“ALL THE LOVELY IN-BETWEEN”: A NARRATIVE INQUIRY INTO STUDENT LIVED EXPERIENCES IN A TRANSDISCIPLINARY DESIGN STUDIO

by

KELLY W. GUYOTTE

(Under the Direction of Tracie Costantino)

ABSTRACT

As I returned to graduate school in fall of 2010, I found myself relentlessly intrigued by the processes of learning, creating, and being. These notions permeated into my inquiries and impelled me into a research space which sought to understand students’ lived experiences as they engaged in processes of becoming. The context of this study was an interdisciplinary STEAM-inspired (science, technology, engineering, art, mathematics) course, the Transdisciplinary Design Studio, at a southeastern research university which enrolled undergraduate and graduate students from engineering, art education, and landscape architecture. Students engaged in artmaking, collaboration, and inquiry while the instructors strove to cultivate a reflective space where students could begin to perceive of themselves as in-process beings as they developed a wide-awakeness (Greene, 1995) towards what it is to be creative and situated within (and beyond) a discipline.

Drawing from Maxine Greene’s writings on aesthetic education (1995; 2001) as a theoretical framework, this study assumed a constructivist lens and was situated within three methodologies: instrumental case study, practitioner research, and narrative inquiry. The research questions were: 1) How did students discuss their conceptions of, and relationships
between, disciplinary identity, creativity, and the creative process as they resided in-between? 2) How do students tell stories of their experiences through visual and verbal modalities? There were three field texts collected which resulted in data triangulation in this study: visual journals, focus groups, and student reflective papers. Through the visual and verbal texts, the analytic method was a visual-verbal narrative analysis which engaged the researcher in a systematic reading of the texts attending to both the visual and the verbal content. The findings were represented through three (co)constructed narratives which immersed the participants in the analytic process in addition to a broader exploration of meta-narratives across participants.

Using the construct of the “in-between,” which symbolizes learning and creating as an incessant process of becoming, student narratives indicated that the interdisciplinary and collaborative nature of the studio cultivated deepened understandings about the self with regard to both discipline and creative process. Student narratives represented multilayered and multivoiced perceptions of identity as they navigated the complex, transdisciplinary learning space.

INDEX WORDS: interdisciplinarity, transdisciplinarity, STEAM education, art education, engineering, landscape architecture, visual journals, creativity, disciplinary identity, collaboration, student experiences, reflection, wide-awakeness, in-between, relational, practitioner-research, narrative inquiry, visual-verbal narrative analysis, constructed narratives, Maxine Greene
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DEDICATION

To my wonderful immediate family which has grown by one since I began my doctoral program and my ever-expanding extended family. Your love and support inspire me daily and I dedicate this—the result of the late nights, the anxiety, the tears, and the joys—to Eric, Emerson, and all the Woodalls, Jefcoats, Wallers, and Guyottes.
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As this study found, it is through our relationships with a host of ‘others’ that our experiences are formed and made meaningful. There are numerous individuals whom I wish to thank that have made this work possible through their physical, emotional, and intellectual support. First, and foremost, I am forever grateful for my husband who always listened as my confidant, fellow teacher, learner, and audience. Your quiet strength was my foundation. To my sweet daughter, you have changed me in every way possible since your came into our lives in the midst of my doctoral journey. Your love and warmth were my motivation. To my family, you never doubted me or my abilities throughout this process. You nurtured confidence when it lacked. To my wonderful colleagues, thank you for allowing me to walk alongside you on this arduous path. Your empathy and words of support prodded me forward. To my brilliant professors, I appreciate the lenses you have offered as you encouraged me see the world in new ways. You helped me envision what is possible. To my advisor, thank you for your unconditional support and guidance. You modeled professionalism and kindness through our every interaction and inspired my own process of becoming in so many ways. To my participants, thank you for allowing our narratives of experiences to intersect and unfold alongside one another. You are the foundation of this research and your words and images inspired me daily.

Finally, I am grateful for the opportunity to work with incredible mentors on such an inspiring project. Thank you to the NSF team for taking a chance on me, for your support and encouragement. I hope this work speaks to our collective passion for teaching, learning, and research.
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CHAPTER 1

Introduction

Moreover, since perception always takes place from a particular vantage point in the lived world—since our efforts to grasp reality must, therefore always be incomplete projects—we feel ourselves summoned to take the kinds of initiatives that relate perspectives into a more or less coherent, even if unfinished whole. It is, I am suggesting, incompleteness—the open question, perhaps—that summons us to the tasks of knowledge and action.

– Maxine Greene, Releasing the Imagination, p. 74

Upon returning to graduate school in fall of 2010, I found myself relentlessly intrigued by process. The processes of exploring, learning, creating, being—these are the notions that permeated into my inquiries and impelled me into a research space which sought to understand student lived experience as they engaged in the process of becoming. Perhaps it was my art education background which fostered this interest, a discipline in which thoughtful engagement in process is deemed vital to effective visual inquiries and creation. It may have been my own experiences as a student where I valued learning not as an outcome, but as a perpetual state of being. The study of narrative research is another option, where I began to understand that the very lived experiences of those we study are ongoing and incomplete. We, as researchers, simply allow our own lives to unfold alongside theirs for the duration of our studies (Clandinin & Connelly, 2000). Regardless of the specific inspiration, it was through these intersections between my teaching, research, and educational experiences that this study was nurtured and developed.
In this introduction, I begin my narrative inquiry with an inquiry into my own narrative—a means of providing insight into the various facets of this study. Upon establishing these underpinnings, the details of the research background and context will be discussed followed by a section which outlines the problem statement and research questions. Finally, the rationale and significance of this study is addressed as well as a section outlining key terms related to this study.

**My Narrative: Discovering the In-Between**

This study emerged from the fortuitous unfolding of seemingly disparate elements in my own lived experience. In fall of 2012, I co-taught a Transdisciplinary Design Studio which enrolled both graduate and undergraduate students from the majors of art education, engineering, and landscape architecture. The opportunity to teach this course emerged from my involvement as a research assistant on a project funded by the National Science Foundation which sought to explore synergistic learning in the design studio. While I found this concept intriguing, I desired to integrate facets of my own interest (visual journals, creativity, and identity) into a narrative inquiry study on student lived experience in this transdisciplinary space. The research team was open to allowing me to nestle my own dissertation research within this context, cultivating a space for the disparate elements to unite in a harmonious whole.

The story of these elements begins with the visual journal. I was introduced to the visual journal during my first semester of graduate school as both a teaching assistant who required their use in my curriculum, and a student who used a visual journal to facilitate my own learning. In this study, visual journals are understood as a hybrid of the artist/designer’s sketchbook and the writer’s journal. They are a tool through which learners document, reflect, and create; using and exploring various modes of expression (Grauer, 1999) in a space where process is valued.
over product (La Jevic & Springgay, 2008). From a pedagogical perspective, visual journaling permits students the opportunity to engage in meaning making which moves beyond the verbal and into the visual, exploring multiple modalities of expression even simultaneously (Grauer, 1999; La Jevic & Springgay, 2008). As one who used visual journals and one who assessed their use by others, I saw these books as a physical space where the creative process and the processes of learning and becoming were documented. The potential of the visual journal as a research tool prompted me to consider how visual and verbal forms of representation might be explored to understand narratives of student lived experience.

The second element abounds from creativity, or more specifically, creativity as a process which transcends disciplinary boundaries. This interest in creativity stemmed from my experiences as a high school art teacher where I watched students with various interests and academic strengths struggle with their perceptions of creativity while many students’ were reluctant to even consider themselves creative beings. Presenting a novel approach to creativity, Robert and Michèle Root-Bernstein (1999) proposed creativity as transdisciplinary. These authors stated, “it is obvious that education based solely on separate disciplines and public languages leaves out huge chunks of the creative process” (p. 13). The Root-Bernsteins’ text, *Sparks of Genius: The Thirteen Thinking Tools of the World’s Most Creative People*, was a required textbook in the Transdisciplinary Design Studio in which creativity was integrated as an explicit component of the curriculum. In this way, inter- and transdisciplinarity was thought to promote “creativity and innovation by permitting scholars to step outside their disciplinary boundaries” (Holley, 2009b, p. 12). Therefore the design studio emerged as a unique context through which perceptions of creativity might be explored. Through a transdisciplinary curricular
approach, I envisioned this space as fostering an understanding of students’ perceptions of creativity and the creative process as it both informs and cuts across disciplinary identities.

The summer leading into my second year of graduate school found me in a research course on narrative analysis where the third element emerged. As I read about narrative research, I pondered the pervasiveness of stories in our lives as they are the interwoven fabric of our lived experiences. I found myself thinking about my teaching practice, five years spent in a high school visual arts classroom. Some of my favorite times were those that fell a few days after a new project was introduced, when the persistent sea of hands flying into the air calmed and there arose a quiet and productive hum in the classroom. The students concentrated on the task at hand and, for a moment, I had a respite through which I could walk around the classroom and dialogue with the students. They told me their stories—ones that would make me laugh out loud, ones that inquired deep into personal challenges or successes, and ones that would induce deep sadness. Their stories were all compelling as they revealed parts of these students’ lived experiences that allowed me deeper insight into who these students were and who they were becoming—their emerging and ever-changing identities. It was through the power of the narrative that I came to better understand my students, and it was through this narrative analysis course that I decided that I wanted to explore stories of student experience in my research.

While the previous discussion may appear disjointed, these are my narratives which do not lend themselves to a linear or formulaic discussion. As researchers, we often strive to piece our studies together so tightly that the seams are imperceptible—for seams are perceived as irrelevant, undesirable, or unaesthetic. As one who relishes in process, I believe that the seams within our lives are where the aesthetics reside. One of the students in the Transdisciplinary Design Studio, Marissa, reflected on her experiences in the course through words that resonated
with me: “from meeting new people from art education, landscape architecture, graduate school and undergrad like me, to the books we read and design challenges we created and all the lovely in-between…” (Final Reflective Paper, lines 115-117). *All the lovely in-between.* I was struck by this phrase as it reverberated subtly but persistently throughout the data analysis process. The seams of our lives are like the in-between in that we can either choose not to view them or to pause and admire the lovely that resides there. These seams are part of our experiences, and our experiences are the stories of our processes in being and becoming. They are messy, ever-evolving, and represent both our trials and tribulations as we come to create ourselves. Rather than disregard the seams which represent our in-betweenness, this study posits that the in-between is where the vibrancy of human experience can be found. Like the created image from AshLeigh’s visual journal below (Figure 1), the in-between resembles the places where the colors from the bleeding tissue paper overlap and suffuse (left). The unexpected and largely unpredicted ways in which the colors combined are some of my favorite aspects of this image. Even the way the colors bled onto the page underneath (right) is worthy of exploration as these serendipitous outcomes of the creative process mirror our processes of becoming.
Figure 1. Images from AshLeigh's visual journal

Through reflecting on Marissa’s words, my mind often wandered to Maxine Greene’s (1995) book, *Releasing the Imagination*. Greene discussed learning as not relegated to students, but a journey undertaken by both teacher and student where multiple perspectives of the world cultivate meaning making as a process:

> Made aware of ourselves as questioners, as meaning makers, as persons engaged in constructing and reconstructing realities with those around us, we may communicate to students the notion that reality is multiple perspectives and that the construction of it is never complete, that there is always more. (p. 131)

It is this ongoing inquiry and (re)construction of realities which seeped into both my lens as a practitioner-researcher and narrative researcher. Drawing inspiration from Greene whose work served as the theoretical framework of this study as well as Marissa’s poignant words, the in-
between is how I frame the students’ narratives of lived experiences. Though each story of the
in-between is as unique as the students who told them, it is through their seams that we can better
understand how the Transdisciplinary Design Studio nurtured a space where students could
reflect and begin to understand themselves as in-process beings. Beings in the process of
learning, (co)constructing, (re)constructing, and developing a wide-awareness to their
perspectives of what it means to be creative and a professional within (and beyond) a discipline.
In this way, beings in process are endlessly in pursuit of becoming. The in-between, then, is not a
transitional space like that of liminality (Turner, 1974), but is a place of permanence which can
be nurtured through courses like the design studio—unfamiliar, transdisciplinary, and nebulous
spaces. If learners can begin to understand themselves in this space, they can see that the
construction of knowledge is never complete, as there is always more.

**Background and Context**

Interdisciplinarity seeks to explore and integrate knowledge across communities that
were once isolated (Holley, 2009b) in order to create and advance knowledge (Boix Mansilla &
Duraising, 2007). While higher education has traditionally embraced a more structured
discipline-specific approach to teaching, learning, and research (Holley, 2009b),
interdisciplinarity brings forth opportunities for learners to develop boundary-crossing skills
which include synthesizing, perceiving multiple perspectives, and tolerance for complexity
(Spelt, Biemans, Tobi, Luning, & Mulder, 2009). Researchers and practitioners have touted the
potential benefits of interdisciplinary education over the past few decades, positing that
interdisciplinarity promotes learning (Lattuca, Voigt, & Fath, 2004), creative problem solving
(Boradker, 2010; Kowal, 2010), and better prepares students for the type of problems found in
the professional world (Newell, 2007; Spelt et al., 2009); however, evidence supporting these notions is limited (Lattuca et al., 2004).

Along with interest in interdisciplinary learning, there has been a strong push for STEM (science, technology, engineering, mathematics) education in the United States amidst concerns that the nation is failing students in these disciplines (National Science Board, 2007). Additionally, STEM advocates connect these fields with economic prosperity and are searching for ways to create a more proficient and diverse STEM workforce (stemedcoalition.org). Taking this concept in a different direction, the Rhode Island School of Design (RISD) has been instrumental in championing a STEM to STEAM initiative which seeks to place the arts and design at the center of STEM with the overarching goal of promoting innovation by encouraging art and design integration in K-20 education (stemtosteam.org).

Interest in the possibilities of the arts and creativity through STEAM initiatives reflects current dialogue in education as a simple internet search speaks to the emergence of K-12 institutions exclusively devoted to advancing the cause (i.e. www.drewcharterschool.org; www.hilburnacademy.net; www.moundsviewschools.org). United States Secretary of Education, Arne Duncan (2011) also addressed the importance of arts education as a vehicle through which creativity and innovation might be fostered, citing the reality of the contemporary work place where “creative experiences are part of the daily work life of engineers, business managers, and hundreds of other professionals” (p. 1). Although some caution that STEAM should be more than simply a means of integrating creativity for economic growth (Sochacka, Guyotte, Walther, Kellam, & Costantino, 2013), the possibility emerges in these spaces for thoughtful collaboration and a purposeful intertwining among disciplines (Boix Mansilla, Miller, & Gardner, 2000).
When STEAM is approached thoughtfully and purposefully, it brings forth the notion of transdisciplinarity (Guyotte, Sochacka, Costantino, Walther, & Kellam, in press). Transdisciplinarity is a type of interdisciplinarity which seeks to synthesize learning across disciplines (Lattuca, 2001) through an integration rather than incorporation of knowledge (Beane, 1995). Through transdisciplinary approaches to education, learners collectively engage in meaning making which transcends disciplinary boundaries and apply concepts in multiple disciplinary fields (Lattuca, 2001). In this view, STEAM is grounded in collaboration where individuals come to understand that learning requires an acknowledgment of multiple perspectives of the world (Greene, 1995).

Through these conceptions of collaborative transdisciplinarity, Greene’s notions of aesthetic education might take root. While this will be discussed further in Chapter 2, Greene (1995) underscores the importance of individuals moving beyond the traditional narrow perceptions of education and into spaces which foster reflection, transformation, interrogation, and critique. It is through a nurturing of these qualities that learners are challenged to begin to conceive of learning as a process, where Greene (2000) explained: “education signifies an initiation into new ways of seeing, hearing, feeling, moving. It signifies the nurture of a special kind of reflectiveness and expressiveness, a reaching out for meanings, a learning to learn” (p. 7). It is through wide-awareness (a profound awareness of the “other” and the self), that learners come understand how they are situated in the world and envision possibilities for their becoming. Greene’s writings on aesthetic education are compelling as they informed the pedagogy of the design studio, the narrative inquiry methodology, as well as the construct of the in-between in this study.
Research Context

This study was nestled amidst a larger research project funded by the National Science Foundation (NSF) which focused on an interdisciplinary course as the research context. The NSF project was conceptualized through a collaboration between faculty from the College of Engineering and the School of Art and served as a second iteration of a similar NSF-funded project (see Costantino, Kellam, Cramond, & Crowder, 2010; Kellam, Costantino, & Cramond, 2009; Kellam, Walther, Costantino, & Cramond, 2013). These two projects resulted in the creation of interdisciplinary STEAM-inspired studio courses at a southeastern research university as the sites for inquiry. Both studios were co-taught by interdisciplinary faculty and enrolled students from art and engineering while the second studio, the Transdisciplinary Design Studio, also enrolled students from landscape architecture. The studio curriculums engaged the students in investigations of open-ended and ill-structured problems (Jonassen, Strobel, & Beng, 2006) surrounding sustainability. This focus on sustainability emerged from both the engineering faculty teaching courses in the environmental engineering program of study and the fact that many of the enrolled students derived from this program. Alongside the sustainability focus, the researchers sought to develop creativity-focused curriculums through which students could engage in these issues through visual arts exhibitions. In both studios, there was an attentiveness to placing the disciplines on equal ground through a reciprocity of beneficial learning experiences.

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Grounded in current dialogue surrounding both interdisciplinarity and STEAM education in K-20 and beyond, the curriculum of these design courses emphasized both collaboration and creativity which are prevalent notions in current engineering and art education discourse. For example, the National Academy of Engineering (2004) pointed to the importance of creativity through their envisioning of the future engineer:

Creativity (invention, innovation, thinking outside the box, art) is an indispensable quality for engineering, and given the growing scope of the challenges ahead and the complexity and diversity of the technologies of the 21st century, creativity will grow in importance. (p. 55)

Additionally, the engineering accrediting board known as ABET (2013), specified that engineering students must know how to work in multidisciplinary teams. Concurrently, in art education creativity is perceived as an essential aspect of the curriculum through which multiple creative processes exist (Zimmerman, 2010). Milbrandt and Milbrandt (2011) also cited the importance of art educators dialoguing openly about creativity, the ways in which it is nurtured in the art classroom, and the cross-disciplinary connections that might be fostered.

I joined the second NSF project during August of 2011 as a research assistant and was asked to co-teach the Transdisciplinary Design Studio with a faculty member from the College of Engineering. We were afforded the opportunity to deviate from the initial studio curriculum in our construction of the course while keeping the basic premise which was integral to the NSF research project. We created two “design challenges” in which the students were placed into interdisciplinary groups of either three or four students with attempts to mix the undergraduate and graduate students. The “Introductory Design Challenge” focused on the issues of local municipal waste reduction while the “Final Design Challenge” asked students to explore the
concept of a water ethic (see Appendices A and B for the project handouts). While the project specifics are not essential to this study, the collaborative, exploratory, and open-ended nature of these assignments was a pivotal facet of the students’ discussions of the design studio as an in-between space.

Returning to the topic of creativity, the students were encouraged to immerse themselves in the early stages of the creative process through an explicit focus on creativity and the framing of ill-structured problems. As consistent with the previous iteration of the studio, we used the Root-Bernsteins’ (1999) book as a required text in the class and also as a framework for the curriculum. Throughout the semester, the students engaged with the 13 thinking tools proposed by these authors through readings and class activities which were led by either the instructors or graduate students enrolled in the design studio. Another similarity from the previous course was the required use of visual journals by the students. Upon joining the research team, I had carefully examined the students’ visual journals from the previous studio and was drawn to the content contained in the pages. Stories surrounding creativity and disciplinary identity emerged consistently, and I became enamored with the visual-verbal content contained in these journals which led to their inclusion as data in this study.

**Research Practicalities**

Thus far, I have described my research narrative as well as the background and context of this study which are pivotal components in the construction of my research problem. I envision these pieces as comprising the metaphorical underpainting foundational to my research. They are the first layer, the preliminary tones and shapes that merely indicate the emerging and evolving composition. The artist’s underpainting is essential to color development and composition of the overall work of art but will eventually be layered upon, adapted, and refined much like the
research process. In this section, I will expand upon this underpainting and discuss the details of the research purpose and questions.

**Problem statement**

A growing interest in inter- and transdisciplinarity, including STEAM education, brings forth questions about the educational experiences of students in such realms (Lattuca, Voigt, & Fath, 2004). For the researcher, questions emerged surrounding how students narrate their journeys as they navigate through these spaces—as they step away from their disciplinary ‘homes’ moving “from the habitual and the ordinary” (Greene, 1995, p. 24) to a place of process, inquiry, and search. Furthermore, the inherently social nature of such collaborative spaces prompted an exploration of disciplinary and creative identity and how identity is understood and (co)constructed through interactions with the ‘other’ (Greene, 1995). As the arts embrace meaning making through visual imagery as well as verbal communication, the final aspect of this research problem arose through the consideration of how multiple modes of expression (i.e. visual journals and focus group discussions) can contribute to a holistic understanding of student experiences in the Transdisciplinary Design Studio.

**Statement of Purpose and Research Questions**

The purpose of this study was to explore undergraduate and graduate students’ lived experiences in the Transdisciplinary Design Studio. Assuming a constructivist lens, this study was situated within three methodologies: instrumental case study (Stake, 2005), practitioner research (Cochran-Smith & Lytle, 2009), and narrative inquiry (Clandinin, 2013; Clandinin & Connelly, 2000). Through these methodologies, the following research questions were addressed:

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2 A more comprehensive discussion of the term (co)construction as written is found in chapter 3.
1) How did students discuss their conceptions of, and relationships between, disciplinary identity, creativity, and the creative process as they resided in-between?

2) How did students tell stories of their experiences in the Transdisciplinary Design Studio through verbal and visual modalities?

**Research Approach**

This study was approved by the institution’s Institutional Review Board and studied eleven students enrolled in the Transdisciplinary Design Studio. The student population consisted of both undergraduate and graduate students from three disciplines: art education, engineering (civil and environmental), and landscape architecture. Case study, practitioner-research, and narrative inquiry were all employed as methodologies while the qualitative paradigm was grounded in constructivism.

There were three primary sources of data (primarily referred to as field texts[^3] in this study) which resulted in data triangulation in this study. The first source was student visual journals which were collected via electronic scanned submissions during the course while the final check also required the submission of the actual book. Once the journals were examined, students were given the opportunity to pick-up these journals as they were also personal documents of learning as well as the creative process; which left the digital files for further reference. The second field text consisted of transcriptions of focus groups which were led by the faculty members of the research team and were recorded on digital recording devices. Students participated in two focus groups in the design studio on designated days during regular class meetings. Additionally, they were divided into three small groups with attempts to divide disciplines, levels, and project teams and were provided with prompts to facilitate reflection and

[^3]: I am aligning my perception with Clandinin and Connelly (2000) who use the term field texts rather than data to signify the perspective that “they are created, neither found nor discovered, by participants and researchers in order to represent aspects of field experience” (p. 92).
discussion. Upon the conclusion of the semester, the audio was professionally transcribed and stored in a secure electronic file only accessible by members of the research team. Finally, the third field text was the students’ final reflective papers. Undergraduate students completed a five-page reflection on their experiences in the course while graduate students wrote a fifteen-page synthesis paper which connected an idea from the course to their emerging research projects. These texts were organized into an Excel spreadsheet and participants were given pseudonyms.

Through the visual and verbal field texts, the selected analytic method was a visual-verbal narrative analysis. This method engaged the researcher in a systematic reading of the various texts attending to both the visual and the verbal content through Clandinin and Connelly’s (2000) three dimensions of narrative (temporality, sociality, and space) while also considering Labov’s (1982) narrative structure (abstract, orientation, complicating action, evaluation, resolution, and coda). (Co)constructed narratives which immersed the participants in the analytic process comprise part of the findings while meta-narratives were also explored. Trustworthiness was addressed through multiple techniques including: memo writing, member checking, peer debriefing, thick description, reflexivity, and maintaining closeness to the field texts throughout the analytic process.

**Rationale and Significance**

This study’s rationale derives from my interest in the Transdisciplinary Design Studio as a space which cultivated an in-process, or in-between, space through which disciplinary and creative identity were understood and (co)constructed alongside each other. The stories of lived experience through this unique educational space provide insight into several realms. For example, the transdisciplinary and STEAM context of this course represents burgeoning
concepts in the American educational system. Studies which seek to understand STEAM at all levels (K-20 and beyond) contribute a practical lens to the highly theorized notion of STEM + Arts initiatives while the visual-verbal narrative focus of this study offers holistic student experiences that can affect theory and implementation of future STEAM courses. Further, as Lattuca, Voigt, and Fath (2004) indicated, there are many questions surrounding the educational outcomes of interdisciplinarity (and transdisciplinarity). Through a more nuanced understanding of courses like the Transdisciplinary Design Studio and student experiences in such contexts, instructors can more effectively address the inherent challenges and cultivate meaningful spaces for students as they engage in the process of learning and becoming.

The methodological significance of this study attends to data as multimodal, encompassing both visual and verbal realms of communication. Addressing narratives as multilayered and multivoiced brings forth a more holistic means of engaging in narrative research. The various modes of communication through which individuals make sense of their lived experiences add dimensions to the student narratives which have not been widely implemented in this methodological approach.

**Definitions of Key Terms Used in this Study**

*Creative Process:* Dudek and Coté (1994) explained: “the entire creative process, from start to finish, is characterized by an urgent and relentless search” (p. 147). In this study, the conception of the creative process encompasses the earliest ‘sparks’ of generative thought, the extending and refining of ideas, and, although not always necessary, the final creative product.

*Identity:* The notion of identity is grounded in the methodological and theoretical foundations which comprise this study, narrative inquiry as presented by Clandinin (2013) and Clandinin and Connelly (2000) and aesthetic education as theorized by Greene (1995; 2000). In
this way, identity is both socially constructed and in a constant state of flux as new understandings and experiences unfold. As Greene (1995) asserted, “Postmodern thinking does not conceive the human subject as either predetermined or finally defined. It thinks of persons in process, in pursuit of themselves and, it is to be hoped, of possibilities for themselves” (p. 41).

Gee’s (2000) conception of identity through the lens of educational research also serves as a means of situating this term. Presented as contextualized, identity is put forth as encompassing four interrelated perspectives: nature, institution, discourse, and affinity. Discussed more fully in Chapter 2, these identities result from outside factors much like the socially constructed perceptions of Clandinin, Connelly, and Greene.

In-Between: The initial inspiration of the in-between originated from Marissa, an undergraduate engineering student, whose final reflective paper revealed the phrase “all the lovely in-between.” This concept reflects numerous facets of the Transdisciplinary Design Studio and the methodology; however, the in-between is primarily a construct used to understand the way the students (co)construct their narratives of the studio as an in-process and relational space. I have elected to maintain the hyphenated spelling of the term as Marissa originally wrote it throughout this paper as it visually symbolizes a between and connective space within the words.

Transdisciplinarity: “Transdisciplinarity is the application of theories, concepts, or methods across disciplines with the intent of developing an overarching synthesis” (Lattuca, 2001, p. 83). It is a type of interdisciplinarity which connects and transcends disciplines (Lattuca, Voigt, & Fath, 2004).

Visual journal: Considered a hybrid of the artist/ designer’s sketchbook and the writer’s journal, visual journals are educational tools through which learners create representations of
their learning and document their creative processes using various modes of expression (Grauer, 1999).

Wide-Awakeness: According to Greene (1995), wide-awareness is a state of heightened consciousness or an “awareness of what it means to be in the world” (p. 35). Wide-awareness requires an active, exploring, and constructing mind through which learning/ being takes place as well as a profound understanding of the self and the other.
CHAPTER 2

Introduction

This study sought to explore student experiences in a Transdisciplinary Design Studio with a specific focus on two research questions: 1) *How did students discuss their conceptions of, and relationships between, disciplinary identity, creativity, and the creative process as they resided in-between?* 2) *How did students tell stories of their experiences in the Transdisciplinary Design Studio through verbal and visual modalities?* This chapter will ground the study in literature related to three foundational premises. The first section brings forth Maxine Greene’s writings on aesthetic education as forming the theoretical framework which permeates throughout this study—from the pedagogical to the methodological. Next, the curricular framework is discussed. As this study is characterized as practitioner-research, insight into this facet is integral to the relationship between theory and both teaching and research practice. Finally, the remainder of the chapter focuses on grounding the particulars of the study in relevant literature surrounding the topics of visual journaling, interdisciplinarity, creativity, and identity.

Theoretical Framework

The pedagogy for contemporary aesthetic education as presented by Greene (1995; 2001) embraces ideals like imagination, possibilities, and wide-awareness. Imagination is a critical component within Greene’s theory of curriculum as it provides students with an alternative way of perceiving the world and also awakens them to previously unforeseen possibilities. As indicated by the title of her 1995 book, teachers are charged with the often arduous task of *Releasing the Imagination* of their students by developing a meaningful and engaging aesthetics-
based curriculum. Through the release of imagination, Greene believed that students learn skills that enable them to be more empathetic, literate, and critical citizens in an increasingly globalized society. In addition, the arts are presented as indispensable agents that loosen the ties of imagination and incite its release. While Greene spoke primarily of aesthetic education, her conceptions are relevant to educators across disciplines who wish to engage students in learning (and being) as an active, social, reflective, and ongoing process. This approach to learning was integral to the pedagogy of the Transdisciplinary Design Studio curriculum; however, Greene’s ideas also seeped into other aspects of the study including the methods, selected field texts, and the overall research paradigm.

In this section, I will explore writings by Greene and bring forth the intersections with aspects of this study which act as the rebar in the theoretical foundation, providing stability and strength. My focus lies within the spaces where her ideas meet the major facets of my research including, but not limited to, learning, interdisciplinarity, and creativity. Much like the integrated approach to curriculum in the Transdisciplinary Design Studio, these aspects cannot be easily separated through distinct borders but instead blur, amalgamate, and infuse with one another. The ensuing discussion begins with a broad discussion of Greene’s conception of aesthetic education which narrows to specific implications for these ideas as related to the study, specifically the notion of the in-between. Next, the conversation turns to the topic of interdisciplinarity as Greene advocated for a more holistic approach to education. Finally, the theoretical framework discussion concludes with a brief exploration of the creative process as it relates to creative identity and back to Greene’s focus on learning as process.
Learning as Inquiry, Inquiry as Process: Situating the In-Between

Greene believed that aesthetic education is a realm where experiences with art can be nurtured and used to engage students more fully in the process of learning and meaning-making. On the topic of aesthetic education, Greene (2001) wrote:

We are interested in openings, in unexplored possibilities, not in the predictable or the quantifiable, not in what is thought of as social control. For us, education signifies an initiation into new ways of seeing, hearing, feeling, moving. It signifies the nurture of a special kind of reflectiveness and expressiveness, a reaching out for meanings, a learning to learn. (p. 7)

Within this conception of aesthetic education, Greene proposed that educators must cultivate an active and informed attentiveness towards various forms of art. She also clarified that aesthetic education is not merely an exposure to art nor is it synonymous with art appreciation. In fact, a sharp distinction between art appreciation and aesthetic education is conveyed by Greene as she felt that the former has traditionally asked their students “to keep quiet, to take notes, and to admire” (p. 56). Although she acknowledged some value in this type of art exposure, she expressed a missing qualitative and experiential aspect which is vital to aesthetic education.

The goal of aesthetic education is articulated by Greene as cultivating an active awareness and critical responsiveness within one’s students. Greene (2001) also employed words like “imagining, thinking, feeling, perceiving, and active beings” (p. 56) to characterize her perspective on education. Within pedagogy that emphasizes reflection, Greene pointed to the importance of thinking as an active and intentional process. She challenged the passive quality associated with thinking that might be equated with a quiet absorption of knowledge. This
passivity is antithetical to the active, engaging, critical thinking that she promoted as vital to empowering students. In addressing this idea, Greene (1995) asserted:

All depends upon a breaking free, a leap, and then a question. I would like to claim that this is how learning happens and that the educative task is to create situations in which the young are moved to begin to ask, in all the tones of voice there are, “Why?” (p. 6)

Questioning is central to critical thinking, but more often students are taught to memorize and recite rather than ask the inquisitive “why?” This inquiry opens students to the previously unknown and, for Greene, leads to an attentiveness—or wide-awakeness—in which possibilities are discovered and explored. In terms of identity, asking “why?” encourages students to think about their own perceptions and preconceptions about the world which can lead to a more developed understanding of the self and the other. It is in this place of “why?” that I find intersections with the concept of the in-between as well as a methodological connection with the reflective quality encompassed in the field texts used in this study.

