to follow your dream and become a teacher for you. Thank God for the inspiration and signs that I received. I know I had that inspiration to become a teacher that day because I wanted to make my mother happy, she was my rock, my everything and my inspiration, she raised me to become a respected young individual and how could I not make her dreams come true. After playing "school" in my basement I realized that I can now put a smile on my mothers face like she puts on my face :). Thank You MOM!!!

Question 5.1: Cross states that: "Design intelligence involves an intense reflective interaction with representations of problems and solutions." Now that we are in week 5 of this course, how are you preparing to have constant, intense reflection in your daily design activities? What will work for you to make sure this happens?

[Participant 1] To have constant, intense reflection of my daily design activities, I start by tackling design problems, in the textbooks, and other learning materials. I will try to tackle the problems, without external help, carefully writing or drawing my thought process. After completing the problems, I will ask my peers to review them, and also my instructors, to evaluate my progress. After their reviews, I will revise tackling the problem, taking into account their comments. Then, I will start soliciting for design problems, from outside and try to solve them, asking for my peers and instructors to review them, to determine my progress.

To ensure the above happens, I will divide my resolution to practice design problem solving into steps, to narrow the scope. Also, I will seek help from the community, peers, and instructors, to ensure I do not give up when it gets tough. Lastly, I will make a commitment and establish a reward system to evaluate my progress and appreciate it.

[Participant 5] The very nature of the work I do for the [removed organization's name] requires constant updates and new ways of presenting the information. We are currently preparing for a major upgrade of our EMR (Electronic Medical Record) software this weekend. We have spent months updating and reworking our written end user materials (tip sheets) our classroom lesson plans, training videos and eLearning modules. Once we have completed that, we have plans on reworking many of them again for our ever changing users. Most new hires are coming to us now with some experience using EMR's where just 5 years ago that wasn't always the case.

A new project I have volunteered for is looking at "test out" options for users that have used the software we use at other institutions for at least one year. These users know most of the basics but they don't know the customizations we have made to the software. This will require us to look at: What should they know? What is the "Michigan Difference" (our customized build) and how do we test what they know.

I am also working with another Instructional Designer on a project to make our classroom training more interactive and job specific. Sadly, most of our current training currently consists of 8 hours of end users following along with a trainer as they demonstrate the common tasks they will do in a day. There if very little "thinking" on the student's part. They simply click along following what the trainer tells them to do. This is the training that was designed and implemented by the software vendor that simply isn't working for us anymore. I have started to introduce small sections of what I'm calling "You tell me". Where the trainer asks the class, "ok I have to start documenting on this patient's chart, where do I go first. Ok let's do that, ok now what do I do." As well as introducing some self-directed exercises for the students to do in class.

What will work for you to make sure this happens? I feel very passionate about both of these projects so that coupled with my manager's desire to make our training better and me a better Instructional Designer will ensure these things will happen;) She is the one that strongly encouraged me to pursue my Master's degree. These will be the main focus of my work (along

with several new features of the software we are installing) for the next year. I want our training to become the model for what other hospitals are doing.

After thinking about this question I also made myself a sign to put on my desk that says "what did you make better today?" to serve as a daily reminder.

[Participant 7] In order to have constant, intense reflection in my daily design activities I plan on following the steps below:
1. I plan on collecting data on a certain design activity. For example, in my classroom I may collect data on how well my students answer questions on a lesson I designed.
2. Then I plan on taking that data and reflect on it. I plan on looking at what one great in my design and what needs to be changed in my design I plan on spending a great deal of time and energy on what needs to change in my design so as to better my design. For example, I would look at which questions my students got wrong and then would reflect on how I taught that material. I would think about the strategies are used and the tasks I asked the students to complete with that new material.
3. Next I would create solutions to improve and the areas of concern in my design. I would try and develop as many appropriate solutions as possible and would try and determine exactly how those solutions would improve those areas of concern. For example, I would determine new ways to teach the material to my students and possibly use alternative materials and manipulatives to help the students to learn The material in a different way.
4. I would then implement those new solutions in my design activity. For example, I would reteach the material in the new, alternative way.
5. After implementing new solutions I would reflect on how the new design activity was implemented. I would once again look at what went well in my design activity and what areas where a concern and I design activity.

I would continue this process until I felt I was an expert in this area. I would also continue this process until I felt as though my students were experts with the new material.

I am preparing myself to do the steps above by doing them in smaller, every day activities in my life. For example, purchasing groceries. In order to ensure I am an expert in purchasing my groceries (I spend the least amount of money, I spend the least amount of time in the grocery store, and I do not buy food I will waste). By practicing this model in my everyday life, I feel as though I will be more capable to do so in my design thinking.

[Participant 8] Design intelligence is needed in order for a person to be able to seamlessly create from beginning until the end. Now that I am at week five of this course, I think that I am beginning to understand the nature of design and a designer's role is in order to functionally create.

For work: I am constantly thinking of ways to better improve my programs. I find that much success comes from doing actual physical activities rather than being talked at. Reading is always an issue with teens of all ages: so I am searching for ways to make that more fun and entertaining for the audience. My teens now ask to do more plays, reader's theaters, reading games, etc.

In addition: I am finding myself thinking of ways, more often than ever, on how to design a path for myself, as a mother, for a better quality of life for my child. I think part of this is because I have many roles and, I think, much on my plate: working full-time, enrolled in graduate school, lack of social life with friends, external family, and significant other. So I must find ways to be able to fulfill play my roles, yet still have positive outcomes with my child.

[Participant 9] As a high school teacher, design is a central part of my work day. I have increasingly embraced the idea that the design process is never complete, but rather is a continuous process that always requires reflection and analysis. This, in turn, leads to design improvements and innovations. Accordingly, I intentionally set time aside to reflect intensely and consistently on my day's work. For instance, when in the process of teaching a lesson, I keep a notebook on my desk and jot down any ideas or tweaks I come across *while teaching*. To illustrate this point, if a question I posed didn't generate as much discussion as I would like, I will note this and ask how could I reword this question to engage students more, adding potential replacements when suitable. I am always asking myself, what would make this more effective, what would make this more engaging? In relation to this, I have a unit calendar for each of the classes I teach. After each class, I add my notes and reflections into the calendar. This calendar then drives future instruction. Prior to teaching the lesson again, I reference my notes and reflections and use this as a guide to improve my prior design. Additionally, a central element of instructional design is assessment. After administering an assessment I reflect upon the results, asking myself the following questions: what went well? why did it go well? What didn't go well? Why didn't it go well? From there I tweak both my assessments and lessons when appropriate. Lastly, a key component of design is collaboration. With this in mind, I pick my colleagues' brains and implement effective strategies they have used in their classrooms. Another goal I have set in relation to this is directly observing my peers (both inside and outside of my subject area). I work in a building with plenty of talented teachers and observing them in action will surely provide inspiration and guide me as an instructional designer as well. To close, I will continue to make an effort to stay abreast with the most current research related to instructional design and I will use this to inform my own design process.

[Participant 11] I am in the process of looking for employment. Part of the reason for that is my current work schedule. It is currently 9:45 - 6:15 most days. On top of that, I am a mother who meets her husband in a parking lot to swap our two boys who are 5 and 2. So needless to say, after my 45 minute commute home, I don't have a lot of time to devote to "constant, intense reflection". The evening is spent going over my 5 year old's homework, eating dinner and getting the boys to bed. After getting up at 6AM to make sure my son is ready for school, I try to get as much homework done as I can.

Understanding that "constant, intense reflection" is necessary practice to become an exceptional designer, I hope to find work with better hours...a 5 o'clock end time would be an improvement over my current situation. However, with all that being said, I can do the following to prepare to have such reflection:
● Maximize the opportunities for reflection in assignments like these. I will hesitate to set limits on assignments that don't have them.
● Seek opportunities that provide such reflection. Like talking to friend in the industry about

what we're doing or learning.
● Create self-directed learning opportunities. Enrolling in a coursera course could provide at least two benefits. I would learn something new as a learner and I could analyze how the program was put together asking the question, "what worked and what didn't work."
● Talking to my husband about things related to adult learning and designing learning for adults helps me a great deal because he's so smart. I can count on him to provide insights I wouldn't normally have thought of on my own. Also, he is great at keeping serious topics light. He is also very encouraging and understanding of what I've taken on. I think he understands what I want to be when I grow up. :)
● Taking opportunities to help my kids succeed educationally. I could and need to take more time with [removed child's name] to ensure he does great in school. I want him to recognize school's importance for his future. He had a presentation assignment which I helped him with and he won an award for it. Made me feel so proud but I recognized the benefits for me as well, confidence in my coaching skills.

[Participant 12] I am preparing to have a constant, intense reflection of my design work by continually having master designs review my work and provide me with constant feedback at how I am doing. This feedback would allow me to begin to develop a deeper understanding and knowledge of the design process and where I can begin to get better as a designer. What would work best for me would be honest feedback on how I am doing and honest feedback on my work.

[Participant 13] One way would be by keeping an instructional design reflective journal based on two simple questions: what went well, what are some things that could be improved?
In addition to keeping a journal, it is important to establish a process and to systematically receive feedback after each project, training session or workshop. Having an assessment program in place, makes the process consistent. And once the feedback is received, it is important to debrief it, if possible with a colleague that can provide additional suggestions. Brainstorming new ideas both individually and collaboratively is important, as well as continuing to ask myself: I am on the right track? What do the learners know, do and value at the end of my time with them, and how does that align with my learning outcomes? Is there any new information needed, and how can I connect it with the learner's prior knowledge? Reflecting on how the feedback can be incorporated in the next version of the design is the next step. Many times after I facilitate a workshop, I have some changes in mind even before receiving the feedback from the participants, just based on the immediate response of the audience. I make sure to either write those changes down, or to modify the workshop right away. Later on, after I receive the feedback from the participants, I incorporate any additional changes. This iterative process comes out of the commitment of making my designs flexible and audience focused.

[Participant 17] Journal not submitted

[Participant 18] Design intelligence is built throughout our lifetimes. We seem to reflect upon our mistakes most, but improving all previous experiences is important to becoming an expert designer. We make design decisions of all magnitudes from the routine to the extraordinary. As a designer there is only so much time we can devote to proper reflection on these activities. Some designs need to be reflected on each day and others can be reflected on more infrequently.

Determining when and how to best reflect on our daily designs is the most critical part of being an effective designer. Reflection requires prioritization, and data gathering. Reflection is also very fluid and as designers we must be able to adapt and change the methods we use to reflect.

Choosing which design activities to devote reflection time to can be a daunting reflection in and of itself. The most effective way to prioritize reflections is by using a goal setting framework. Goals are a great way to frame your design activities both in the local and global sense. The goal setting framework can also provide a means to prioritization of your reflections. For instance, if you have a goal to save money you probably set a yearly goal of amount you want to save. You design a way to achieve this goal. You may only choose to reflect on this design several times throughout the year because your assessment of the design comes when you measure the goal. In this instance the yearly amount. Conversely we may reflect more frequently on shorter term goals.

Quality reflection also requires gathering data. Many times during reflection we look at the data at the end of the design process. Preparing to gather data at key points during the design process may allow for more robust reflections. The source of our data is also particularly important. A diverse collection of data will lead to a more meaningful reflection. When we look to collect data most times we choose a point where there is a flaw in our design. This is typically referred to as learning through our mistakes. Great designers, however, do not just collect data when there is a flaw in their design; great designers reflect on a continuous basis, reflecting as much on the flaws as they reflect on the successes no matter how small or how large.