One of Greene’s most prominent concepts is that of wide-awakeness. In *Releasing the Imagination*, Greene (1995) presented wide-awakeness as an “awareness of what it means to be in the world” (p. 35) and incited both teachers and learners to embrace this state of heightened consciousness. Greene (1995) explained that teachers must cultivate this quality in students as it not only brings forth an awareness of self, but a consciousness of the other:

That is why we teachers must so emphasize the importance of persons becoming conscious of their own consciousness. People must become aware of the ways they construct their realities as they live together—how they grasp the appearances of things, how and when they interrogate their lived worlds, how they acknowledge the multiple perspectives that exist for making sense of the commonsense world. (p. 65)
As evident in this statement, wide-awakeness is nurtured through an active engagement with the world as a social space where meaning is (co)constructed as we engage with the other. It is the inherently social quality of the lived world that relates to the constructivist paradigm and narrative methodology of this study.

Through developing wide-awakeness, learners begin to perceive of the world as a vibrant and lively space where being requires critical inquiry. Greene (1995) positioned herself along these lines and articulated: “My argument is simply that treating the world as predefined and given, as simply there, is quite separate and different from applying an initiating, constructing mind or consciousness to the world” (p. 23). This statement highlights an important aspect of Greene’s view of education in that it is largely constructed by individuals through their experiences in the world. Like Dewey (1938/ 1997), Greene maintained that interactions with our surroundings and the other are vital to the meanings we create. She articulated that students “need to be empowered to reflect on and talk about what happened in its varying connections with other events in the present as well as the past” (1988, p. 127). It is through this reflection and dialogue that individuals inquire into their lived experiences as they make sense of their world. In the design studio, opportunities such as the focus groups provided students with a space through which dialogue with others occurred while the visual journal fostered an internal dialogue with the self—both of which inspire active and critical reflection on lived experiences. In keeping with Greene’s constructivist and experiential perspective, the various field texts provided students with a space where experiences invited questions, and these questions could be explored.
Greene often spoke of imagination invoking the possible, and it is through an awareness of the possible that the mind is free to wander, to question. In addressing these moments of possibility through encounters with art, Greene (2004) stressed:

It remains important to remind learners, however, as well as ourselves that this cannot touch our own experience unless we are sensitive to the need to open, to move to unexplored spaces. There are always new patterns to be made, new connections to be found as the search for meaning proceeds. (p. 23)

As students navigate through their educational experiences, Greene believed that they must be awakened to possibilities which lie in the unexplored and teachers are charged with the task of moving students into these spaces where they “consciously undertake a search” (p. 24). It is through this process of searching that individuals move into the unexplored spaces, like the in-between, and are awakened to the relentless nature of the search.

Through the quest for knowledge, Greene asserted that our learning is never concluded. It is not the period at the end of a sentence but rather an ellipsis which denotes a continuation, an incessant search, a “to be continued….” Along these lines, the in-betweenness of the Transdisciplinary Design Studio visually resembled the linear meanderings of a Brice Marden painting (see Figure 2). There is no clear starting or stopping point but there is a definite path that takes us into the unknown. At times, multiple layers of these paths indicate the past, where we have been on our journey into meaning making. Sparks of illumination coupled with moments of clouded struggle are but snapshots captured in walking the Marden-esque landscape. In considering this, one cannot help but realize the complex space that is the in-between. Through embracing learning and being as an in-between space, the notion of “to be continued…” becomes more than learning as inquiry; it nurtures inquiry as experience. As Greene (2001)
proclaimed, “there is always more to be found, horizons to be breached, limits to be broken through, always untapped possibility” (p. 206).

Greene’s conception of aesthetic education posits that learning is not merely something that can be attained; rather it represents an ongoing process embedded in evolving lived experiences. Through this process of learning, wide-awakeness is necessary through an active engagement with the world as a physical and social space. These notions permeate into my study on multiple levels including my role as a practitioner-researcher, the unifying construct of the in-

Figure 2. Marden’s (1991) Cold Mountain Series, Zen Study 5

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between, the methodological underpinnings of narrative inquiry, and the field texts which sought to embrace Greene’s focus on process and reflection.

**Interdisciplinarity and Becoming “Multi-Lingual”**

Interdisciplinarity is an important aspect of this study both in terms of context and as it relates to the multimodal quality of visual journals. As this research is situated within a design studio comprised of students from art education, engineering, and landscape architecture, a concentrated focus on interdisciplinarity is essential. Cultivating synthesis among these three disciplines is vital to establishing an effective and meaningful course that holds relevance for all groups of students. In this section, I will be referring to interdisciplinarity as the umbrella term which encompasses transdisciplinarity. Later in the chapter, I will more fully discuss the nature of transdisciplinarity, but for this discussion the terms are used interchangeably.

As students engage deeply and purposefully in their respective disciplines, they become fluent in the language of those disciplines. While it is often not explicitly addressed, there are many instances where aspects of interdisciplinarity are discussed by Greene. An avid reader and teacher of literature, Greene promoted literacy as a vital aspect of education. It is within the topic of literacy that the concept of interdisciplinarity emerges as a means of empowering students to find their voices, to think critically, and to express themselves. As implemented in the design studio, visual journals comprise a space where students could communicate within a mode that was comfortable while, simultaneously, experiencing the freedom to explore new languages. This section begins with a discussion of “language” as discussed by Greene and the implications for this conception in the design studio as it related to the process of visual journaling.

Becoming literate in multiple languages allows students the opportunity to travel across boundaries that were previously confining and silencing. As Greene (1995) explained,
It becomes all the more important that they tap the full range of human intelligence and that as part of our pedagogy, we enable them to have a number of languages to hand and not verbal or mathematical languages alone. […] Mastery of a range of languages is necessary if communication is to take place beyond small enclosures within the culture; without multiple languages, it is extremely difficult to chart the lived landscape, thematizing experience over time. (p. 57)

Establishing a “multi-lingual” approach to education builds a natural connection to the interdisciplinary curriculum. In The Dialectic of Freedom, Greene (1988) specified that these languages “include many of the traditional modes of sense-making: the academic disciplines, the fields of study” (p. 127). Greene argued that teachers should focus on allowing students to become fluent in the languages and texts that are often specific to disciplines like science and art. This fluency acts as a type of passport which permits easy travel across the borders that interdisciplinary curricula attempt to break down. Having a variety of languages at their disposal is valuable for students in interdisciplinarity both inside the classroom and as they move into the professional world.

As students become literate in multiple languages, they will likely exercise their newfound freedom to explore previously unknown spaces. Unfamiliar vistas will emerge and evoke the concepts of possibility and imagination for which Greene so fiercely advocated. Students will absorb the native tongue of new worlds and may yearn for creative means of expression to share their novel discoveries. It is within this community of literate learners that Greene promoted writing as a venue for students to reflect, share, and even struggle. Greene (1995) affirmed, “It is by writing that I often manage to name alternatives and to open myself to possibilities. This is what I think learning ought to be” (p. 107). The conception of learning as
awakening possibilities is a constant thread throughout Greene’s theory and is often supported through student writing and reflection. As an essential part of the design studio curriculum, reflection nurtured a space where students could inquire into their own learning, processes, and being. Additionally, from a researcher perspective, this notion of reflexivity was embraced as essential to a rigorous analytic process.

In returning to the fact that Greene upheld a pedagogy in which aesthetics is central, it is no surprise that the arts comprise a starring role. Aside from written reflection, artistic expression is another mode through which students explore the language of their learning which holds relevance for the visual aspects of this study. Greene often spoke of interactions with art forms as eliciting meaningful responses and evoking critical thinking, but it is important to remember that these artworks are, first and foremost, works of expression. They were created by artists to communicate about their understanding of the complex world. Greene believed that the arts provide an alternative to more traditional means of expression, such as writing and speech, through which individuals can utilize movement, color, rhythm, or emotion to convey a novel idea. In this way, visual expression serves as another language through which students can make sense of their world as they engage with content and think through materials (Hetland et al., 2007).

According to Greene, being “multi-lingual” encompasses visual language as well as written and spoken words through which individuals might represent their thoughts and ideas. In this study, the multi-modal quality of the visual journal permitted students from the different disciplines to not only express their ideas through the languages in which they were fluent, but to explore new modes of communication and widen their fluencies to encompass new languages.
Through visual journaling, students were encouraged to explore and express themselves through various languages and to flex their multi-linguistic prowess.

The languages of which Greene spoke not only intersected the pedagogical underpinnings of the visual journal, but the visual-verbal narrative approach used in this study. Although it will be discussed in detail in the following chapter, this analytic approach embraces and holds narrative sacred as multivoiced and multilayered (Johnson, 2004). Attending to visual and verbal modes of communication provides the participants, the researchers, and the reader the opportunity to engage in meaning making as a multi-lingual process.

**Creativity and Being In-Process**

In the previous sections, it should be evident that Greene emphasized education as an enduring process. In fact, Greene (2001) defined aesthetic education as “a process of enabling persons to become different, to enter the multiple provinces of meaning that create perspectives on the [art] works” (p. 5). In examining education as a process, ideas brought forth in the previous sections begin to re-emerge. Wide awakeness, releasing the imagination, searching, asking “why?”, envisioning possibilities, and the push for active beings in the classroom are all references to the process of education. In this section, I will unpack this idea and focus on the process of creation as it relates to the concept of creative identity in this study.

Postmodernism is presented by Greene as one foundation for her process-focused conception of education. Greene (1995) asserted, “Postmodern thinking does not conceive the human subject as either predetermined or finally defined. It thinks of persons in process, in pursuit of themselves and, it is to be hoped, of possibilities for themselves” (p. 41). This perception of humankind is ingrained within Greene’s curriculum as she placed emphasis on questioning, reflection, and the process of learning. The possibilities that Greene discussed so
often in her theory of education can be realized but are then replaced with new possibilities, a cycle which continues incessantly. Greene is careful not to present learning as a static structure which is passed like a torch from teacher to student but as something fluid and ever-changing. It looks and means something different to each learner as we all come to know through different processes.

One way through which individuals come to learn and understand the world is through engagement in the creative process. Greene (2001) asserted, “Creation does not imply a making something out of nothing. It has to do with reshaping, renewing the materials at hand, very often the materials of our own lives, our experiences, our memories” (p. 96). In this way, our experiences are the stone from which we carve, the canvas on which we paint, the paper on which we write, and the music with which we dance—they are the substance of our creativity.

Greene (2001) proposed that creativity and the process of creating is not relegated to the artistic elite and asserted: “…I would affirm the value of making, shaping, expressing—of releasing as many persons as we can into the adventure and discipline of working with the materials of paint, sound, language, body movement, clay, voice, film” (p. 202). This assertion alludes to the act of creation as a release through which individuals express themselves through a multiplicity of languages or modalities. Creation as eliciting freedom emerges in Greene’s thoughts as she explained: “To think of the creative spirit is to think of moving beyond into spaces where we can live now and then in total freedom” (p. 201). The idea of moving beyond one’s perception of reality into spaces where the imagination can be released is a pivotal step in the creative process. In this study, the act of visual journaling serves as one space where learners experienced the freedom to explore as referenced by Greene. Exploration with and through different media might cultivate a sense of wonder within the learner where one’s perceptions are
challenged “and suddenly the world seems new, with possibilities still to be explored” (p. 116).

This view of both learning and the act of creation emphasizes process rather than product and is foundational to understanding the in-between.

For many individuals, the notion of creativity conjures images of artists who painstakingly engage in the making of products—works of art which grace the walls of homes, galleries, and museums. Greene (2001) provided a unique perspective of creativity as more than product through summarizing:

It is largely through some immediate involvement with ‘making’ (or, if you like, creating) that individuals who are not themselves artists can begin to get a sense of what is demanded by what might be called artistry. To understand on any level what excellence implies in this domain is to be acquainted with more than visible or audible products and achievements. It is to know something of the process, the craft. (p. 202)

In this view of creativity, Greene envisioned the creative process as not intimidating, overwhelming, or invoking fear. Rather, the creative process is much like the process of education where learners at all stages are en route. We may not know the destination but if we are wide awake to possibilities, there are sure to be many worthwhile stops along the way. Greene (2001) revealed, “Excellence, after all, refers to a quality of being to the ways in which people go about their lives, attend to their work; it is not simply a mark for a final product” (p. 202). It is this perspective that the Transdisciplinary Design Studio sought to promote—establishing a sense of solace in being in-process. Of being in-between.

**Summary**

In the introduction to this chapter, I mentioned the difficulties that arise in trying to neatly separate the many concepts that Greene (1995; 2001) brought forth in her discussions on
aesthetic education. There is no clear line of distinction like the one found in oil and vinegar, but a delicate dissipation which resembles food coloring slowly penetrating water. Greene’s ideas are holistically presented where each one permeates into another. In this section, I have attempted to briefly push apart the ideas of learning and inquiry, interdisciplinarity, and creativity and the creative process in order to demonstrate the intersections between Greene’s ideas and my own. It should be evident that even within this forced separation, these three ideas are highly interrelated. Like the food coloring amalgamation, these ideas infuse. If anything, I hope this provides validity to the complex lens this research assumed. Like Greene, I do not envision clear boundaries between the aspects of my research nor do I want to separate concepts that are so highly connected. In the complex in-between, I sought to explore what Greene so eloquently articulated as the process of learning as becoming.

**Curricular Framework**

Although Greene’s ideas are a major component within my foundation, the concept of creativity as presented by Robert Root-Bernstein and Michèle Root-Bernstein (1999) is another vital element which contributed specifically to the curriculum of the design studio. In *Sparks of Genius: The Thirteen Thinking Tools of the World’s Most Creative People*, the authors based their perception on in-depth studies of some of the world’s most creative individuals and argued that our fragmented and often discipline-specific view of creativity is unnecessarily limiting. Root-Bernstein and Root-Bernstein proposed thirteen thinking tools which function to “cultivate imagination along with intellect, to reintegrate knowledge of mind with knowledge of body, to reveal in glorious detail the ways in which artists, scientists, dancers, engineers, musicians, and inventors think and create…” (p. 29). As indicated in this quote, the thirteen tools break through
traditional disciplinary boundaries and embrace a more holistic view of creativity which holds implications for a variety of different fields, including STEAM education.

As Root-Bernstein and Root-Bernstein (1999) assumed a transdisciplinary approach to developing their theory of creativity, they emerged as a likely fit within the Transdisciplinary Design Studio curriculum. Root-Bernstein and Root-Bernstein situated themselves within a hybrid space between cognitive research and education to provide a unique perspective to the curriculum. The authors undertook a restructuring of creative capacities and conceptualized thirteen thinking tools which they asserted are “at the heart of creative understanding” (p. 25). Through studying highly creative individuals, they shifted their focus from the differences among these creative individuals and their creative processes to the underlying universalities.

Observing, imaging, abstracting, recognizing patterns, forming patterns, analogizing, body thinking, empathizing, dimensional thinking, modeling, playing, transforming, and synthesizing are put forth as the thinking tools that were commonly present among the creative thinkers the Root-Bernsteins (1999) studied. Within each chapter of *Sparks of Genius*, the authors presented individuals from various fields ranging from mathematicians, scientists, and engineers to visual artists, performers, and poets who demonstrate proclivities for these creative modes of thinking. Their basis for this perspective is that it more holistically examines creativity as universal processes rather than as a product. Root-Bernstein and Root-Bernstein asserted that “it is obvious that education based solely on separate disciplines and public languages leaves out huge chunks of the creative process” (p. 13). This process view of creativity aligns with the perspective taken in this study and provides an interdisciplinary lens through which creativity is explored.
In the Transdisciplinary Design Studio, learners both engaged with the ideas presented by Root-Bernstein and Root-Bernstein (1999) in *Sparks of Genius* and also experienced and practiced the thirteen thinking tools through interactive studio lessons, discussions, and exercises. Some of these lessons were created and led by the instructors while others were taken on by the graduate students enrolled in the course. Whether one is a future engineer, future artist, future educator, or future landscape architect, the Root-Bernsteins asserted: “innovation is always transdisciplinary and multimodal. The future will therefore depend upon our ability to create synthetic understanding by integrating all ways of knowing” (p. 314). Inspired by the ideas of Root-Bernstein and Root-Bernstein, understanding creativity as a transdisciplinary process emerged as an explicit focus of the Transdisciplinary Design Studio curriculum.

**Review of Literature**

Thus far I have presented the foundational premises of this study as discussed in the respective theoretical and curricular frameworks. While I have discussed some of the essential concepts such as interdisciplinarity, identity, and creativity, this discussion has been limited to the writings of Greene and Root-Bernstein and Root-Bernstein. In this section, I widen my lens to encompass recent and relevant literature which addresses the aforementioned topics as well as visual journals with the intention of establishing a more solid footing for my research. I will begin with an exploration of visual journaling as situated within the literature as it comprises an integral space for reflection and meaning making in the design studio. The discussion progresses to interdisciplinarity which will define *trans*disciplinarity and discuss issues of creativity and collaboration. Next, creativity and the creative process are brought forth and situated primarily in literature in the cognitive sciences and art education. Finally, a brief section on identity will provide a lens through which the study’s findings can be viewed and understood.
Visual Journals

The visual journal can be understood as a hybrid of the artist’s sketchbook and the writer’s reflective journal where visual imagery and written texts coexist—oftentimes symbiotically. Functionally, the artist’s goal is not that different from that of the writer. Both explore, document, reflect, and communicate their ideas through their preferred mode of expression. Whereas sketchbooks are often image-focused and journals are typically dedicated to written expression, the visual journal embraces multiple modes of communication. This section will discuss the characteristics of the visual journal as well as empirical research studies that focus on the use of this tool in educational settings.

The concept of the visual journal goes by many different names. Dias and Grauer (2005) cited several names for the visual journal such as: visual diaries, visual thinking journals, drawing files, sketchbooks, and workmates. Taking inspiration from language arts, Stout (1993) employed the term “dialogue journal” to describe her conceptualization of the visual journal. Stout pushed the boundaries of the traditionally text-heavy dialogue journal and brought forth the “dialectical interplay between visual and verbal thinking” (p. 42). Anderson and Milbrandt (2005) called their notion of the visual journal the “research journal” and/or “research notebook” which emphasize personal reflection and critical thinking. Lastly, the term “visual-verbal journal” as an alternative to visual journal is a straightforward reference to the written text and imagery that lies within the journal. It is important to note that while disparities may exist regarding certain aspects of the visual journal, the name included, consensus can be reached on physical and conceptual elements such as the embracing of multiple modes of expression including, but not limited to, visual and verbal.
La Jevic and Springgay (2008) have written about the use of visual journals in pre-service education. These researchers envisioned visual journals as “a space for the students to explore ideas, beliefs, and opinions through words and images” (p. 73). Another well-known proponent of the visual journal, Grauer (1999) reiterated that the multimodal quality of visual journals represents both visual and verbal thinking and encompasses a multiplicity of forms. Grauer specified that visual thinking can comprise a variety of different media and imagery including: “drawings, sketches, collages, photographs, graphics, and personally meaningful symbols” (p. 146). As Grauer indicated, visual journaling is open to various and alternative means of expression so students have freedom to communicate in the form that is most appropriate and comfortable to them. Dias and Grauer (2005) cited a long list of imagery that may appear within the pages of a visual journal including: “articles; web information; drawings, paintings, prints, ideas for various media; photos, digital prints, fabrics; found items; poems, quotes, found text, narratives” (p. 36). It is the flexible intermeshing of image and text through various expressive modes that makes the visual journal unique as fostering creative exploration.

As individuals have multiple options for communication and expression, there is an important explorative quality to the visual journal. La Jevic and Springgay (2008) explained:

Students are asked to keep visual journals to reflect on and demonstrate their search for ideas, to document media exploration and artistic decision making and revision, to present research, and to discuss/reflect on implications for classroom practice. The visual journals become a space for the students to explore ideas, beliefs, and opinions through words and images. (p. 73)

Expanding on this idea, the visual journal is not only a place where students can search for ideas but can search for the most appropriate way to express those ideas as they consider the
relationship between their aesthetic choices and content. This is why exploration is essential. It is through exploration of materials, techniques, and expression that student ideas begin to take shape and meaning is born.

Through exploration, the visual journal serves as a space where the creative process is recorded. As Dias and Grauer (2005) indicated, visual journals are “records of process; we can see how our thinking changes and develops over time” (p. 32). La Jevic and Springgay (2008) also emphasized the process nature of this tool by calling it a work in progress that can be worked and reworked by the student. The ability to revise, revisit, and reevaluate are critical components of the process and explorative nature of these tools. With this in mind, the visual journal is not a finished product but a visual record of thinking and making. Additionally, the in-process nature of the visual journal contributes to its value as a formative form of student assessment where “the process of learning is encouraged and valued above the final product” (Anderson & Milbrandt, 2005, p. 77).

The visual journal as containing insight into student learning and creativity has served as the impetus for several research studies which sought to explore the potential of these tools. La Jevic and Springgay (2008) are two a/r/tographical researchers who examined undergraduate student visual journals in a course entitled “Art in the Elementary Schools.” Student participants were encouraged to engage in self-reflection and critical inquiry through weekly visual journaling where a variety of media was available. The researchers found that visual journaling provided opportunities for students to not only communicate through multiple modalities, but also to peel back their layers of experience between the intersections of artist (a), research (r), and teacher (t) through a/r/tography. In essence, the authors cited that students were conducting lived a/r/tographical research through their own inquiries and creative expressions.
The idea of using artmaking in journals as a means of reflection is also brought forth by Milne (2004) in a study on pre-service educators. Milne turned to reflective artmaking because “It may be, though, that reflection through words alone is unnecessarily limiting” (p. 37).

Similarly, Gilbert (1998) drew inspiration from sketchbooks as legitimate research tools in a study of post-graduate students working towards certificates in education. Gilbert pointed out that despite introducing students to a variety of sketchbooks, a majority of the participants relied more heavily on written communication as they felt more comfortable expressing themselves in this way. The concept of the pedagogical sketchbook emerged in Gilbert’s study as a term to describe the student’s exposure to and grappling with teaching-related concepts. Not a new innovation, German and Swiss painter Paul Klee’s (1944) pedagogical sketchbook kept during his teaching tenure at the Bauhaus is referenced in a similar vein to those kept by the students. Gilbert summarized, “Sketchbook research provides a cognitive bridge to the independent ground of knowing how to develop in art alone: an essential skill for a future art educator” (p. 265).

In addition to Gilbert, Costantino (2013), Sinner (2011), and Graham (1997) also focused on the preservice art educator although through the lens of reflective journaling. Costantino (2013) brought forth the notion of aesthetic reflection which refers to the explicit conveyance of meaning through visual modalities. Through visual journals kept by preservice art educators, Costantino examined aesthetic reflection as a means of cultivating empathy and what Greene (1995) called the social imagination during a practicum experience with middle school art students. Similarly, Sinner’s (2011) case study on the visual journal of one preservice art teacher also examined this tool as a context where reflection and meaning making occurred. Sinner (2011) explained, “Journals operated as a space where preservice teachers recorded their ebbs
and flows as they moved through the program and into the profession” (p. 188). Finally, Graham’s (1997) research on two preservice art teachers involved in student teaching focused on the traditional reflective journal, not a visual journal, as cultivating “a personal teaching voice and as a means for developing a teacher’s creativity” (p. 4). As indicated in these three studies, the journal represented a space of critical and process reflection in which future art educators both made sense of their experiences and fostered understandings of what Sinner refers to as “their teaching selves” (p. 188). Therefore, journaling is presented by these authors as an activity through which vital pedagogical development for preservice art educators occurs.

While the literature on visual journaling in art education is relevant given the enrollment of these students in the Transdisciplinary Design Studio, it is also notable that researchers outside of art education explore journals and their potential in curricula. Guwaldi (2008) examined reflective visual journaling within interior design as means of cultivating student understanding of sustainable design. The author discussed reflection as a “catalyst for critical thinking” (p. 98) which is deemed important for designers focused on sustainability as it “requires holistic, systemic way of thinking and a mindset that encourages integrated design” (p. 98). While this study primarily centered on traditional written forms of reflection, Guwaldi cited the implications of using journaling in a more multimodal way in other design courses. The single-modal approach to journaling as addressed in this study is a limitation to visual journal literature outside of the arts and education.

In a different context, Ghaffari (2008) conducted a qualitative study on undergraduate junior student nurses learning pathophysiology. These students were asked to engage in reflective journaling as an extra credit assignment in the course with the intention of using reflective writing to promote critical thinking, foster meaning making, and enrich construction of
knowledge. The findings are significant as Ghaffari (2008) discussed reflective journal writing as bringing forth insightful self-exploration or self-learning. Additionally, the author cited an evident re-affirmation of participant career path and career goals. Like the Guwaldi (2008) study referenced above, this study focused on written expression in journaling. Despite this fact, both researchers point to journaling as a more holistic and critical path to meaning making through which “students can articulate connections between new and existing knowledge, between the learner and the learned, and beyond” (Ghaffari, 2008, p. 19). These significant learning outcomes hold implications for this study despite the lack of visual imagery within the journals studied by these researchers. Two dissertation studies are notable exceptions to the focus on written text in journaling, a mental health study on mother-daughter relationships (Smith, 2005) and a study on art therapy and counseling students (Deaver, 2009), both of which employ visual journaling as forms of reflection.

As evident in the aforementioned studies, much of the focus of visual journal and related research is grounded in higher education, and more specifically preservice art education. This may be due to the concept of visual journaling being relatively new in the realm of education; however, there is evidence that this topic is beginning to garner more interest outside of postsecondary contexts. In 2009, the state of Georgia adopted new Performance Standards in the area of visual arts (Georgia Department of Education). The term “visual journal” appeared in standards beginning in seventh grade and in high school courses including Art I, Drawing, and Painting. The inclusion of visual journals in state mandated standards serves as an indicator that these tools have the potential to impact or reflect student learning. Like the Georgia Performance Standards, a majority of the literature on visual journals is found within the context of the visual arts; however, the multimodal quality of these tools suggests a wider implementation. A master's
thesis on the visual journal (Scott, 2010) explored these tools in the secondary art classroom providing implications for academic levels other than postsecondary. As this study contends, there are implications for visual journal implementation in other disciplines including core subjects, in interdisciplinary contexts, and as field texts in qualitative research. In embracing the visual journal as a space where multiple languages might be practiced (Greene, 1995), interdisciplinary spaces emerge as a likely fit for this educational and research tool. By permitting individuals the opportunity to communicate learning and their lived experiences through various languages, researchers have the opportunity to attend to these notions in a more complex and holistic way. Further, it is through such holistic approaches that researchers might gain greater insight into their participant experiences. These gaps, or possibilities, in visual journal research will be addressed in this study. The following section continues the conversation on interdisciplinarity and situates it within the literature to foster a better understanding of this approach to curriculum and its importance to the study.

**Interdisciplinarity**

Interdisciplinarity encompasses another important thread in this study; however, prior to exploring this concept, it is important to understand what is meant by the term “discipline.” Beane (1995) provided a description of discipline as a “field of inquiry about some aspect of the world” and “a lens through which to view the world—a specialized set of techniques or processes by which to interpret or explain various phenomena” (p. 617). Establishing a definition for discipline is meaningful as it relates to the research’s focus on student perceptions of disciplinary identity. In conceiving of discipline as described by Beane, interdisciplinarity can be understood as “the active integration of concepts, ideas, or knowledge from normally distinct fields of study” (Holley, 2009a, p. 333). While most individuals experience education through
the traditional disciplinary or separate-subject approach, interdisciplinary curricula create a more organic system for meaning making which mimics the borderless nature of the non-academic world (Beane, 1995). The concept of interdisciplinarity is often presented as an alternative to this compartmentalized conception and strives towards knowledge integration which is, in fact, a defining quality of this approach. In this section, I will introduce the concepts and characteristics of interdisciplinarity, briefly explore its relationship to creativity and collaboration and then discuss relevant empirical studies on the topic.

Interdisciplinarity promotes a more holistic approach to learning through the thoughtful integration of disciplinary knowledge. It is also through these approaches that learners begin to make connections between newly attained knowledge and that knowledge which preexists from earlier times and/or different contexts. Lattuca, Voigt, and Fath (2004) explained this phenomenon:

Interdisciplinarity may succeed because it provides individuals with more opportunities to connect new knowledge to existing knowledge. This process might occur as instructors and students call upon disciplinary information to solve complex, boundary-spanning problems or as they access relevant memories and experiences that facilitate understanding of new concepts and ideas. (p. 30)

Holley (2009b) echoed this notion in stating that the two goals of interdisciplinarity are exposing learners to forms of knowledge not typically connected in courses and the synthesis of this knowledge in order to address and understand broadly constructed questions. In other words, interdisciplinary approaches encourage opportunities for explorative inquiry into deeper realms of meaning making.
As scholarship, interdisciplinarity can be broken down into four main typologies as discussed by Lattuca (2001): informed disciplinarity, synthetic interdisciplinarity, transdisciplinarity, and conceptual interdisciplinarity. Each of these typologies demonstrates a distinct approach to both teaching and research. For the purposes of this study, the context of the studio is most effectively characterized as transdisciplinary. Lattuca described transdisciplinarity as “the application of theories, concepts, or methods across disciplines with the intent of developing an overarching synthesis” (p. 83) where concepts and theories transcend disciplinary boundaries and can be applied to numerous fields of study. In transdisciplinary approaches to education, the different disciplinary perspectives are enhanced through a reciprocity or “fruitful exchange of concepts or modes of thinking across disciplines” (Boix Mansilla, Miller, & Gardner, 2000, p. 33)—what the authors call a *purposeful intertwining*. It is not an incorporation of disciplinary knowledge but a thoughtful integration (Beane, 1995).

Another aspect of the studio curriculum was the focus on complex and very “real” problems. Problems like these are thought to enhance interdisciplinary learning as students are engaged in “authentic tasks similar to those they will be expected to perform as workers or as citizens” (Lattuca, Voigt, & Fath, 2004, p. 32) which is also reiterated by Holley (2009b). Along these lines, exploring issues associated with environmental sustainability through creative thinking is one focus of the Transdisciplinary Design Studio where methods of inquiry were not relegated to specific disciplines. Yet it is how those questions are conceptualized, grappled with, and ultimately presented that holds significance for students from all disciplinary backgrounds.

Being that another prominent focus of the studio curriculum was creativity, it is important to understand how interdisciplinarity connects to creative thinking. Kowal (2010) pointed out the ubiquity of creativity as it permeates into everyday life and experiences in a holistic, non-
disciplinary manner. Kowal went on to discuss creativity as both intersubjective and learnable in which case it bridges disciplines “in unexpected ways and illuminates the character of interdisciplinarity” (p. 296). Holley (2009b) also addressed this idea of creativity connecting disciplines when she stated:

Whereas disciplines serve to compartmentalize knowledge into isolated, separate units, interdisciplinary work integrates these once-isolated communities. Interdisciplinarity encourages creativity and innovation by permitting scholars to step outside their disciplinary boundaries. (p. 12)

For both Kowal and Holley, creativity is manifested through the freedom that interdisciplinarity grants the learner. The simple act of breaking down the barriers between disciplines, or rather building a bridge between them, might serve as a catalyst for creative thought to emerge.

Addressing creativity, Marshall (2005) concisely asserted that, “Creativity, like learning, is rooted in finding or making connections” (p. 230). In interdisciplinarity, the idea of integration is often synonymous with the cognitive and creative construct of synthesis (Boix Mansilla, 2010; Root-Bernstein & Root-Bernstein, 1999; Spelt, Biemans, Tobi, Luning, & Mulder, 2009). Both integration and synthesis might be conceived as the development of understandings through knowledge interaction and construction. Nikitina (2005) elaborated on the often messy process of synthesizing knowledge:

When one thinks of interdisciplinary insight, one typically thinks of it as an instantaneous flash of imagination that intuitively and inseparably blends ideas and creates a striking new synthesis…In reality, interdisciplinary thought goes through a complicated chain of operations before it reaches (if it happens) a satisfactory synthesis. (p. 389-390)
The concept of synthesis is important to this discussion of interdisciplinarity and creativity as Root-Bernstein and Root-Bernstein (1999) presented it as a thinking tool utilized by highly creative individuals.

Expanding beyond the connection between creativity and interdisciplinarity, there emerges another important thread in this study. Transdisciplinary collaboration was an essential aspect of the Transdisciplinary Design Studio course as students were required to work in groups for the two major projects, the design challenges. Holley’s (2009a) research on interdisciplinarity as transformative change indicated that collaboration and interdisciplinary engagement are often perceived as synonymous. Through a disassembling of disciplinary walls, individuals are provided with opportunities to move between different disciplines and foster connections with others working towards a common goal. While collaboration is often perceived as an essential part of interdisciplinarity, Thagard (2010) posited multiple options for working in this realm including individuals with deep knowledge bases in multiple fields who work “at the intersection of two or more disciplines” (p. 237). Therefore, interdisciplinarity is not inherently collaborative although in the case of the Transdisciplinary Design Studio, collaboration was an explicit part of the curriculum.

When individuals from various disciplines join together in collaboration, they do not need to ignore or attempt to erase their disciplinary groundings but might rather demonstrate a wide-awakeness as they move into these new spaces of learning and research (Giri, 2002; Wall & Shankar, 2008). Klein (2005) cautioned that “difference, tension, and conflict are not barriers that must be eliminated” (p. 45). Rather, these qualities contribute to the negotiation of knowledge between the disciplines. McMurry et al. (2012) explained that pedagogical and epistemological approaches can either limit or foster effective interdisciplinary collaboration;
however, simply recognizing these differences amongst disciplines can cultivate more holistic perspectives on why differences exist and how they can be integrated into the collaborative meaning making process. In other words, interdisciplinarity has the potential to elevate the relational quality of learning into a space where it can be critically examined (Wall & Shankar, 2008), allowing for individuals to develop and deepen their understandings of the self and the other.

Deepening this discussion on interdisciplinary collaboration, the recent calls for STEAM educational initiatives create a direct connection to the Transdisciplinary Design Studio. While STEAM is not always an inherently collaborative practice, the way it was conceptualized in the course encouraged students from the three disciplines to work collectively and dialogically. The premise of STEAM at the postsecondary level draws from different rationales including the apparent “lack of creativity and innovation in recent college graduates in the United States” (Land, 2013, p. 548). On a basic level, researchers and educators cite the need for creative scientists (Madden et al., 2013), designers (Maeda, 2013), and engineers (National Academy of Engineering, 2004) and call upon the arts to fulfill this desire through nurturing creativity and innovation within these disciplines. Art educators are also aware of the possibilities in STEAM as a means of moving the arts from the margins of education (Greene, 1995) and into mainstream or “core” conversations on curriculum (Wynn & Harris, 2012).

As Bequette and Bequette (2012) cautioned, STEAM should not just focus on the arts as strengthening STEM, but researchers need to inquire into how STEM can strengthen the arts. These authors also called for further research on the benefits and merits of STEAM citing the need for pedagogical insight into how disciplinary differences are addressed, the conceptualization of design as bringing forth “overlapping cognitive and procedural
dispositions” (p. 47) (i.e. the creative process), and explorations of the intersections between problem-based learning and design pedagogy. If STEAM is approached as a collaborative, transdisciplinary, and reciprocal venture as was the focus of the design studio curriculum, this study is likely to provide insight into all of these inquiries as grounded in student experiences.

Finally, research that encompasses interdisciplinarity brings forth several notions relevant to this study. Interdisciplinary programs of study were found to cultivate many qualities within students including tolerance of differences, inclusiveness, and openness (Haynes & Leonard, 2010). Haynes and Leonard (2010) also found that interdisciplinarity invoked undergraduate students to more actively engage in meaning making surrounding their topics of exploration as well as their personal identity. Concurrently, Nikitina (2005) spoke to the cognitive benefits of interdisciplinarity explaining that a “hybridization of disciplinary views may manifest itself in easing of tensions and differences among disciplines” (p. 407). In this way, coming to know the disciplinary “other” nurtured pathways towards understanding and the development of new knowledge.

Through these outcomes of interdisciplinarity, there is also a call for students to engage in frequent reflection (Boix Mansilla, 2010; Boix Mansilla & Duraising, 2007; Haynes & Leonard, 2010; Myers & Haynes, 2002; Sill, 1996). Focus groups, reflective journaling (both visual and verbal), and the students’ final reflective papers are examples of how this was encouraged in the Transdisciplinary Design Studio. In this spirit, this study addresses the ways in which student reflections contribute to holistic depictions of student experience and perceptions.

Creativity and the Creative Process

In this discussion of creativity and the creative process, it is important to begin by establishing an understanding of these concepts. As Treffinger (2011) pointed out, “Creativity
may well be one of the most complex forms of human effort and expression” (p. 6) which leads to different definitions by different scholars whose research interests often seep into their conceptions of this quality. A pioneer in the field of creativity research, Guilford’s (1950) definition of creativity connected creative thinking, problem solving, and novelty. More recently, Weisberg (2006) provided his perspective on creative thinking stating that it “refers to processes underlying production of creative products, which are novel works—or innovations—brought about through goal-directed activities” (p. 7). In this view, Weisberg specified the factors which contribute to innovation as being skills, knowledge, and reasoning processes. Across both of the perceptions, novelty (or originality) emerged as a defining characteristic of creative behavior.

Within creativity research, creative problem solving, the creative personality, the creative process, creative products, creative environments, and broader topics like the general creativity versus domain-specific creativity debate all emerge as commonly researched topics. For the purposes of this study, the creative process is of particular interest. By the creative process, many researchers refer to the events which surround “the cognitive processes contributing to the production of novel problem solutions” (Mumford, Reiter-Palmon, & Redmond, 1994, p. 5). In the field of creativity studies, a great deal of research has sought to understand these complex processes (Dudek & Coté, 1994; Getzels & Csikszentmihalyi, 1976; Mace & Ward, 2002; Torrance, 1979; Torrance, 1995) and numerous individuals have presented their theories on the stages of the creative process. One of the most well-known theories derives from the early work of Wallas (1926) which cited a four stage model including preparation, incubation, illumination, and verification. Wallas’ stages are not only influential to early conceptions of the creative process but are also evident in contemporary approaches (Lubart, 2000-2001).
For the purposes of this study, I align my conception of the creative process with Dudek and Coté (1994) as they proposed this definition: “the entire creative process, from start to finish, is characterized by an urgent and relentless search” (p. 147). The notion of the creative process as a search is meaningful as it relates back to Greene (2004) when she stated: “…There are always new patterns to be made, new connections to be found as the search for meaning proceeds” (p. 23). The description put forth by Dudek and Coté (1994) echoes many aspects of Greene’s philosophy of education where there is an in-progress, active, and explorative quality to learning and creating. These qualities of searching are also reflected in the formative nature of the visual journal. In this section, I will broadly discuss the creative process from the perspectives of psychology and art education including empirical studies of the topic.

One of the most obvious limitations to studying the creative process is the fact that it is typically an internalized process within the creator. Eisner (1960) pointed out this very issue when he stated: “We need to be clear on the fact that we can never see the creative process ‘qua process.’ We must infer the nature of the process from what we can observe” (p. 28). In other words, the creative process can only be understood through some external manifestation on the behalf of the creator. With this complication in mind, relatively few researchers focus on the creative process as creative products are more accessible and often perceived as more appealing research foci.

Getzels and Csikszentmihalyi (1976) defied this logic and are well-known for their interest in the early stages of the creative process, specifically problem finding. They explained: If the process of artistic creativity, and of creativity in general, is to be understood more fully, the study of what the artist does cannot be restricted to the visible solution, the
finished product. It must include the earlier, crucial step: formulation of the creative problem to which the solution is a response. (p. 5)

These researchers conducted one of the earliest longitudinal studies on problem finding where the formulation and envisioning of creative problems were of primary interest. Getzels and Csikszentmihalyi cited positive findings for early and sustained engagement in the creative process in that students who engaged in problem finding behavior were more likely to produce original artwork than those who assumed a more problem-solving approach. It is worth noting that a later study by Dudek and Coté (1994) which replicated many aspects of Getzels and Csikszentmihalyi’s found contradictory results. Dudek and Coté cited that the solution phase was more indicative of creative output; however, they also critique the vagueness of Getzels and Csikszentmihalyi’s definition of problem finding and believe that they might have been referring to problem expression rather than problem finding.

Within the field of art education, there are numerous references to the creative process, and the writings of Dewey (1934) serve as an essential starting point of this discussion. In *Art as Experience*, Dewey discussed in detail numerous ideas pertaining to the experiential quality of arts and aesthetics including an underlying attention to the creative process and the artist’s act of expression. According to Dewey, “Every experience, of slight or tremendous import, begins with an impulsion, rather as an impulsion” (p. 58). It is the impulsion that Dewey presented as the catalyst of the creative process as it propels the artist to the medium and serves as the initial inspiration for creation.

Another important factor in the creative process as posited by Dewey is emotion. Emotion, by itself, is not meaningful expression. Dewey (1934) believed that emotion must undergo a period of incubation and subconscious maturation before it can be creatively conveyed
in an artwork. This period, which is referred to as gestation, falls between conception (impulsion) and the creative birth of the artwork and is essential to changing emotion into aesthetic emotion. In other words, incubation allows inspiration the opportunity to develop prior to the creative birth. Dewey’s conception of the creative process encompasses the whole process from impulsion to incubation to creation and is only fully realized when the artist deems the artwork complete. Despite the philosophical nature of his conception, Dewey’s intense interest in creative expression sets the stage for subsequent works on creativity.

The work of Viktor Lowenfeld, including his pivotal book Creative and Mental Growth (1947), represented an important shift in the field of art education towards an era focused on creative self-expression. Beginning in the 1930s, creative self-expression would reign as the dominant approach to art education until the emergence of Discipline Based Art Education in the 1980s (Zimmerman, 2009; Zimmerman, 2010). Taking the position that creativity is a cognitive function, Lowenfeld (1960) stated that “intelligence as well as creativity are essential to human growth” (p. 23). Lowenfeld discussed the concept of creative intelligence as separate from purely intellectual actions through “the use and application of sensitivities” (p. 23) that are subjective, fluent, and flexible. The idea of the creative intelligence holds implications for the field of art education as Lowenfeld argued that it spurs creative expression. In his conception of art education, this author believed that students must be gently guided by teachers so that their creativity can emerge over time (Zimmerman, 2010).

Lowenfeld (1960) asserted that the creative process might be thought of as congruent with the personal development of the individual as they explore themselves and their ideas through creative expression. Lowenfeld perceived creative development as occurring through sequential stages that begin with young children and the Scribbling stage to teenagers and the
stage called Adolescent Art (Burton, 2009). Burton (2009) summarized: “Lowenfeld’s developmental theory is characterized by processes of creative practice exemplifying what he calls creative intelligence at work, rather than the aesthetic products of artistry” (p. 335). Overall, the process-oriented approach to creativity is an important and lingering contribution by Lowenfeld.

Also within the context of art education are studies which focus on the creative process. An early study by Beittel and Burkhart (1963) discussed three different categories of art students: Spontaneous, Divergent, and Academic. According to the authors, these three types of art students are largely characterized by the strategies they employ during the creative process. Throughout the article, Beittel and Burkhart (1963) brought forth various personality and environmental issues that distinguish these categories of art students from one another; however, the beginning stage of art creation is presented as one of the most important factors in differentiating between these individuals. Beittel and Burkhart’s emphasis on the creative process, or as they call it the “discovery dimension of art” (p. 29), relates nicely to the perception of the creative process as a place where exploration and experimentation occurs. For these researchers, discovery is a form of meaning making which places a new importance on the process of creation.

The creative process is also discussed in more recent publications within art education, notable are two case studies conducted by Patricia James. In an earlier case study, James (1997) explored the creative process as it is observed in a non-art major as she participated in an undergraduate sculpture course. This study focused on the creative process as it pertains to working with materials, stretching the imagination, release of personal emotions and the social impact of the environment. Similar to the ideas of Getzels and Csikszentmihalyi (1976), James
asserted that a complex interaction of internal and external factors is integral to what she terms a “systems approach to creativity” (p. 86). James (1997) stated: “In any approach to teaching studio art, it is important that the teacher understands the systemic complexity of artistic creative processes, variations among individual students, and the multiple ways that a studio class provides constraints and opportunities for learning” (p. 87). Therefore, developing an understanding of the intricacies inherent to the creative process can be beneficial to both the teacher and the student as they move through a studio course.

In a similar fashion, James’ (2004) more recent study constructed a portrait of an undergraduate student as she engaged with two different forms of creative expression in an art education course: photomontage and masked performance. James described the course as emphasizing “metaphoric and creative thinking rather than established artistic techniques, [and] includes music, movement, and text with visual art” (p. 360). She elaborated explaining that the course assignments were geared towards cultivating creativity through various modes of expression while reflective writing assignments encourage students to think about their own creative processes. As addressed above, creativity comes forth as an explicit aim in this curriculum.

In these articles, James (1994; 2004) perceived the creative process as a more holistic approach. James (2004) summarized the importance of the creative process not just within her study, but its relationship to art education as a whole:

Knowing established artistic concepts and techniques are certainly valuable ingredients for effective artistic expression, but an understanding of creative processes also is a vital component for success. Such knowledge enables students to learn to work with metaphor, chance, ambiguity, multiple sources of knowledge, and emergent information as well as
conscious planning and reflection. In this way, students can shift from working within self-imposed boundaries to becoming comfortable with open-ended exploration. (p. 372)

The implications of this research point to the benefits of curricula which facilitate engagement in the creative process. Within these two studies, James (1997; 2004) puts forth strategies that may be beneficial for eliciting reflection on creative behavior including written reflections, group discussions, relevant readings, and meaningful artmaking. In essence, James believed that creativity can be understood through multiple modes of expression and a variety of facilitative strategies which contributes to a more comprehensive understanding of this process.

Finally with regards to the field of art education, I will briefly discuss Walker’s (2004) article which is aptly titled “Understanding the Artmaking Process: Reflective Practice.” In this study, the author followed the progress of undergraduate and graduate students as they engaged in and reflected on a studio methods course. The artmaking process as brought forth by Walker centered on big ideas as the conceptual structure. Big ideas are often perceived as the entry point into artmaking as they should be relatable and meaningful to the specific student group (Walker, 2001). In developing an understanding of the creative process, Walker asked students to reflectively document the process through which their artwork evolved by writing “decisions, changes, and insights” (p. 8) that occurred throughout the ten-week period. Walker expressed that “the reflective aspect was a highly significant factor in developing the students’ understanding about artmaking as a conceptual process” (p. 12). Reflection is touted as integral to the creative process when it is implemented as a teacher-directed and explicit curricular component. If presented to students in this manner, Walker believed that creative behavior such as “inventive and critical artistic activity such as delaying closure, risk-taking, actively searching
for contradictions, rejecting the conventional and familiar, and exhibiting tolerance for ambiguity” (p. 12) will emerge.

Stepping outside of art education, creativity is also addressed in engineering and engineering education literature as the discipline progresses towards a more globalized job market (Katehi & Ross, 2007). In a 2004 publication entitled The Engineer of 2020: Visions of Engineering in the New Century, the National Academy of Engineering discussed creativity as a growing and indispensable quality of engineering. The complexity and technological diversity that is emerging within the current state of the profession are cited as major factors in the need for a more creative engineer. In order to address these concerns, current dialogue in engineering design education brings forth creativity as necessary rather than as an accessory (Charyton & Merrill, 2009). From this engineering education perspective, creativity is perceived to be a vital facet of the profession, reinforcing the need to also make it an explicit part of the university curriculum (Kazerounian & Foley, 2007). The engineering education accreditation board, ABET (2013), reiterated this notion, advocating for “creativity, invention, and cross-disciplinary fertilization to create and accommodate new fields of endeavor, including those that require openness to interdisciplinary efforts with nonengineering disciplines such as science, social science, and business” (p. 50). In this view, creativity and interdisciplinarity emerge as interconnected, where engineering students are ushered into new learning spaces through their engagements with the other—spaces which have the potential to spur creative thought and innovation.

The previously mentioned first iteration of the design studio was conceptualized as a means of meeting the calls for more creative and innovative engineers through enrolling students from different disciplines—art and engineering (Costantino, Kellam, Cramond, & Crowder,
While this current study also brought landscape architecture students into the design classroom, the context and pedagogy of the previous studio was an essential foundational to the Transdisciplinary Design Studio’s emphasis on creativity. Consistent with the first iteration, the goals with regard to creativity included exploring problem finding and framing as well as engaging the students deeply in the Root-Bernsteins’ transdisciplinary creative thinking tools (Kellam, Walther, Costantino, & Cramond, 2013). Further, the studios emphasized the importance of reflection in engineering education (Walther, Kellam, Radcliffe, & Boonchai, 2009) which complements the previously mentioned studies’ findings from the field of art education. These findings indicated that reflection was an integral aspect of the creative process (James, 1997; James, 2004; Walker, 2004). Overall, the explicit focus on creativity served as an answer to recent calls for this need (Kazerounian & Foley, 2007) while the interdisciplinary context fostered an environment where cross-fertilization, hence creativity, could occur (ABET, 2013).

In this section, I have explored the creative process as presented in the literature. Through this exploration, I found that one of the most challenging aspects of creativity and the creative process is the various ways in which it is conceptualized and defined. There is no single agreed upon definition in either case. In addition, the innate complexity in understanding the creative process as a largely intrinsic behavior provides another limitation with which to contend. Regardless, several studies found that reflection fostered an awareness of the creative self and creative process (James, 1997; James, 2004; Walker, 2001). Through the implementation of opportunities for reflection as well as multiple modalities through which the students engaged in
creating and thinking, this study sought to attend to these limitations and focus on student perspectives of these concepts.

Identity

Like creativity, identity eludes a clear and agreed upon definition. Because identity emerged as an important facet in the narratives of the in-between, this section will focus on defining and discussing the concept of identity as it relates to the context of educational research. To start, Gee’s (2000) concise description of identity as “being recognized as a certain ‘kind of person’ in a given context” (p. 99) serves as an effective means of narrowing this broad and complex topic. The contextualization of identity is relevant to the design studio where students were nudged out of their disciplinary homes and into an emergent and nebulous space. Considering identity as tied to context relates back to Greene (1995) when she asserted that the imagination permits individuals “to adjust to what they gradually find out about the intersubjective world as they move further and further from the views of their original home” (p. 21). These views also echo Dewey’s (1938/1957) theory of experience as enmeshed in ongoing interactions with the world where experiences inform identity. Gee (2000) went on to assert that individuals possess multiple identities which are connected to their social interactions and “performances in society” (p. 99). This is presented as distinct from what he called a core identity which is less context-specific and more intrinsically situated.

Through this perspective, Gee (2000) discussed four interrelated facets of identity which contribute to better situating this concept as discussed in this study: nature, institution, discourse, and affinity. Nature-identities (N-Identities) originate from things of which individuals have no control, for example genetic makeup. Through this perspective, “the source of this power is nature, not society, and the process through which this power works is development (it unfolds
outside [one’s] control or the control of society)” (p. 101). Institution-identities (I-Identities) emerge from an external source through which it authorizes certain titles, rights, responsibilities, to an individual through a power structure. For example, my I-Identity as a graduate student and research assistant were conferred by the university at which I am enrolled. The next of these is that of discourse, or dialogic, identities (D-Identities). Gee explained this form of identity as an individual trait which is grounded in the discourse or dialogue with others—traits which are fostered through relational interactions and discussions. In other words, the recognition of this trait by others nurtures identity which is either ascribed or achieved. The fourth identity discussed by Gee (2000) is termed affinity perspectives (A-Identities). These identities are grounded in experiences or the practices undertaken by the individual through what is called an affinity group. In the affinity group, individuals share common allegiance or practice through the process of participating or sharing.

Gee (2000) was careful to point out that these four identities are not distinct; rather they often intersect in complex ways. For example, my I-Identity of being a graduate student also grants me membership to certain student groups such as a student-faculty research group on the university’s campus (A-Identity) and also furthers certain D-Identities such as being a hard worker. Another example is provided by Gee which discusses the ways in which institutions such as universities promote trends in teaching and learning such as collaborative, team-based learning practices. In this example, the I-Identity promoted by the university (teaching best practices) fosters A-Identities amongst these learning communities (student-based teams) despite the institution still retaining “a good deal of power” (p. 107). Essentially, the four identities often combine and intersect in complex relational ways.
Extending beyond this discussion on identity, it is important to return to the goal of this study which is to explore lived experiences of students in the Transdisciplinary Design Studio. While I have provided insight into how the notion of identity is situated, the emphasis of the findings chapters is broadly focused on narratives of identity related to creativity and disciplinary grounding. Gee’s (2000) specific perceptions of identity are helpful for framing identity in educational research; however, they do not comprise a specific framework for the following discussion. Rather this discussion of identity serves as a lens through which one can better understand this complex topic and the ensuing findings.

Summary

The preceding sections focused on prominent topics which are enmeshed in this study of lived experience. Visual journals, interdisciplinarity, creativity and the creative process, and identity comprise the underpinnings of the study and served as the relevant topics in this discussion. The inter- or transdisciplinary context of the Transdisciplinary Design Studio emphasized creativity through the curricular framework of the Root-Bernsteins’ (1999) book while students were encouraged to engage in reflective visual journaling as a means of understanding these process and experiences (Anderson & Milbrandt, 2005; Dias & Grauer, 2005; La Jevic & Springgay, 2008). Additionally, the multimodal affordances (Dias & Grauer, 2005; Grauer, 1999) of the visual journal contributed to what the next chapter will discuss—the visual verbal narrative analytic method. Through the transdisciplinary collaborations in the design studio, students inquired into their own identities as well as the identities of the other students enrolled in the studio (Giri, 2002; Haynes & Leonard, 2010; Wall & Shankar, 2008). In this way, transdisciplinarity emerged as an inciting aspect of the studio context which nudged students away from their disciplinary homes and preconceptions. Identity in this case study is
considered contextualized and grounded in societal and institutional engagements and experiences as presented by Gee (2000).
CHAPTER 3

Introduction

The purpose of this case study was to explore undergraduate and graduate students’ lived experiences in the Transdisciplinary Design Studio. Initially, this study was conceptualized through the unique opportunity to co-teach a design studio which enrolled students from two different disciplines, engineering and art education. The integration of visual forms of meaning making (visual journals) permitted a holistic lens through which these stories could be explored and served as an alternative to the traditional text-based narratives of student experience. As the studio evolved to encompass both undergraduate and graduate students as well as a third discipline, landscape architecture, the prospect of understanding how students navigated through this space contributed to the uniqueness of this case. The study addressed two research questions:

1) How did students discuss their conceptions of, and relationships between, disciplinary identity, creativity, and the creative process as they reside in-between?

2) How did students tell stories of their experiences in the Transdisciplinary Design Studio through written and visual modalities?

This chapter provides insight into the research methodology and design of this study. I will begin with a description and rationale for the research approach and then discuss the methodologies and research design. Next, insight into the collection of data (primarily referred to as field texts) will be addressed which will lead into a section which introduces the methods for analysis. The following sections will focus on the protection of human subjects, researcher
subjectivity, issues of trustworthiness, and the study’s limitations. Finally, the chapter will conclude with a summary.

**Research Paradigm**

Elucidating her philosophy of education, Maxine Greene (1995) wrote: “In my view, the classroom situation most provocative of thoughtfulness and critical consciousness is the one in which teachers and learners find themselves conducting a kind of collaborative search, each from her or his lived situation” (p. 23). She went on to explain that a constructing and initiating mind brings a level of consciousness to the world that not only more fully engages individuals in their pathways to wide awakeness, but contradicts notions where the world is approached as predefined and “simply there” (p. 23). In other words, it is through a critical awareness of interactions and experiences that individuals come to construct meaning of their lived worlds. These views of education and learning expressed by Greene are foundational to the paradigm on which my research rests which is the qualitative notion of constructivism.

Constructivism as a theory emerged from Piaget’s research with children where it was revealed that their knowledge was based out of active engagements with the world (Burr, 2004). Epistemologically, constructivism rejects the positivist view that reality and knowledge are stable and instead embraces the belief that there is no absolute reality or, perhaps more accurately, that we cannot know this reality (von Glasersfeld, 2002). Rather than accepting the world as “simply there,” constructivists acknowledge that meaning is fluid and created by individuals through their interactions and lived experiences (Constructivism, 2007). With this in mind, the social and experiential emphasis of the constructivist paradigm holds significant implications for the realm of education. From this perspective, von Glasersfeld (2002) stated that “learning […] requires self-regulation and the building of conceptual structures through
reflection and abstraction” (p. 14) as opposed to rote memorization. It is a cultivation of the process of knowledge construction that emerges as the primary goal of constructivists where students are encouraged to deliberate, question, reflect, and look inward rather than outward (Gergen, 1995).

The pedagogical nature of the Transdisciplinary Design Studio moved beyond convergent thinking and instead promoted an exploratory search upon which students come to dialogically interact with course content and construct their own meanings. The interwoven constructivist pedagogy facilitated social interaction in group work and discussions as well as individual engagement in visual journaling and reflection. As Greene (1995) posited, it is through these experiences that meaning can be made through a wide-awake and conscious collaborative search; searches that also encompass the teacher as researcher.

While the social, experiential, and reflective notions underlie the constructivist pedagogy of the Transdisciplinary Design Studio, assuming a constructivist lens for this qualitative study also complements the narrative inquiry methodology. In narrative inquiry, the focus is not on uncovering a ‘truth’ in lived experience (Tamboukou, 2008), rather it is on understanding lived experiences and how those are revealed and constructed through narratives (Bold, 2012). It is what Josselson (2011) proclaimed: “Narrative truth involves a constructed account of experience, not a factual record of what ‘really’ happened” (p. 225). Additionally, approaching the specific data as field texts (Clandinin & Connelly, 2000) contributed to the perspective that these texts (visual, verbal, and oral) are not static records but are (co)constructed between participant and researcher. In this study, (co)construction is presented as dialogic where meaning is not simply constructed but derives from both previous experiences and social interaction (Dewey, 1938/
1997)—it is always an act of (co)construction. Therefore, a constructing mind is perceived as an essential quality for effective methodological practice in narrative research.

**Methodologies and Research Design**

This study employed three complementary methodologies: case study, practitioner-research, and narrative inquiry. In this section, these methodologies will be discussed as grounded in pertinent qualitative research literature and with relevance to the design of the study.

**Case Study**

Stake (2005) defined a case study as a “specific, unique, bounded system” (p. 445) which requires a thorough and thoughtful attention to the activities that occur within this system. The single case within my research is a split-level (undergraduate and graduate) Transdisciplinary Design Studio course offered at a public university in the southeastern United States. Further, the case study fits Stake’s (2005) definition of an intrinsic case study which is sought when the researcher possesses an interest in a specific, pre-selected case. The uniqueness of this context as transdisciplinary and with a curricular emphasis on creativity was a desirable quality of the case with the overarching goal of exploring student lived experience.

**Case Selection.** My involvement as a research assistant on a National Science Foundation funded project contributed to the case selection of the design studio. The Transdisciplinary Design Studio was offered during the fall academic semester of 2012 (August-December) and met twice per week in the School of Art. Additionally, I served as a co-instructor for the course along with an instructor from the College of Engineering, Dr. Nicki Sochacka. The opportunity to assume a practitioner researcher role (Cochran-Smith, 2005; Cochran-Smith & Lytle, 2009) was beneficial as it permitted a deep and holistic understanding of the pedagogical components as well as insight into overall student lived experience throughout the course.
In addition, the transdisciplinary nature of the course created a unique context where students from different backgrounds explored issues of sustainability through a curriculum which promoted creative thinking and studio habits of mind (Hetland, et al. 2007). The constraints and affordances (Eisner, 2004) of such a complex educational space contributed to a vibrant depiction of experience and compelling narratives surrounding disciplinary identity and the creative process. Finally, the use of visual journals by students in the course provided visual-verbal field texts alongside focus groups and other course documents which permitted a holistic and multi-layered lens through which student experiences might be explored. It was these factors which contributed to the selection of the Transdisciplinary Design Studio as the case under study.

Participants. Participants in this study were pre-selected through their enrollment in the Transdisciplinary Design Studio during the 2012 fall semester. The course was co-listed in both environmental engineering and art education as two separate courses with sections available to both undergraduate and graduate students from these disciplines. The art education listing was a split-level course in which undergraduate and graduate students could enroll. This course traditionally fulfilled the requirements for an upper-level studio course in the art education degree program through which visual arts studio experience is requisite. In addition, interest from students in landscape architecture resulted in opening the course to graduate students from this major as well. The total number of students enrolled in this course was twelve students with one student dropping due to time commitments from required courses in her program of study. Of the eleven students, five were from the College of Engineering (four undergraduate, one graduate); four were from the School of Art (three undergraduate, one graduate), and two were from the College of Environment and Design (both graduate) (see Table 1).
Table 1
Student Participants

<table>
<thead>
<tr>
<th>Student</th>
<th>Gender</th>
<th>Major</th>
<th>Degree Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amy</td>
<td>female</td>
<td>Art Education</td>
<td>undergraduate</td>
</tr>
<tr>
<td>Sara</td>
<td>female</td>
<td>Art Education</td>
<td>undergraduate</td>
</tr>
<tr>
<td>Vanessa</td>
<td>female</td>
<td>Art Education</td>
<td>masters</td>
</tr>
<tr>
<td>Christy</td>
<td>female</td>
<td>Art Education</td>
<td>doctoral</td>
</tr>
<tr>
<td>AshLeigh</td>
<td>female</td>
<td>Environmental Engineering</td>
<td>undergraduate</td>
</tr>
<tr>
<td>Ellie</td>
<td>female</td>
<td>Environmental Engineering</td>
<td>undergraduate</td>
</tr>
<tr>
<td>Marissa</td>
<td>female</td>
<td>Environmental Engineering</td>
<td>undergraduate</td>
</tr>
<tr>
<td>Ethan</td>
<td>male</td>
<td>Environmental Engineering</td>
<td>undergraduate</td>
</tr>
<tr>
<td>Quentin</td>
<td>male</td>
<td>Civil Engineering</td>
<td>masters</td>
</tr>
<tr>
<td>Tyler</td>
<td>male</td>
<td>Landscape Architecture</td>
<td>masters</td>
</tr>
<tr>
<td>Grant</td>
<td>male</td>
<td>Landscape Architecture</td>
<td>masters</td>
</tr>
</tbody>
</table>

Unit of Analysis. Within this case study, the unit of analysis consisted of all eleven students enrolled in the class. Within these eleven total participants, I chose to focus on three participants for a more in-depth narrative exploration of relational experiences. These three participants were selected using specific criteria (discussed further below) and represented a diverse selection of the student population—encompassing both undergraduate and graduate levels, engineering and art education majors, traditional and nontraditional students, and self-identified white and non-white ethnicities.

Practitioner Research

Greene (1995) asserted, “To think in relation to what we are doing is to be conscious of ourselves struggling to make meanings, to make critical sense of what authoritative others are offering as objectively, authoritatively ‘real’” (p. 127). In practitioner research, individuals have the opportunity to embrace the ideas articulated by Greene to thoughtfully consider and critique one’s practice. By engaging in this type of research, practitioners take on active roles in developing a deeper and more reflexive approach to teaching and learning in that the spaces

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5 All names appearing in this study are pseudonyms
where they teach become sites for inquiry. This practice of using contexts of practice for educational research blurs the line between theory and practice and is an important feature of practitioner research (Cochran-Smith, 2005; Cochran-Smith & Lytle, 2009). More specifically, Cochran-Smith and Lytle (2009) discuss their idea of “theories of practice” as stemming from a complex interplay between the practitioner and the learner where practitioners are constantly theorizing based on their experiences and implementing those theories into practice. This concept is summarized by these authors: “Thus in all educational settings, practice, which is deeply contextual, relational, and interdisciplinary, is also and always theoretical and interpretive” (Cochran-Smith & Lytle, 2009, p. 134). Therefore, theories of practice can be described as a reflexive and ongoing dialectic between theory and practice.