For instance, I struggle with my weight. Throughout my life I have been constantly designing ways to improve my health by losing weight. As I go through that process I tend to only gather data when I do not make a goal or when there is a flaw in my design. If my goal was to loose 10lbs but I only lost 5lbs then I would reflect on what went wrong. If my goals were to lose 10lbs and I lost 12lbs then I would press on not really gathering any data at that time. I wouldn't reflect, but rather celebrate my success and continue to move forward. The above example is poor design to me. There is very pertinent data to gather among the success. Maybe I was able to get more sleep in the week I lost the weight. Reflecting on how and why I was able to get more sleep in that particular week could be very beneficial to my overall design process. Conversely if I were to notice I wasn't getting enough sleep during a time when I didn't meet my goal I would be more motivated to gather that data and although it is helpful data I may have been able to avoid the poor design. It is also important to gather diverse sets of data. In the above example if the only data I gathered was the number on my scale it may prove harder to improve my design. Deciding where to gather data and how can be difficult and great designers are experts at where and when data gathering should happen.

Applying this type of framework to my designs is a tough task. It is easy to miss out on details when we reflect without a plan. The best way to ensure our reflections happen with proper frequency and quality is to be organized. The emergence of cloud technologies has been a wonderful tool for me when it comes to documenting and organizing my designs and the reflections that come with them. In addition to cloud technologies certain apps can be a great way to document and gather data about my designs. The app and cloud technologies also or collaboration. Collaboration or group reflection is a great way to strengthen my design ability.

Let's take the weight loss example for instance. I use the app My Fitness Pal. This app allows me to track all kinds of data and it allows me to collaborate with others who have a vested interest in my health (fiancé). Tracking my food intake, sleep, exercise and producing detailed reports about my nutrition allows for a very detailed review of my design. Coupled with this app I use google docs to plan my weekly meals and shopping lists. Google docs allows other members of my household to contribute remotely when it comes to grocery purchasing and meal prep. I think at this time it is important to note that even though I have found several technologies that assist me, I must be ever vigilant about new and emerging technologies that could be even better.

[Participant 19] Something I used to do when I taught in India 2 years ago was blog my reflections for my lessons and my thoughts about my teaching style. Now when I go back to that blog, I can see the things that I've learned that year in terms of my way of tacking problem solving. However, I didn't blog on a daily basis and it wasn't constant or intense. I realized this working last year at [removed school's name]. I changed from blogging a few times a month to daily reflecting in my calendar. I would write down things that went well and didn't go well and also things I needed to keep in mind for future lesson planning. I also would write down and important things I learned during workshops or conferences that I wanted to incorporate in the future. I found this type of reflecting to be much more useful to me and it really helped me to grow immensely as a teacher in that year. This year as an adult ESL instructor, I have continued reflecting in the same format. So far, reflecting in a calendar right after the lesson is over has worked for me. In the future, I would like to reflect using google calendar or docs so it is electronic and can be documented in a better way.

[Participant 20] Design is in our everyday life, we sometimes don't even know it but we are actually designing, when making different choices whether it being where you are going to eat or what you are going to wear, you are designing a plan of what you are going to do and how you are going to do it. I've never really looked at my daily life as constant process of design but when reading about design it makes me realize that everything I do has some sort of design. Being a kindergarten teacher I design daily with a lot of the activities that I create whether it being a project, lesson, activity or even lesson planning. When I am designing and preparing my daily lesson plans it is a constant reminder of reflecting on what level my students are at and how they will reflect on the lesson. When designing a lesson plan I first start with a design process by thinking of a plan on what I want to teach the children, I then think of how I am going to teach them the content I want them to grasp, once this is all said and done I start to create my lesson. While creating my lesson plans I try different methods daily that I think will be beneficial for my students, as all students have different learning styles I try and direct my lessons so benefit all the students in my class. Once I am done creating my lesson plan I am then ready to present my lesson to my students, while presenting my lesson to my students I am constantly observing my students in how they are reacting and grasping the information being presented. I am able to write down what worked and what went wrong I am also able to make note of what the kids enjoyed and didn't like. Once the day is over I now have those notes to reflect off of for myself, I now know what I need to change or what I will keep for the next time around. When reflecting daily on my lesson plan this allows me to know what I need to redesign and re-plan for the near future, reflecting on my daily process allows me to become a better teacher daily. I remind myself daily to reflect on my daily teaching and lessons due to the students success and future, I

was put in their lives to brighten and give them a better educations so I am sure to reflect not only on them but myself as well.

Question 5.2: He also states that design intelligence is NOT simply a given 'talent' or 'gift' but can be a trained and developed. How do you plan to train and develop your design intelligence?

[Participant 1] To train and develop my design intelligence, I plan to read extensively on design topics and resources on the same. Furthermore, the base of every practice and expertise is knowledge. My first step towards training and developing my design intelligence is to acquire and accumulate knowledge about design principles and basis of designing. Before I get to try design problems, I need to have a database, rich with designing information, in my mind. The knowledge will help when it comes to problem tackling. Then, I will embark on learning from expert designers, and the masters in the same. To gain experience, learning from others, is essential. By modeling what the experts do, and trying it out late alone, I will be mastering the ways and methods of problem solving. Every time I solve a problem with an experts help, or following a master's teaching, I will evaluate what principles, from my design database, are at work, and understand their varying application. Knowledge and experience will be the ways to train and develop design intelligence.

[Participant 5] I will be taking on additional projects outside of my normal scope of work. I feel this will give me more experience in problem solving, analysis and design as well as expanding my knowledge about areas I am not as familiar with as I am in my current role. (Which is mainly Nurses and Doctors in our ambulatory clinic setting.

I have also asked to work with our teams that develop training on soft skills such as customer service or even some of our annual compliance classes we are required to take. (Fire Safety, Protecting Patient Information, Sexual Harassment in the Work Place). I would like to see their processes for developing training solutions. This could also help me to see patterns in problems and solutions in different areas of the hospital that I could apply to my own daily design work.

Observing other software training is also on my Design Intelligence learning plan this year. As well as continuing my Masters coursework.

This week I found out I will be writing a new course for our nurses on a new feature they will be using to document patient phone calls. Nursing leadership has asked that I make it very interactive and scenario based which is a very big change to how they usually want the training.

This new project will allow me to go and observe how the nurses currently work, learn the new process, and

[Participant 7] I plan to train and develop my design intelligence in several ways. Just like I do in my teaching career, I plan to partake in professional development opportunities in the field of design. I hope to continue obtaining knowledge on the topic of design and directly use that knowledge in my everyday life. I also plan to continually practice design and hope to find a

"mentor " in the field who can help me and guide me through this practice. I can hope that that mentor would help me stay involved in the field and would help me to continue to evolve with design.

I plan to take my ever-growing knowledge on the field the design and apply it directly into my career as a teacher. I hope to surround myself with colleagues who are passionate about design and use it directly in their teaching as well. I understand that my design intelligence will not always be perfect and may never be complete, but I believe that making mistakes helps people learn. So I plan on making mistakes, I plan on sharing those mistakes with others, and I plan on learning from those mistakes. I hope those mistakes will make me a stronger designer and have a stronger design intelligence. I also plan to look at those mistakes, reflect on those mistakes, and make sure I learn from those mistakes.

As I consider myself a lifelong learner, I plan to constantly stay involved in the field and be passionate about the field of design and my design intelligence.

[Participant 8] I wholeheartedly agree that any skill can be trained and developed. I think, innately, we all have a lot of the same skills: we are just at different skill levels. I may be better at logic puzzles than the next person, but it doesn't mean that said next person cannot work on it to become better.

I plan to train and develop my design intelligence mostly through job experience, speaking to coworkers, classmates, and other colleagues about present and future projects.

[Participant 9] As referenced in this week's presentation, to become an excellent designer you must have the time necessary to practice design and your practice must be deliberate and reflective. Accordingly, my ability to design a social studies curriculum has expanded considerably over the seven years that I have been in education which stem. This growth largely stems from my ability to practice design, learn from my mistakes (based on personal reflection and feedback from students and colleagues) and develop accordingly. For instance, I've taught United States' history for the past five years; however, the way I structure my classes (from lesson structure to assessments, to presentations, etc…) now is considerably different than the way I designed my classes five years ago. In order to train and develop my talents further, I will continue to follow the steps I detailed in my response to the first question. This includes real-time reflections, post-lesson reflections, collaboration and observation and lastly, research and implementation. To add, I will strive to become more creative in my design process, moving from what Spector labels an early adopter towards the innovation level of design. In order to develop this ability further, I will actively create novel approaches to teaching the content in my classroom (I believe I already do this, I will just attempt to do this more consistently). Moreover, I will continue to embrace the trial and error nature associated with the design, which will make me more willing to try new things in the classroom and by extension, improve my design ability. Lastly, I will embrace the idea that as a designer I should be solution focused as opposed to problem-centric.

[Participant 11] This program, currently, gives me the most opportunity to train and develop my design intelligence. From this program, I believe I will learn the fundamentals of adult learning

principles, instructing and design principles. Within each class, I expect there to be a major project and/or research opportunity which will develop my knowledge, skills and experience. While in the program, I am also working. Within my work environment, I plan to watch for opportunities to design learning, if I stay with my current employer. However, my hope is to gain employment as a trainer/instructional designer so that I am in the environment every day. I have two employment opportunities I am waiting to hear back from. The first is the job with [removed organization's name] as a training specialist. According to the job description, designing learning would be required. The second is a branch manager position with a credit union. That one seems more likely...it is interesting to me that the credit union does not have a training department and that their call center manager does all their training. If hired, I see myself acting as a consultant for the organization with regard to learning. At the very least, I could ensure that my staff are coached and trained using engaging, innovative methods.

I also plan to renew my membership to ATD so that I can stay on top of industry best practices by participating in webinars, attending conferences, etc. I also plan to attend more ISPI monthly meetings. It's helpful to be in a room with other designers and industry professionals.

[Participant 12] My plan to train and develop my talents is to work closely with someone who will give me feedback on how I am doing. Without this sort of intense feedback, I will not know where I can improve on my talents.

[Participant 13] Just like a teacher can choose to use multiple points of entry to teach a course, each of us is the teacher of our own lifelong designer journey, that encompasses training our design intelligence. I realize that is not sufficient to be able to solve a problem. Reflecting on what went well, and helped me reach a solution, the solution itself, as well as reflecting on the things that could be improved helps me as a designer develop and establish my own process. Even after I reach a solution I ask myself: was the solution I reached the best solution possible, and what makes this solution superior to others? Are there any circumstantial factors that influenced the solution and how are these factors making this solution unique? Just like Cross stated, this process is leading to a combination of doing and thinking or reflecting on your process, and eventually it will help build a template for success.

Observation is also crucial. What do successful instructional designers do? What worked in the instructional design solution one provided, and what did not work, or could be change? Through observation and reflection I learned that with every single one of the challenging design projects I took on, I reach a point at which I freak out (sometimes, actually if I am truly honest, many times repeatedly). Learning that freak outs are normal part of the design process, helps me stick to the project and continue to work hard, knowing that I will eventually get there. I might finish by hating the first draft, but at least, that initial draft will help me get some clarity.