As indicated previously, this study is characterized as one of practitioner research. The context of the Transdisciplinary Design Studio was the research site where I served as an instructor. More specifically, this study is situated within Cochran-Smith and Lytle’s (2009) description of the scholarship of teaching which focused on those in higher education who are “engaged in sustained inquiry into their teaching practices and their students’ learning” (p. 40). Through an attention to the scholarship of teaching as well as student learning, my study was focused on understanding how students tell stories of their lived experiences in the design studio, particularly those focused on disciplinary identity and the creative process. In taking on a practitioner research approach, I had the opportunity to meet the students in the midst (Clandinin, 2013; Clandinin & Connelly, 2000) and inquire deeply into their/our experiences. In this way, practitioner research provided insight valuable for transdisciplinarity educational practices and the impact of those practices on student experiences.
Narrative Inquiry

The final methodological lens through which my study was perceived is that of narrative inquiry. As Clandinin and Caine (2008) asserted, “narrative inquiry is first and foremost a way of understanding experience” (p. 542) as it values human experience “as a source of important knowledge and understanding” (Clandinin, 2013, p. 16). Through this methodology, researchers explore participant’s storied life experiences as they are preserved holistically rather than parsed into thematic or discursive units (Josselson, 2011; Riessman, 2008). In this way, narrative inquiry differs from many other qualitative analytic approaches like grounded theory (Riessman, 2008).

Since the mid-1980s to 1990s, there has been a growing interest in narrative within the social sciences (Clandinin & Caine, 2008; Riessman, 2008). This “narrative turn” stemmed from challenges to realist and positivist thinking that was pervasive in the research world for much of the twentieth century. In this time, realism gave way to interpretivism as researchers in fields such as sociology and anthropology explored their roles within research rather than seeing themselves as removed from the field of study. When this turn began is up for debate, but many scholars point to the 1960s as a crucial point in the emergence of narrative in the Western world as major shifts in technology, politics, epistemology, and social equality were underway (Riessman, 2008).

John Dewey’s writings on experience often serve as a theoretical foundation in narrative inquiry (Bach, 2007; Clandinin & Caine, 2008; Clandinin & Connelly, 2000). An educational philosopher, Dewey was captivated by the concept of experience and wrote numerous publications on the topic with an attention to its role in education and even aesthetics. Dewey (1938/1997) theorized that experience encompasses two essential principles—interaction and
continuity. The principle of interaction centers on the notion that individuals inhabit a social world where interactions form the foundation for meaning making. In other words, experience is situated and constructed in social interactions. Similarly, the principle of continuity acknowledges that experiences are not isolated events but that each new one builds from prior experiences—an iterative succession of experience where past-informs-present-informs-future (Clandinin & Connelly, 2000).

Dewey’s conception of experience influenced Clandinin and Connelly’s (2000) assertion of narrative as encompassing three dimensions with regard to temporality, sociality, and space. The first two dimensions draw directly from the principles of continuity and interaction discussed above where continuity promotes a backward-forward inquiry while interaction moves the researcher inward-outward. According to the authors, the backward-forward continuum denotes temporality where one considers past, present and future. Inward inquiries, on the other hand, travel intrinsically within the participant and explore emotions, reactions, and ethical positioning while outward looks to the “existential conditions, that is, the environment” (p. 50) which informs the participant’s experiences. The final dimension is place, or the physical boundaries in which the narrative inquiry is situated. It is these three dimensions through which narrative inquirers live, understand, and construct narrative texts (Clandinin & Caine, 2008; Clandinin & Connelly, 2000).

Many researchers who employ narrative methodological approaches acknowledge the challenging task of defining narrative (Josselson, 2011; Riessman, 2008; Tamboukou, 2008). In fact, Clandinin and Connelly (2000) consciously avoided presenting a definition for narrative in their book, Narrative Inquiry: Experience and Story in Qualitative Research, focusing instead on what it is that narrative inquirers do. Other narrative researchers are much more forthcoming in
revealing their conceptions of narrative. For example, Riessman (2008) presented a broad conceptualization of narrative in stating:

The term narrative in the human sciences can refer to texts at several levels that overlap: stories told by research participants (which are themselves interpretive), interpretive accounts developed by an investigator based on interviews and fieldwork observation (a story about stories), and even the narrative a reader constructs after engaging with the participant’s and investigator’s narratives. (p. 6)

Here, Riessman addressed the many formats that narrative might take in narrative inquiry all of which possess an interpretive function. She went on to summarize that “narratives are strategic, functional, and purposeful” (p. 8). Another narrative researcher, Polkinghorne (1995), presented narrative as “type of discourse composition that draws together diverse events, happenings, and actions of human lives into thematically unified goal-directed processes” (p. 5). While specific conceptions of narrative may vary, most researchers agree on the three dimensions of narrative space as presented above by Clandinin and Connelly (2000) which encompass an attention to temporality, sociality, and place. It is through an attention to Dewey’s principles of interaction and continuity as well as the dimensions of temporality, sociality, and space that my study sought to understanding student lived experience in the Transdisciplinary Design Studio.

Finally, Clandinin and Connelly (2008) cited two methods through which narrative inquiry is approached: living or telling stories. Through the triangulation of the narrative inquiry and practitioner-research methodology, this study employed a consideration to both the living and the telling through which the researcher’s experiences unfolded alongside those of the participants, and the researcher provided avenues through which their stories could be shared. These authors caution that regardless of the narrative entry point, researchers “need to attend to
the ways individual narratives of experience are embedded in social, cultural, and institutional narratives” (p. 542). The two subsequent findings chapters will demonstrate an attentiveness to these broader narratives as situated within the participants’ own words and connected to relevant literature.

**Visual Narrative Inquiry.** While the term *narrative* often conjures an attention to written or spoken text, the methodology of narrative inquiry also encompasses other expressive modalities. Riessman (2008) explains that: “Words, however, are only one form of communication; other forms (gesture, body movement, sound, images) precede words in human development and continue to communicate meaning through the life course” (p. 141). There are many contemporary researchers who have broadened their conceptions of narrative to encompass various means of communication including photography (Bach, 2007; Bach, 2008), videos (Binder & Kostopoulos, 2011), found and created images (Clark, 2011; Johnson, 2004; Tamboukou, 2008; Wright, 2007), and movement/ gestures (Beattie & Shovelton, 2011). For this study, I have conceptualized narrative as encompassing visual imagery in addition to written and oral text.

Narrative researchers who explore experience as it is documented within these visual contexts often assume an analytic approach referred to as visual narrative analysis. Visual narrative analysis “pushes the boundaries of narrative and narrative analysis” (Riessman, 2008, p. 145) where multiple layers of meaning contribute to understanding lived experience (Bach, 2008). Essentially, this analytic methodology embraces the complexities of narrative as it is revealed and generated through the various modalities through which humans communicate and construct meaning. This section brings forth a brief history of visual methodologies in the social
Inquiries into the visual are strongly grounded in the disciplines of anthropology and sociology where advancements in photography and film in the late nineteenth and early twentieth centuries inspired a turn to the visual (Harper, 1998; Prosser, 1998). In sociology, field workers were inspired documentary photographers like Dorothea Lange who captured images focused on social welfare during the 1930s. Sociologists recognized the deep level of involvement and insider perspectives these photographers were able to obtain through their photographic documentations and sought to apply similar approaches in their fieldwork (Harper, 1998). Early pioneers in visual anthropology were Gregory Bateson and Margaret Mead whose work focused on the documentation of non-Western cultures (Riessman, 2008). Individuals like Bateson and Mead inspired a “visual turn” in both sociology and anthropology which mirrors that of the narrative turn in that researchers moved away from formalism and towards interpretivist and phenomenological perspectives in research (Banks, 2007; Riessman, 2008). This turn gave way to a formal recognition of the field of visual methodologies such as visual ethnography in the late 1980s to 1990s (Berg, 2008).

Firmly rooted in the traditions of visual ethnography, visual narrative analysis is often focused on the use of photography as the medium of choice. Hedy Bach (2007) is one such researcher who uses the camera to explore narratives through both autobiographical and photo voice approaches. She explained that “visual narrative inquiry allows me, as autobiographical narrative inquirer and as narrative inquirer in relation with others, to add layers of meaning to stories lived and told” (p. 283). Extending beyond the photograph, Maria Tamboukou (2008) conducted visual narrative research on the Welsh portrait artist, Gwen John, exploring her
paintings, correspondence, and other publications based on her art. Tamboukou elaborated on her process:

What I have found fascinating, however, in the textual/visual interface is that it has created conditions of possibility for forceful encounters between the actual and the virtual and has created a space where process in narratives can be further explored. (p. 287)

Greer Johnson (2001; 2004) also situated her research in the space between text and the visual her research as she investigates visual-verbal narratives of student teacher’s experiences.

Assuming a multimodal approach to narrative, Johnson (2004) indicated that:

The combined visual–verbal narrative genre itself positions storytellers to question the ‘truthfulness’ of the stories they are telling: to tell tales in different voices. Therefore, the story is capable of sustaining multiple tellings and readings that might help to re-situate the writer and the audience within a different, institutionally critical, identity. (p. 425)

As Johnson points out, visual narratives lend themselves to multiple readings which comprises an important part of the aforementioned researchers’ analytic process. Bach, Tamboukou, and Johnson all engaged in numerous readings of their texts where they peeled away the various layers of the narratives, attending to the complexities and voices that inhabit each layer.

So, why are researchers so intrigued by this multilayered and multivoiced approach to narrative? First, as indicated above, an attention to or inclusion of the visual in narrative research proves beneficial when words cannot effectively encapsulate a participant’s experience (Weber, 2008). As Keats (2009) explains, “Without a nonverbal means of expression, participants may be limited in how they articulate their experiences” (p. 187). Having the freedom to communicate in nonverbal ways can encourage embodied cognition where understandings pervade the senses in provoking and captivating ways (Weber, 2008). An advocate for arts education, Eisner (2002)
similarly addresses that expression through an artistic medium affords the creator a visual language which conveys qualities that are inexpressible through words.

The visual language of images can be liberating for participants but is also highly interpretive and can pose ethical challenges for researchers. Using techniques like photovoice in which participants photograph aspects of their lived experiences (Berg, 2008) can place participants in positions where they may expose themselves and their community to scrutiny. Researchers must be mindful of the vulnerability of techniques like this one and consider ethical implications that may arise. Visual methodologies also embrace an open-endedness which resist single interpretations where “images can give rise to a range of alternative paths of inquiry” (Banks, 2007, p. 60). This quality of visual inquiry is considered a strength by some researchers while others are critical of the “vulnerable” and fluid nature of images (Bach, 2008). Weber (2008) pointed out that the visual is not that different from verbal communication in that “Images, like words, can be used to twist and distort and mislead” (p. 50). The multiplicity, complexity, and nonlinearity of visual narratives bring forth an ambiguity which requires the researcher to remain reflexive and deeply engaged in the field texts. Along these lines, I have addressed the specific ways that reflexivity was maintained in this study in the discussion of process below. As daunting as it may seem, it is through visual images that the analytic door is pushed open even further, broadening our scope and deepening our understandings of experience (Pink, 2007; Weber, 2008).

Finally, one of the most cited reasons for including visual images in narrative research is, put simply, their pervasiveness. Banks (2007) states, “images are ubiquitous in society, and because of this some consideration of visual representation can potentially be included in all studies of society” (p. 3). Our world is becoming increasingly visual in this digital age and
images comprise an important part of how individuals conceive and construct experience. Therefore, if researchers exclusively rely upon verbal forms of communication, they may be neglecting important aspects of lived experience. Through this study, I strove to approach lived experience in a holistic way which is why visual images were included as an integral aspect of the students’ meaning making processes. If image-based creation was used as part of the students’ meaning making and inquiry process, I felt it was essential to use a methodology which supported this notion.

**Data Collection Methods**

Data within this study were collected from August to December 2012 and encompassed various modes of visual and verbal expression. Student visual journals, two approximately 45-minute focus groups, and the students’ Final Reflective Papers comprised the data set, or field texts. In this section, I will discuss these field texts and their relevance to my study. Table 2 below outlines the relevant information that will be covered in this section.

*Table 2*

Student Field Texts Breakdown

<table>
<thead>
<tr>
<th>Student</th>
<th>Visual Journal</th>
<th>1st Design Challenge</th>
<th>2nd Design Challenge</th>
<th>Focus Groups</th>
<th>Format of Final Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amy</td>
<td>3 checks</td>
<td>Group 1</td>
<td>Group 2</td>
<td>Facilitator 2</td>
<td>reflective paper</td>
</tr>
<tr>
<td>Sara</td>
<td>3 checks</td>
<td>Group 2</td>
<td>Group 3</td>
<td>Facilitator 3</td>
<td>reflective paper</td>
</tr>
<tr>
<td>Vanessa</td>
<td>2 checks</td>
<td>Group 1</td>
<td>Group 1</td>
<td>Facilitator 3</td>
<td>synergistic paper</td>
</tr>
<tr>
<td>Christy</td>
<td>2 checks</td>
<td>Group 3</td>
<td>Group 1</td>
<td>Facilitator 3</td>
<td>synergistic paper</td>
</tr>
<tr>
<td>AshLeigh</td>
<td>3 checks</td>
<td>Group 2</td>
<td>Group 2</td>
<td>Facilitator 1</td>
<td>reflective paper</td>
</tr>
<tr>
<td>Ellie</td>
<td>3 checks</td>
<td>Group 3</td>
<td>Group 2</td>
<td>Facilitator 2</td>
<td>reflective paper</td>
</tr>
<tr>
<td>Marissa</td>
<td>3 checks</td>
<td>Group 2</td>
<td>Group 3</td>
<td>Facilitator 1</td>
<td>reflective paper</td>
</tr>
<tr>
<td>Ethan</td>
<td>3 checks</td>
<td>Group 3</td>
<td>Group 1</td>
<td>Facilitator 1 (1st focus group- absent)</td>
<td>reflective paper</td>
</tr>
<tr>
<td>Quentin</td>
<td>2 checks</td>
<td>Group 2</td>
<td>Group 3</td>
<td>Facilitator 2</td>
<td>synergistic paper</td>
</tr>
<tr>
<td>Tyler</td>
<td>2 checks</td>
<td>Group 1</td>
<td>Group 3</td>
<td>Facilitator 1</td>
<td>synergistic paper</td>
</tr>
<tr>
<td>Grant</td>
<td>2 checks</td>
<td>Group 3</td>
<td>Group 2</td>
<td>Facilitator 2</td>
<td>synergistic paper</td>
</tr>
</tbody>
</table>
**Visual Journals**

As discussed in Chapter 2, the visual journal is best conceptualized as a hybrid between the artist’s sketchbook and the writer’s journal where individuals have the opportunity to explore ideas using different expressive modalities. La Jevic and Springgay (2008) proclaimed that, “Visual journaling establishes an opening of inquiry for students to document their reflections, questions, and beliefs” (p. 82). Along these lines, individuals may use the space within visual journals to: critically reflect on their learning, explore through ideas and media, construct meaning, make connections, express personal thoughts, and document creative and cognitive processes. Though many consider research documents as purely text-based, Prior (2003) stated that: “documents frequently contain pictures, diagrams, emblems and the like, as well as words” (p. 5) and can be multimodal. The flexible and multimodal quality of the visual journal comprises its largest strength and made it a valuable source in this study.

As part of the assessment requirements for the Transdisciplinary Design Studio, students were asked to keep a visual journal throughout the semester. These documents were integral components of the course as everything from daily notes and reflections to sketches and design plans were included. The consistent use of visual journals by the students provided an effective longitudinal exploration of how student ideas and experiences expanded and evolved throughout the semester. For consistency, each student was provided with a hardbound 8”x10” book filled with blank pages during the second class meeting when these tools were formally introduced. During this introduction, a visual PowerPoint presentation outlined the many functions and possibilities inherent in visual journals where examples from arts-based and design-based disciplines were provided. In addition, students were provided with a “Visual Journal Guide” (see Appendix C) which students attached to the first page of their visual journal to remind them
of the book’s intents and purposes throughout the semester. Finally, students were provided with a zipper pouch filled with various artemaking implements such as drawing pencils, pens, watercolor pencils, a water brush, erasers, and pencil sharpeners. These items were distributed to promote creative exploration and multimodal expression as students engaged in visual journaling.

The Transdisciplinary Design Studio met twice per week (Mondays from 2:30 to 4:45 and Wednesdays from 2:30 to 5:30) during which students were expected to use their journals. Throughout the semester, students engaged in prompted visual journal responses which addressed a specific topic or question posed by the instructors. Topics and questions varied and ranged from 1-minute papers which demonstrate new understandings or questions related to course material to visual representations of abstract concepts (see Appendix D). As indicated on the “Visual Journal Guide,” students were also encouraged to use their visual journals outside of class including the documentation of Meta-Moments, or moments of realization and/or awareness of their learning, connections, and creative processes.

As apparent in Table 2, student visual journals were collected two times during the semester for graduate students and three times for undergraduate students during scheduled visual journal checks (see Appendix E for more information). For these checks, students were asked to electronically submit high quality, uncropped, and unedited scans of their visual journals. With regard to the final visual journal check of the semester, students were also asked to turn in their actual journal for researcher review along with the scanned document. For all journal checks, a formative assessment checklist was provided to assist students in meeting criteria (see Appendix F) while a final summative grade was assigned based on completion of
required prompts (see Appendix G). Neither the checklists nor the final grades were used as data in this study.

**Reflections**

Student reflection was an important aspect of the Transdisciplinary Design Studio as it facilitated meaning-making, awareness of creative processes and proclivities, and provided the opportunity to synthesize their learning in a holistic manner. Hetland, Winner, Veenema, and Sheridan (2007) discussed the importance of reflection in reference to the visual arts studio course as it cultivates insight into one’s own creative work and process as well the work of others. Hetland et al. were careful to specify that reflection should move past the “yes/no”, or convergent, lines of questioning of which students are most familiar. Instead, open-ended questioning which encourage learners to “think about and explain their process, decisions, and intention” (p. 65) and to evaluate their own work and the work of others were presented as more effective means of engaging students in reflection. This style of questioning is consistent with cultivating reflection in students as it cultivates inquiry which allows them to become aware of their creative processes.

Student reflections took many forms. Throughout the course, students were asked to complete 1-minute papers either at the beginning of class to check for understanding of assigned readings, or at the end of class to facilitate thoughtful reflection on the activities of the day. In addition to the 1-minute papers, other reflection-based prompts were presented to the students for inclusion in their visual journal. Extending beyond the traditional written reflection, these visual journal prompts provided opportunities for students to create visual-verbal reflections in order to promote engagement in multi-modal thinking and expression. As Milne (2004) pointed out, “it may be, though, that reflection through words is unnecessarily limiting” (p. 37). The purpose of
reflecting was not only to engage students deeply in the course content and meaning making, but to encourage students to use multiple modes of expression for communicating their thoughts, inquiries, and experiences.

Most of the student reflections occurred informally as summative work within the context of the visual journal; however, students also engaged in focus groups and were asked to submit summative written reflections at the conclusion of the semester. As evident in Table 2, the undergraduate students were responsible for writing a reflection focused on synthesizing course content with their outside knowledge and experiences while the graduate students were encouraged to perceive how the course contributed to their developing research projects (i.e. master’s theses/ applied projects or doctoral dissertations). These reflections had bearing on student performance as they comprised specific percentages of their course grades. Because of the higher stakes quality, it is possible that these reflections in particular demonstrated a type of response bias where students provide reflections with the intention of pleasing the instructors rather than authentic expressions of experience.

**Focus Groups**

Throughout the semester, students participated in two focus groups which were scheduled after the first major assignment and the final project respectively (see Table 3 for dates). Focus groups are a form of data collection which resembles group conversations group interviews (Kamberelis & Dimitriadis, 2005) and emphasizes group interaction (Morgan, 1996). Many cite the emergence of focus groups as beginning after World War II (Kamberelis & Dimitriadis, 2005; Steward, Shamdasani, & Rook, 2007) at which time behavioral researchers began exploring the potential of this data collection tool. For this NSF research study, focus groups
were implemented by the research team as a means of fostering “deliberate reflection” of learning experiences in the studio (Walther et al., 2009; Walther, Sochacka, & Kellam, 2011).

The style of the focus groups was aligned more closely with a directive approach (Steward, Shamdasani, & Rook, 2007) where a handout with prompts were provided for the students and used as an informal topical guide throughout the focus group. The focus group protocol itself was characterized as semi-structured which Roulston (2010) described as using a prepared list of open-ended questions where the interviewer “follows up with probes seeking further detail and description about what has been said” (p. 15). Additionally, the facilitators for the focus groups were not the instructors but faculty members of the research team. This decision was made by the research team to help foster a psychologically safe and open environment where the students would feel free to discuss sensitive issues and provide more holistic narratives of experience. Overall, the facilitators’ roles within these focus groups served to foster interaction among the student participants (Roulston, 2010) while also eliciting elaboration and clarification.

During the focus groups, each facilitator provided their group of students a handout with potential prompts which were devised to promote reflection and spark conversation (Appendices H & I). These prompts served two different studies, the study discussed in this paper as well as the larger study on synergistic learning funded by the NSF. Once the students received the handout, the facilitators reminded the students of the confidentiality of the focus group discussions as outlined in the IRB consent forms as well as the purposes of the research projects. They were then allotted five minutes to look over the prompts and jot down notes for discussion points. After the initial five minutes of written response time, the focus groups engaged in dialogue for anywhere from 35-45 minutes with the facilitator employing Roulston’s (2010)
suggestions for clarification/ transition statements and summarizing statements when appropriate.

The focus group interview encompasses benefits and drawbacks in this study. As the theoretical underpinning of narrative inquiry is grounded in Dewey’s conception of experience as socially constructed, the focus group provides a context where meaning is made through dialogue with the other. Morgan (1996) explained, “What makes the discussion in focus groups more than the sum of separate individual interviews is the fact that the participants both query each other and explain themselves to each other” (p. 139). The constructivist nature of the focus group permits individuals to articulate and makes sense of their experiences through candid dialogue while the group format also fosters participation (Vaughn, Schumm, & Sinagub, 1996). In this way, the focus group provides insight into the relational ways in which individuals position themselves with respect to others (Kamberelis & Dimitriadis, 2005). Further, Walther, Sochacka, and Kellam (2011) also found that reflective focus groups invoked individuals’ awareness of moments of critical learning.

There are limitations to the use of focus groups, including having three different members of the research team serve as focus group facilitators. Kidd and Parshall (2000) pointed out that: “Difference in moderator experience and interviewing style may affect the flow, texture, and content of focus group interviews” (p. 302-303). Along these lines, the group make-up itself likely contributed to the effectiveness of dialogue. One group in particular ended up consisting of three art education majors and an underlying tension arose as two of the three students were in the same design challenge team. Attempts were made to divide up teams and majors as much as possible for the focus groups (see Table 1); however, a change in teams from the first to the second project as well as an absence in the first focus group resulted in a shift in groups and one
group being more homogeneous than the others. This homogeneity did not appear to disrupt the narratives of experience as they were still honest and comprehensive; though it is worth noting for transparency of the data collection process. Finally, in using focus groups as data collection, it is important to acknowledge that these group contexts have the potential to cause social discomfort and the tendency for individuals to provide socially acceptable responses (Byers & Wilcox, 1991). Despite these potential limitations, the benefits of using focus groups was substantial in elicting relational, honest, and holistic depictions of lived experience.

**Participant Observation**

Participant observation comprised the final method of data collection and is unique as it provides a different source of data other than the documents discussed above. Originating in cultural anthropology and commonly used in ethnographic research, participant observation is a qualitative method of data collection through which the researcher “takes part in the daily activities, rituals, interactions, and events of a group of people” (DeWalt & DeWalt, 2002, p. 1). The information gathered through degrees of passive and/or active engagement (Spradley, 1980) with the participants contributes to systematically generating knowledge and holistic understandings of the research context. As a practitioner-researcher, I assumed the role of complete participant observer (Spradley, 1980) when I was fully involved in teaching and learning activities with the students. At other times, it was possible for me to take on more of a passive participant observation role when Nicki was leading the class or while students were engaged in studio work or group work. This shift in roles provided me with multiple lenses through which I could perceive the participants and course activities.

Using participant observation, I recorded notes to document my observations related critical events during class meetings. Being an instructor made it challenging to take field notes
during class which is why these were not used as primary sources. While participant observation
was a secondary source, these notes were often referenced in conjunction with the primary
sources to either complement or refute developing interpretations.
### Table 2

Field Text Collection Summary

<table>
<thead>
<tr>
<th>Source of Field Text</th>
<th>Course Integration</th>
<th>Frequency of Implementation</th>
<th>Documents</th>
<th>Focus Groups</th>
<th>Participant Observation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students</td>
<td>Required component of the course- 20% of final grade for undergraduates and 10% of final grade for graduate students.</td>
<td>Regularly Utilized primarily during class meetings held twice/week for 3 hours. Use outside of class is also encouraged.</td>
<td>Multimodal</td>
<td>Required component of the course. Reflections comprise part of overall assessment in design challenges. Final synthesis/ reflection is also 5% of final grade.</td>
<td>Facilitated by research team; enrolled students are participants</td>
</tr>
<tr>
<td>Students</td>
<td>Required component of the course. Serves as a formative assessment to generate information about the course.</td>
<td></td>
<td>Written/ visual</td>
<td></td>
<td>Audio and audio transcriptions</td>
</tr>
<tr>
<td>Format</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

| Primary or Secondary | | | | | |
|----------------------|-----------|-----------|-----------|-----------|
| Primary              | Visual Journals | Reflections | Focus Groups | Participant Observation |
| Secondary            | | | | |

<table>
<thead>
<tr>
<th>Course Integration</th>
<th>Frequency of Implementation</th>
<th>Documents</th>
<th>Focus Groups</th>
<th>Participant Observation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required component of the course- 20% of final grade for undergraduates and 10% of final grade for graduate students.</td>
<td>Regularly Utilized primarily during class meetings held twice/week for 3 hours. Use outside of class is also encouraged.</td>
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<tr>
<td>Required component of the course. Serves as a formative assessment to generate information about the course.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Frequency of Implementation</th>
<th>Documents</th>
<th>Focus Groups</th>
<th>Participant Observation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regularly Utilized primarily during class meetings held twice/week for 3 hours. Use outside of class is also encouraged.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Periodically Specific times include: September 12, 2012 October 17, 2012 December 3, 2012 December 6, 2012</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Two Times: September 17, 2012 November 14, 2012</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regularly During class meetings held twice/week for 3 hours. Total of 6 hours/week.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Data Analysis Methods

Visual-Verbal Narrative Analysis

In speaking of narrative research, Polkinghorne (1995) distinguished between two types: analysis of narrative and narrative analysis. In the latter, the findings are represented through an emplotted narrative, or story and Polkinghorne explained that “the process of narrative analysis is actually a synthesizing of the data rather than a separation of it into its constituent parts” (p. 15). Initially, the decision to employ a narrative analytic method emanated from a desire to explore holistic visual-verbal depictions of student lived experiences and reveal those stories through (co)constructed narratives. In this study, I will be using the term (co)construction as written in reference to my constructivist epistemology and Dewey’s (1938/ 1957) theory of experience as grounded in the criteria of interaction and continuity. These foundational assumptions contribute to the construction of knowledge as being relationally (co)constructed; in other words, it through the other that we come to know the self (Clandinin, 2013). In this way, every act of identity construction is also an act of (co)construction.

As indicated above, the primary field texts collected for this study represented both visual (visual journals) and verbal (visual journals, focus groups, final reflective papers) modes of communication. Utilizing these two seemingly disparate expressive modalities resulted in a search for an analytic method which would place equal emphasis on visual and verbal texts as well as reflect my theoretical and epistemological stances (Guyotte, 2013). This parallels what Kingsley (2009) asserted: “The interrelationships between visual and non-visual data generate varied types of knowledge” (p. 546). In this way, Johnson’s (2004) research on student teachers’ constructed comic books which combined both visual imagery and text emerged as an exemplar
for this study. Calling her method *visual-verbal narrative analysis*, Johnson explained her underlying process:

> The visual–verbal narrative (picture book) examined in this paper demands to be read through at least two semiotic channels (visual and verbal), because it operates through two distinct ‘grammars’ of communication. It allows the storyteller (as more conventional stories do not) to speak in two voices at the same time. (p. 426)

This description aligned nicely with my conception of visual and verbal texts as comprising different layers, or voices, to understandings of lived experience. Adding another level to Johnson’s method, I contend that the space between the visual and verbal is also worthy of investigation as these modalities infuse and inform one another in a dialogic manner⁶.

The essence of visual-verbal narrative analysis resides in storytelling as a complex and multifaceted dialogue where participants have the opportunity to expand their thinking into domains other than traditional oral or written form (Kress, 2011). This multilayered (Bach, 2007) and multivoiced (Johnson, 2004; Josselson, 2011) approach to narrative inquiry embraces a more holistic view of what constitutes text where “images become ‘texts’ to be read interpretively (as written transcripts are)” (Riessman, 2008, p. 142). Riessman (2008) indicated that visual narrative analysis is rapidly developing where considering both image and spoken/ written texts alongside one another reveals interesting aspects of human identity. While many researchers speak to the importance of visual imagery in narrative inquiry (Bach, 2007; Bach, 2008; Riessman, 2008), there is an inherent privileging of the visual through the designation *visual narrative analysis*. As I strove to consider both text and image as contributing equally to my exploration of lived experience, I have adopted Johnson’s term *visual-verbal narrative analysis*

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to describe the method utilized in this study as it denotes a connectedness between these modalities.

In employing this multilayered approach to narrative content, the visual-verbal narrative analysis actually began when these field texts were collected during the implementation of the design studio as gathering and analysis are recursive processes (Hoonaard & Hoonaard, 2008). As a practitioner researcher, I was responsible (along with Nicki) for conducting formative and summative assessments of student work. These initial glimpses at the field texts from a primarily practitioner perspective allowed me to glean valuable information about the ways in which the students were engaging in meaning making and discussing their lived experiences and identities through the visual-verbal texts.

Upon undertaking a more formal analysis after all the data was gathered, I was attentive to my role in the midst (Clandinin, 2013; Clandinin & Connelly, 2000) and maintained reflexivity through memoing about my own process of making sense of the field texts while attending to the (pre)conceptions I faced as the instructor. Addressing and engaging with some of my challenges with this practitioner-researcher role, I wrote a reflexive paper which explored my research in-progress (see Appendix J for an abstract of this paper). The formal stage of analysis began with a general reading, visual and verbal, of all the field texts at which time I documented my first impressions of the texts including striking prose, metaphors, introspective moments of reflection, references to identity, and my own reflexive notes (Keats, 2009) in a Word document memo. A segment of an early memo can be found in Appendix K. During this reading, I strove to gain a more holistic sense of the students’ narratives including prominent issues found in my second research question surrounding creative and disciplinary identity. Researcher memos reflected my desire to stay close to the text by often including the participants’ in-vivo text (in
the participant’s own words) corresponding with my own inquiries as well as detailed descriptions of the visual content.

Concurrent with this initial reading, an Excel workbook (Figure 3) was used to begin the process of organizing these field texts for analysis. Each participant was allotted a separate Excel worksheet where both image and text were added into designated columns. Whereas NVivo had served as a useful tool for preliminary explorations of the field texts through the context and parameters of qualitative research coursework, the narrative and multimodal approach to this study impelled me to consider a more appropriate alternative which would allow for a more fluid movement between image and text as well as intertext (across students’ field texts) and intratext (with one individual’s field texts) readings (Keats, 2009). Further, my visual arts background left me wanting to create my own organizational tool, manipulating it to my own specifications.

![Figure 3. Excerpt from Excel Workbook](image-url)
Upon completing this initial reading, the concept of the in-between continued to resonate with me as documented in my researcher memos (see Appendix L for memos referencing the in-between). It was at this point that I made the decision to use this construct as a lens through which the findings would be considered. Through more specific readings of the individual student’s texts, I constructed a visual concept map of how my research questions were being addressed while also considering how the students were constructing the studio as an in-between space (Figure 4). Butler-Kisber (2010) recommended the use of concept maps during the analysis process when patterns within the field texts begin to emerge.

The process of creating the concept map began with incorporating the names of all the participants around a white space in the center. As I engaged with the field texts, text deemed relevant to the research questions was connected to each participant along with direct quotes—both in light blue as seen below. Through this process, certain concepts emerged which cut across participants and these were integrated into the center of the concept map—the light purple. It was through this process that I not only gained insight into each individual’s narratives of lived experience, but the concept map also provided broader conceptions of how metanarratives (or patterns) were forming across participants. Approaching analysis through this visual-verbal approach complemented my methodological assumptions about the importance of both of these modalities in meaning making.
Figure 4. Illustration of researcher concept map (above) and detailed view (below).
The abundance of visual connections depicted through arrows in the mind map led me to consider the relational quality of the student narratives, and I began an inquiry into how these narratives could be presented as thoughtfully interwoven. I endeavored to explore the student narratives through depth and breadth which led me to focus on a small selection of relational narratives in Chapter 4 and metanarratives of the entire data set in Chapter 5. Through the engagement with the visual concept maps, I selected three students whose stories became enmeshed through their tellings of disciplinary and creative identity and commenced in the next step of analysis.

These three students were chosen for multiple reasons. They were initially considered because their narratives focused on meaningful interactions with one another by specifically addressing at least one of the other two (i.e. AshLeigh referenced Ellie and Christy; Ellie spoke about Christy; and Christy discussed Ellie). Additionally, they all depicted honest and holistic portrayals of disciplinary and creative identity. Finally, an attention to a diversifying the narratives was considered as the students represented two of the three disciplines enrolled in the course (engineering and art education), both the undergraduate and graduate level, and self-identified white and non-white ethnicities. Tables were created for each participant, and I conducted a specific reading (Keats, 2009) into each individual’s field texts focusing on my research questions. Concurrently, I held Labov’s (1982) narrative structure in mind as I loosely organized the text according to the structural elements of abstract, orientation, complicating action, evaluation, resolution, and coda while attending to the three dimensions of narrative—temporality, sociality, and place (Clandinin & Connelly, 2000). An example of AshLeigh’s narrative construction table appears in Appendix M.
After the focused reading of each student’s field texts and the completion of their respective tables, I began creating their narratives. As much as possible, I strove to use the students’ own words and phrases which appear italicized in Chapter 4 although some narrative smoothing (Spence, 1986) was used (i.e. utterances such as “like” were removed). Interpretive or clarifying additions were included to increase readability or provide additional context when deemed necessary—the non-italicized text. Concurrently, images were incorporated into the verbal narratives to both complement the text but also allow the reader to engage in the meaning making process alongside the researcher—contributing to a multilayered (co)construction. This process might be thought to mirror the artistic act of assemblage where constituent parts are pieced together into a coherent and harmonious whole (Polkinghorne, 1995). Once all of these narratives were constructed, they were sent along with a draft of Chapter 4 to each participant who offered feedback and suggestions for revision (see Appendix N for an email excerpt). It is worth noting that these narratives depict but a glimpse of each student’s lived experiences in the course and focused on discussions of disciplinary and creative identity and the other.

The final formal stage of analysis expanded my lens to the metanarratives which emerged throughout the corpus of field texts. I turned my attention back to the concept map and concurrently engaged with the Excel spreadsheet while generating understandings of these broad narratives of experience. Focusing on my research questions, I began pulling out segments of text which focused on perceptions of disciplinary and creative identity and putting these into another table. Certain words and phrases appeared across student narratives, and I organized the texts into sections of similar concepts which were color-coded and eventually served as the organization for the discussion in Chapter 5. Table 3 illustrates the three major concepts,
underlying facets, and an example of a relevant quote for each. Image and text were brought together in this chapter to provide rich and holistic depictions of student lived experience.

Table 3

<table>
<thead>
<tr>
<th>Concepts, Facets, and Relevant Quotes</th>
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<tbody>
<tr>
<td>Concepts</td>
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<tr>
<td>Creativity and the creative self</td>
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<tr>
<td>Disciplinary self and disciplinary others</td>
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Protection of Human Subjects (IRB)

Participation in this study was completely voluntary and was approved through the Instructional Review Board at the University of Georgia. Through participation in this study, students were asked to participate in normal class activities including visual journaling, reflective activities, studio projects, and class discussions. Involvement did not increase student workload beyond the regular course expectations and curriculum of study. In addition, grades and class standing had no effect on student participation nor did participants receive any extra credit. All information that was obtained in this study was confidential and remained in a locked filing cabinet in a secure location whereas electronic files were stored on a computer with password protection on secured servers for three years. Only the research team had access to the data. Participants were not and will not be identified in any reports of this study and pseudonyms will be used to ensure confidentiality. Finally, there were no benefits associated with participation in this study outside of the benefits to learning that occur from participation in the course. There were no anticipated risks, discomforts, or stresses from participation in this study (see Appendix O for the standard consent form).

Subjectivity Statement

Preissle (2008) cited that researcher reflexivity “can be considered the process for which subjectivity statements are the product” (p. 844). In creating my subjectivity statement, I elected to use a digital format where the process of creation engaged me in the reflexive act of uncovering and understanding my personal subjectivities. Using both image and text provided an opportunity to depict my experiences, dispositions, and beliefs through a multilayered and multimodal presentation which echoes the inherent complexities of human nature. As my
research centers on the metacognitive and creative potential of multi-modal expression within visual journals, I felt this approach was appropriate.

*Figure 5. Visual Subjectivity Statement*
Rather than provide a written account which simply reiterates what is present in the subjectivity statement above (Figure 5), I will provide insight into the process of creation. Through this insight, one can gain knowledge not only of my subjectivities but also of how these subjectivities are depicted through the multimodal format. I began by creating a list of nouns which describe me from a personal, sociocultural, practitioner, and disciplinary perspective. Words like educator, wife, Christian, white, middle-class, feminist, mother, and graduate student comprise this list and are also found within this subjectivities statement. These terms are merely elucidatory of the qualities that describe me up to this point in my life but they also assist in understanding my research foundation. Definitions for these terms appear lightly in the background but are layered again in the foreground to create a sense of depth and complexity as researchers are multifaceted beings.

Three stylistically different self-portraits can be seen through the text, the most defined one appears separately facing forward on the left side of the composition while the other two appear lower, almost melding together as opposite profile views look backwards and forwards. These three images represent my past, present, and future. Notice that the portrait looking backward is blurred as my perception of the past fades into generalities and details become lost; while the forward facing portrait is loosely sketched as the future is yet undefined. These dichotomous portraits hint that subjectivities are not static; rather they are nebulous and represent our views at any one given point in our life. The forward-facing portrait has a transparent quality as I seek to break down my own façade to uncover deeper understandings of my positionality as a researcher through the creation of this very statement.

In the background, the state of Georgia is discernible. Georgia has been by home since birth and is where I currently reside- I am a Southern woman with Southern experiences, and I
attended a Southern university for all three of my degrees. These experiences partially comprise my research lens. Splattered on top of this map and across the composition are watercolor marks which symbolize my passion for art, creativity, and my time spent teaching in the art classroom. Within one of the paint splatters appear several important terms that I wanted to emphasize: art educator, PhD student, constructivist, guide. Two interconnected circles represent an important aspect of my life, my marriage.

Moving beyond the image above, it is also important to also situate my subjectivities within the transdisciplinary context of this study. I am a former high school visual arts teacher; therefore, it is these experiences that I carried with me as a practitioner and a researcher. As I moved into the in-between spaces of the Transdisciplinary Design Studio, I became aware of my association with a “home” discipline of art education, and I felt a heightened sense of discomfort as I reflected upon my lack of knowledge and experience in both engineering and landscape architecture. Despite a few lessons taught to engineering students, a few observations in environmental engineering classes, and many discussions on engineering culture with the co-instructor, Nicki, I understood my role as a learner with regard to these disciplines. Being a learner on a deep level such as this, while also being a teacher, was unfamiliar to me—just as it was for the students who were supplanted into an unfamiliar learning context with a host of disciplinary others. This discomfort nudged me further and further in-between, which allowed me to walk alongside the students as we traversed the unfamiliar and ever-changing landscape of transdisciplinarity.

**Standards for Research Quality**

Freeman, deMarrais, Preissle, Roulston, and St. Pierre (2007) cited that both theory and practice are key sources for standards of evidence and quality and it is through the interaction
and interrelationship between these two dimensions that quality of research is maintained. From a theoretical perspective, I desired for my theoretical framework based on Greene’s conceptualization of aesthetic education to permeate into all aspects of my study including how I approached the research process. By striving for this level of thoughtful integration, I sought to maintain consistency which contributed to high standards of research quality to establish trustworthiness. With regard to research practice, Freeman et al. (2007) discussed accountability in terms of transparency of process through “systemic and careful documentation of all procedures” (p. 26). In this section, transparency of process will be revealed through a discussion of three aspects of verification as presented by Lincoln and Guba (1985): credibility (validity), dependability (reliability), and transferability (generalizability). While Lincoln and Guba also addressed confirmability (objectivity), I believe that this form of verification is embedded in the three discussions below as well as the subjectivity statement above and did not warrant a separate section.

**Credibility/ Validity**

The terms credibility and validity are often used in reference to discussions of truth with regard to the findings (Lincoln & Guba, 1985). In this study, credibility was addressed through multiple techniques. One of the unique qualities of the Transdisciplinary Design Studio context was the regular and active presence of a second instructor during every class meeting. Peer debriefing (Lincoln & Guba, 1985; Spall, 1998) was an essential and regular part of the research process both during the semester-long class and for the following year and a half while the data was analyzed and the study written. Additionally, memos, tables, mind maps, and (co)constructed narratives were shared with Dr. Sochacka and other members of the research team for feedback during this timeframe.
As a practitioner-researcher, I was engaged in the research context for a prolonged period of time (Lincoln & Guba, 1985) and was afforded the opportunity to get to know the participants as both students and peers (the latter as a fellow graduate student). Further, this study relied on a triangulation of sources (Denzin, 1970; Lincoln & Guba, 1985). The use of texts that included both verbal and visual texts along with sources which documented different points in the semester permitted a more holistic and multivoiced lens through which lived experiences could be explored (Johnson, 2001; Johnson, 2004; Josselson, 2011).

In addressing validity within a narrative methodology, Polkinghorne (2007) specified that data in narrative research is held to the standard of storied evidence which is focused on the accuracy of the description of an event rather than whether the event actually occurred. In order to address this facet of validity, I have invited the participants to reside alongside me in the (co)construction process. Through member checking (Lincoln & Guba, 1985; Stake, 1995), the (co)constructed narratives and the analytic sections in Chapter 4 were emailed to AshLeigh, Ellie, and Christy. Each of these individuals was asked to provide feedback—including suggestions for improvement, clarification, and/or changes. If any suggestions were offered or changes made, I sent the revised text to the student for their perusal once again, keeping the analytic process iterative.

Finally, Polkinghorne (2007) addressed validity in terms of the narrative interpretations, explaining that: “The general purpose of an interpretative analysis of storied texts is to deepen the reader’s understanding of the meaning conveyed in a story” (p. 483). The goal is to move beyond the stories themselves and to delve into the interpretive analysis. In the findings chapters, I have included the students’ in-vivo text as well as discussions from relevant literature and research to support the interpretations. Inconsistencies and contradictions are also noted and
discussed. Constructivist paradigms, including narrative inquiry, recognize that multiple interpretations exist (Polkinghorne, 2007); therefore, it is not a matter of finding the interpretation but putting forth a valid interpretation which is deeply grounded in the participants’ texts as well as supported by external sources.

**Dependability/ Reliability**

As Lincoln and Guba (1985) pointed out, reliability is a prerequisite for validity. In establishing reliability for this study, I engaged in memo writing throughout the analytic process beginning with the very first analytic session (Corbin & Strauss, 2008). Memo-writing stems from grounded theory tradition and is an approach taken by the researcher to promote both documentation and thoughtful analysis throughout the research process (Charmaz, 2006). It is similar to what Lincoln and Guba (1985) referred to as process notes in their discussion of audit trails. Memos were recorded in a Word document which was kept open and used during every analytic session.

While undergoing analysis, I also engaged in a more sustained inquiry into how issues of my methodological and theoretical lenses were influencing my engagement with the data. I perceived this inquiry to be an in-progress exploration of my study, and I reflected on facets of being in the midst (Clandinin, 2013; Clandinin & Connelly, 2000) and wide-awake (Greene, 1995) as they were relevant to my research process. An abstract of the resulting paper can be found in Appendix J.

**Transferability/ Generalizability**

Like Stake (2005) said, “The purpose of a case report is not to represent the world, but to represent the case” (p. 460). The case study design contributes to a brief discussion of generalizability which is often perceived as the applicability of the findings outside of the
research context. Citing a common misconception related to this qualitative design, Flyvbjerg (2006) asserted that it is possible to generalize based on a single case but cautions that formal generalization is often overrated in scientific inquiry. While the goal of this study is not to create generalizations, there is the potential for transferability of the findings into other contexts. My focus, however, is on understanding and generating knowledge of this particular case through thick description (Thick description, 2007) and the cultivation of the opportunity for vicarious experience (Stake, 1995). Stake and Trumbull’s (1982) concept of naturalistic generalizations is also relevant as it emphasizes vicarious and tacit knowledge grounded in experience. This case study may contain naturalistic generalizations where the data presented evokes vicarious experiences for the reader which may contribute to improvements in practice.

**Study Limitations**

Throughout the discussion of data and analysis, I addressed perceived limitations in this study in terms of specific techniques and approaches. In this section, I will touch on a few broader methodological limitations in order to provide transparency and a holistic lens towards the trustworthiness of this study. Assuming the role of a practitioner-researcher poses potential strengths and weaknesses. My degree of immersion in the classroom straddles, or blurs the lines between practitioner and researcher providing a deep level of insight into the curriculum, pedagogy, experiences and interactions within the course meetings. As Cochran-Smith and Lytle (2009) pointed out, “In the university context, blurring boundaries and roles allows for innovative programs of research and new kinds of knowledge as well as new tensions and professional dilemmas” (p. 43). In other words, it has the potential to flourish in this in-between space and provide valuable insight into the scholarship of teaching and learning (Anderson & Herr, 1999). Conversely, this role brings forth limitations as this deep and prolonged engagement
in the studio context is compelling as the researcher is part of the unraveling process but cautions that “being close can mean being too close and losing perspective” (Huberman, 1996, p. 132).

In order to address the limitations associated with a practitioner-researcher methodology, several measures were taken to counteract bias and a narrowed lens towards the analytic process. First, memo-writing was a regular and active part of the research process where issues were addressed surrounding being in the midst as a researcher and reflexivity. Second, peer debriefing was used to maintain an openness to alternative perspectives and either confirm and/or refute the developing analysis. Third, a consistent engagement with the field texts themselves was an integral part of the research process where the in-vivo text was used to (co)construct the narratives and illustrate the analysis and findings. This engagement was essential in uncovering both the relational interconnectedness of the narratives as well as the metanarratives that were consistent amongst the data set. Further, member checking was implemented to ensure that the participants felt that the findings were a fair and accurate representation of the students’ experiences in the course. Finally, multiple methodological approaches were employed encompassing case study and narrative inquiry which addressed McWilliam’s (2004) call for multiple and innovative approaches which might more effectively attend to the complex nature of practitioner research and these research contexts.

Another limitation which expands beyond the practitioner-researcher methodology was the small data set. Eleven students were enrolled in the Transdisciplinary Design Studio and served as participants in this study. While a small data set is not unique in qualitative research, particularly case study research, it might be perceived as a limiting factor in research on student lived experience. To address this limitation, there was an attentiveness in the two following chapters to depicting both the depth and the breadth of the narratives through (co)constructed
individual narratives and metanarratives. Additionally, the detailed student information and thick, rich descriptions cultivated vicarious experience with the reader.

**Chapter Summary**

In this chapter, I have provided insight into the methods and methodology in which this study is grounded. Greene’s (1995) theoretical underpinnings are interwoven throughout the constructivist paradigm while the research questions themselves contribute to the case study and narrative methodological approaches. The site for inquiry was a Transdisciplinary Design Studio which was taught in fall of 2012—a course in which I was an instructor which contributed to taking on a practitioner research lens. Eleven students deriving from three different disciplines served as student-participants, and various field texts were collected including focus groups, visual journals, and final reflective papers. Through attending to both visual and verbal texts, I have borrowed from Johnson (2004) and used a visual-verbal narrative analysis which sought to understand data as multivoiced and multilayered. The findings themselves represent both depth (individual (co)constructed narratives) and breadth (metanarrative) of student lived experience while I strove to maintain attentiveness towards the dimensions of narrative inquiry as grounded in Dewey’s (1938/1957) conception of experience and Greene’s (1995) theory of aesthetic education as demonstrating a wide-awareness to the self and the other. Finally, ethical issues as well as issues of trustworthiness were discussed in order to maintain transparency of the research process (Freeman et al., 2007).
CHAPTER 4

The Relational In-Between: Intersecting, Paralleling, Unfolding Alongside the Other

In her final paper of the semester, Marissa, an undergraduate student from engineering, reflected on the Transdisciplinary Design Studio writing: “From meeting new people from art education, landscape architecture, graduate school and undergrad like me, to the books we read and design challenges we created and all the lovely in-between…” (Final Reflective Paper, lines 115-117). Throughout the data analysis process, I found myself both captivated and enticed by what this student poignantly termed, the “in-between.” The in-between is brought forth by Marissa as encompassing all of the moments that do not neatly fit into the experiential categories she names—perhaps they defy categorization, or perhaps they are even ineffable. As I reflected upon her words during data analysis, I realized that Marissa captured aspects of this study, my narrative inquiry and practitioner-research methodology, and the essence of the design studio through this one hyphenated word—*in-between*.

The in-between represented a myriad of concepts in my narrative study as it conjured up notions of the students as in-process beings; the design studio as comprising an in-between space between disciplines; being in the midst (Clandinin, 2013; Clandinin & Connelly, 2000) as creating an in-between amongst researcher and participant; and even the data in my study as inhabiting the visual and verbal in-between. As I reflected on this construct, the in-between emerged as the space in which our students constructed themselves and their understandings as they navigated through the design studio. It was where they become aware of their thinking and their creativity. It was the space where they resided, perceiving it as temporary yet slowly
discovering that it was permanent. The in-between was where stories surfaced chronicling who our students were, who they have become, and who they might be. Through my analysis, the construct of the in-between emerged as I sought to understand the experiences of students as they navigated through a complex, provocative, and nebulous educational space. Hence, the research questions were: 1) How did students discuss their conceptions of, and relationships between, disciplinary identity, creativity, and the creative process as they resided in-between? 2) How did students tell stories of their experiences in the Transdisciplinary Design Studio through verbal and visual modalities?

As I engaged with the data and considered how the participants were telling stories of their in-between, I began to realize that these were not neatly wrapped packages of individual experiences that could be opened and explored one at a time. They were reminiscent of the in-between space itself—complex, provocative, and nebulous. One afternoon, I sat in my advisor’s office dialoguing with her about my study, and she became contemplative as we spoke about the Transdisciplinary Design Studio. She said something to the effect of: “You know… one of the most fascinating aspects of this course is that we co-enrolled students from different disciplines. It is these relationships and collaborations that make their experiences so compelling…” (T. Costantino, personal communication, December 2, 2013). Her thoughtful musing resonated with me as I was deep in the analytic process and was finding that many of the student narratives were paralleling and intersecting as complex narrative webs. It was this relational complexity which echoed the very nature of the in-between space as I conceptualized it. Hence, if I only provided one story for my readers to open, I was not providing a holistic or accurate perspective of these participants’ experiences as they unfolded in their field texts. The three narratives discussed in this chapter are exemplar narratives which coherently illustrate the participants’ in-betweens as
paralleling, intersecting, and contributing to a holistic perspective of the collective unfolding of experiences in the design studio.

In exploring the participants’ field texts, I often felt as if I were hovering gently over these participants’ lives and watching various perspectives of the same experience, a phenomenon referred to as the *Rashomon* effect after the 1950s movie. Of course, my presence was much more than a passive watching as I was a practitioner researcher and my imprints were left on their experiences just as theirs were left on mine as we met in the midst. As I engaged with these stories, I began to conceive of the notion of being in the midst as encompassing much more than the in-between as relegated to participant and researcher interactions. Like my advisor had pointed out, there was a relational quality among the participants—a quality to which I felt obligated to attend as a narrative inquirer and practitioner researcher. In this way, being in the midst might be more accurately understood as we were *all* unfolding alongside each other; that our collective unfolding is an important aspect of narrative inquiry—and an important facet of my exploration of the in-between.

As I broadened my conception of what it meant to be in the midst, I thought about my research goal and questions. Neither identity nor experience is constructed in isolation, and I was finding that many of the stories my participants told fed into an *other’s*, or sometimes multiple others’, and that it was often the interaction between participants that played into these facets in impactful ways. It was what Clandinin (2013) referred to when she stated that “narrative inquiry is more than the presentation of the research in narrative form, for example, but that it stems from a ‘transactional or relational ontology’” (p. 16). In addition, as visual-verbal narrative inquiry contributes to a multi-voiced and multilayered depiction of experience, I considered the ways in which I could stay attuned to the relational quality of the in-between as a complex web. I
also considered the ways in which I might communicate these findings by providing a more holistic perspective of participant experiences. With these things in mind, the next two chapters reveal my findings. In this chapter, I focus on three (co)constructed narratives which emphasize identity and experience as relational facets of lived experience in the Transdisciplinary Design Studio. The subsequent chapter broadens my view to encompass all eleven participants and explores relevant metanarratives and themes which emerged across the experiences in-between. In this way, I hope to provide insight into both the depth and breadth of lived experiences in the design studio.

Each of the three narratives presented in this chapter interweaves various field texts including participant visual journals, focus groups, and reflective papers. Additionally, they have been (co)constructed with the participants as I have solicited their feedback during the analytic process. I begin each section with a brief introduction to the participant including a direct quote from their visual journals, a discussion of the ways in which our own narratives intersected, and insight into how they conceptualized the design studio as an in-between space. Next, I reveal the (co)constructed narrative, a visual-verbal assemblage which focuses on compelling aspects of experience as related to professional identity and the creative process. After each of the narratives, I will briefly discuss the narratives and make connections between the concepts discussed and relevant literature. At the conclusion of this chapter, I will explore these three narratives and the relational quality of the in-between. This relational web begins with AshLeigh, an undergraduate student from environmental engineering, whose narrative alluded to both Christy and Ellie as they all three met in the midst and traversed the in-between.
AshLeigh’s Story: Letting Go

I : Creative Thinking :: Leaves : Tree

Sometimes I’m there sometimes I’m not

Either way, I am always changing
growing & adapting to creatively thinking

-AshLeigh, Visual Journal, p. 59

In a lesson on analogizing, the students in the Transdisciplinary Design Studio were asked to compose an analogy that explored their conceptualization of the self as related to creative thinking. AshLeigh wrote of her relationship to creative thinking being similar to that of leaves on trees. While this sentiment appears straightforward as leaves are known to transform, drop, and reemerge once again depending on the season, AshLeigh’s allusion to her sometimes there/sometimes not creativity is a powerful verbal representation of her struggle in the design studio with framing and understanding her creative self. For AshLeigh, time spent in-between was replete with inquiries into creativity, disciplinary pre- and misconceptions, getting to know the other, and all the while coming to understand the self.

I came to know AshLeigh prior to teaching the design studio when I was both a presenter in one of the engineering courses in which she was enrolled and a facilitator in reflective learning focus groups affiliated with the same course. At the time, she was a sophomore in her environmental engineering program, and I recall speaking with her after the final focus group of the semester about the Transdisciplinary Design Studio. Through our interactions in these focus groups, I knew that she enjoyed my visual journal and visual arts-based presentations, and she eagerly engaged as we spoke about the curriculum of the design studio as being one focused in
creative thinking tools. As we parted ways, AshLeigh expressed her interest in the design studio acknowledging it as an opportunity to explore through visual media and be “creative.”

Jumping forward to the Transdisciplinary Design Studio’s first focus group, AshLeigh discussed my presentations in her previous engineering courses saying “Kelly came and that’s when it got more interesting,” and my presence signaled a response that “Ooh, we get to be creative” (Focus Group #1, lines 381/386). As indicated in these early interactions and texts, creativity played an important role in AshLeigh’s perceptions of and experiences in the design studio. The aspiration to be creative also fostered a tension between desire and reality where seeing the art education students and a respected fellow environmental engineer student work in their visual journals incited AshLeigh to (re)consider her own creativity. AshLeigh’s narrative reflects back to the first day of the Transdisciplinary Design Studio and her (pre)conceptions of what it meant to be an engineer and artist. As she got to know the other, AshLeigh came to question her creative self and understand her creativity as ultimately grounded in her life experiences. The narrative below is primarily constructed from AshLeigh’s visual journal, focus groups, and reflective paper and the images are presented alongside verbal text creating the visual-verbal narrative. Further, the verbatim text is preserved through italics while the un-italicized text represents my additions and narrative smoothing (Spence, 1986). Here is AshLeigh’s story:

Prior to taking the Art Studio, I can personally admit that I was very shallow about how I thought about non-science majors. People in our discipline can be a little shallow, in that if it’s not engineering, math or science, it doesn’t matter. Little comments that teachers may say, it’s like, “oh, those art people”…or “you’re majoring in English or basket weaving.” Little stuff like that makes it seem like, if you’re not majoring in engineering or something hard, then what
you’re doing is pointless. So walking into the studio for the first day was particularly awkward for me. I felt unsure about how the course was going to go and I had my ‘engineering persona’ on display. I developed my ‘engineering persona’ while in school here. This persona is overly confident and borderline cocky but the reason I think I had this persona on display was because I did not want anyone to assume I was anything other than an engineering major—I did not want people to think I was not smart. I thought engineering and science majors were better and smarter than art majors and I even remember feeling a little offended during the first week when we were asked to make connections between engineering and art.

Figure 6. Activity from the first day of class where students were asked to interview a student from a different discipline and then create a visual-verbal representation of their understandings of each other's discipline. These posters were used as a catalyst for dialogue about the connections amongst the disciplines.

Reflecting back, I feel very foolish in the way I was thinking. It was in our very first meeting that I began to slowly let my engineering persona go as our class discussed the connections between our disciplines. While I knew the class would be interdisciplinary, I did not know that each person, having their own experiences and backgrounds, would be able to
contribute so much to my learning in the course and in my life. I still vividly remember the first day of class and a comment that Christy, an art education major, made. She was talking about how a city was built and I was utterly amazed about how detailed she was in articulating her experience. She related the way people respond to a city to the wind, the buildings, and sound. This was my first insight that artists and art majors have a much more in depth understanding of life and its surroundings than I thought.

Over time, I interacted and got to know my art education classmates. We discussed their classes and how challenging what they do is— I mean just watching them work in their visual journals was inspiring. I felt bad that I used to think these same people were lazy for not majoring in science but now I feel like they are brave. Few students have the courage to step into a field such as theirs. I still remember wanting to major in music but I was discouraged because the field is so uncertain. Now, I have genuine respect for those who were far braver than I was. Developing this respect for the art ed. students allowed me to completely let my engineering persona go.
Art students were not the only people to have an impact on me and my creativity in the class. Ellie, an environmental engineering student, was probably the most influential person in helping me learn more about myself. She’s really artistic. She always does these weird drawings in her journal, but she’ll smudge them at the end, and they’ll still look nice when she’s done. I don’t understand how she does it. But she doesn’t care about messing up because she’ll just make the mistake work. She would pour whatever she wanted onto the page and by the end, she was happy with her result.
I have personally always struggled with being a perfectionist and this class really brought that issue to light. I was scared of making mistakes and I admired that Ellie never cared. Her free personality is what allowed her to make such fascinating images in her journal. So, during the middle of the semester, I thought I would try to take more risks with my journaling.

I think it is challenging for me in that I’m a perfectionist and I try too hard to make my journal perfect. I care about what we’re working on, so I care about my journal and what I put into it. Honestly, I am terrified of making mistakes and I hate doing things that look bad so I’m always scared to take a risk on a drawing or something because I don’t want it to turn out ugly. Through this class, I learned that I am truly a product of my experiences and so is my art. I try to make everything perfect because almost everything in my life seems so screwy—my life was so far from perfect. It’s a little depressing but true. By learning this about myself I am able to relax.
and realize that it is okay to make mistakes. Through visual journaling, I’ve tried to loosen up a bit and use more color and take some risks. So that’s the rewarding part, but it’s hard, because I don’t like messing up. I still have not been able to let go all the way of wanting things to be perfect but I do think the changes I have made so far not only improved my art but also my problem solving.

Figure 9. Unprompted image (left) and image-bleed (right) from AshLeigh's visual journal

Discussion

AshLeigh’s narrative brought forth two primary facets of letting go including a construct she termed her “engineering persona” and her self-proclaimed rigid creative process. Through both of these acts of release, she detailed how getting to know others prompted her to (re)consider her own perceptions and (re)construct new understandings. Prior to introducing
Ellie’s narrative, I will briefly explore the concepts of an engineering persona and creativity as discussed by AshLeigh and their connections to relevant literature.

It was not until AshLeigh’s final reflective paper that she discussed the idea of an engineering persona. In their ethnographic study on engineering education, Stevens, O’Connor, Garrison, Jocuns, and Amos (2008) outlined three dimensions which encompass the becoming of an engineer: the development of accountable disciplinary knowledge (ADK), forming an identity as an engineer, and navigating through engineering education. AshLeigh’s description of her engineering persona appears to arise from the idea of an ADK, or the knowledge that engineers must possess to perform in the workplace. Her perception of engineers was grounded both in her mathematics- and science-heavy program of study and the emphasis of these subjects by professors in her department who relayed this knowledge as prerequisite for the engineering profession. As apparent above, AshLeigh’s initial perceptions of her classmates were embedded in words like “smarter,” “better,” and “lazy” establishing a clear distinction between science and non-science majors. Hays (2013) proclaimed that one benefit of interdisciplinarity in the research world is that it counters the fact that “the advancement of disciplinary knowledge may have unwittingly and exclusively benefited the sciences, institutionally and financially, and has led to an intellectual hierarchy of the humanities and sciences” (p. 235). Interdisciplinarity, then, was presented by Hays as a means of challenging this intellectual and disciplinary hierarchy.

The hierarchy of sciences placed above non-sciences was visibly embedded in AshLeigh’s perception as she lacked a clear understanding of what it meant to be in another discipline. Similarly, oversimplifications of another discipline, in this case art and/or art education, were found by McMurtry (2006) to be a common practice in her research on professional interdisciplinarity. The transdisciplinary context of the design studio cultivated a
space for AshLeigh to (re)consider these oversimplifications, the hierarchy, and her own engineering persona. Through engaging with her peers from art education, she uncovered flaws in her perceptions of non-science majors as she developed an understanding and respect for the other. She was able to let go of her engineering persona and disassemble the perceived (or taught) intellectual hierarchy between science and art.

Another prominent feature of AshLeigh’s narrative in the design studio focused on her struggles with creativity, particularly as she became inspired by Ellie. Intertwined in AshLeigh’s understanding of creativity is a focus on both process and product (Rhodes, 1961) which is evident in her fascination with watching Ellie work in her visual journal and the actual products that she created. AshLeigh described in detail Ellie’s uninhibited creative process and marveled at her aptitude for taking aesthetic risks while still producing “such fascinating images.” Perfectionism and risk-taking emerged as prevailing notions of AshLeigh’s creative identity as she struggled with the former and sought to embrace the latter. Similarly, Csikszentmihalyi (1996) brought forth risk-taking as one of ten traits of creative individuals and Sternberg (2000) pointed to creative behavior as inciting a willingness to take sensible risks. AshLeigh equated risk-taking with Ellie’s creative process and therefore she attempted to loosen up and let go of her perfectionism which proved to, itself, be an ongoing process. In this way, letting go was a process AshLeigh was still pursuing as the semester drew to a close.
Crazed and disorganized, he rises from fire; unaware of himself he decides to inquire. Green beauty surrounds him and he falls to his dreams, fooled by a nature that is not what it seems. Before it reigns triumph, he finds his mistake and realizes too he can change his own fate. He ascends to the sky, remaining deep in contemplation, until he reaches a point of divine illumination.