While being unique and innovative is important, I believe there's no need to reinvent the wheel with every single project, especially because most projects come with a time constraint that does not even allow for that. Thus using frameworks becomes crucial. I use Backward course design and Universal design for learning, and usually a combination of these two frameworks.

To me, the space (and technology) also matters. Whenever possible, I look for an environment conclusive to group work and sharing, where it is easier to get up and have a brief conversation with a colleague (that can provide guidance or feedback important for developing the next phase of the project).

[Participant 17] Journal not submitted

[Participant 18] In order to develop my design intelligence, I must be open and accepting of change. I must be cognitively aware of the changes that are happening to me and I must also be proactive in forcing changes in my intelligence.   Repetition and knowledge are also two key factors to increase my design intelligence.

Currently I am studying design in this class, but what other areas do I need to study in order to increase my design intelligence? I have not pinpointed these yet, but know I must begin the process of identification key areas to study. As I continue to increase my knowledge I need to go back and improve my designs. If I only work on new designs with new knowledge I fear, I may never see the true improvement of my design intelligence. Going back to past designs with new knowledge will also allow for repetition.

I am a firm believer that repetition can lead to success in anything. If I use repetition in a way that allows me to focus on the way I design as much as it focuses on the designs themselves, I should be able to increase my design intelligence. My current job allows for continued tasks that occur on a yearly basis. I plan on using these task as a repetitive process for increasing by design intelligence.

[Participant 19] Reflection is key in training my design intelligence. As [removed instructor's name] stated in the week video, time and experience doesn't automatically help someone become an expert in something because you can do something wrong for ten years. I personally cringe thinking about some of the lessons I facilitated during my time student teaching, because I know that my understanding of creating lessons to meet the needs of the learners is so much stronger now. As described in the previous question, effective reflection will help me to train my design intelligence.

Also, in the Cross book, it mentions that deliberate application and guided practice is needed. I spend a lot of time lesson planning for even short lessons. I do this, because I really want to better my skill of crafting lessons. Although I may have facilitated a lesson on the same topic before and know a few strategies I have used in the past, I still spend time thinking of more effective ways to facilitate that same lesson. When I observed veteran teachers last year, I noticed that they have a depth of understand on how their students learn that I don't have yet. Their understanding then helps them create lessons relevant to their students. I also learned that these teachers are willing to break the rules or the ways that administration wants them to teach because they are confident in their design process and their intuitive ability. I'm definitely not at that stage yet.

I see myself as an advanced beginner. I understand that the rules need to be bent when necessary and based on what my students need. I also understand the complexities of my students' needs, but often times struggle with creating a lesson that is intricate enough to meet those needs. I also don't find that designing is an intuitive process for me at this point.

[Participant 20] Like reading children are not gifted with the ability and talent to read, rather their brains are functioned to take in this information and allows them to learn which just depends on how much you feed your brain as child to learn how to start reading. The same goes with Design we as humans are not born with a natural ability to design but rather the right hemisphere of the brain allows us to grasp this information and build. Some might be quicker learners than others but that does not mean an individual cannot be a designer if they put their heart and mind into it. I believe if you put your heart and all into something you are able overcome any situation you encounter. I never use to think of the terms design let alone even know what design intelligence meant now that I understand the terms I am able to build on this daily. Although I haven't really changed my everyday routines but, I am now able to reflect deeper on what I am designing. Designing for me happens in my daily routine when preparing and presenting lessons to my students. I know change the way I reflect on myself after giving a lesson, I am able to determine what went right and what I need to change reflecting deeply daily will allow me to build my design intelligence. Intelligence does not only build from your daily doing and reflecting but rather incorporating design in your everyday language, understanding and using my body to think of ideas. It is important to always think of your own doing but also, collaborating deeper with co workers and receiving feedback on how your design went. Before I would only present a lesson that I knew would be easy enough for the children to take in but now that I reflect deeper on myself I am able to reiterate and desig my lesson to make it work for the next time around. If we do not try designing new things then we will never be able to build our design intelligence.

Question 10.1: What changes in how learners do what they do or think should occur?

[Participant 1] No response

[Participant 5] They should begin looking at the training they do as more interactive, less telling, more training. I want them to see how doing this will make the class not only easier on them, but more meaningful for their students. I hope that once they see how easy it is to make a few changes to make the class more interactive, they will embrace the idea and use it more and more on their own

[Participant 7] No response

[Participant 8] In coming up with the outcome and assessments, I've caught myself thinking that I definitely needed to think of my clients: caregivers *and children*. The object of my design is to teach caregivers (learner) on how they can further foster a positive relationship with their children as well as help guide them (their children) down the right path (respectively). I needed

to continuously think of how to help bridge the caregiver and children together in order to meet whatever criteria each set (caregiver and child) was looking for in "storytime."

[Participant 9] No response

[Participant 11] Participants in this course will learn that having negative opinions about their employees often have the unintended consequences of low performance of those employees. Learning how to think more positively and expecting the best out of everyone will increase performance and morale. A change in attitude may need to occur, more awareness of the messages they're sending to employees

[Participant 12] No response

[Participant 13] The main goal of this workshop is to bring awareness and help participants build empathy towards transfer students. By inviting participants to think about a situation in which they felt uncomfortable, or a time when they travelled abroad, and then connecting this to the transfer students, participants should become more empathetic towards transfer students.
On our campus it is very common for faculty members to work individually, and at times, to feel isolated because of that. However, this is a hands-on workshop, and participants will have the opportunity to work together with colleagues across disciplines and academic rank. At the end of the workshops, participants will be able to incorporate the results of their collective work into their courses, in a traditional, hybrid, or online format. At the end of the workshop, I will invite participants to exchange contact information with at least one of their peers, in a hope that this collaboration will continue as they start implementing the strategies and resources into their respective courses.

[Participant 17] Journal not submitted

[Participant 18] There are 3 main facets of how the learners thinking should change. They should be able to understand the key components of how social constructivism can be used in the classroom with the assistance of IPads to enhance the student experience. Tech Warriors should also understand how to incorporate IPads into lesson planning in an effective way. Learners should also be able to identify key IPad software that is currently being used in classrooms

[Participant 19] The biggest change that I would like to see in my learners is their approach to lesson planning. Many teachers have go-to routines of lecturing or having students copy down notes they write on the board. By teaching them a variety of different student-centered activities, I want teachers to start thinking about ways to engage their students by implementing those strategies in their lesson planning.

[Participant 20] We all have a moment in life when we are uncertain what are purpose in life is or what we want to do with our lives. People are so busy with their everyday lives they believe it is nearly impossible to earn a degree but, with this workshop students will be able to see how convenient it is to earn a master's degree. This workshop will also, give students an opportunity to explore different ways on how an [removed program's name] could open up many opportunities for them. Students will be able to. Students will now be at easy thinking it is not

possible to earn a degree with their busy schedules they will also be able to think of different career options.

Question 10.2: How will you know that these changes have occurred?

[Participant 1] No response

[Participant 5] By observing their classes and seeing what techniques they are using and how the students are reacting. I can also add questions to the student survey asking if the class was interactive enough. (I review all my trainers post class surveys)

I know my trainers well enough to be able to tell by their attitudes and body language if they are embracing the changes. I will be able to tell by how much they are participating (or not) in the group discussions and activities.

[Participant 7] No response

[Participant 8] In order for me to assess the outcome(s) that I've had to put together by identifying what I wanted the caregivers to get out of the projected storytime/design: I came up with assessments that I thought to be concise and straight to the point, as well as learner-centered. While I kept the children in mind, I had to come up with how to assess the caregivers to see if they had grasped the concepts/outcomes I wanted them to learn.

[Participant 9] No response

[Participant11] ● Field observations
● Returned assignments where participants give feedback about how a method worked for them
● Increased sales and service performance of employees
● Survey of employees prior to training on employment satisfaction
● Reported increase in employment satisfaction surveys by employees

[Participant 12] No response

[Participant 13] During the workshop, participants are active in their peer groups, and make meaningful contributions to their group.

After the workshop ends, participants are implementing four resources and strategies discussed in the workshop in their courses.

[Participant 17] Journal not submitted

[Participant 18] The Tech Warriors will be able to show on assessments that their thinking has developed and changed. The feedback from the mentor teachers should also indicate the learners have applied this knowledge in active environment. Lastly the learners will successful earn their digital badge showing they have changed their way of thinking about IPads in the classroom.

[Participant 19] The last part of my training is giving times for teachers to revise their lesson plan. By seeing lesson plans that shift from teacher-centered to student-centered, I will know that the changes have taken place. I also have mini assessments through the training such as learners creating a venn diagram and a flipbook that will help me to assess each chunk of the training.

[Participant 20] 1. Students will be able to explain the term-Instructional Technology and Distance Education by applying the term in their own words.
2 Student will identify the program outline of courses
3. Find and explore IT course offerings
4. Students will be able to explain program to another friend
5. Students will be able to identify the equipment necessary to complete the program (computer, internet or mobile devices)
6. Students will be able describe the opportunities to available to IT graduates.
explain the importance of receiving a master's degree they will have an opportunity to sign up for courses they may be interested in.

Question 10.3: What activities will help facilitate these changes in thinking and what learners do?

[Participant 1] No response

[Participant 5] Seeing the facilitator and then their fellow trainers demonstrate how to make the classes more interactive. My hope is they will begin to see how this can make the classes easier on them and more meaningful to the students. Also seeing their learners being more engaged in the classroom.

[Participant 7] No response

[Participant 8] No response

[Participant 9] No response

[Participant 11] Role plays will help. Especially powerful will be to task participants to bring with them a problem they're currently facing to the classroom to share. through what they learn they will come away with some appropriate leadership responses to get the best possible results.

[Participant 12] No response

[Participant 13] I believe the introductions, and faculty members sharing their personal stories. For example, hearing [removed name] talk about his journey, will help build empathy and relevance.

Also asking participants to think about a time when they felt uncomfortable or a time when they travelled abroad, and then connecting this to the transfer students, will help them become more

empathetic towards transfer students.

Small groups activities: identifying the behaviour of transfer students that are not transitioning effectively; discovering strategies that can be used support the transfer students in the classroom

Writing a reflection paper will help solidify these changes.

[Participant 17] Journal not submitted

[Participant 18] The learners will be shown visual example of the material to understand how the pedagogy and lesson plans are formatted. The learners will also hear from mentor teachers about the expectations of them as Tech Warriors. The learners may also complete some group work to simulate what may happen in the classroom. The learners will also get hands on experience with IPads to learn about the software that may be accompanying them in the classroom.

[Participant 19] A huge chunk of the training is modeling the student-centered activities with the learners by facilitating a jigsaw group, flipbook creation, discussion with sentence starters, integrating graphic organizer to categorize thoughts, and doing a think pair share. By learning in a student-centered approach, teachers will realize that it is possible to teach using those strategies in all content areas.

[Participant 20] Various activities will help facilitate these changes in thinking by the different strategies used to help the students understand the program.

1. Students will be introduced to the terms Instructional Technology and Distance Education. Once the students have been introduced to these terms they will have time to put these terms in their own words and explain it to a partner sitting next to them.
2. Students will be given a guideline of the program and different course offerings. Students will given the website to look up the program guidelines and the website to explore the different courses. A counselor will also be present to help guide them.
3. Students will have an opportunity to hear a live speaker talk about different career options and how a master's degree in instructional technology benefitted them.
4. Students will have an opportunity to reflect with one another.
5. Students will have an opportunity to ask questions to professional counselor.

Question 10.4: How are you discovering your content? How can you chunk your content? How will you sequence your content?

[Participant 1] No response

[Participant 5] Personal experience from years of training in the legal, banking, and now medical fields. Internet searches, YouTube, talking with other Instructional Designers I work with. How are you discovering your content? Personal experience from years of training in the legal, banking, and now medical fields. Internet searches, YouTube, talking with other Instructional Designers I work with.

How will you chunk and sequence your content? I organized my outline in the order in which things need to occur for the trainers to see the value in what I am teaching them and to make them comfortable with trying something new that will benefit them and their participants.
● Here's what we are currenlty doing...
● Demonstrate are basic facilitation skills we can easily add to our current classes.
● Let the learners decide which skills will be added to what lessons and how.
● Let the learners practice using lessons they know very well with a few new facilitation skills added.
● Encourage learners to add even more of these to make the classes more interactive and engaging.

[Participant 7] No response

[Participant 8] Essentially, I chunked the materials in a manner that made most sense: by categorizing them as what outcomes I wanted to assess.

[Participant 9] No response

[Participant 11] Google searches, articles about related topics.

[Participant 12] No response

[Participant 13] I printed copies of all my end users, and went through all of their descriptions, as they are my audience. With my audience in mind, I asked myself: what would I like the participants to know, do, and value by end of the workshop?

These simple questions served as guiding questions that allowed me to look for content for each one of these chunks, a combination of facts (know), actions (do), and values (value). I used the Wayne State Library (online) resources for most of my literature searches.

Additionally, I have had conversations with faculty members on campus that have transfer students in their courses. I was interested in finding out how can they identify the transfer students that take their courses, and if the behaviour of transfer students differs from the one of other students. While these conversations were very different, they had a common element: the need to identify (early) the behaviour of transfer students that are not transferring effectively, and the need to support the students in the classroom.

I have also spoken with a few transfer (undergraduate) students, as I wanted to see what are some of their challenges, and what type of support they would find beneficial. Clear and explicit instruction on assignments came up repeatedly.

This combination of literature research and "field" research allowed me to gather enough information to start working on my content outline. My content outline is based on Gagne's events of instruction and learning processes.

[Participant 17] Journal not submitted

[Participant 18] I used the current Pre-Student teaching handbook and consulted subject matters experts in the office of clinical experience to align my instruction with what the learners will need to know and accomplish.
1. Introduction
2. Pedagogy with IPad
3. IPad Software and functionality
4. Lesson Planning with IPads
5. Conclusion

[Participant 19] I am discovering my content by the countless books I have regarding teaching ESL students. I am also using material I have learned from my SIOP training and other ESL pedagogy classes I have taken.

[Participant 20] I have been discovering my content through Wayne State University's website but, not only have I been receiving my information through there website I also been able to reflect on my own life. I myself am in the process of receiving a master's degree in instructional technology here at Wayne State, this has helped me a lot to understand the beauty and importances of a online program, it has allowed me to explore different career options and has encouraged me to tell everyone about it. Also, [removed instructor's name] has helped me discover a lot of my information by encouraging me to always dig deeper and deeper and revising and adding content weekly, she truly has been an amazing inspiration.

I've broken my research into different segments allowing students to reflect with one another which will allow students to reflect with one another after each powerpoint is over.

Question 10.5: What constraints have you encountered during your design project so far? How are you dealing with them?

[Participant 1] No response

[Participant 5] I have never designed content like this. In my position it's always been, so here's this new thing write a class or tip sheet about they do it. I jump right in and start writing content. No outlines, no analysis, just write it. It's information users need to know to do their job so knowing their hopes, dreams, and fears have never come into play. They will learn this because they have to, end of story. Working step by step through this process has been challenging but very helpful and it is making me look at how I currently design content very differently. Really "deconstructing" it before building it.

[Participant 7] No response

[Participant 8] I found the best way for me to connect with this design was to think of myself as the parent or caregiver. While I originally thought that I was going to breeze through designing

as a former teacher or librarian: it clouded my judgment for the most part. Not to say that my skills did not transfer: they definitely did! I just had to think further outside the box.

[Participant 9] No response

[Participant 11] The first constraint I've encountered is time. This assignment was to design a 2 hour learning event? The topics that need to be covered in order for learners to fully understand what I'm asking them to do extends that time out beyond 2 hours. I think a potential answer to this constraint is to give them the facts, sort of what they need to learn about being a Pygmalion leader, then send them out into the field to test the methods to see how they work. One assessment I plan to use is keeping a journal. I will provide a handbook with the key takeaways with plenty of writing/note taking space. Their post training assignment will be to try some methods and record the outcomes and send it to me/the instructor within a certain time frame.

[Participant 12] No response

[Participant 13] While I love that this workshop provides faculty members with the opportunity to get together, talk to peers, and collaborate on developing and implementing strategies and resources for supporting the success of the transfer students, it is important that the strategies and resources are:
a. Strongly evidence-based, thus the research component for this workshop is very important
b. Applicable to our campus, an urban research university with an access mission

To make sure that the strategies and resources are evidence-based, I started researching the literature. I looked for books, book chapters, journal articles, and peer reviewed articles that focus on transfer students' success. A lot of the literature is approaching the subject from the academic advising side, and does not include references to what instructors can do to support transfer students' success. To deal with this constraint, I extended my research and I have also included references posted by other urban research universities. This allowed me to find a good amount of articles focused on the success of transfer students in the classroom.

Another concern was how can we make this material applicable to our campus? To make sure that the material is applicable to our campus, participants are the ones to identify the behaviour of students that are not transferring successfully. This strategy allows me to engage participants with each other, the content, and myself - as the facilitator. Thus learning is not unidirectional, from one subject matter expert to the participants, it will happen as the result of active collaboration of all subject matter experts, of all the instructors attending the workshop.

[Participant 17] Journal not submitted

[Participant 18] Some of the constraints I have dealt with are not knowing who the mentor teachers will actually be. I also do not know how many learners I will be expecting in the program. It has taken me awhile to explore the pedagogy associated with what will be happening in these classrooms. I have dealt with many of these constraints by pressing forward with what I do know and designing an instruction that can be readily adapted to any changes that might happen between my project and the summer course. I have also encountered constraints in

the amount of work time I have to allocate to the project. The project coupled with other coursework is starting to become a heavy time consumer. I have dealt with this by allocating some work time to reach out to colleagues about my project due to the fact it is work related. Before I was treating this as only related to school, so I was trying to complete it solely outside of business hours.

[Participant 19] The biggest constraint I have encountered is limiting my content into a two hour training. Student-centered instruction for ESL students could easily be a yearlong training. There is so much to teach and a lot of support I can give to teachers who are new to teaching using a student-centered approach. Limiting my content was incredibly difficult for me. I had to prioritize what was most important to teach as an introduction to student-centered learning. Also, in my mind, I imagine this as the first training to countless other trainings teachers will have throughout the year. Imagining it that way made it a bit easier to cut down on some of the content that I found was really important to teach.

At [removed school's name] in Gujarat, India I observed that many of the teachers (9th-12th grade) based their lessons on traditional teaching methods such as lecturing or reading the textbook. The students are taught in English. However, English is their second language and the vast majority of students struggle in their English reading, writing, speaking, and listening skills. I believe that the students need to be practicing their English skills in all subjects instead of just English class. I think the students would greatly benefit if teachers facilitated lessons that were student centered and there was a better ratio to "teacher talk" and "student talk" I would like to provide teachers training in employing student centered activities aimed for ESL students (I'm thinking along the lines of SIOP strategies). What will be difficult is these teachers have little exposure to teaching in this way. They were not taught that way, they didn't learn to teach that way in college, and haven't really observed other teachers teaching that way. Some of these teachers are new, but many of them are veteran teachers who will be reluctant in embracing new teaching strategies if they do not see the benefit of it. Also, the subject areas all vary. Also, I don't want them to think that the new way of teaching emphasizes English skills by compromising the teaching of their subject area.

[Participant 20] I've ran into many different constraints throughout this project but one thing I must say I am truly bless this assignment and project were broken down into different parts. With this project being broken into different parts it allowed me to focus on the constraints I encountered and allowed me to get feedback from [removed instructor's name] to fix these problems I encountered. I love how [removed instructor's name] took time out of her busy day and continuously commented on our work and told us what needed to be improved this allowed me to fix these issues and understand what I was doing incorrect not only did she take time to provided feedback she also took the time to meet with every student through google talk and allowed them to ask questions, there were a few assignments that I was completely blinded and frustrated and [removed instructor's name] put me at such ease and walked me through step by step on how I will overcounter these constraints and how I need to take a deep breath and it will all come together, she never once doubt me and was such a huge inspiration. There were so many times where I wanted to give up because I didn't understand something and nothing made sense but hearing [removed instructor's name] voice in my head kept me going she was so quick

and prompt to answer any questions I had and helped me through any constraint or problem I had.

Question 14.1: As you reflect back on your work on your instructional design project, what role has uncertainty played in the process for you so far? How have you responded to uncertainty? Has it influenced how you move among the design spaces or other aspects of your process?

[Participant 1] In the beginning, while brainstorming, I was having some uncertainty about what I was going to make my design project about. There were many factors that made my first idea an uncertain idea because the idea was not specific enough. I was able to conquer the uncertainty by following the guidelines set out for me by the facilitator and getting feedback from the facilitator and peer groups. Yes, it has influenced me greatly because the feedback I receive I can use to make my project better and more noticeable.

[Participant 5] Having never designed a prototype there was a lot of uncertainty? Am I doing this right? Is this what the customer wants? Having examples helped.

How have you responded to uncertainty? By doing what I think the client wants to see, asking questions and asking for clarification when needed. Also working with my project group and asking them questions on what and how they were doing things.

Has it influenced how you move among design spaces or other aspects of your process? I think it helped me to keep things basic enough at first that sections could be moved around as needed. Once the basic structure was what I wanted it to be, it was just a matter of filling in the details.

[Participant 7] Uncertainty has played such a HUGE role in in instructional design project. At the beginning of this journey, I would have never considered myself a designer… not in the slightest. As I started formulating the components of my IDP, I was always second guessing myself, wondering if I was designing the correct way or if my brain was even ready to be a designer!

I think I responded most to those uncertainties by relying on my peer group as well as you (removed instructor's name). My group and you were SO helpful throughout this journey. Always easy to contact and quick to give really helpful feedback. I also think sometimes I just went with my gut, even if I was uncertain. It was definitely scary at times (and gave me some anxiety) but I think I learned so much because of it. Overall, I think how I have reacted to my uncertainties is truly the only reason my instructional design project resulted as it did. If I would have reacted differently, been more timid or not asked for help, I think the process would have been completely different from beginning to end.

[Participant 8] Uncertainty played a great role when we were placed in groups and had to come up with a design based on a particular theme. Although we were quite uncertain with different aspects to our design, we remedied that by coming together (we all come from different backgrounds, therefore, our thought processes were different from one another) to find a solution

to our problem(s). I believe that this experience overall has made an impact on how I will move among design spaces as well as influenced how future designs will come together.