-Ellie, Final Reflective Paper, lines 53-57

In her field text above, Ellie articulated the storyline of the image which was created after listening to an orchestral composition by Debussy entitled *La Mer*. This lesson focused on the Root-Bernsteins’ creative thinking tool of imaging which might be thought of as one’s visual imagination, or the ability to conjure up images mentally. In this lesson, the students were asked
first to simply listen to this composition and allow images to seep into their minds. Following the initial listening, they were tasked with creating in their visual journals a visual representation of the music based on the images that emerged in their mind’s eye. Although the image above appeared in Ellie’s visual journal, dated September 26, 2012, the story was written in her final reflective paper which was submitted at the end of the semester on December 6, 2012. In this paper, Ellie reflected on the exercise in imaging:

I really enjoyed the exercise we did in which we listened to a classical musical piece and then had to visually express our feelings regarding the composition. It stimulated certain senses that encouraged emotional and visual responses that I was not even aware of. My thoughts formed a storyline of an individual's journey of self-exploration... (Ellie, Final Reflective Paper, lines 49-57)

While the story above is an example of creative writing that may or may not have biographical significance, the notion of self-exploration is inherent in many of Ellie’s narratives as she resided in-between. She wrote in her visual journal about her desire to be the best person she can by facing her faults, becoming self-aware, and continuing her pursuit towards becoming a more “holistic individual” (Visual Journal Check #2, p. 22). For Ellie, the in-between was a space which focused on process and was “all about the journey” (Visual Journal Check #2, p. 2).

Like AshLeigh, I got to know Ellie through my interactions with an undergraduate Environmental Engineering course she was enrolled in prior to the Transdisciplinary Design Studio. She was not part of the focus groups that I conducted; however, we had brief discussions during the days in which I presented arts-based lessons. The first time I spoke to Ellie, I was walking around the classroom and was drawn to the unique images she was creating. I could immediately tell that she had experience in the visual arts as Ellie appeared both comfortable and
confident as she worked in her visual journal, traits that in my experience, many individuals without an arts background do not initially exhibit. Her images were also approached quite skillfully and I inquired about her experiences with artmaking to which she replied that she had taken photography courses in high school. Later that semester, I learned of Ellie’s plans to take the Transdisciplinary Design Studio.

Perhaps this background in the visual arts contributed to Ellie as perceiving herself as a “very visual” (Visual Journal Check #2, p. 25) individual who enjoyed doodling as a way to keep focused. In this way, Ellie inquired deeply into the process of creativity. Ellie’s (co)constructed narrative begins with a significant moment in the first design challenge where she considered how to communicate to her group mate, Christy, that the community initiative was not to be implemented but was rather an exercise in envisioning the possibilities—knowledge stemming from her previous experiences in engineering studios. As Ellie came to more fully appreciate creativity and problem solving as a process, she made connections to her experiences in engineering and the tensions between her own creative process and the traditions in her home discipline. Throughout her narratives, Ellie emphasized the importance of collaboration as broadening her creative lens and attributed this interrelationship amongst students as pivotal to her lived experience in the studio. Like AshLeigh’s narrative, Ellie’s derives from her field texts, including both focus groups, her visual journal, and her final reflective paper. Here is Ellie’s story:

I think the biggest ah-ha moment that our group had was the day that Christy was, like, “well, we’re actually going to do this, right?” In the first design challenge, Christy became extremely overwhelmed in designing the community outreach party for our Athens waste project because she thought everything we were planning needed to be implemented. From past
experience, I realized that it was not feasible to actually carry out our planned events for such a large scale design project given time and money constraints, but that planning the events to raise community awareness on the topic was necessary in the team’s problem solving process. And the whole time, I was like, “do I tell her that we’re not going to really do this or not or do I let her get really excited about it?” because she was so excited. She was, like, “We’re going to have a party. We’re going to hand out these flyers. Everyone’s going to come.” I couldn’t tell if she was just really into, like, the role-playing of doing the party thing or if she really thought we were going to have a party. I didn’t want to be, like, “there’s not going to be a party; I’m sorry.”

Figure 10. Image from Ellie’s visual journal which responded to the prompt: “Create a visual or visual-verbal representation depicting your understandings of waste after the Introductory Design Challenge.”
One day she was super overwhelmed, and I looked at her and I was like, “you’ve got to understand that we’re not actually going to do any of this.” I said, “We’re just going to think about doing it.” And, at that point she was like, “oh.” And I think that made everything a little bit easier. But that was the difference between us, because I’ve done this before, and I know that we plan everything out, but we don’t actually do it. It’s all about the journey. It’s this mental thing which I think it took a while to understand that. Once I communicated this to her, she was relieved and it seemed that our team was finally on the same wavelength and able to take the next step together.

Figure 11. Page from Ellie's visual journal which was created after the first focus group
But in a way, I feel like her actually thinking of it as a feasible thing helped her to come to some really, really good conclusions, like saying this is feasible; this would actually work. I just think it’s interesting; our process involved getting opinions on the design aspect of the final project, and I guess just in general, kind of just saying, “I think we should do this” or “that would look good with this.” I thought the collaboration was a lot stronger and covered a more wide range of options than it had last semester. I feel like somebody would be like, “yeah, let’s do that,” and then everyone else would be, like, “yeah, that sounds cool.” I learned that convincing yourself that it’s possible can provide good solution possibilities, but knowing that it doesn’t HAVE to occur relieves the overwhelmed aspect of the solution identification process.

Figure 12. Two-page spread from Ellie's visual journal with representations of the Introductory Design Challenge
Through my experiences, I have come to realize that it really is more about the process. It’s not actually about the answer. It took me two projects last semester to realize that I wasn’t really supposed to be focused on the answer as much. We focused on the question and the process of working with groups and working with different stakeholders, and like, understanding dynamics of how projects fit together. Planning all this stuff out and not having, like, a single final image and outcome gave us a lot of possibilities. I think that making the art project and following through and everything—actually building something was really, really rewarding, but it’s hard to think, like, know this initiative might never happen outside of this context, but yes, we have to think about it and solve it, and make ourselves think that it’s going to happen.

I have really enjoyed this studio course because I feel that the project assigned was feasible enough to get really excited about. A lot of the concepts in this class are similar to the ones in my previous studio course, but I find it to be very rewarding to see a problem/solution form visually. Actually doing it, actually engaging with the materials, you see, like, this is where you run into mistakes. This is where the design flaws were. We kind of got, like, the nails wouldn’t go in right, the wood wasn’t lining up, the screwdriver didn’t work. But if we hadn’t actually done the art project, then we wouldn’t have gotten, like, feedback, you know, which I thought was very rewarding, as compared to, I don’t know, thinking of a solution and not actually getting a response from the end solution. It is also easier to edit and find mistakes (and fix them) when you can see the outcome of your work progression.
Figure 13. Ellie's visual journal reflection on the Introductory Design Challenge

Working with students of different majors as well as graduate level students was really eye opening and has given me new insight of problem identification and solving. I think that it really helped give more perspectives on the project, and helped me—and I guess them—to better understand different ways to approach different learning processes. I feel like we get into these majors, and we learn how to learn a specific way. But when you work with other people who have been spending all this time learning a different way, when they all come together, I think the collaboration is much better than just working with a bunch of people who have the exact same major, are in the exact same age group and position in life that you are. I think that it
becomes, what's the word for it, like a lot better put together, and you get to consider more options. I feel also that it is much more realistic working with people of different disciplines because that is what I will be doing often in my profession as an engineer, architect, and designer.

As an engineering major, I feel that this course taught me a lot about identifying problems with caution, care, and an open mind. Engineers are usually taught to think fast in stressful situations. My initial response to a problem has been based on speed rather than understanding, which is what this class helped me get away from. It is extremely easy to jump to conclusions with deciding what the problem is. We are all programmed to make certain assumptions based on our knowledge and personality types, which is why stepping outside your natural thought process, keeping an open mind, and discussing with others is extremely important in problem identification.

The whole idea of "what is the problem?" bothered me a lot in the early weeks of the semester. The idea that every solution creates a new set of problems and that no solution is final is still odd to me. It gives me the impression that nothing is certain and that no matter how many options I try to view, I will never completely satisfy any problem with an answer. In this way, identifying the true problem is key and if not done with care, no proposed solution will fix it. Also, it is important to understand that there is always a new way to view a problem; nothing is black or white and every solution opens new windows for problems to sneak in. This knowledge will affect every problem I ever experience in the future whether professional or social, internal or external, big or small. We are all so hasty to find solutions or play the blame game, but no good solution will come without complete responsibility and complete problem understanding.
As I’ve thought about these ideas and spent more time with students from other disciplines I’ve noticed that my approaches to problem solving have shifted slightly from an engineering function oriented perspective to a more holistic "thinking outside of the box" perspective that considers various viewpoints. Reading Sparks of Genius helped me to view my life and my passions in a new light and taught me ways to approach problems as well as opportunities. Every chapter gave me a better understanding of creativity and how different individuals have used different creative tools to explore and pursue their passions. I know it seems corny, but some of the things that I read in this book I truly would not have ever considered, with respect to my creativity and with respect to approaching life. I was earnestly moved.
Along these lines, I think that if engineering provided a more playful environment rather than stressful environment, the department would probably recognize that students have exercised their creative thinking capabilities and possibly even come up with a better problem solving design strategy. Stress kills creativity and, though is a good tool for determining if a student has actually mastered the material and is fit for any future situation—it makes students do the bare minimum due to time constraints. Playing, on the other hand, gives us a carefree zone in which to utilize creativity and think outside of the box.

![Figure 15. Sketch from Ellie's visual journal](image)

I have realized that there is an incredible color spectrum of human thinking tools, knowledge, personalities, and creative though processes. It is similar to viewing a single object from multiple perspectives. From each direction, it looks slightly different, but no viewing angle
is right or wrong. Collaboration is the key to understanding what the object (or problem) represents as a whole. When our team was presented with a design problem, each individual approached the problem from a different point of view, but with a collaborative effort we were able to put together a beautifully composed design project final. The final product utilized each individual’s talents to create a cohesive piece that defined the problem and worked towards raising awareness within the community. Although the projects incorporated minor solutions, it allowed community residents and people viewing the exhibits to think of their own ideas and explore their own curiosities.
Reflection:

November 28th 2012

Setting to office in 10 years. Mind wanders to USA years. Remember? Learned? Experience?

I feel like I had a true interdisciplinary course that taught me how to work with people on all different backgrounds and ages. I was comfortable and myself and I think that made me more receptive to learning, communicating and experimenting with my creative abilities. When problem solving, this has been one of the most rewarding classes I've ever had because I felt the environment was based on learning to experiencing & thinking rather than stressful cramming and competing and thinking how my teachers told me to. It was a course guided by the minds of individuals and collaboration rather than a course that guides the minds of individuals and forces collaboration.

Figure 16. Ellie's final visual journal entry
Discussion

In the final image above, Ellie depicted an open mind which emanated the facets of learning she felt were significant in the Transdisciplinary Design Studio. Understanding, creativity, independence integrated with collaboration, self-reflection, and growth in freedom are the words and phrases that literally leapt from her mind as she reflected on the course she described as “an environment of learning & experiencing & thinking.” As explicitly expressed in the narrative, Ellie sought to embrace learning and problem solving as a journey as she engaged in the design studio. Through her discussion of the problem solving process, she elaborated on notions like her shift from an engineering-focused creativity to “thinking outside the box”, play, and the value of collaboration and multiple perspectives. In this section, I will briefly discuss these intersecting concepts as grounded in relevant literature.

One of the most prominent aspects of Ellie’s narrative is her engagement with, and inquiry into, the problem solving process. While Runco (2004) was careful to point out that “Not all creativity involves problem solving, and not all problem solving requires creativity” (p. 680), the way in which Ellie described problem solving was often congruent with a creativity approach which values the process of finding and framing problems (Chand & Runco, 1993; Getzels and Csikszentmihalyi, 1976; Runco & Chand, 1994). It is worth noting that various terms are used to describe preparatory behaviors in creative thinking including problem identification, problem defining, problem framing as well as others (Runco & Chand, 1995); however, it is not necessary for this discussion to define the nuances between these terms. Rather, I will explore problem solving and creativity more holistically as consistent with Ellie’s discussion above.

In reflecting on problem solving, Ellie focused on the early stages of the creative process and her new attentiveness to identifying problems with “caution, care, and an open mind.” She
noted the tensions within her home discipline of engineering where she felt pushed to jump into finding the solution without spending adequate time fully considering the potential problems. Additionally, Ellie explained her initial frustration in pondering, “What is the problem?” Ellie’s focus on problem finding and her desire to engage fully in this part of the creative process echoes what Getzels and Csikszentmihalyi (1976) asserted in their research: “Problem finding may well be at the origin of the creative vision” (p. 251). As she wrestled with the inherent uncertainty enfolded in complex problems and the problem solving process itself, she began to consider multiple perspectives and resigned to the fact that there are multiple answers to a given design problem (Jonassen et al., 2006). It was these realizations which nudged Ellie towards learning to tolerate ambiguity (Sternberg, 2000) and embrace process rather than product.

Ellie also discussed playing as an essential quality of the problem solving process. The Root-Bernsteins’ (1999) included *playing* as a thinking tool in *Sparks of Genius*, one of the required texts for the Transdisciplinary Design Studio. In this text, play was defined as an action in which one engages simply for fun, where success and failure are not considered, and where rules are broken and (re)created. Play is also viewed by the Root-Bernsteins’ and others as crucial in fostering creative thinking (Csikszentmihalyi, 1996; Getzels & Jackson, 1962). Above, Ellie reflected on the role of play in the discipline of engineering, or lack thereof. She again lamented that the focus was typically on product rather than process and commented on the stressful time restrictions which often prevented students from holistically engaging with the problems. According to Ellie, play is an important aspect of what she discussed as the “outside the box” thinking style that she adopted through her engagement in the design studio. Through this mode of thinking, Ellie sought to immerse herself more completely in the early stages of the
creative process in order to play, brainstorm, and consider multiple perspectives—all while cultivating a strong and successful collaboration in her group work.

Collaboration and the consideration of multiple perspectives are notions which were stitched throughout Ellie’s narratives. Ellie perceived the diversity in her groups as contributing heavily to the success of their projects as each individual brought different perspectives and knowledge to the problems they explored. These seemingly disparate pieces carried by each group member fit together to form a cohesive whole in the final exhibits. In other words, the knowledge embedded in solving (or exploring) their problem was distributed among the group and integral to addressing the problem holistically (Jonassen et al., 2006). This might also be perceived as distributed creativity where the group also dialogued and worked collectively towards a creative outcome (Sawyer & DeZutter, 2009). Ellie also wrote that viewing the problems from multiple perspectives embraced multiple solutions which is an important characteristic of creativity known as divergent thinking (Guilford, 1959). For Ellie, interdisciplinary collaboration was a valued aspect of the design studio as it led her to adopt a new “outside the box” thinking process and engage more fully with the problems solving process—all while gaining an appreciation for the process, the journey, of learning.

Christy’s Story: “So I jumped”

Knowing what you don't know, knowing the pattern of your ignorance can be as valuable as knowing what you do know.

To me, this means that being aware of your weaknesses can allow a greater sensitivity in your work. For me, it's the tendency to move too quickly towards a solution. I learned that in this class. Now that I'm aware, I can purposefully slow myself down.

- Christy, Visual Journal Check #2, October 3, 2012
When the students were prompted to reflect on the passage above which appeared in a chapter entitled “Pattern Finding” in *Sparks of Genius*, Christy wrote about a realization that she had regarding patterns in her own creative process. It was through her experiences with the first design challenge that her inclination to hastily move to solutions became apparent and emerged as a perceived weakness that Christy strove to overcome. While this realization may seem generic given the focus on process in the design studio and the tendency for many of the students to jump to solutions, it was Christy’s extensive background as a professional artist and the independent nature of this profession which provided a unique lens through which her realization occurred. In the design studio, Christy was faced with the knowledge that her professional working style and creative process were neither compatible with the collaborative group work nor the nature of the problems posed in the design challenges. In this way, the in-between cultivated a space where Christy was stretched to (re)consider her personal creative process within the context of a collaborative environment, holding herself back for the good of the group and for the good of the concepts under exploration. Furthermore, this space impelled her to (re)evaluate the tensions between her experiences as a professional and a student.

Christy is best characterized as a non-traditional student in the sense that she had spent over a decade in the professional world as a practicing artist and a professor of the visual arts. She held a terminal degree in studio art, a Master of Fine Arts (MFA), which required intensive education and practice in a fine arts discipline. In the design studio, Christy was also the sole doctoral student; enrolled in the same Art Education program as I although we did not know each other prior to the course. Interestingly, Christy was very cautious in revealing her extensive experience in both studio and teaching to Dr. Sochacka and I, as I did not learn of her college-level teaching position until after the semester was over. As we chatted in a lounge area in the art
school, our impatient infants wriggling in our arms, she told me of her background, and I remember thanking her for not divulging the information during the semester and telling her that I was sure that I would have been nervous had I known that I was teaching a college professor. During the (co)construction of this narrative, Christy also commented that she became aware of a tension through this professor-student transition which caused her to constantly “re-negotiate [her] place in the class” (Christy, Personal Communication, January 13, 2014) and in the culture of the university; a process which she confessed was ongoing.

Christy’s background as an MFA student and professional artist was an important facet of her narrative of the in-between. She told stories of her struggles with the first design challenge, how she “jumped” into solving the problem without her group, and her realization that the problem was not hers to take ownership of but rather belonged to her group. Being an MFA student, as Christy discussed in her visual journal and in the first focus group, can be an insular experience and often she recounted her challenges with learning to work collaboratively and resolving the tensions between her own creative process and a collective group process. Christy’s narrative begins with the first assignment, the Introductory Design Challenge, and how a well-meaning individual’s utterance to “chill out” caused her to pause and join in the group’s collective process. The story is primarily composed of text from her visual journal and the two focus groups. This is Christy’s story:

*When they first handed out the assignment, I was the person who jumped into the solution immediately, by myself, without my group. I was doing research, collecting images, writing a proposal. I was ready to go. Our second group meeting, I had three fully fleshed out ideas ready for the group and I was ready to do it. My poor group just looked at me like I was insane and I really needed more to do in my life than to work on this project, but I didn't get it at first, I didn't*
get the working backwards idea. I could not stop myself from jumping to the solution method and what I need to do is to stop and define the problem—to find the heart of the problem.

Figure 17. Four pages from Christy's visual journal depicting her initial sketches for the Introductory Design Challenge
In my work, often times I will go to a site and sit and let sounds and smells and things direct ideas and inspire ideas. I went downtown and sat and there's an excitement, there's twinkle lights. There are all kinds of things that are happening downtown. That is what I responded to and so my first ideas were about performance, live performance downtown. Projecting images, sound of glass breaking. I wasn’t at all bothered by the open-endedness of the question, that’s sort of what I do. I deal in metaphor all the time. I was very comfortable taking that huge open question and making it my own. The problem was, it wasn’t mine. It was ours. That’s where I had the most difficulty.

Figure 18. Entry from Christy's visual journal demonstrating her attention to sights and sounds as she conducted research for the Introductory Design Challenge
I was also the only art major in my group, but I’m also a professional artist so I jumped.
I’m a pretty careful reader. I really thought I had this figured out. It is not at all what I thought it was. It was an undergraduate environmental engineering student who was just a very generous, comforting individual in the group; she said to me, “Chill out.” It wasn’t in front of the other group members; she said it under her breath. She said, “We do this, don’t worry about it. We do this all the time, just chill out.” I was like, “Okay.” I was shocked. Because you know, I’m 40 years old and I’ve been a professional artist and teacher, and she’s maybe 22-23. And I’m like, “You’re the smartest person I’ve ever met.” She was very calm, and I responded to that calmness. I was sitting over here bursting with ideas, not nervous but anxious energy, and she was calm and she was listening and she was letting the process unfold.
Figure 19. Visual-verbal representation from Christy's visual journal of her state of mind with regard to the Introductory Design Challenge: “positive/ excited/ overflowing”

She was very comfortable—both of the engineers were very comfortable with the process, they did not seem worried about it. Whereas the two graduate students, myself and another graduate student who’s in landscape architecture we were—“Let’s get it done. Let’s get these ideas flowing, let’s go.” We were the ones who were sort of battling with ideas. We were like throwing ideas at one another and they were slamming up against one another. The other two were… they weren’t non-invested, but they were… It was just a different way of relating to what we were doing. They were much more relaxed about it.
Part of it may just be personality, but she... I mean she very was very clear about the fact that “We do this all the time.” She was experienced with the nature of the process, because the thing that kept upsetting me, upsetting my equilibrium was that in class we’d get started and then we’d have to stop, and talk about Andy Goldsworthy and then we’d get started and we’d have to stop and listen to the visiting artist, and then we’d get started and then we’d have to stop. I didn’t get that the instructors were consciously putting these, what I thought were obstacles in our way when they were actually... They were speed bumps to keep you from moving to a solution too quickly.

Figure 20. Sketch from Christy's visual journal depicting the group's plan for the sculpture
I think what made it click for us was the work. We started hammering nails and when the four of us started hammering nails, doing manual labor, the girls stayed behind to hammer and the boys went to get us coffee and you know that was kind of surprising and funny. I think that’s when we kind of became friends.

Working collaboratively is always a challenge. Different egos operate in different ways. I definitely will take away from this to pay more attention to the group, not necessarily their ideas—I mean their ideas are good—but their behavior and their mood. I think gauging that earlier will be more helpful. It’s difficult to gauge emotional temperature in the beginning. My first instinct is to react when I hear a bad idea. At one point, someone brought up an idea and very loudly, I said, “No.” That did not work out very well. Everyone sort of got a shocked look on their face and it just kind of disrupted what we were doing and I tried to make a joke about it, but afterwards I thought, “That was really inappropriate.” I didn’t mean it the way that it sounded. It taught me that sometimes it’s more important to keep your mouth shut rather than disturb the group dynamic and to use the activity as a learning experience. The group member's solution would not have been my solution but by listening to him I have a better understanding of working in groups.

I think that... I think that as professional artists we are kind of insular, but we do have critiques and we do have feedback—we get feedback and we have of course reviews and things like that. I think that what I would take away from this that would help me in my own work is... the slowing down. The reason that I have to slow down is I have to give myself time to absorb other people’s opinions. It is important to open yourself up to possibilities, whether the solution is mine or part of a group. I don’t know that I will ever go into group work or collaborative work as a profession, but in either case, I think that listening is really important. I vow to be a better
listener. When I reflect back on this class, I will remember my experience as a member of a group. An MFA trains you to work independently. I had never been dependent on other people before completion of a project or its success and I can’t say it was fun but it was beneficial. I learned patience, perseverance, and empathy. Empathy is still the most useful tool for me. I am using it every day in so many ways. These qualities are invaluable especially in that patience was not one of my strong suits.

Discussion

In the Transdisciplinary Design Studio Christy was required to work not only with others, but with diverse others—from different disciplines, of different ages, and having different life experiences. Christy addressed her lack of experience in working collaboratively in her field texts and was open about her intrapersonal and interpersonal struggles. She spoke about the ways in which she and another graduate student kept slamming ideas against one another, the way a calm peer urged her to sit back and let the process unfold, and her reaction towards a group member who proposed a solution which she perceived as a bad idea. Through these experiences, Christy began to realize the nuances inherent in transdisciplinary collaboration which prompted her to (re)consider her own creative process in light of new understandings.

Csikszentmihalyi (1999) asserted that creativity is observable at the intersections between the individuals, domain, and field. For Christy, her extensive experiences in the MFA world dictated how she viewed and approached creative problems. As she moved into a collaborative learning space, Christy became aware of her creative process as fostered by years of independent work as an artist as well as a prior MFA education which emphasized creating and deepening a personal artistic identity (Thornton, 2013). She described her experiences working independently often in a very insular manner and the ways in which her MFA experiences and professional
work cultivated a type of creative autonomy (Thomas & Chan, 2013; Thornton, 2013). The design studio curriculum pushed Christy away from these strong autonomous creative roots and into a collaborative, or distributed, approach to creativity where each individual shared in the generation of a creative product (Sawyer & DeZutter, 2009). As Thornton (2013) asserted, this autonomy “can encourage artists to undervalue social interdependence” (p. 45). Therefore, the design studio was an uncomfortable space for Christy as it challenged years of professional training and work, yet it invoked her to perceive creativity at new intersections in the field of transdisciplinarity.

The creative autonomy fostered in her MFA and work as an artist contributed to one of Christy’s difficulties in the first design challenge. Through the independent working space of an artist, she was familiar with engaging in her creative process which resulted in a profound level of ownership of the work she produced. While Moran and John-Steiner (2004) cited many benefits to collaborative creative work, they also discussed the inherent challenges including impatience and ownership. For Christy, it was a matter of resolving her tendency to take full ownership of both the process and product of her creative work, leading her to the realization that the problem was not hers, it belonged to her group. Releasing ownership of the problem allowed her to more fully consider the challenge as a collaborative and social venture.

As Christy engaged in collaboration, she grasped the incompatibility of her own creative process with the collective process of her group. She discussed in her field texts the realization that she needed to slow down and hold back rather than jumping to solutions which was her first instinct in the introductory design challenge. Like Moran and John-Steiner (2004) indicated, creative collaboration requires patience. Initially, Christy struggled with fully engaging in the early stages of the creative process which was valued by Ellie in her narrative where she spoke
of the importance of problem finding and framing. Of course, Christy largely attributed her effort to slow down and embrace process to Ellie’s suggestion to “chill out.” As she began to realize the importance of the process rather than the solution, Christy held herself back for the good of the group so they could move forward collectively. In this way, she (re)envisioned the perceived obstacles in the curriculum as speed bumps and began to open herself up to the possibilities that lie within collaboration. Ultimately, Christy found the experience to be valuable despite the challenges she encountered.

**Tensions, Wide-Awakeness, and the Relational In-Between**

In presenting narrative inquiry as both encompassing and structured by the three-dimensions of temporality, sociality, and place, Clandinin and Connelly (2000) contended that narrative researchers are not alone in this space. They noted that “this space enfolds us and those with whom we work” (p. 60) and Clandinin (2013) expounded that the very nature of narrative inquiry is that it “assumes the relational” (p. 23). Clandinin went on to define the relational in narrative research as encompassing numerous interactions including those between individuals; between individual and his/her physical world; between various narratives of identity; and between past, present, and future. It is the relational quality of narrative inquiry which makes being in the midst an essential action for researchers as we not only consider the participants as residing in three-dimensional spaces, but the knowledge that we are also “part of the storied landscapes we are studying” (Clandinin, 2013, p. 30).

It was by being in the midst that I was provoked to (re)consider how my participants were making sense of their lived experiences in the design studio. The struggles which emerged time and time again from the different participant narratives were much more compelling and holistic when considered through a relational lens. Clandinin, Murphy, Huber, and Orr (2009) explained...
this phenomenon: “Gradually, we began to understand tensions in a more relational way, that is, tensions that live between people, events, or things, and are a way of creating a between space, a space which can exist in educative ways” (p. 82). The notion of relational tensions as fostering a between space is poignant as it references the very construct on which my analysis rests—the *in-between*. Although the term “tension” might carry a negative connotation, I interpreted Clandinin et al.’s explanation in a more constructive light where tensions are gentle nudges and tugs which keep us connected to the other and impel us to fully engage in, and inquire into, our daily lived experiences.

Notably, Greene (1995) also discussed the idea of an in-between as related to author Hannah Arendt, an influential figure in Greene’s philosophy of education. Greene described Arendt’s account of a relational web, revealing that common interests “lie between people and therefore can relate and bind them together” (p. 70). She then elaborated on Arendt’s concept stating that this “subjective in-between” is intangible yet integral to the relational web individuals weave with one another as it opens possibilities, arouses the imagination, and allows people to “feel themselves part of the dance of life” (p. 72). In other words, the subjective in-between fosters an awareness of how reality is constructed within oneself and amongst the other through an active interrogation of one’s own lived experiences. The term subjective, then, is not referring to the individual him/herself but rather references subjectivity as a state of being—as *perceived* and as *experienced* by the individual. It is through the subjective in-between that people begin to perceive their dance not as a solitary activity but a collective movement which inspires and feeds wide-awakeness.

As indicated in the chapter introduction, I use the in-between to represent and understand multiple facets of both the design studio as well as my methodological underpinnings; however,
the in-between might also be a valuable construct for understanding the relational quality of the three narratives. For Clandinin et al. the tensions that exist among individuals were vital to creating and nurturing an in-between. Additionally, Greene spoke of the in-between as a subjective space through which individuals acknowledge themselves as socially situated and connected to the lives of the other. In the discussion that follows, I will explore the relational tensions of the in-between as narrated by AshLeigh, Ellie, and Christy and the ways in which those tensions cultivated a space of wide-awakeness and oftentimes transformation.

**Being/ Becoming Wide-Awake**

As AshLeigh, Ellie, and Christy narrated their time in-between, they all demonstrated an attentiveness towards the other. Through each of the (co)constructed narratives above, the participants reflected on their experiences in the design studio and came to pinpoint specific individuals—in this case each other—who directly impacted their perceptions, conceptions, and/or actions. This awareness of the self and the other is an important facet of Greene’s (1995) notion of wide-awakeness as she expounded:

> People must become aware of the ways they construct their realities as they live together—how they grasp the appearances of things, how and when they interrogate their lived worlds, how they acknowledge the multiple perspectives that exist for making sense of the commonsense world. (p. 65)

To be wide-awake, according to Greene, individuals must be mindful of their own consciousness as well as their interconnectedness to the world in which they live. It was by being wide-awake that AshLeigh, Ellie, and Christy gained an awareness of the impact of the other and sometimes their impact on the other as they resided in-between.
In unpacking Greene’s (1995) conception of wide-awakeness, the imagination is an essential capacity as it enables individuals to envision “possibilities for their own becoming and their group’s becoming” (p. 39). It requires imagination and an active attentiveness that gazes both inward and outward—as being wide-awake is not simply achieved, but must also be regarded as an act of becoming. As AshLeigh, Ellie, and Christy were practicing wide-awakening, they were in the process of becoming more attentive to and reflective of their relationship to the other. It was through being/ becoming wide-awake that these three participants were able to experience the in-between as a relational space, and it was through being/becoming wide-awake that I was able to perceive of the connections between these narratives of lived experience. Figure 21 illustrates the relational web depicted as a concept map on which this chapter focuses. In this illustration, facets the three participant narratives are explored with an attention to how these narratives demonstrate wide-awakening to the other and the points at which these narratives intersect as they unfold. While I elected to concentrate on the relationships between these three participants, it was only through a wide-awake and holistic analysis of the field texts that the relational quality of these narratives emerged.
Figure 21. The relational web as illustrated in a concept map which visually explores narrative connections.
**Relational Tensions In-Between**

If wide-awareness, described by Greene (1995), is conceived as fostering an attentiveness to the other where multiple viewpoints loom omnipresent in one’s relational world, it is likely that tensions will surface. Being/becoming wide-awake gives way to Clandinin et al.’s (2009) discussion of the relational where tensions among individuals cultivated a meaningful and educative between space. In defining tensions as forces which impel individuals to (re)consider and (re)imagine their own becoming, the relational in-between emerged as an integral construct for understanding lived experiences in educational spaces and, prominently, in the Transdisciplinary Design Studio. Through the relational in-between, AshLeigh, Ellie, and Christy were faced with tensions that developed through their interactions with each other; tensions which promoted (re)considerations and (re)imagining in each individual’s becoming.

**AshLeigh.** Letting go was an important theme in AshLeigh’s narrative where she released and (re)defined what it meant to be an engineer and began to open herself up to a more impulsive, imperfect, and freeing process of creation. These efforts were due largely to the relationships forged while she resided in-between, as she was awakened to the possibilities that lurked just beyond her being. One such possibility materialized as AshLeigh recalled an important moment in letting go of her engineering persona in her Final Reflective Paper where she reflected on the insightful and in depth comments made by Christy. AshLeigh went on to discuss how this experience coupled with learning about the challenges faced by the art majors and the inspiration of watching them work in their visual journals inspired her to “completely let [her] engineering personal go” (Final Reflective Paper, line 29). When the relationships among AshLeigh and her art education peers created tensions with her self-conceived engineering persona, she began to (de)construct and (re)construct this identity to better accommodate her new
understandings of the other. In a similar way, Greene (1995) framed teaching and learning as “leaving something behind while reaching toward something new” (p. 20). It is this release, a letting go, which allowed AshLeigh to envision herself differently.