[Participant 9] Prior to this class, the overwhelming majority of instruction I've designed has been for young teens. Accordingly, a significant portion of the uncertainty I experienced during the design project was designing specifically for adult learners. I responded to this uncertainty by researching the differences in adult learners and attempted to structure a course that was mindful of these differences. To be more specific, I wanted to design a course that would provide my learners with skills/knowledge that could be applied immediately while offering plenty of opportunities for self-direction during the learning process. It was with this in mind that I came up with the idea of designing a self-defense course combat the prevalence of sexual assault on college campuses.

Another element of uncertainty that influenced my project design relates to project expectations. One of the shortcomings of online learning is the difficulty in communication. Undoubtedly, this will result in some of the nuances in expectations being lost or misinterpreted. I responded to this reality in three ways. To begin, [removed instructor's name] was readily available to answer any questions of clarification I had, as were my group members. With that being said, I also wanted to embrace this uncertainty to an extent.

One thing that was stressed from the beginning of the course was the uncertainty associated with design and I viewed this design project as a perfect opportunity to experience uncertainty within a design context. This acceptance of uncertainty has been a part of my evolution as an instructional designer over the past 8 years. When I first began teaching, uncertainty was everywhere and it was overwhelming. I had no idea what I was going to teach outside of the broad standards set by the state and I had a vague idea of how I was going to teach these vague content standards based on my experiences as an undergrad. At the time this uncertainty undermined my confidence in my abilities. Ironically, this uncertainty also forced me to become a better teacher. I wanted to have an answer for every question and scenario, I wanted my curriculum to be informative and engaging, in short, I wanted to be an amazing teacher. And, as I became more seasoned as a teacher I not only developed and expanded my curriculum, but I began to develop the sort of "design thinking" required to respond in real time to the variety of instructional problems that occur within the framework of teaching a lesson or an entire course. To conclude, this course has offered an opportunity to further my understanding of design-thinking and to apply it in real time.

[Participant 11] Uncertainty has played the main protagonist in the creation of my project. Everything from the topic itself to every detail was created I always questioned it. As you know, I was uncertain I wanted to continue with the topic because, while I could see the program in my mind, I had no idea how to get that information into a program that made sense. My program literally attempts to change how people think and believe. How do you do that? How do you convince people who are/have been managers to change their belief systems? I still deal with a high level of uncertainty when reviewing it because I wonder, "Who would be interested in this program? How can I capitalize on it? Is it really a good addition to my portfolio or just a 'bunch of bunk'?" I am uncertain of how my current employer would react to it, if I presented it to them. I wonder how it would be received if I were the one to present it. (Given I was transferred

from the [removed department's name].) With that being said, I've embraced the uncertainty that comes with designing. I allowed it to calm my panic at times when I felt I didn't have enough content or didn't know what to do next. It also made me feel better about jumping from space to space. As a result of this assignment, I can now confidently say that I DO NOT believe designing instruction is a linear process. While I was in the [removed department's name], I was told to use ADDIE, and with my very limited knowledge about instructional design, I still didn't know where to begin. It was a very uncomfortable place to be. The method of instruction you used, breaking up the components the way you did, helped me to see the process as just that…parts. It doesn't really matter when one part gets done, because it all needs to be done for the prototype. So that provided some relief.

[Participant 12] Uncertainty played a role throughout the design process because I wasn't sure I was doing the right thing at each step until I met with the groups during our group times. Now going through a design process I feel more confident about my ability to put together a solid design proposal. I never really thought of design as spaces, per say. I thought of them more as ideas to refer back to when I am working on a learning outcome or planning an activity. I had my main goal that I kept in mind throughout the entire process.

[Participant 13] Reflecting on my design process has helped me understand that, for me, uncertainty leads to freak out moments. In time I have learned that freak out moments are a normal - and helpful - part of my design process. And while it is not always easy to embrace uncertainty and channel all that energy into creating a better design, it is what leads to my most creative moments and a better design.

During the very beginning of the semester it was difficult to deal with uncertainty. I think because of that I was even more through in reviewing every piece of information, and trying to make sure I was moving in the right direction. I have never had a course quite like this, and because of that I struggled with opening up and added (unnecessary) limitations to how I could handle an assignment – a great example would be the Visual Thinking Assignment. However, once I understood that uncertainty was built into the course design, and dealing with uncertainty was an important component of my growth in this course, I was able to let go of the limitations that I put on myself and implicitly on the various projects I worked on, either individually or within my small group

[Participant 17] Journal not submitted

[Participant 18] Uncertainty ebbs and flows just like many other aspects of designing and life for that matter. I find that uncertainty is affected by many extraneous factors and sometimes serves as a curse or a blessing. If I am in a bad mood for instance and I am facing uncertainty then that uncertainty is amplified into a negative characteristic. Alternatively if I am in a great designing mood then uncertainty becomes synonymous with freedom. Uncertainty in the right design environment is welcomed.

Using these observations about uncertainty I try to react to it by putting myself in situations where I am in a good design space. Before I start designing I try to avoid factors that will lead to uncertainty affecting me in a negative way.

Design spaces have helped me deal with uncertainty. Before when I designed everything was so linear and followed a waterfall model. I moved through design spaces very rigidly and only in one direction. Allowing myself to move more freely through design spaces helped me to deal with a majority of uncertainty. It put uncertainty in perspective. If I was very uncertain in one space I could move to another to see if the uncertainty was larger or smaller there. I also knew it was ok to leave one design space with uncertainty because I could come back to it later.

[Participant 19] Uncertainty has a played a huge role in the process. Although, I was well versed with the content part of my project, I had no idea how I would teach it. I knew that for my end-users student-centered teaching was a novel concept and something many would be hesitant in accepting. Through this training, I am asking them to shift their approach to lesson planning and shift the way they view their role and the role of the student. That is not an easy task, especially when some of the end users have had years of teaching experience. It has influenced the way I moved among design spaces. I was constantly going back from the ideate and define spaces because some of the things I created were too advanced for my end-users. So I had to reflect on that and reevaluate what I defined before going back to the ideate stage.

[Participant 20] During this assignment I ran into uncertainty many times, although I was uncertain throughout this process I never let it overcome me or define me. When being uncertain with something it is important to dig deeper and overcome those challenges not letting them define you and that's exactly what I did throughout this project. Although, I must say [removed instructor's name] was a true asset in guiding me through the right direction she always reminded me that I'm doing so good I'm so close you can do this. Anytime I was uncertain with an assignment she was right there to answer all my questions, I've never had a professor so prompt and guide me through the semester so amazing like [removed instructor's name]has. What truly helped were how [removed instructor's name]broke up the assignments this allowed much less space for uncertainty or failure. I've never been one to like or do well with uncertainty but I must say I did pretty well getting through all the challenges I faced. It has made me realize that it is important to get other peoples feedbacks and not always focus on what you like because, you are designing for an audience not for yourself. I know realize that throughout my design process I should ask for feedback and use that feedback to reflect on my work. This is a very important process of the designing world.

Question 14.2: Knowing that you will be presented this week for an additional element to your final EDP, how do you feel about the uncertainty of that? How are you preparing to manage the unknown?

[Participant 1] After the long process of collecting information, designing the outline, defining a good outcome, defining an assessment for the outcome, defining the content, creating a prototype and finalizing each detail I feel I am prepared for any uncertainty at this point. For me, I try to clear my mind of any distractions so that I am able to focus on any unknown. I prepare myself, regularly, for the unexpected so I have a strong mind to help me in the preparation of anything unknown.

[Participant 5] Things like this happen to me at work every single day. My project teams change build, timeline, and what they want in regards to training materials all the time. Just this week the 2 major projects I have been working on for the last 3 months and thought I would be working on for the next year have been delayed until 2018. Just like that! I went from having a plan of work, timelines, and had started updating materials just to be told sorry, the University has decided to push both these projects back. It's just part of the job. After 4 years of being here. I am use to it. You have to adjust and be willing to turn on a dime or you will never make it.

How are you preparing to manage the unknown? As I mentioned before, in Instructional Design you have got to be flexible. I always try and have a plan b in mind. Now at work with these projects being delayed, I can turn my attention to redesigning our classroom training and spending time with our trainers teaching them some basic facilitation skills to make our classes more interactive.

[Participant 7] Well when I initially heard that there was going to be a twist, I got scared! I didn't know what to expect and that made me a little anxious (again, ahh! I think I need to relax more). However, when you described in the video for Week #14 how this has happened every time you have brought something to a client, it made a lot of sense to me. I relate it to teaching my students. No matter how excellently I think I have prepared a lesson to teach, there always has to be some sudden, unplanned for differentiation that has to happen. Sometimes that is scary, awful, and stressful but other times I think my best teaching comes from it.

[Participant 8] I feel pretty confident based on how much I have already compiled together. The practice of uncertainty thus far has made me realize more so than ever that it is important to be able to think fast on your feet.

[Participant 9] I have been thrown so many curveballs during my career as a high school social studies teacher that I am comfortable with uncertainty and I am confident I will respond appropriately. The primary thing I've done to prepare for this uncertainty is to wait and speculate. I've brainstormed and jotted some ideas as to what I think the change might be and I've noted some potential responses, but I didn't' want to get ahead of myself

[Participant 11] I think my past experience in a training environment prepared me for the twist. I remember my co-workers, who were working on the training project for the new corporate banking line of products, being exasperated with all of the changes the client asked for. It was sort of like they didn't expect it to happen and weren't prepared for it. This assignment helped me understand that changes are a necessary part of the ebb and flow of designing; and that while I can't be ready for the specific changes requested, I can be ready and willing to be flexible when they ask for them. I think designing instruction is fun to begin with but the challenge of creating a new task…or a new module (like I thought the twist would be) makes the assignment interesting.

[Participant 12] I wasn't worried about it because I knew there were opportunities to create better activities, I just needed to think a little more outside the box

[Participant 13] Design is not something isolated that one creates to hide in a closet. Design is all about making the end-users' lives better, and helping individuals live more fulfilling lives. I embrace uncertainty, and in this context, the need to change, because I know this change is only going to benefit the end-users, and thus make the design more effective. I see every new design as a pilot, and look forward to receiving feedback from my client(s) and/ or end-users. I am very open about this process and let my client(s) and/ or end-users know about it, as I want them to know that the design is not about me, it's all about them. I am also very specific about how will I use the feedback to create what I like to call the "2.0 version" of the design. Once saved, always saved does not translate into once designed, always designed, as design is a continuous process. Plus, having to change one of the activities makes the project more realistic, as I am yet to design something that does not need to be changed or improved.

How are you preparing to manage the unknown?
One way in which I prepare for the unknown is by focusing on the client, and understanding that the design is not about me, it is all about the needs of the client. That helps me stay focused and go out of my way to meet and exceed the client's needs. Really listening to the client, and making sure I actually hear and understand the needs of the client is crucial. Clear communication is also key. Staying humble allows me to work together with a team, to ask for feedback and to be explicit about what am I looking for in the feedback. Also designing a flexible product helps- this requires staying open from the get-go, as thinking that I will design the perfect product will not allow any room for improvement, and I will set myself up for failure.

By now, I expect the unknown - I am yet to work on a project that didn't have a twist. I think of ways in which I can approach the unknown and possible solutions that I can test out. Based on that, I figure out what is the best course of action. Creating a prototype – as I have been reminded this semester – helps me tremendously, as it give me a clear idea of what I like and dislike, what is doable and what is not, as well as gives me something that I can share with the client, to give the client something to react to. Based on the feedback I receive from the client, I know what other changes to make as I continue to refine the design, and all of a sudden the unknown because clear, or at least more clear. To sum up, I work through the unknown, I plan and expect the unexpected, and when it happens – and somehow it always happens, I work through it.

[Participant 17] Journal not submitted

[Participant 18] The uncertainty about my prototype will be taken care by moving back through my design spaces to find a possible solution. The uncertainty is only in the prototype, but as I move through my other design spaces there me be less uncertainty and the solution may already be there in the other parts of my project. If the solution is not there I will at least moved into a design space where I can start the process of retooling my prototype. This course has given me a method to uncertainty and really has allowed me to disconnect uncertainty from chaos. By doing this I am much more prepared to handle uncertainty.

[Participant 19] I already knew the element before answering this. I do feel like it will be difficult for me to redesign an activity because in my case the activities and the content are intertwined. For example, I am teaching them about sentence stems by having them use sentence

stems. I am teaching them about the numbered heads discussion strategy by facilitating a discussion using that strategy. I will need to go back to each slide and think about it from the client's perspective.

[Participant 20] I am not a good public speaker so for me to present my EDP and get negative feedback would be very tough for me to handle. I would be very disappointed and angry at myself. Knowing the unknown is very frustrating I like to be prepared for whatever I am encountering especially when I have to present something since I am terrified to speak in front of people. Everyone always asks me then how are you are teacher if you fear public speaking and uncertainty but it is totally different when teaching kindergarten students, they are not judgmental and do not criticize you, if I do something incorrect the only thing I have to do is laugh about it and say oppsy I made a mistake and the children laugh. I went ahead and fixed my EDP but who even knows if the clients will like it this time around, I am now going to feel scared and worried about presenting because they already didn't like it once around. When designing its important to get feedback from some peers, so I asked a few of my co workers if they liked the new addition to my presentation.

Question 15.1: Go back to your previous responses during this semester on the "What is design?" question. What has changed in your definitions after completing this course and your [Instructional Design] ID project?

[Participant 1] I have discovered over time, while working on the ID project, that I have more elaborate knowledge of what designing is all about. Design is very focused on details, creativity and developing something new that hasn't been used before. Design requires passion and does take time in the process of designing something new. When looking back into older versions of the EDP I noticed that I was able to create new ideas in my head, similar to the light-bulb effect. I have learned that this is a continuous process and it does not stop when you think that the process is finished.

[Participant 5] I'd say my definition is the same except now I would add that design is really never finished. Situations change, problems change, employees change, systems change...and so must design. It must constantly be revalued and improved upon.

 Here was my original response1.What is design? Design is taking something that already exists and making it better or using it to create something entirely new. It's about looking at an item or a project in a "big picture" way, but then breaking it down into smaller pieces to see what can be approved upon. In the process, many times new ideas create completely new concepts. Design is about improvement. Making things better, faster and sometimes easier. It doesn't really matter what the subject is whether it be kitchen gadgets, high end jewelry, or race cars it's about making something better. Whether it be done in teams or individually, designers usually follow the same process. They look at what already exists, draw on personal experience with topic, look at the overall problem, break it down into smaller sections, brainstorm ideas, refine and evaluate those ideas, and then design a new product/solution all while keeping the customer and end users needs in mind.

[Participant 7] I think my response to the initial question is still spot on. I think design is so many things and I do think the end goal is improvement. However, now I know that design is way more in-depth and challenging than I could have ever imagined. Designing, what seems to a normal eye, the simplest things has SO many components to it. Even the design of socks took so much thought, preparation, tweaking, etc. to complete.

[Participant 8] I suppose the one that sticks out to me the most about this question is the concept that design does not necessary have meaning behind it. People design items for a wide variety of reasons and not just out necessity. The design process itself is an eye-opening experience and allowed my group and I to develop a better understanding of how the thought-process works. We definitely did a lot of exploring, redefining concepts, and prototyping thanks to some of our more artistic folks. I enjoyed the process in its entirety and really liked that our group members explored all options and finalized our product in a timely manner.

[Participant 9] I think my initial definition is a solid definition of design. During week 4 I wrote: "Design is the process of innovation through the creation and implementation of new ideas. These solution/improvements can build upon an already existing model (e.g. Kenneth Grange's improvement of sewing machines) or they can be truly novel in their approach (e.g. the invention of writing by ancient Sumerians). These examples also illustrate that design can result in tangible goods, services or systems. Lastly, design can involve the application of an already existing technology or process in a new setting (e.g. Murray Gordon's incorporation of ovens in Formula One racing)."

The only thing that I would add is that design often involves an ongoing process of improvement. Accordingly, my new definition is:
Design is the process of innovation through the creation and implementation of new ideas. These solution/improvements can build upon an already existing model (e.g. Kenneth Grange's improvement of sewing machines) or they can be truly novel in their approach (e.g. the invention of writing by ancient Sumerians). These examples also illustrate that design can result in tangible goods, services or systems. To add, design can involve the application of an already existing technology or process in a new setting (e.g. Murray Gordon's incorporation of ovens in Formula One racing). Lastly, rather than being a process that always has a definitive beginning or end, design can be an ongoing process that requires constant analysis, reflection, innovation, and implementation. For instance, instructional designers are involved in the process of creating new systems of learning that draw upon the experiences of prior learners in order to improve future learning.

[Participant 11] Looking at my past response to the question, "What is design?" I would say that not much has changed. The one change I noted, is that now I see the value and place for instructor-led training which at the beginning of the semester, I wanted to totally replace with online instruction. Also, I am surprised by the fact that I wasn't as creative with my activities as I could have been although I do think they are appropriate for the content.

[Participant 12] I don't believe that anything has changed in my belief about design that it is ever-changing and unique. In fact, I think that it strengthened by believe in those two ideas because the client is always going to be changing something that you have done in order to help

make it unique, It is up to me in order to challenge myself to be more unique and creative in my design work in order to bring the best product to the client.

[Participant 13] Design is a whole, its own entity, that has a beginning, a middle and an end. Design is complete in itself, yet it constantly speaks about its designer behind it, while truly focusing on its rightful owner, the end-user. Design is collective, interactive, reflective, but also humbling. Design is also the result of embracing uncertainty, allowing yourself to go out of your comfort zone, and thinking outside of the box.

After re-reading my definition of design from earlier in the semester I would add that design is continuous. As we grow as individuals, but also as designers our vision continues to grow too. Earlier in the semester, I was defining design as a journey, not a destination. Now I would say it's actually a double journey. With every new design, more miles are added to the designer's personal journey. In the same time, the design undergoes its own parallel journey leading to taking shape, maturing, and improving.

[Participant 17] Journal not submitted

[Participant 18] My original definition was: "Design is a set of complex abilities and processes that allow one to take a problem and formulate a tangible solution."

The main flaw in my definition was the second part. I still believe design is set of complex abilities and processes, but the second part has changed. The word problem is very tricky when it comes to design. I feel that if designers followed the old "if it ain't broke" tutelage then many designs wouldn't even happen. Design is about continually analyzing the world around us and many times what people think are not problems can actually benefit from design. I no longer believe design is necessarily an answer to a problem and furthermore I don't think we need a problem in order to design. Even in our projects this semester I wasn't even sure of the problem until halfway through the design. I was still designing though. I also am not sure the term tangible solution is correct either. Sometimes just designing in your mind can strengthen your ability for later designs. Sometimes when we design there are no solutions what so ever. I also do not like how my definition did not mention the end user either. The end user is one of the more critical pieces of design. If I had to rewrite the definition I would keep the same input but change the output to something less rigid and include the end user.

[Participant 19] One thing I would add to my definition is the emphasis on communicating your design. In my previous definition I mentioned the use of sketches and prototypes to express thoughts, but something I've realized through creating my EDP is that is really important to create a prototype that the client can understand easily. In my first draft of the EDP, I had large chunks of text. With the feedback from my group and professor I was able to condense all of that information into bullet points. So a huge part of design is also being able to efficiently communicate and express design ideas.

[Participant 20] In the beginning of the semester my term on design has definitely changed over the course of time. In the middle of the semester my definition on design was a bit stronger and had more depth to it. Now being in the last week of the semester I feel as if my definition is

pretty strong but still not 100 percent because there's so much that goes in design. It's not just designing something it's really getting to know your clientele prior to designing, once you have gotten to know them you are really able to build out your design. Designing is in our everyday lives and making sure we understand that is important. Also, it important to realize that you might design something and your client does not like it so it's important to be open and have a strong shield when designing. Also, I never realized how important collaborating with people when designing.

Question 15.2: Go back to your previous responses during this semester on the "What's instruction?" question. What has changed in your definitions after completing this course and your ID project?

[Participant 1] I don't believe my views on instruction have changed since the beginning of the course. I still believe that instruction is a basic tool that gives guidance to users/designers on how to design a particular product in the different stages that will instruct the designer/user to a finalized product. The same process that I followed to make my ID project is the same way the instructional design is explained.

[Participant 5] To it I would add that it is what we as designers create. It can take many forms and be delivered in many different ways but basically it is teaching someone how to do something they have either never done before or maybe never done something a certain way before. It teaches them how and changes how they think about what they do.Below is my original answer

What is instruction? Instruction facilitates learning and performance through teaching or training. It is guiding a person through a concept or steps to a process with a specific objective in mind. It can be formal or informal, spoken or written. It is leading a person towards a new or better way of completing a single task or a series of tasks. It also involves testing that understanding to ensure the learner has indeed learned something.

[Participant 7] Just like my definition of design, I think my initial definition of instruction is spot on but just barely touches the surface of what instruction truly is. Instruction has so many components to it that are similar to design. It is crucial to be aware of your end users, what your goals are, what you want to accomplish, how you want to accomplish that, and how you will check to make sure that was accomplished. Instruction is not just the "what" you are teaching but SOOOO much more!

[Participant 8] I think what I would add to my initial response to this question is that it is the product of what instructional designers design and that it is typically a step-by-step approach that may include signage, etc. They are essentially detailed information that includes directions on how to perform tasks effectively. I may be explaining this in a manner that I'm not meant to: much of the information that needs to be provided for users must be included. I think that after this course, I am more aware of this fact and have decidedly not to leave anything out for better or worse. Though I also think that it is nearly impossible to come up with everything for a perfect prototype.

[Participant 9] In week 4 I wrote, "According to Spector, instruction '...facilitates learning and performance' and is goal-oriented." While I agree with this definition, what has changed is how I would clarify learning, performance, and goal-orientation. Accordingly, here is my new definition:
Effective instruction is the process of facilitating learning and performance (the acquisition of specific knowledge, skills, etc…) aligned with specific objectives that can be measured in an assessment. Effective instruction must define how learners will demonstrate that a change in their knowledge and/or abilities has occurred and define how this change will be measured.

[Participant 11] I feel like my definition of instruction didn't change as much as my take on assessments did. To me, instruction still refers to the art of teaching someone something they didn't know before in order to increase their knowledge, skills and/or abilities. Previously, like when I was in the [removed department's name], I thought that in order to assess what a participant learned you had to give them a "final exam". Now I know that assessments come in all shapes and sizes and so does instruction. I have a new appreciation for activities like teach backs and self-studies. In the future, when designing instruction that is longer than 1 day. I will definitely consider self-study methods, or what are more commonly called "flipped classroom" designs/activities in P-12 education. I think it's interesting to get most of the content covered that way so a lot of time can be spent practicing or using the knowledge.