Contrary to the letting go *completely* of her engineering persona, AshLeigh articulated the process of embracing a new creative process in a more tentative manner. AshLeigh also reiterated this notion in her Final Reflective Paper, writing that she consciously decided to take more risks in her visual journal but confessed: “I still have not been able to let go all the way of wanting things to be perfect” (lines 48-49). Attributing this (re)consideration of her creative process largely to Ellie, and on a smaller degree to the art majors, AshLeigh reflected on her perfectionist tendencies and concluded that she strove for perfection “cause almost everything in [her] life seems so screwy” (Visual Journal, 10/31/2012, p. 81). Again, her intersections with another, this time Ellie, brought forth tensions in AshLeigh’s process of creation which cultivated self-reflection and a desire to let go.

Through AshLeigh’s confession of not being able “to let go all the way,” the relational in-between prodded her into a space of becoming—a space where she resided upon her final reflection on the course. She wrote:

> I learned more about myself in this class that I have ever learned in all of my previous courses combined… I will take everything I have learned from the books, the people, and the experiences and apply them to my life and academics from here on out. (Final Reflective Paper, lines 107-113)

For AshLeigh, learning about herself through her relationships with the other was pivotal in her acknowledgement of her own becoming. She left the course seeking to invest these learnings in
her future experiences, finding value in the process of letting go of the past and reaching forward to future experiences.

**Ellie.** It was not evident through Ellie’s field texts that she was aware of her impact on AshLeigh; however, Ellie’s lived experiences were consumed with her own relational tensions which are worthy of exploration. Ellie’s experience in the design studio immersed her in learning as a journey. Through this journey she embraced process and perceived of the others as providing welcomed alternative perspectives, inciting and nurturing her own personal growth. One of the prominent tensions which arose during the first design challenge focused on her group member, Christy, who (mis)understood the community initiative as a task that was to actually be implemented rather than conceptually explored. She wrote in her visual journal,

Situation: One group member became extremely overwhelmed by the project because they believed that everything we were doing had to actually be implemented [sic] and from past experience I knew it was more about the idea than implementation [sic]….(p. 2)

As Ellie engaged with her group member, she struggled with how to communicate to Christy that the event they were planning would remain in the planning stages. She even debated whether or not to reveal this information when she noticed how excited Christy was about the event, lamenting in the first focus group that she did not want to disrupt Christy’s enthusiasm for the project.

It was the relational in-between which resulted in Ellie’s perceptible tension with Christy, but it was also the relational which prompted her to finally intercede for Christy’s benefit and for the benefit of the group. Upon noticing the degree to which Christy was overwhelmed in class one day, she finally spoke up which made a difference in the group moving forward. It was Ellie’s observation of Christy being “super overwhelmed” that led her to divulge information
which might help ease some of her anxiety and help her group move forward. The relational tension became too taut for Ellie, and she sought a release to (re)establish equilibrium.

Relational tensions also emerged through Ellie’s interactions with interdisciplinary others during the collaborative projects. While the tension with Christy was challenging for Ellie, collaborative tensions carried an overall positive quality as she attributed them to helping her consider multiple perspectives and (re)envision her own approach to problems. As Moran and John-Steiner (2004) asserted, “Collaboration is not absence of tension, but fruitful cultivation of tension” (p. 12). In this way, Ellie described enjoying the group work as “it is much more realistic working with people of different disciplines because that is what I will be doing often in my profession as an engineer, architect, and designer” (Visual Journal Check #1, p. 13). In multiple field texts, she cited the relational as integral to her development as an engineer, attributing her own self-comfort in the course as making her “more receptive to learning, communicating, and experimenting with my creative abilities when problem solving” (Visual Journal Check #3, p. 24). Ellie’s receptivity, or wide-awakeness, to both herself the others in the class might have positively affected the relational tensions where the nudges and tugs were perceived by Ellie as simply part of the journey towards self-discovery.

Christy. In the first focus group, the facilitator encouraged Christy to unpack the relational between Ellie and her. It was Ellie’s simple yet profound utterance of “chill out” which incited Christy to pause as she realized that she abandoned her group by jumping hastily towards solution. Christy specified that it was her comfort with the open-endedness of the problem in the first design challenge that prompted her to make it her own but, thanks to Ellie, she realized that it was not her problem—it was a collective problem. While some individuals may have been turned off or provoked by Ellie’s words, Christy appeared to immediately embrace the
suggestion as it allowed her to step out of her own working process and realize that she “was hung up on the solution method” (Visual Journal #1, p. 38) and needed to step back and let the process unfold. Ellie’s two words were pivotal in Christy’s experience in the first design challenge as they impelled her to (re)consider both the assignment and her own creative process.

While the relational was integral in helping Christy slow down, (re)consider, and (re)align her own creative process with her group’s process, it was also a challenge for Christy as she navigated through the collaborative nature of the course. She explained that her experience as an MFA “trains you to work independently” (Visual Journal Check #2, p. 43) and that she was unaccustomed to depending on others for a project’s success. In fact, a note jotted in Christy’s visual journal read: “environmental pieces- exciting; group work- frustrating” (Visual Journal Check #2, p. 2). Christy’s professional experiences were focused on a more independent style of work, and collaboration was presented as “frustrating” which sometimes resulted in a strained relational tension between herself and the others with whom she worked.

Despite the relational as fostering frustration at times, Christy came to a conclusion in her final visual journal entry writing that the group work may not have been fun, but was beneficial. She went on to attribute her group work as cultivating patience, perseverance, and empathy and even wrote a little note to myself and Dr. Sochacka: “Thank you Kelly & Nicki for the experience. It has been an amazing one” (Visual Journal Check #2, p. 43). As I (re)read these words, I have found myself perplexed by the apparent frustration and inherent challenges that Christy wrote and spoke about in her field texts juxtaposed by this last sentence. Amazing. The word echoed in my mind. I conducted a quick search and found a definition which read: “causing wonder or astonishment” (Collins English Dictionary, n.d.). Perhaps Christy’s statement was not a juxtaposition to the rest of her entry but an acknowledgement that her lived experiences in-
between stirred wonder or astonishment in her process of becoming. Much like the term tension carries a negative connotation, amazing often carries a positive one; however, as I reflected it occurred to me that it might simply be that this space moved her. In this way, the relational tensions kept Christy moving, becoming, and ultimately contributed to an “amazing” experience in the design studio.

**Chapter Summary**

When we meet our participants in the midst, and when our participants meet each other in this fluid space, our stories intersect and interact through the relationships we forge with each other. It is often through these interactions that individuals are challenged to inquire, (re)consider, and (re)construct our perceptions of past experiences as new ones unfold. As Dewey (1938/1997) theorized, new experiences are grounded in previous ones yet modified through one’s current lens resulting in a continuous cycle of meaningful growth. Through AshLeigh, Ellie, and Christy’s engagements in the Transdisciplinary Design Studio, they were faced with new experiences and knowledge which sometimes contradicted their previous experiences resulting in a (re)construction of their professional identities and (re)consideration of their creative processes. It is the relational quality of the design studio that impacted these narratives of lived experience and cultivated personal growth, and it is the relational on which this chapter focused.

As I engaged with these three narratives, I began to visualize the relational web between AshLeigh, Ellie, and Christie as a physical work of art. Drawing inspiration from a/r/tography, a subset of arts-based research, my roles as an artist, researcher, and teacher intersected as I

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7 Christy provided her insight on this statement during our (co)construction, writing: “Astonishment that I could and would reframe my modes and methods of being in classroom according to context. That level of flexibility or openness was not something I was aware I needed to or could engage in. The course was instrumental in changing the way I engage with others as a student and instructor” (Christy, Personal Communication, January 13, 2014).
inquired “in the world through a process of art making” (Springgay, Irwin, & Kind, 2005, p. 899). I envisioned the materials (colored threads) carefully stitched on and through an un-textured, slightly off-white paper. These threads would entangle and separate and entangle once again depicting the ways in which the participants’ lives paralleled, intersected, and unfolded alongside one another while they resided in-between. I am a researcher in the midst and through creating, I was able to inquire into and visually explore the ways in which the narrative space enfolded all four of us. My in-between, a relational in-between, impelled me to (re)consider the ideas brought forth in this chapter through the same visual-verbal modes of representation that I valued in the participants’ narratives.
The three narratives presented above depict but a glimpse of the paralleling, intersecting, and unfolding alongside nature of participant experiences; however, they concisely illustrate being in the midst as requiring both an awareness of ourselves, and an awareness of the other’s impact on our ongoing narratives. While each of these participants resided in-between, they summoned a wide-awareness which nudged them into a complex, relational web. This web
visually depicted the connections between the participants, and I envisioned each of the arrows in the illustration above (Figure 22) as symbolizing a line of tension. As evident in the three narratives, these tensions are integral to the interconnectedness, the in-between, which was fostered between AshLeigh, Ellie, and Christy. In this chapter, I have focused on these relational tensions as they interweaved to form experiential narratives—that interdisciplinarity has the potential to cultivate a vibrant and evocative space. A space which nurtures wide-awakeness and transformation. A space that stirs students to become introspective while maintaining an awareness of their being/becoming in the world. Interdisciplinarity offers students the opportunity to reside in-between and the option to remain there as long as they continue to embrace moving forward as a process rather than the achievement of a destination. If they can even begin to appreciate the relational tensions in-between as what keeps them prodding forward, then their becoming might be situated in a valuable space of learning.
CHAPTER 5

Expanding the In-Between: A Holistic Narrative Exploration

In the previous chapter, I presented findings which centered on a relational perspective of three narratives of lived experience in the Transdisciplinary Design Studio. The decision to create two findings chapters emerged through the visual-verbal analytic process where I perceived the narratives as unfolding alongside, and entangling with, other narratives. Images and texts cut paths to other individual’s narratives, and they could not be easily separated for an isolated scrutiny. In this way, I was inspired to share and discuss these (co)constructed narratives as relational—bound together in the context of the design studio. AshLeigh, Ellie, and Christy were brought forth as illustrating the ways in which participants’ lives were informed, intertwined, and challenged by the other as they navigated and resided in-between. In this dialogue, the construct of the in-between focused on the tensions amongst individuals as they came together in a unique, complex learning environment.

As discussed in the Chapter 4 summary, AshLeigh, Ellie, and Christy demonstrated a wide-awakeness which permitted them to be/ become open to new understandings about themselves as they resided alongside the other. It is the process of being/ becoming which provides a lens through which I will explore the in-between in this chapter. Being/ becoming represents an awareness of the self as in-process, where wide-awakeness to the self and the other stirs students into reflection, an openness to disruption, and oftentimes growth while they reside in-between. Striving towards a wide-awakeness to the epistemological underpinnings of visual-
Verbal narrative analysis prompted an internal dialogue surrounding how this widened lens might be effectively explored.

Along these lines, I opted to organize this chapter not on coded themes which would be more appropriate in a grounded theory approach; rather I am focusing on broad concepts related to the research questions which allow the narratives to remain holistic and intact. The organization around themes resulted in a parsing of the narratives which neglected many of the inherent strengths to this methodological approach including what Polkinghorne (1995) explained: “…is actually a synthesizing of the data rather than a separation of it into its constituent parts” (p. 15). Therefore, the metanarrative concepts are organized into the three major sections of this chapter through which the researcher’s interpretive comments and relevant research are interwoven. There is a methodological emphasis on presenting the narratives as horizontally crossing all participants as opposed to Chapter 4’s focus on deepening the personal and relational narratives as situated within the three selected participants. Despite the meta-level view, thoughtful engagement with the students’ field texts is demonstrated through using their direct quotes as much as possible.

The ensuing sections present a synthesis of prominent concepts of being/becoming as situated in: creativity and the creative self, disciplinary self and disciplinary others, and navigating transdisciplinarity which, in its complexity, encompasses several facets. Just as the narratives represented in the previous chapter entangled, these topics are not easily separated (Josselson, 2011) as participant narratives often started with a focus in one concept and then moved into another as the narrative unfolded. In this way, it might be best to perceive this chapter as organized into sections for clarity but, once these imposed lines of distinction are removed, the narratives gush back together to form complex seas of lived experience.
The inherent uniting thread amongst these concepts of being/becoming is the 
(co)construction of identities. I use the term (co)construction rather than construction on the 
heels of the previous chapter where I perceived the other as disrupting or challenging the 
students as they navigated the in-between. It was through wide-awareness that they became 
aware of the other in transdisciplinarity and cultivated an awareness of self, where identities 
were (co)constructed through the relational. Therefore, these concepts are bound by the tension 
of identity which will underlie the subsequent discussion. The conclusion of this chapter will 
focus on the implications of this narrative inquiry study for education, teaching, and research 
methodology.

Creativity and the Creative Self

As an explicit aspect of the Transdisciplinary Design Studio curriculum, creativity 
emerged as a prominent topic in the students’ narratives. Remarkably, some of the most 
compelling and holistic narratives about creativity and the creative self were voiced by the 
engineering students. In the second focus group, Marissa, an engineering undergraduate, 
reflected on her experiences in the Transdisciplinary Design Studio and confessed, “I don’t think 
I’m that creative, now that I’ve taken this class. I thought I was, but I’m not” (Focus Group #2, 
lines 143-144). Despite this assertion, Marissa communicated an honest and insightful narrative 
about her perceptions of the creative self, as both embedded in her disciplinary experiences and 
affected by her transdisciplinary experiences with the art education students.

The creative self emerged in Marissa’s dialogue in the second focus group on several 
occasions. She began her discussion by explaining a realization which arose from personal 
experiences in the course:
I guess I take a little while to be creative. It doesn’t happen right away. I have to think awhile, and I don’t know, I just realized that every time we have like…we’ve only had two, like, main projects, but then we had the community initiative, and then the art piece. […] I don’t know. It takes me awhile. (Focus Group #2, lines 137-143)

She went on to describe this self-perception as stemming from seeing the art education students’ visual journals and her proclamation that she’s “just not creative when it comes to stuff like that” (lines 153-154) but that she desires to possess this type of creativity. In unraveling her definition of creativity further, Marissa explained, “I think I’m creative in everyday life, like, just little things, but I’m not artsy-creative” (lines 199-200). In this way, Marissa’s defined her creativity as “little c” creativity which encompasses more of an everyday form of creativity as opposed to “big C” which refers to transformative ideas which lead to notoriety in one’s field (Csikszentmihalyi, 1996).

Later in the focus group, Marissa elaborated on her perception of “little c” creativity and presented a more complete definition of this idea in terms of production:

But I also think…when I think [of being] creative, I think of something I’ve never seen or something that’s, like, undefined or something that you don’t expect or something, because if it’s being creative, it’s like, you’re making it up from…like you haven’t seen it before. It’s not something that exists. It’s, like, different. That’s what draws me to things. (Focus Group #2, lines 202-206)

Through this definition of creativity, Marissa addressed the notion of creativity as being novel or original which echoes Simon’s (2001) assertion: “we judge thought to be creative when it produces something that is both novel and interesting or valuable” (p. 208). Similarly, Cropley and Cropley (2005) proposed engineering creativity as valuing relevance/effectiveness, novelty,
elegance (aesthetics), and generalizability. These four aspects of creativity complement Marissa’s discussion of everyday creativity through which the emphasis on functionality in her discipline might supplant the quality of aesthetics, or an “artsy” quality, in creative products.

Within the “little c” creativity of which Marissa spoke, she provided an interesting distinction between her notion of everyday creativity and “artsy” creativity which appeared to underpin the visual journal work she observed from the art education students. She reiterated her appreciation of novelty in stating that she “always liked art, and I don’t know, off the wall things, like different things” (Focus Group #2, lines 156-157) but that she did not previously have a way of applying her creativity. Contradicting her previous statement, Marissa continued on to say that she did see herself as creative, although being creative is “not easy” (line 161). Perhaps this difficulty was grounded in what Marissa described as the lack of creativity in her discipline of engineering where the students are given “something to think about, and we can’t change it. We have to learn it that way and do it the way they tell us to, so we don’t have to do much creating or changing” (lines 171-174). This notion follows the discussion of accountable disciplinary knowledge (ADK) in Stevens et al.’s (2008) study which found that early engineering coursework focused on “well-defined problems, each with a single, correct answer” (p. 358) and, in labs, a recipe which students must follow to produce the intended outcome. While the authors found that this changed significantly in upper-level courses in engineering, it reflected Marissa’s comments as an early third-year student in the environmental engineering program.

Whereas Marissa distinguished between everyday creativity and artsy creativity, Ethan also discussed his perceptions of creativity; though through a slightly different lens. In the second focus group, the engineering undergraduate explained that “there’s, like, problem solving creativity, and then there’s, like, artistic creativity…which I think engineering students might
excel more in the problem solving against the artistic” (Focus Group #2, lines 264-266). Similar to Marissa’s notions above, Ethan understood creativity as encompassing artistic work and referenced the disciplinary differences between these types of creativity. In his visual journal (Figure 23), he also jotted down notes prior to the second focus group about creativity and the disciplines stating that “creativity comes easier for Art Ed students, ENVE [environmental engineering] students just as creative, just takes longer” and cited the difference between “problem solving creativity and artistic creativity” (Visual Journal Check #3, p. 16). Elaborating on these forms of creativity, Ethan wrote about creativity in a class exercise which involved innovative use of materials to solve a design problem. In this exercise, he perceived the engineering students as demonstrating problem solving creativity whereas the art education students’ visual journals were cited as an example of artistic creativity.

Figure 23. Ethan's second focus group notes: Problem solving vs. artistic creativity
Interestingly, Marissa responded to Ethan’s comments on this exercise in the second focus group and that she “thought right away” (line 253) to use the materials innovatively explaining that it was a different approach to problem solving. Marissa confessed that her behavior “was creative, but it was more like, [the instructors] gave us what we were doing” (lines 257-258). These statements paralleled her previous statement of the type of creativity traditionally practiced in her discipline as situated within certain parameters. In this way, Marissa and Ethan presented artistic creativity as associated with the creating of an aesthetic product, such as the visual journal, and problem solving creativity as more internalized and perhaps more cognitively driven. This follows what Madden (2004) referenced in terms of a perceived creative dichotomy juxtaposing an invention-cognition view against an artistic view. Using an arts policy lens, Madden went on to point out that these views are not mutually exclusive. However, the dichotomy is problematic in stimulating a broader discourse of creativity as artistic creativity encompasses qualities (i.e. aesthetic and emotional) which move beyond those associated with invention-cognition.
Ethan further explained the creative differences between the art education students and the engineering students in the second focus group. He asserted that creativity “comes a lot easier for them than for us” (lines 163-165) but that it did not mean that the engineers are less creative; rather, “It’s just, that’s the way that [the art education student have] been thinking all along, and that’s their natural way of thinking, whereas, we kind of have to dig a little bit deeper” (lines 168-170). While students like Marissa and Ethan were open to understanding creativity as encompassing different skills, they emphasized disciplinary differences in creative thinking and behavior as observed in the design studio. Both engineering students attributed their perceptions of creativity as stemming from experiences in the students’ respective disciplines. They perceived the visual arts background of the art education students as nurturing creative thought which cultivated a “natural” process of creativity while the engineering students had to work harder to be creative. Along these lines, Ethan reiterated Marissa’s statement and asserted that in
engineering there are definite right and wrong ways to do things whereas his experiences in the design studio taught him that “there’s not, like, right or wrong” (Focus Group #2, line 21) when it comes to the creative process. The notion of one correct answer in engineering education emerged in Kazerounian and Foley’s (2007) study on barriers to creativity in engineering education. Concurrently, this statement by Ethan echoed findings from a previous iteration of the course where an engineering student made a similar observation about the right and wrong of engineering problems juxtaposed against the creative process as nurtured in the design studio (Costantino, Kellam, Cramond, & Crowder, 2010).

Summarizing his thoughts on creativity, Ethan reflected on his creative self in a visual journal entry which followed an exercise on empathizing and creativity: “I learned that I am definitely a creative thinker, but I am not necessarily an artistic thinker. [...] I have a lot of creative ideas, but have trouble materializing them” (Visual Journal Check #3, p. 9). Again, he reiterated a distinction between artistic thinking and other forms of creativity and echoed Marissa’s sentiment of the challenges in bringing creative thinking to fruition. Though neither one elaborated on their difficulties with this aspect of the creative process, Ethan provided a perspective which demonstrates that creativity is a skill that can be developed. He wrote in his final reflective paper: “I realized that creative thinking is something that cannot necessarily be forced. It is something that must be developed naturally over time as one experiences and learns different things throughout life” (lines 93-95). The cultivation of creativity is further discussed in Sara’s narrative on creativity below.

Building off Chapter 4, another facet of AshLeigh’s narrative focused on creativity in engineering. AshLeigh was in the same focus group as Marissa and Ethan, therefore her dialogue
is congruent with many of the aforementioned narratives. In this focus group, AshLeigh recounted her second test in a required course called Strength of Materials (Strengths):

I think, sometimes, you have to be creative. I remember… it was our second Strengths test, and I had no idea how to do the problem, but […] I had to figure out, like, how to do it and end up with the right units. So I just started playing with numbers, and I mean, I got it right, but I think you need to be creative in situations like that, but it’s loosely called creative. I don’t know. (lines 179-188)

She went on to describe this type of creativity as encompassing the characteristic of resourcefulness (Hunter, Bedell, & Mumford, 2007). This description of creativity complemented Marissa’s definition of “little c” creativity and her assertion of creativity in engineering as possessing more parameters under which students work. It is interesting to note how AshLeigh’s language changed through the course of this statement by initially framing her behavior as creative yet, at the end, calling it “loosely” creative and ending with a noncommittal “I don’t know.”

AshLeigh, like many of her engineering peers, struggled with both seeing herself as creative and calling her actions creative which is perhaps rooted in the types of creativity that the engineering students discussed. Through these discussions, there emerged a clear distinction between artsy or artistic creativity versus every day, problem solving, or resourceful creativity. Many of the engineering students implied that the former is perceived as being more creative while the latter is less creative, which might account for the engineers’ struggle with understanding the creative self. This perspective connects to what McRobbie (1998) found and Taylor and Littleton (2012) described as “contemporary creative work is said to be strongly associated with established images of the creative maker or artist” (p. 134). In this way, the
engineering students’ descriptions of creativity as “artsy” and “artistic” align with this romanticized perception and further cultivate distinctions within this perceived creative hierarchy.

The discussion of perceived differences between creativity in engineering and the arts leads into another facet of AshLeigh’s narrative. In her final reflective paper, AshLeigh brought forth her struggle with reconciling risk taking in the two disciplines. She explained,

A difference I debated with for a while was the fact that I think it is more acceptable to make mistakes in artistic fields. Those mistakes can turn into some very beautiful pieces of art. I will say that it is acceptable for all fields, and probably recommended, to make mistakes in the development phases of an idea. This is the part that your idea won’t actually kill anyone. The mistakes that are made in the phase of problem solving help create better solutions because you are able to learn a way not to solve the problem.

While it is absolutely unacceptable to build a bridge that has errors in it, it is ok to make those mistakes early on because it makes you a better problem solver in the end. (lines 97-105)

In this paragraph, AshLeigh focused on mistakes as part of the creative process. According to her, there is a distinction between the two disciplines where mistakes are perceived as an acceptable and even fortuitous part of the creative process in the visual arts and implied that this is not so in engineering. Despite this assertion, AshLeigh does emphasize similarities across these disciplines, citing that risk-taking (i.e. mistakes) is an important facet of the creative process “for all fields” as it results both in improved problem solving skills and more thoughtful creative products.
AshLeigh’s comment in her reflective paper addressed what appears to be a metanarrative in her field surrounding creativity. Kazerounian and Foley (2007) cited that traditional perspectives in the field of engineering downplay risk-taking which often manifests in student academic performance; a quality that is evident in Chapter 4 as AshLeigh’s struggled with letting go of perfectionism in her visual journal. Additionally, the researchers cited that “the example of building bridges, making mistakes, and loss of lives comes up often” (p. 762) in engineering discourse; again, precisely echoing AshLeigh’s sentiments surrounding risk-taking and the creative process.

Further unpacking the engineering students’ perceptions of creativity brings forth a consideration of what it means to be creative in mathematics and science versus the arts. Weisberg (2006) explored this topic through a comparison between Watson and Crick and their work on the double helix and Picasso’s well-known painting, Guernica. He brought forth an interesting perspective which appeared to underlie many of the engineering students’ comments and hesitancy to identify themselves as creative where: “the artist brings objects into existence as he or she carries out the creative process” while “the scientist does not bring objects into being through the creative process; he or she discovers objects that exist independent of the scientist and of the creative process” (p. 54). Though Weisberg went on to discount the simplicity of this notion citing specific similarities between the creative processes of the artist and scientist, the creation versus discovery argument presents an interesting lens through which the engineering students’ comments might be considered. Marissa’s conceptions of everyday creativity, the distinctions between artistic and other forms of creativity, and AshLeigh’s Strengths test experience all point to a valuing of creation rather than discovery as a defining quality of
creativity. As these students struggled to articulate their ideas and experiences, they revealed interesting facets of their creative identities.

Though the engineering students provided extensive, thought-provoking perspectives on creativity, Tyler, a graduate student from landscape architecture, also told a concise story about a general (re)consideration of creativity based on the studio curriculum. He described the Root-Bernsteins’ text:

…the way the book laid out these creative tools, thinking tools, just having…just knowing that those exist and being able to like, you know, recognize the patterns going on in your own creative process is helpful. I’ve never thought about creativity in terms of its components and things […] that it’s made up of. (Focus Group #2, lines 68-74)

For Tyler, the book and course curriculum provided both a language and a framework for understanding creativity and his own creative process. He later explained, “It’s almost like I looked at creativity as one general term, not that it was made up of these other, you know, sub-categories of ways that people are creative” (lines 127-129). Though Tyler spoke more broadly about creativity than his engineering peers, he articulated an important realization about creativity that moved it from a general understanding to a more nuanced perception of how creativity is manifested in his own thinking and behavior. He attributed his new understanding as grounded in the Root-Bernsteins’ text as well as the lessons based on the creative thinking tools which concretized his perception through action.

Similar to Tyler, Amy addressed the Root-Bernsteins’ text as influential in her perceptions of creativity. An undergraduate art education student, Amy expressed the importance of *Sparks of Genius* in a visual journal response:
Most important/revealing/useful things I've learned this semester about my own creative process is how I am able to think creatively. The book 13 thinking tools was very helpful and it addressed the tools used to think creatively. A lot of times these things go unsaid & therefore [it’s] useful to know & reflect on it. (Visual Journal Check #3, p. 50)

Concurrent with Tyler’s discussion, Amy’s statement revealed that having a language through which to consider and discuss creativity was helpful for developing understandings of her own process. In Sparks of Genius, the Root-Bernsteins (1999) brought forth their conception of synthesizing education which rested on eight premises. One of these specified the need for an integrated curriculum which cultivates a “common descriptive language for innovation” (p. 317). Through this goal, the authors cited the need for a common language that binds practitioners from various disciplines and promotes the sharing of process, experiences, and innovations as transcending disciplinary boundaries. While transdisciplinary communication will be discussed further in a later section, the text as fostering a common creative language which inspired students to reflect on creativity emerged in several students’ narratives.

Amy also discussed visual journaling as an important aspect of her creative process and appreciated the way in which it nurtured reflection:

Visual journals have always been helpful to me in many of my classes. In [art education] classes, it helps me to reflect & think about the things I've learned. In studios, it allows [me] to explore ideas for final projects (thumbnails). Allows me to play w/ ideas & forms & techniques also helps me keep organized. (Visual Journal Check #3, p. 5)

In this statement, Amy described how visual journaling provided a space for reflection and exploration (Guwaldi, 2008; La Jevic & Springgay, 2008). Parker’s (2005) research on sketchbooks in art and design education found that sketchbooks facilitated engagement in two
primary facets of Wallas’ stages of the creative process: preparation and incubation. Similarly, Amy discussed her creative process in terms of thumbnails (preparatory sketches) and playing with ideas, forms, and techniques; actions which fall within these early stages of creation. Amy’s comments capture the ways in which visual journaling fostered reflection on her interrelated processes of learning and creating. Evidence of these early stages of the creative process is found throughout Amy’s visual journal where images and text present inquiries into the process and an attention to the developing aesthetic product (Figure 25).

Figure 25. Sketches from Amy's sketchbook of the final gallery exhibit

Another art education undergraduate, Sara, wrote extensively about creativity in her field texts, most prominently in her final reflective paper. In her final paper, she presented three “C’s” on which her discussion focused: connection, creativity, and communication. These concepts were perceived by Sara as surfacing over and over throughout her experiences in the design studio in terms of her own thinking and behavior—and often as observed in the behavior of
others. In her visual journal, Sara described creativity as “intellectually visualizing something unique and applying it to the limitations of our physical world” (Visual Journal Check #3, p. 4). This perception correlates with Rhodes’ (1961) early yet well-known definition of creativity as Sara noted an importance of the process (visualization), the product (application), and environmental press (limitations of our physical world). Akin to Marissa, Sara’s definition emphasized uniqueness, or novelty; however, the idea of limitations emerged as an interesting facet. The limitations of which Sara spoke might be considered within Eisner’s (2002) conception of constraints and affordances where the former impels the artist to learn “how to think within the parameters that any material or process imposes” (p. 236). In this way, the limitations addressed in Sara’s definition of creativity actually push the creator to embrace constraints not as obstacles, but as opportunities under which creative behavior must operate.

Figure 26. Excerpt from Sara's concept map that was submitted with her final reflective paper:

"Every person is creative"
While Sara was very articulate in her definition of creativity, she also believed strongly that creativity can be nurtured, asserting:

I hold firm to the theory that every person is capable of creative thought and processing. Creativity is like a muscle – it needs exercise to function at its optimum level. I have found that, like the first trip to the gym, the first dive into creative exploration is quite intimidating. Individuals who do not engage in creative exercise frequently are timid, shy, and oftentimes afraid of failure. (Final Reflective Paper, lines 79-83)

She went on to describe her disappointment that many of her peers marked themselves as not artistic in the design challenges. She observed that “The engineers in the class readily labeled themselves as ‘not creative’ and would readily let the art majors do the ‘artsy stuff’” (lines 89-90). Corresponding with the engineering students’ perspectives, Sara brought forth the adjective artistic as a descriptor for creative behavior using the terms synonymously in her discussions. This presents an interesting connection to the ways in which the engineers referenced creativity and the valuing of artistic behavior as creative behavior.

Like Tyler and Amy, Sara found the Root-Bernsteins’ text to be impactful and described an observable behavioral shift amongst her peers and even in her own creative process. She continued on in her reflective paper,

It was not until after engaging in the activities described in Sparks of Genius that I saw my fellow students taking small risks to practice creativity. It was through low-risk activities and a little bit of creative freedom that we all became comfortable enough to stretch our creative muscles. (lines 90-93)

Relating back to AshLeigh’s narratives, risk-taking was brought forth by Sara in reference to creative behavior and the ways in which the text, and related lessons, encouraged this type of
exploration. Sara attributed the activities themselves and the freedom in these activities as fostering a low stakes environment through which the students could flex their creative muscles through taking small risks. Basadur (1987) found that low-risk taking was a barrier to creativity in work environments, and other researchers specified that risk-taking and/or freedom were conducive to stimulating creative behavior (Amabile, Burnside, & Gryskiewicz, 1999; Ekvall & Tangeberg-Andersson, 1986; Kazerounian & Foley, 2007; Politis, 2005; Prather, 2008).

The low stakes environment which cultivated risk-taking in her peers was also pivotal in nurturing Sara’s creativity. She described how a graduate student-led printmaking lesson focused on the Root-Bernstein’s thinking tool playing, was an experience that allowed her to (re)consider and stretch her own creativity. In her visual journal, Sara wrote,

As [a] B.F.A. student, a majority of my college career has been focused on PRODUCT. Learn it as fast as I can and then crank out as much as I can in as little time as possible.