[Participant 12] I think I would add that instruction is more than just telling and showing people how to do things. It is explaining to them that there is a need for something to be done and why this solution is the best one out there, if it it makes people uncomfortable.

[Participant 13] While cars are the product of car designers, instruction is the product of instructional designers. Looking at instruction as a product can be challenging at times, as it may not seem as concrete as a car, or a computer. But seeing instruction as a product can help me as an instructional designer stay focused on the end users of my product, and continue to think of innovative ways of designing instruction to benefit the end-users. Both the "Visual Thinking Exercise" and the "End Users Description" helped me understand how important it is to design with the end-users in mind.

[Participant 17] Journal not submitted

[Participant 18] "Instruction is the transfer of functional knowledge from one person to another in a mutually agreed upon environment and set of outcomes."

The later part of my definition has changed. In my first definition I said a mutually agreed upon environment. This was wrong, I do believe that learner centered instruction is the best type. I also believe it is the job of the ID to create meaningful outcomes. The learner shouldn't have to agree to the outcomes as I implied in my first definition. If I had to re-write the definition it would go something like:

"Instruction is the transfer of functional knowledge from one person to another in an environment suitable to the learner and meets a well-defined set of learning outcomes."

This course has also taught me about learning outcomes. I added the word learning from my first definition because I was able to define better what outcomes I was talking about.

[Participant 19] What has changed in your definitions after completing this course and your ID project? Something I would add to my definition of instruction is always keeping the end-users in mind. To create the end-user identities before going into the content, outcome, assessments, and activities was immensely helpful because it helped me to narrow down my instruction. Student-centered learning can easily be a one day training or an on going training. To limit it to a 2 hour training, I really had to keep going back to see the needs of my end-users and decide what was most important to teach. My previous definition of instruction focused on the outcomes and activities part of instruction. However, all of that is rooted with the end user in mind.

[Participant 20] I believe my prior response was pretty content on what instruction is the only thing I believe that I had missing was that when designing something you are the instructor, I never really looked at being a designer as the instructor but then again the designer is instructing everything that is going on with the design. It is important to be an instructor when designing because you may have other people working with you and also when presenting a design project you have created.

When thinking of the term instruction, I use to only think of what we as educators had in our classrooms and how we instructed our students to do an assignment or project. Now that I have a better understanding of definition and have been in the instructional design program for some time now I believe that there are 5 areas that cover instruction "design, development, utilization, management, and evaluation". To be a designer you must have instruction of how you are going to design something. Although there are many different approaches of instruction it all just depends on what you are trying to fulfill. When working with design it is important to think of a plan and that is when instruction falls in place. When thinking of instruction in a designing world you are usually hired by a company and an instructional plan is usually given to you or you must create an instructional plan on what the company wants fulfilled. Instruction does not always go as planned and usually must be reconstructed what ideas or thoughts you have. Also when working with people we do not know we need to come up with an instructional plan by getting to know that person, for instance I am a hands on type of person and my sister is a visual learner we would be on different teams.

Question 15.3: Go back to your previous response to 4.3 were you described your beliefs, self-awareness and precedents. What do you have now? Where are you today after 14 weeks of design thinking? What does it mean to you to be a designer? What goals do you have for yourself? What actions will you take to develop as a designer and reach those goals?

[Participant 1] I still believe that design is the very basis to creative innovative products. My view on design has improved since the beginning of the course by expanding my mind to realizing there is a lot more to design then just the creation, there is the brainstorming and coming up with good ideas that also affect this process. My self-awareness has changed since the

beginning. I am now more familiar with myself as a designer and am aware of the potential I have to create an idea and make it into a reality by designing. Designing has always been a passion of mine because I like to create new things and share my ideas with others. During these 14 weeks, this has not been an easy process but the benefit of these 14 weeks has been that I am able to learn new things to improve my way of designing and being provided with feedback from my peers and instructor. To be a designer, to me, means that I am able to share my different ideas with other people in order to create something useful to help people in the future or currently. Design has shaped my thinking process and gives me better ideas and helped me to discover successful examples, which impacts my designing process. The goals I set for myself is to constantly improve my thinking process and develop better skills to create and focusing on my reading in order to help with the thinking process in my development. I also want to work with a group to design so that I am able to share my ideas and gain new ideas from the peers in my group, in which I will be able to achieve my goals. The EDP I created, I created solely on my own but the goal is to evolve myself as a person and design something with a team/group.

[Participant 5] I would add looking at things more "big picture" and maybe not just how designing happens in my current job. Looking at how other designers design and finding ways to incorporate their ideas or methods into what I do.

Where are you today after 14 weeks of design thinking? I have a greater appreciation of other ways to design training. Perhaps now I see more of the actual process. Before this class I was just designing, now I can see the different stages and how designs need to keep changing and evolving.

What does it mean to you to be a designer? It means you create content that teaches others new information. Through your designs you change how people think and how they do their job. You need to keep them engaged, interested, and wanting to learn more. I want to re-evaluate all of my training content and find ways to improve it. Design is never really finished and needs to be looked at and improved upon.

What goals do you have for yourself? To finish this Masters program of course. But I would also like to get into other types of Instructional Design, not just software related training.. My long term goal is to retire in 15 years and move to Texas. There I hope to do some freelance type ID work.

What actions will you take to develop as a designer and reach those goals? Again finish this program but I have also joined several design groups at work. I have joined groups focused on Adult Learning, Elearning, and one on Technical Writing. I also have plan to change all of the current training content I am responsible for. It is not interactive enough and our trainers are bored with teaching it. I will start my teaching the lessons created in my prototype. I am also re-writing one lesson at a time for my classes. I am adding interactions, self directed exercises, and completely re formatting them to make them not only more meaningful for the learners, but also easier and hopefully a little more fun for the trainers that teach these classes every week.

[Participant 7] I believe these are my additional/newly changed beliefs, precedents, and self-awareness:

Design is all about working together towards an end goal. Whether you are working with your colleagues, teammates, or design team design is all about collaborating to best serve your client. Design is also all about identifying the issue and determining the best way to solve it. In order to best serve those clients, designers must understand what those clients need.

Self-Awareness: I am a lifelong learner. I have always been a lifelong learner, but I have found that this course has really stretched me to continue my learning. I think I have learned more in this course than any of my graduate courses and it makes me think that excited to continue the process.

I am a leader. I say it all day, everyday to my students. "Are you being a leader?" I think I am a leader at work, in school, and in my personal life. I live my life to the fullest and am always striving to be the best me I can be!

I am a collaborator. I work best when I work with others. Giving and receiving feedback makes me learn best! I thrive when I am learning from others and I think it makes me the most effective student, teacher, friend, and colleague I can be.

Precedents: The only other precedent I believe I could add, after taking this course, is teammate. I didn't realize it before but design does take such a huge amount of teamwork! I have been a teammate all my life. I grew up playing sports and still do today. Growing up playing sports taught me so much about collaboration and time management (especially in high school). Being on team's now brings me so much joy! I love working spending time with my friends doing things I love, but I still find I am as competitive as I was in highschool. I still try my best and expect my teammates to do the same :)

After 14 weeks of design thinking, I am in such a different place than I was when I began. I never saw myself as a designer. Not at all. Now, at the end of this course, I can proudly say I am a designer! I design for myself, my students, my family, and others. I am constantly designing. Designing, to me, means seeing a challenge and improving it. Designers get the jobs done. They design, share their product, make adjustments, reshare, and continue that process until their design is exactly what their client wants. Designers want to make their clients happy. As a designer, my goals include continuing to be a lifelong learner and to use design to improve my student's learning experience. I think I must stay up to date on my design process, I have to keep practicing it. I can't let myself get rusty, I have to keep designing! I also think I have to always put my students needs first. They are my end users and their needs should always drive my design. I also think I need to continually be reflective on my design and I must collaborate with my colleagues!

[Participant 8] I really do not think that much has changed about my 4.3 assignment. I'm still all of those things. As a designer, I've found myself to like this new title. I have goals on becoming better professionally and I believe truly that this course has helped me along. I plan to continue working on my techniques so that my future curricula are better enhanced.

[Participant 9]

Additional Beliefs (In Pink)	Additional Self-Awareness (In Pink)	Additional Precedents (In Pink)
• Competition inspires innovation • Good ideas stem from collaboration • Have empathy for the user • Big questions to ask: why don't we try this? • Think divergently • Think about the problem first • Trial and error is part of the process • Be willing to fail • Think outside of the box • Design is a continuous process • If institutions want to incentivize creativity, they need to provide a degree of autonomy and provide room for safe collaboration. • We must embrace technology. Technology has the potential to revolutionize the personalization of education and improve educational outcomes • Be a risk-taker • Seek out experts, stay aware of the latest research regarding instructional design • When designing, we must think about motivation theory, incentives, opportunities for autonomy	• I design as an high school educator • I attempt to engage students • I think about the teenage mind and how it impacts the ability to learn • I try to take advantage of technology • I incorporate real world learning • I explain why the lesson has value • I collaborate with my colleagues to find new insight to old problems • I try to keep abreast with current research regarding pedagogy • As a high school teacher, we must be mindful of standardized testing and we attempt to prepare students for said assessments • The new system of evaluation our district has implemented has made me and my colleagues more willing to share the amazing things taking place in our classrooms and more willing to take risks • I try to listen to my students, seeking their feedback, in order to improve instruction • As an APUSH teacher, I am thinking deeply about historical thinking skills and designing instruction aimed at developing these skills • As the US History PLC leader, I am attempting to think deeply about effective instruction and assessment and to share these concepts with my peers	• I've learned from my past mistakes and have adjusted my lessons accordingly. • In particular, I have a much greater understanding of student engagement • My most useful learning experience came in my rookie years as a teacher (trial and error) • I seek feedback from my students to inform future decisions • I've come to learn the value of consistent reflection and corresponding adjustments • Based on prior shortcomings, I want to become better at structuring cooperative learning and incentivizing cooperation • This course has furthered my willingness to embrace change and uncertainty • I am most engaged when I care about what I am learning, accordingly, I try to provide opportunities with choice and connect learning to students experiences. • My experiences as a football, basketball and track coach have also impacted they way I approach teaching • My experiences learning Brazilian Jiu-Jitsu also shape the way I see learning. I know what contributes to my engagement or lack thereof.

[Participant 11]

Additional:

Beliefs	Self-Awareness	Precedents
Designing is not a linear process Designing is a fun and challenging process I am more creative than I thought I was; really didn't think I would be able to put my vision to paper for my project Design something, whatever it is should solve a problem or make life easier somehow.	Current professional identity – instructional designer/trainer who is gaining valuable experience *I am at the experienced beginner level who sort of loves the idea of not having rules. It really opens up the possibilities of innovation for the client.* I also now understand how to talk about ID a bit more…I know the players in the game due to this class. I can be more conversational about training/ID topics and have just enough experience to be able to relate to other designers. I would be a good collaborator in the ID field. I have valuable input to offer and would value other's input on my designs.	Used to look for "rules"; for the client or someone to tell me what I can do to meet a need or solve the problem. I don't need that anymore. I've always loved working with the MS Office Suite of products, now I can do that for a living!

I am at the experienced beginner level who sort of loves the idea of not having rules. It really opens up the possibilities of innovation for the client. Being a designer means that I can use my creative abilities to solve problems associated with performance. I can help with the knowledge, skills and abilities of employees so they can reach their fullest potential. As a designer, I can have a voice and help leaders shape their approaches to management by helping them see problems from a different perspective. I can help get the message from employees to management by shaping learning interventions that will be best for them.

Goals:
I am leaning towards pursuing my Ph.D. (what do you think? Do I have what it takes?) But first and foremost, I would like to find a job designing instruction/assessments for a company that values learning in the workplace.

I would like to make a difference in people's lives and am interested in designing learning solutions related to health and wellness. I recently contacted a friend of mine who owns a gun training/education company about putting together a class for children. Not sure if anything is going to come from that conversation, but I may put something together anyway.

A dream would be to become a respected expert in this field who earns a good living through consulting and/or creating a program that a Fortune 500 company wants to buy and use. J I would love to be able to pay off my husband's and my student debt AND be able to pay for my sons' college should they choose to go. I would love to set an example of success for my boys so they grow up knowing that you can truly be whatever you want to be. (Sorry, was that a tangent?)

Actions:
I will keep building my portfolio as I work on projects for school
I may put together an online class targeted toward children about guns. (Maybe a gaming app.)
I will look for opportunities to freelance or volunteer as a designer to keep building my resume/experience/reputation

[Participant 12] I think I would add that in order to be a successful designer one needs to take people's attitudes about about your design into account. Everyone is not going to be open to your design, but it is up to you as the design to build into your design answers to questions that they might have. For example, some instructors might not be open to trying new technology in a classroom, but if you can show them the positive impact it might have in the classroom. Instructors then can begin to think differently about technology after getting more comfortable with it

[Participant 13] I still believe, probably more than ever before, that student engagement is key to students' learning and success. What changed? The degree in which I believe this. Having engaged with my peer group during the semester helped me value students engagement in an online course so much more. I have also learned, once again, how important it is to be part of a group, to work together and learn from each other. I hear and say this all the time, but once again I have seen the importance of not assuming anything, but thoroughly investigating all options, without immediately dismissing points of view, or suggestions that are very different from mine or my expectations.

Having focused more on the technical expertise required for my job, in the past years I have delivered mainly technological workshops with pedagogical components, or co-facilitated pedagogical workshops. While I have been thinking about switching gears and transitioning into more pedagogical workshops, this course opened my eyes about not adding any unnecessary limitations, and gave me the confidence to move towards a stronger pedagogical role. I am excited to report that on December 2nd I facilitated my first fully pedagogical workshop, and in January I will be co-facilitating the "Supporting the success of transfer students in the classroom" workshop. I am also excited to join a pedagogical book club, and continue to learn and grow as a designer.

[Participant 17] Journal not submitted

[Participant 18] When I look back at my table of beliefs, precedents, and self-awareness I really wouldn't add anything per say, but I surely have defined some of the concepts in the table around designing. For instance I had a section entitled know your audience, but after taking this course I have realized this is my ability to have learner/end user centered approach. I also spoke about framing the problem effectively and through this course I have learned that this was making sure I had a good problem statement to guide my ID.

One of my beliefs was know your medium. I have figured out that my medium is concepts maps and that I specifically like to make them in a digital program. I lack the fine motor skills to sketch or draw.

More than adding to my tables I have connected my tables to what I feel will make me a great designer. Looking back at the tables was a very nice way to bring the whole course together and truly allowed me to see myself as a designer.

Being a designer means dealing with and almost embracing uncertainty. Being comfortable with uncertainty is what makes many of the designers we studied so great. Throughout this course I have become increasingly comfortable with uncertainty and have added to my tool box ways to deal with uncertainty. Being a designer also means producing a quality product. Especially in ID, this product can have many forms and iterations, but it is most important to produce a product that is deemed quality by the learner first.

I have many goals for myself regarding designing. I want to become a better ID. I want to finish my ed specialist program in two years, and I want to move on to my doctorate. I would also like to use my ID knowledge and credentials to provide for my family in the future.

The specific actions I will need to take to accomplish this revolve around practicing my design. I need to continually build on the skills I have learned in my coursework to become a better ID. I will need to practice these skills in my current job and take on any tasks that might lend itself to my improvement as an ID. I need to build my network up by communicating with faculty in my program and showcasing my abilities in my courses. I also need to study learning theory more outside of classes to become well versed in those theories. I will also need to take inventory of other skills I may need outside of class to study more. Keep a portfolio of my best work to show to potential employers.

[Participant 19] For self-awareness, I would add that part of design is embracing the ability to change. In our EDP, it was an interesting challenge to have to change one of the activities. I found that difficult, because each of my activities took a lot of thought and energy to design and were intentional. To have to scrap one activity altogether felt like I was deleting something that contributed to the overall training. However, it is common for clients to want changes. In fact, when I was volunteering for the [removed organization's name] creating an elearning course, there were times the clients asked for drastic changes and I had to go along with it even if I disagreed. Therefore, I need to learn to be flexible to meet the needs of the client. Some goals I have for myself is to design in areas where I am not a subject matter expert. So far everything I

have designed has been something I have been passionate and knowledgeable on. If I want to explore working in the corporate world, I need to experience designing something where I have to rely on a subject matter expert for content. Not having done that before, it is something I fear. I wonder if I can be as passionate about instructional design in content areas I'm familiar with as instructional design where I am not familiar with content areas. Due to that, it is my goal to secure an internship for instructional design in a field that is very different from the education world. Some actions I will take to develop as a designer is learn by myself things I can do with elearning software like Captivate. I learned a lot over the summer, but feel like I have barely touched the surface. In my freetime I watch youtube videos regarding elearning software to learn more about the design aspect of using Captivate. Some other things I've researched and will continue learning about is how design meetings operate and the day to day responsibilities of an instructional designer.

[Participant 20]

Beliefs(What you currently know about design from education/experience)	- When creating and designing something it is important to set a goal and have direction. - You will not always be successful. - Must explore and try different things. - You will be critiqued and judged on your work. - Must be strong and have an imagination. - Must be creative and take chances. - Strive for your best. - You can do it. - Always give your all and have an open mind. Added on - Never Give Up - Think outside the box - Have God in all that you do. - Ask for different opinions, know you're not always right
Self-awareness (What is your current professional identity, and how does that impact…, how does your character affect decisions).	- Not always the same can change from time to time. - Management (time, responsibility) - Caring, giving and going above and beyond for my students. - Exploring different ideas and strategies. - I was raised in a strict catholic family so a lot of decisions I come

	up with are an image of God. When designing anything I always think of God first. ● It is important to have beliefs and have a strategy for what you are designing. ● Must be content and know what you want. ● Do not do design something you do not believe in just to satisfy others. Added on ● Giving all that you have ● Important to be open minded ● Being strong and open to change ● Provide more time for myself ● Understand my clientele deeper.
Precedents (how do your past experiences in life and design build on and affect your work)	● I've been judged a lot and have learned that in the end no one matters but what you strive for. ● You won't always be right. ● People may not like your work or ideas. ● Made me realize I need to be strong and not care what other people think. ● Be creative, try different ideas. ● Explore and use your imagination. ● You won't always succeed but always give your best. ● Think outside the box. ● Designing is a process and will not happen overnight. It takes time!! ● Sleep on your thoughts. ● Write, draw and build your ideas. ADDED ON ● Try different things ● Do not just stick to what you are comfortable with. ● It's important to ask for feedback ● You won't always get the best grade or feedback but that's okay. ● BE STRONG!!

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ABSTRACT

A QUASI-EXPERIMENTAL RESEARCH STUDY EXAMINING THE IMPACT OF REFLECTION ON SELF-EFFICACY IN GRADUATE DESIGN STUDENTS

by

CHRISTINA CHATEAUVERT

December 2017

Advisor: Dr. Monica W. Tracey

Major: Learning Design and Technology

Degree: Doctor of Philosophy

While the concept of reflection is not new to education, researchers suggest that students be given more space to engage in meaning-making activities (Sambrook & Willmott, 2014). In recent years, there has been an increased emphasis placed in education on self-reflection. In part, because of Donald Schön's (1983, 1987) work on reflection-*in*-action and reflection-*on*-action. Schön's view of reflection-*in*-action puts students in the "midst of action," reshaping the problem or experience, and making fresh decisions to guide next steps. Reflection-*on*-action allows students to think back on what has occurred and how that experience will shape future decisions. Taking a similar approach as Schön, David Boud, Rosemary Keogh, and David Walker (as cited in Hong & Choi, 2011; Mann, Gordon, & MacLeod, 2009) describe reflection as a way for individuals to take a step back from their experiences, think through what has happen as it related to emotions felt, and then evaluate the situation from a new point of understanding. Reflection provides an avenue for students to explore their relationship with the changing world and start to build their perceptions of self and in the context of their professions.

Design students are not only faced with challenges in an every changing world but also lack the strategies to increase levels of self-efficacy. This poses a problem on how best to impact

the development of self-efficacy in students using reflective practices and has several implications on the way in which instruction can be designed to create deeper reflection in students within the academic setting. This mix-methods quasi-experimental study attempted to explore the impact of using reflection as a tool to increase self-efficacy in graduate design students. The goal was to examine how various reflective writing prompts impacted the level of self-efficacy and reflection levels of the graduate design student. Social cognitive theory (Bandura, 1997), constructivism and reflective practices (Schön, 1983, 1987) guided this study.

Both qualitative and quantitative data was collected and analyzed to provide a comprehensive view of the research. Findings indicated that self-efficacy decreased over the course of the semester. The study also set out to examine how various reflective writing prompts impacted the level of reflection of graduate design students. As analyzed by the REFLECT rubric, results indicated that the reflection-on-action writing strategy produced the highest level of reflection in graduate design students. Some participants challenged their beliefs in light of new perspectives, resulting in changed perceptions and growth. Others maintained a consistent view of their definitions of design, instruction, and themselves as a designer. Those who challenged their current thinking reached higher levels of reflection.

AUTOBIOGRAPHICAL STATEMENT

Christina Chateauvert currently works as a User Experience Lead at Ford Motor Company and focuses on using design thinking practices to improve employee productivity. In this role, she oversees transformational projects and is an advocate for end users in changing the way they work. Christina is also an adjunct instructor at Wayne State University (Detroit, MI) in the Learning Design and Technology program. Past experience includes career development, instructional design, talent management, and corporate training.

Christina's research interests include designer self-efficacy, reflective practices, professional identity development, and human-centered design. She has a passion for educating others in using human-centered design to discover solutions for their business problems and adopting design thinking mindsets in their leadership styles. She enjoys promoting valuable learning and leadership, advocating effective communication and change, and inspiring creativity to coincide with structure.

Christina is a big fan of the design firm IDEO and was selected by IDEO U, their learning division, to be a participant in a six-month coaching fellowship. In this opportunity, she served as an alumni coach in their online courses: provided feedback to learners, hosted working sessions, and contributed to the global community of coaches. Christina is also a member of the Association of Educational Communications and Technology (AECT) and Michigan Council of Women in Technology (MCWT). She has a BA in communications and English from Olivet College (Olivet, MI), a MA in Writing and Publishing from Emerson College (Boston, MA), and a MTD (Masters of Training and Development) from Oakland University (Rochester, MI).