But playing…Playing is hardly allowed. So I want to play more with the materials.

Explore. Experiment. Do it for FUN. (Visual Journal Check #3, p. 12)

Through this passage, Sara presented playing as dichotomous to her product-oriented studio experiences. This experience was pivotal for her as she broke through the disciplinary traditions of creative production and embraced the process of creation through playing. Sara reaffirmed the positive nature of this experience in her final paper:

Our lesson in play allowed me to enjoy printmaking for the first time; I was not burdened by “getting it right”. With that pressure gone, I was able to experiment and enjoy the process of printmaking. In the end, I also enjoyed the product. I felt both creative and confident. (Final Reflective Paper, lines 93-96)
Similarly, playing emerged in several other students’ field texts with regard to creativity including those of Ellie (playful environment), AshLeigh (playing with numbers), and Amy (playing with ideas/forms). As evident in all of these discussions, play was perceived as an important characteristic of the creative in-between cultivating a space where students might explore, take risks, and reflect on their own creative processes. Inherent in these discussions was the disassembling of the perspective that there is one “right” way and a (re)envisioning that there are multiple answers and approaches to any creative problem, much like Ethan stated above. For Sara, the ability to play and engage fully in the process of creation resulted in a creative product that she enjoyed and a personal feeling of being both creative and confident.

Figure 27. Sara's relief print from the lesson on playing
The Disciplinary Self/ Disciplinary Others

Through the narratives on creativity and the creative self in the previous section, it should be evident that entangled in many of these perceptions is a grounding in disciplinary knowledge and experience. Therefore, these discussions of creative and disciplinary identity are impossible to unravel completely as they overlap and inform one another much like the relational in-between in Chapter 4. In many ways, this section will serve as a continuation of the last or at the very least, it will intersect the narratives at various points. Here, I will focus on student perceptions of disciplinary identity as it relates to understandings of the self and the other.

Since the disciplinary self was often intertwined with the creative self, I will begin with where the previous section left off. Sara brought forth creativity as an important aspect of her experience in the design studio, one of three major themes in her final reflective paper. In the concluding paragraph of this paper, she revealed:

I have been challenged, pushed, and grown in such a way that, like a rubber band, I cannot return to my original state. This will help me in my future career as an art teacher; the best teachers never stop learning. Through this [transdisciplinary] studio and its influence on my other classes and extra-curricular activities, I have become more aware of my own creative processes and my thinking patterns. I have learned how I specifically learn, and I believe that knowledge will positively influence my abilities in synthetic thinking for the rest of my life. (Final Reflective Paper, lines 110-116)

In this conclusion, Sara expanded her insights and asserted that the design studio seeped into her other lived experiences and helped her to become more aware of her creative processes and thinking (Schraw & Moshman, 1995). This metacognitive awareness was poignant for Sara as
she presented this knowledge as influencing her professional life as an art teacher and reflecting her perception that “the best teachers never stop learning.”

In order to more fully understand Sara’s proclamation of growth and awareness of process, it is necessary to explore her lived experiences in the introductory design challenge which focused on minimizing waste in the local community. For this project, Sara was paired with an undergraduate and a graduate student from engineering:

It's me and two other Engineers. They're used to knowing exactly what is expected of them, they're used to knowing, “This is what I have to design. I have to get it done in two weeks. This is what I'm allowed to do. This is what I'm not allowed to do.” (Focus Group #1, lines 176-192)

Through this statement, she shared her perception of the problems and parameters that are placed on engineers in their courses—ideas which were echoed by Marissa in the previous section. She went on to explain that this understanding stemmed from observing the engineering students’ desire to jump straight to product. Interestingly, this observation contradicted Christy’s experiences in the first design challenge (see Chapter 4) where she observed the engineering students’ willingness to engage fully in process and her own tendency to jump to solution. This incongruity might be attributed to individual differences or that the graduate engineering student who took on a leadership role in Sara’s group was in a different engineering program and did not have the same course experiences had by the undergraduates.

In considering the role of creative products, contemporary perceptions of art education challenge the product-focused traditions in the field and embrace concepts like authenticity, investigation, and meaning making (Gude, 2013). Dialogue surrounding these aesthetic strategies
in her other art education courses, particularly a secondary methods course in which she was concurrently enrolled, likely resonated with Sara as she commented:

I made the connection with this assignment and that it’s designed to be open-ended to stimulate the thought process, and that was fine. I understood that as an art education major, but I felt that other members of my group...wanted to jump straight to final product. (Focus Group #1, lines 156-159)

This insight demonstrated an awareness of the pedagogical underpinnings of the lessons in the Transdisciplinary Design Studio which was fostered in Sara’s art education program of study. As someone who previously taught one of these courses, I knew that the required courses engaged students in contemporary readings and dialogue about curricula in order to cultivate thoughtful and reflective practitioners. Through these experiences, Sara was explicit with her assumption that she, as an art education major, was aware of this underlying pedagogy but that her peers might not have picked up on this facet of the assignment.
Figure 28. Sara's visual-verbal representation of the disciplinary differences in her group’s problem solving processes

Sara went on to summarize the perceived dichotomy between her own understandings and experiences and those of her engineering group members:

It's that balance between, “Hey, do we want to just sit here and do deep thinking all day long?” Or, “Hey, we got a project due in a week and half. It's [crunch time] let’s make something, who cares if it actually make sense or not.” (Focus Group #1, lines 274-276)

In this statement, Sara addressed two of the inherent challenges faced by her group. Not only did the students have to consider and integrate various approaches in the design challenges, but they also had to work within time constraints which may have affected their overall process. Sara resigned to the fact that her group had to move beyond thinking and make something, anything, by the project deadline. The group’s difficulties in overcoming disciplinary differences and a
lack of understanding about one another’s process resulted in a disjointed and, according to the group, a largely unsuccessful final product. Through the challenges encountered in the introductory design challenge, Sara’s conclusion in her final reflective paper is better understood. It was partly through working with others possessing different thinking and working processes that she became more aware of her own—knowledge that she felt directly impacted her professional and lifelong growth as an art teacher.

In the introductory design challenge, Sara and AshLeigh were members of the same group. While some of their specific challenges will be explored in later sections, some of AshLeigh’s comments are worth exploring as relevant to the current discussion of disciplinary identity. AshLeigh’s final reflective paper began with a hefty admission in the shallowness she perceived of non-science majors (see Chapter 4). As she carefully unpacked this statement, she revealed several notions which contributed to this perception including an “engineering persona” which supported science majors as equated with intelligence and art majors as being lazy. In their study, Stevens et al. (2008) also pointed out that the identity formation dimension often results in a “we” (engineers) vs. “they” (non-engineers or liberal arts majors) mentality.

The “we vs. they” perception was embedded in AshLeigh’s engineering persona; however, it also emerged in other field texts. In the first focus group, AshLeigh explained:

The young lady in the group who was difficult […] She’s an art education major and I think me and the other engineer in the group figured out why she was so…a little complicated to us, was because she was an art major and she had to take everything a step at a time. She didn’t like skipping over steps even though they were understood. She sat there for 30 minutes and drew a visual map of what we were talking about so that she could understand what we were talking about. (lines 463-488)
The incident that AshLeigh discussed in this statement was fresh on her mind in the first focus
group, and her frustration was evident in the description of her art education peer as being
“difficult” and “complicated.” AshLeigh attributed these qualities to Sara’s disciplinary identity
and her creative process. While AshLeigh thought that the steps were “understood” and assumed
that it was a lack of understanding that was confusing Sara, Sara articulated above that it was her
desire to embrace the underlying pedagogy of the assignment and engage in a thoughtful
reflection of the open-ended problem which kept her from jumping to a solution. In this way,
there was a misperception of the other (“they”) and the creative processes of each.

The third member of Sara and AshLeigh’s group also provided interesting insight into the
professional identity of engineers. Quentin, the graduate engineering student, wrote about the
“we” aspect of the dichotomy:

As engineers we always have limited resources and limited access to both equipment and
specialists. As a result we take it upon ourselves to measure and plan "twice" before we
"cut". What that means is making sure we have every calculation and measurement made
that we can before going to the mill or before using [our] limited resources to build or
experiment. We're trying to take every stakeholder into account and plan according to the
problem and constraints provided by a client. (Visual Journal Check #2, p. 45)

Through this comment, Quentin demonstrated a deep awareness of the engineering profession
and the rationalities behind the production process. Jocuns, Stevens, Garrison, and Amos (2008)
found that engineering students early in their programs of study emphasized fundamental math
and science knowledge while those with deepened experiences in coursework and internships
shifted their perspectives to a more mundane and nuanced view of the profession. Quentin’s
status as a graduate student denoted a more advanced knowledge of what it meant to be an engineer which is evident in this detailed description.

Quentin also spoke about the introductory design challenge using “we vs. they” language in the second focus group:

But I mean, if there’s anything I took out of it, it was understanding that we do, really, think very differently. And it’s interesting. I mean, I like how I think as an engineer. And I don’t know how I feel about it how she thinks as an art education major, but there [are] similarities in that we all…we all think about the big picture. But we may not have that as a priority, because for me and AshLeigh we wanted to…we focused on the detailed end product, because that’s what we had to come up with. (Focus Group #1, lines 333-340)

This insightful reflection connects to many of the same things that his group members referenced in their discussion of professional identity. Quentin began with the assertion that the two majors think differently—he thinks like an engineer, and Sara thinks like an art education major. What is compelling about this statement is the perspective that he liked his disciplinary thinking and then admitted that he did not know how he felt about the art education mode of thinking. Quentin did not elaborate on his uncertain stance towards the other; however, this statement likely reflects the struggle that the group encountered with communication which is discussed more fully below. It might also reflect Bradbeer’s (1999) identified barriers to interdisciplinarity which included “different (and some less desirable) approaches to learning in students” (p. 392). From Quentin’s account above, it appear as though his perception of Sara’s approach to thinking and learning might encompass this notion. Quentin continued on to outline both similarities and differences between the disciplinarity thinking of the two majors; a similarity being big picture thinking and a difference being the engineer’s focus on product. Both Quentin’s and AshLeigh’s
awareness of the engineers’ product-focus served as validation for Sara’s observations and hinted at the disciplinary obstacles encountered by this group in the first design challenge.

Moving beyond the group of three, Ethan provided an interesting perspective to the disciplines enrolled in the design studio. In the second focus group, Ethan recounted an earlier conversation with his classmates: “we were talking earlier about the different disciplines, and I feel like engineering is on one side, and art ed is on the other side, and then landscape architecture is somewhere in the middle” (lines 309-311). He then posed this assertion to Tyler, the landscape architecture student in his focus group, for feedback. Tyler vacillated for a moment explaining that that the professions of art and design have very different projects and clients but concluded: “…I’d be happy saying landscape architecture is somewhere in the middle. I’d be honored to have both skills” (lines 333-335). It is interesting to note Ethan’s distancing of art education and engineering as he perceived them to be dissimilar, situated on opposite sides of a continuum. Tyler, on the other hand, observed that the skills involved in both disciplines would be beneficial to a landscape architect. Similarly, Boradkar (2010) posited that: “Design straddles craft and science, the humanities and the social sciences, as well as art and engineering in its practice and its theory. Design is generative and analytical; it demands creative thinking and critical problem solving” (p. 281). As Ethan and Tyler dialogued about the relationships between the three disciplines, they revealed interesting perspectives about the disciplinary self and the other.

In the second focus group, Tyler provided insight into the perspectives of art education and engineering from his own observations in the studio:

So, in working with art ed and environmental engineering students, to me, I think it’s become clear that each of our disciplines has a different perspective on things, you know,
whether it be a project, like, put tacks on a wall or visual journal, approach to a project, whatever, but I…it’s not intentional. I think it’s a result of years and years of training and personal experiences inside and outside of the classroom. You can start to see that in the language that we use. Like, if [Marissa] were an art ed student, she probably would have described that paper sculpture she made very differently, using artsy words, et cetera. But an art ed student would probably describe the pin-up tack very differently than you did, again, maybe because they’re different forms of creativity. But even in class discussions, you’ll hear…it’s never condescending, but sometimes, you’ll hear…or accusatory, but you hear one discipline…refer to the other disciplines as if we’re very segregated. (lines 272-288)

This statement is included in its entirety as it encompassed compelling perceptions and experiences related to disciplinary identity in the design studio. Here, Tyler explained that the unique perspectives of students in the course were largely due to the discipline-specific, compartmentalized contexts to which most of the students’ educational and personal experiences were relegated. He used language as an example of how these disciplinary differences manifested in the course and even brought forth the notion that perhaps there are different forms of creativity embedded in the disciplines, despite the transdisciplinary focus of the thinking tools Root-Bernsteins’ text. As Tyler indicated, the complex nature of the Transdisciplinary Design Studio brought forth many layers of complexity which manifested in the students’ interactions.

In the last sentence of Tyler’s statement, he noted that there is a clear separation, or segregation, between the disciplines evident through the dialogue in the class discussions. This segregation was a challenging curricular obstacle that the co-teacher and I strove to overcome. It
was frustrating when we observed situations that reinforced disciplinary stereotypes or when we witnessed a student lose his or her voice as a result of these perceptions.

One such example caught our attention during an in-progress critique when Quentin was charged with thinking of how his engineering project might benefit from the knowledge of an artist. He hesitantly replied that they could “make it pretty?” This very misconception was addressed by Hocking (2010) in addressing the role of designers as contributing only to the making of “pretty stuff.” From our perspective, we thought we had failed—it was late in the semester, and Quentin had demonstrated a shallow understanding of the work and knowledge of an artist after we had attempted to nurture dialogue and awareness of the disciplinary others. We later learned that our concerns were for naught, as Quentin had immediately felt bad about his response. He spoke about this experience in the second focus group and reflected in his visual journal (Figure 29) that his poor answer actually steered him to a “greater understanding of how to look at other disciplines” and showed him how he could be “ignorant or closed minded” (Visual Journal Check #2, p. 59). Despite our experiences with disciplinary segregation, we also came to discover moments like these. Moments of self-reflection that led to the development of new and deepening understandings of disciplinary identities.

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8 This situation was also discussed in an email exchange between myself and the co-instructor which can be found in Appendix P
Figure 29. Quentin’s visual journal reflection

Inherent in these narratives of the disciplinary self and other are complex and even contradictory perceptions that the students grappled with up until the end of the semester. Along these lines, Tyler engaged in a reflective dialogue surrounding disciplinary identity and understandings of the other during the second focus group:

Tyler: Like we...like we accept that we think differently and are different. And that’s kind of an interesting phenomenon in class. I’m not sure how to solve that. I think that’s probably what the class is for. [laughing] And I’m sure we’ve all
gotten better at it, but it’s just that I’ve kind of noticed that, and it’s been eye opening.

Facilitator #1: Do you feel like you’ve gotten better? I don’t know if that’s the word that you used, whether…

Tyler: I think we’re both learning from each …

Facilitator #1: …one is better or not.

Tyler: No.

Ethan: Right, right. Right.

Tyler: No. I think we’re just both learning from each other …

Ethan: Right.

Tyler…just because we realize we’re all different. (Focus Group #2, lines 290-305)

The transdisciplinary nature of the design studio contributed to compelling interactions between the students as they discovered their similarities and differences. Tyler’s comments in the focus group pointed to an important, although sometimes frustrating, facet of the in-between space Nicki and I endeavored to cultivate in the course. Above all, the in-between is a learning space. It is a space that embraces process over product, both in terms of creation and in terms of identity. As Tyler reflected on the three disciplines enrolled in the design studio, he articulated this notion as he asserted that the students were learning from each other. Not “did learn” or “learned” but, with just a few days left of class, they were still learning. Tyler understood that students were in-process beings, becoming professionals and perceiving their own identities and the identities of the other as relational—as intertwined—despite their differences.
Navigating the Transdisciplinary In-Between

Giri (2002) presented transdisciplinarity as a field which cultivates the relational, explaining: “In transdisciplinary striving, relationship rather than our separate disciplinary Being is the ground of our identity. This calls for looking at disciplines in relational terms rather than in isolationist or oppositional terms” (p. 106). Advocating for a “creative transdisciplinary practice,” Giri elaborated that the focus should neither be on the self nor the other but rather on the relational—a giving/receiving endeavor. In this way, the relational is a symbiotic in-between, a tension which entreats individuals and groups to explore dialogically as they embark upon quests for understanding.

In the design studio, narratives emerged surrounding both the constraints and affordances (Eisner, 2002) of the transdisciplinary nature of the curriculum. The boundaries fostered by years of insular disciplinary study were discussed by some students as obstacles whereas others perceived the studio as an opportunity to move into a more collaborative learning space. This section focuses on inter- and transdisciplinary notions that intersected student lived experiences and became prominent narratives of the in-between. Four concepts were prominent in student field texts and are explored in the narratives below, including: 1) obstacles of communication; 2) finding common ground; 3) collaboration and “real” world experiences; 4) empathizing. Each of these is illustrated by a quote taken directly from the student-participants’ field texts and is unpacked and explored through a grounding in literature, empirical studies, and other field texts.

“But it was just like, a disconnect”: Obstacles of Communication

When students from three seemingly disparate disciplines joined together in the Transdisciplinary Design Studio, the co-teacher and I anticipated that the collaborative nature of the group projects might pose a number of challenges—including communication across
disciplines. For most of these students, this was their first experience in a true transdisciplinary course and, for the art education majors, it was a rare opportunity to work collaboratively in the realm of visual artmaking. Rosbach (2012) asserted that a major obstacle in transdisciplinary group ventures is the “communication between and among individuals possessing different ways of knowing generated through diverse systems of representation” (p. 20) and proposed the concept of a trading zone (trading/ sharing knowledge across disciplines) as a means of understanding the cultural complexities in such a space. Citing Galison (1997), he explained that this concept was adapted from anthropology which encompassed a symbolic-spatial zone in which trading occurred. Rosbach (2012) applied this concept to laboratory research collaborations between different kinds of physicists.

Along these lines, I found that the concept of a trading zone complemented the construct of the in-between as they represent similar ideas through their collective research explorations, finding a shared language, and the search for understanding. As students navigated through the transdisciplinary space created by the design studio, they told stories about communication/ (mis)communication and the challenges they faced in working with the other. In this way, the in-between presented a space where students narrated the complexities of transdisciplinarity and where sharing (or trading) knowledge was embedded in learning how to communicate across disciplines.

In transdisciplinary trading zone theory, Rosbach (2012) emphasized the need for an inter- or metalanguage which represents a “higher level of shared meaning” (p. 23) within collaborative interactions. A similar idea was also addressed above with regard to the Root-Bernsteins’ (1999) call for a common descriptive language, specifically addressing innovation in transdisciplinarity. As students found themselves working with individuals from other
disciplines, they discovered challenges in translating ideas from one disciplinary language to their own. For example, Vanessa confessed: “I mean, every time the environmental engineers talk, I'm just like, ‘what?’” (Focus Group #2, lines 405). She elaborated on her lack of understanding of the engineering students in the second focus group:

Vanessa: One time we were talking about something, and he was just saying comments that were just so moronic, so I was just like, “what ev's.” To be quite honest. That just sounds awful. But it was just like a disconnect, I feel like. Is that mean?

Sara: No.

Christy: No, it's very honest.

Sara: It's brutally honest.

Vanessa: It's really way easier for me to connect to the landscape architects, because they are architects, which is…

Christy: Designers.

Vanessa: You know, very more design-based. But they're very artistic, because they have to make these beautiful, most of the time, public spaces…

(Focus Group #2, lines 424-434)

The disconnect of which Vanessa spoke arose from her interactions with her engineering peers as she perceived the fields of art (education) and landscape architecture as sharing more of a common aesthetics-based practice. In the dialogue above, Vanessa began by talking about a specific engineering student with whom she worked in the second design challenge but then she expanded her argument to a more general level when she discussed her relationship to the two landscape architecture students and their professional work. Vanessa’s honest dialogue focused
on shared language as necessary for facilitating transdisciplinary collaboration (Storey & Joubert, 2004). She found that the lack of a shared language fostered a disconnection between art education and engineering whereas the presence of a metalanguage created a connection between her landscape architecture counterparts and herself.

For Amy, another art education student, the engineering-based content was sometimes overwhelming, and she struggled with its disciplinary language. She explained:

And just from my background, I haven't encountered any of this stuff, so everything's new, and they have a lot of information, it's just a lot of time it just goes over my head, and I don't really understand all the statistics and all the everything that goes into it. And so doing that—I just stopped listening after a certain point, and then I can't focus on anything. I know [it is] helpful information, but I can't process it. (Focus Group #2, lines 568-575)

Here, Amy felt a disconnect between her own disciplinary knowledge and that from engineering which went over her head at times during the design studio. Like Vanessa, it was the lack of a shared language which caused Amy to feel overwhelmed and even shut down in processing the information. For both Vanessa and Amy, it was the engineering students’ disciplinary language which contributed to a lack of connection between the students as well as a perception of language as an obstacle in communication. In the situations discussed above, Vanessa and Amy sometimes found the boundary between art education and engineering to be too treacherous to cross.

AshLeigh’s narrative in the previous chapter emphasized the relational quality of her experiences in the design studio; however, another narrative focused on the challenges and frustration she encountered in the first design challenge. In this project, AshLeigh was grouped
with a graduate student from engineering and an undergraduate from art education. She elaborated on her experiences in the first focus group:

The people in the group are nice, outside of working with each other. I’ve had so many frustrating moments. I think the worst one happened two weeks ago. […] In the class before that, we had all agreed, kind of, on where we were going with our project, and we all agreed to bring in materials so that we could start working on our piece. […] The next class period, another, a young lady in the group did not say anything for the first two hours of the studio. I was trying to pull her in the conversation so that we could get a group perspective. There were only three of us. I’m like, “What is your… what do you want to do? How do you feel about this?” She wouldn’t say anything. […] Then she just went on a rant about how everything was terrible. I got a little upset because I was trying to include you the whole class period. I wanted your ideas and perspective so that we could have a really good project, and then she just comes out of nowhere with all this mess, and it’s like, “We could have gotten over this and solved everything and figured it out had you communicated earlier, but you wait until we have one hour left of class and the project is due next week, and then you give us this.” (Focus Group #1, lines 174-194)

This detailed unfolding of AshLeigh’s experience focused not necessarily the lack of a metalinguage which plagued the group, rather it was a (mis)communication. In this way, the term *(mis)communication* encompasses the failure, lack, and/or ambiguity of dialogue between group members. According to Giri (2002), the first virtue of creative transdisciplinarity is dialogue and AshLeigh’s comments above indicated the absence of this virtue leading to a major obstacle in the progress of the group. Another intriguing facet of the text above was the way in which AshLeigh moved between talking about her peer (“she”) and talking to her peer (“you”).
Without moving into a formal discourse analysis, it is possible that AshLeigh’s frustration with her group member led her to envision the event so vividly that she said the things she wanted to say at time as if she were speaking directly to Sara. In retrospect, she attempted to reconnect the severed lines of communication and foster dialogue, even in the absence of her peer.

AshLeigh also narrated this experience in her visual journal (Figure 30). In response to a prompt which asked students to represent their state of mind in the first design challenge, AshLeigh depicted a large yin-yang symbol which is often a symbol for harmony. She replaced each of the small circles inside each enveloping shape with what appear to be pieces of trash referencing the waste-focus of the first design challenge. Inside the symbol, erratic scribbles of black and red spill over the interior and exterior lines, and text reads “WTF!” and “Really??” on each side. The intrinsic meaning of the symbol is contradicted by the text and mark making—reflecting the apparent lack of harmony that AshLeigh felt at this time. This visual juxtaposition denoted her perception of the in-between as a space of disharmony and frustration when the group failed to effectively communicate and unite in the task at hand.
One of AshLeigh’s group members in the first design challenge, Sara, also provided her perspective on the experience in her final paper. She explained, “Miscommunication runs rampant between disciplines, which I have experienced firsthand. The design challenges within the [Transdisciplinary] Design Studio showed me that not every person thinks the same way I do” (Final Reflective Paper, lines 57-59). Sara’s perception of (mis)communication as a prevalent challenge in transdisciplinary work stemmed from her experiences in the introductory design challenge. In the first focus group, she spent a significant amount of time discussing her experiences and attributed their issues to both disciplinary differences and to (mis)communication. At one point, Sara conjectured as to what her group members may have thought: “I guess maybe they were just...Maybe they just sat there and pretended to understand,
because they were tired to listening to the art major ramble on about [these] big lofty ideas...” (Focus Group #1, lines 264-266).

As Sara did not feel heard or understood by her group, she searched for tools which might help her improve communication with the other. She elaborated in her final reflective paper on how she strove to combat (mis)communication:

It became necessary for me early on to employ the use of empathy and analogy in my communication efforts. By taking on the perspective of my classmates, I was able to momentarily break down and recombine concepts in a way similar to their own methods. (lines 59-62)

Sara attempted to empathize with her peers and used analogizing in order to communicate more effectively—both of which are creative thinking tools discussed in the Root-Bernsteins’ text. In fact, the co-teacher and I observed one of her attempts at mending communication with her group as she created a detailed mind map on the whiteboard in the classroom the meeting after the peak of (mis)communication and frustration. Sara often worked through her ideas using concept maps, and we watched as she posed question after question to her group; working feverishly on the board, drawing arrows and making connections between their ideas. A complex and detailed image materialized on the board, and I cannot help but think about all the arrows as, once again, representing the relational tensions between each individual as they resided in-between.
Figure 31. Excerpt from Sara's concept map which accompanied her final reflective paper: “No communication = miscommunication”

The third group member, Quentin, also referenced the challenges with communication, writing: “Understanding requires dialogue—open dialogue. As a group we have been having a hard time understanding both each other and the project” (Visual Journal Check #1, p. 12). In the first focus group, Quentin recounted his perspective of the first design challenge and cited communication as a major source of their group’s breakdown:

Quentin: Communication was the biggest thing. I thought we were communicating well…

Facilitator #2: Yes.

Quentin…because we were talking. We were talking, and nothing came out.

[laughing] I was just like, okay, all right, all right, let’s back up a second and figure this out. (Focus Group #1, lines 356-360)

Quentin was the only graduate student in the group and, like the others, worked to restore communication to his group—backing them up in order to move them forward. In his visual journal reflection from the first design challenge, Quentin detailed the class meeting discussed above. He wrote about the need for communication to be sparked and his wide-awareness towards the needs of the group at large, primarily that of a safe space. Through his efforts, he
concluded that communication was restored calmly and dialogue was fostered. A small illustration appeared at the bottom of the page with text that reads “Keeping the ideas floating” along with a floating orb and an arrow pointing upward (Figure 32). Despite the (mis)communication and subsequent frustrations detailed by the group members, this experience was pivotal for each of the students. Each of the accounts above emphasized the importance of communication to effective group work, the obstacles embedded in transdisciplinarity, and the efforts of each to foster shared dialogue.
While many of the students told stories of their struggles with group communication, there were also narratives of success. Marissa wrote enthusiastically about communication in the first design challenge:
Today our group creating the stepping stone for our project in a pleasant and efficient manner. :) Our communication skills are great and we tend to agree on ideas. We came up with a few idea[s] today but nothing is solid yet. This is going to be a good group!

(Visual Journal Check #1, p. 10)

Like Marissa pointed out, effective communication was perceived as essential to successful collaborations in the design studio. In transdisciplinarity, students learned the necessity of dialoguing with, rather than dictating to, the other (Giri, 2002). They began to understand the need to move past the language learned in their own disciplines and embrace a shared, dialogic language (Rosbach, 2012). As Greene (1995) expounded, “Mastery of a range of languages is necessary if communication is to take place beyond small enclosures within the culture” (p. 57).

Therefore, the transdisciplinary space of the design studio cultivated an in-between where students could hear, practice, and potentially learn new languages and metalanguages as they communicated with the other and traversed a complex social landscape.

“Maybe its b/c we were all equally lost :)”: Finding Common Ground

In transdisciplinarity, the curricular focus rests on an exploration of questions that cut across traditional disciplinary boundaries yet entreats students to apply the knowledge within their own fields (Holley, 2009b; Lattuca, 1995). The expansive quality of such questions brings forth inherent complexities, particularly when the disciplines are as varied as those found in the Transdisciplinary Design Studio. The two design challenges presented to the students were best characterized as ill-structured and open-ended problems which reflect those faced in fields like engineering. Jonassen, Strobel, and Lee (2006) explained: “Ill-structured workplace problems have vaguely defined or unclear goals and unstated constraints” (p. 139). Along these lines, ill-structured problems carry multiple solutions, multiple paths to solutions, multiple evaluation
criteria, while also requiring learners to make informed qualitative judgments and be able to articulate their decisions. Jonassen et al. asserted that the types of problems typically faced by engineering students in their classrooms are not adequate preparation for the complex and interdisciplinary problems faced in the workplace; therefore, Nicki and I made a pedagogical decision to integrate these experiences into the design studio curriculum.

Many students wrestled with the open and ill-structured nature of the design challenges. As discussed in Ellie and Christy’s narratives, it was the exploratory nature of the projects coupled with the lack of a clear solution which confused many students, and they often looked to those more experienced for guidance. Christy, for example, looked to Ellie, whose unique environmental engineering educational experiences encompassed explorations of similar socio-technical, workplace problems—problems that Jonassen et al. (2006) assert are needed in the engineering curriculum. Marissa also discussed her experiences with similar projects in the past, writing: “I was used to this and enjoy it now. When I first took a studio class it was extremely overwhelming though” (Visual Journal Check #2, p. 2). Despite their experience, even the engineering students grappled with the projects at times. Quentin lamented: “I’m still confused but [don’t] really know how to communicate it. I’m mostly frustrated with the task at hand and [don’t] know what I’m supposed to get out of this” (Visual Journal Check #1, p. 14). With background experiences in a civil engineering as opposed to his peers who were environmental engineering majors, it is likely that Quentin was not as familiar with the type of projects which were structured after those in environmental engineering design courses. The challenges faced by students, including the engineering students, in the design challenges cultivated an in-between space where students found common ground—and began working together towards a common goal.
Upon receiving the assignment for the first design challenge, Amy scribbled in her visual journal: “Need to figure out what exactly is the final product they want…DO NOT understand assignment AT ALL” (Visual Journal Check #1, p. 12). In visual arts education, there are often multiple solutions to visual problems like the ill-structured problems discussed above; however, most undergraduate studio assignments require the exploration of a specific concept along with requirements for media which provide students with parameters that guide their vision. Visual arts problems in these studios are also quite different as they often don’t address the complex social aspects as those found in the design studio curriculum.

*Figure 33. Amy's visual journal entry: "...DO NOT understand assignment AT ALL"

Amy’s emphatic words demonstrated a frustration with the openness and vague expectations of the assignment. In the first focus group, Amy explained the transition from exploring the project independently versus working with her group:

Then we were like, oh! Because all of [the individuals], we were just like, I don’t know, the whole time. Then finally, when we got together, we were like…we talked it over, and we were like, okay, then let’s do this and this, and everything just fell in place after that. And it was so much easier than when we were just given it and by ourselves, just I don’t know, lost, I guess. (Focus Group # 1, lines 128-132)
Amy’s comment about herself and her team members being lost when individually faced with the problem hinted at the sometimes overwhelming nature of these types of problems and the advantages to approaching them collaboratively. Moran and John-Steiner (2004) emphasized creativity itself as often a social process and that collaborative support is necessary. These authors assert that “collaborators not only recognize but also accept and co-participate in the uncertainty, ambiguity, and challenge of the creative path” (p. 16). As Amy found, it was through creative collaboration, or co-participation, that the individuals were able to make sense of the complex problem and move forward, collectively.

Another aspect of Amy’s statement indicates the varied knowledge brought forth by the transdisciplinary group members. In their study, Jonassen et al. (2006) cited two prominent themes in their research on ill-structured problems in engineering curricula which focused on the importance of distributed knowledge among the collaborators as well as the nature of most engineering problems as requiring collaboration. In this way, the authors pointed out that working in groups permits individuals from various backgrounds to piece together their knowledge and expertise so that the problem is approached holistically. This concept was also explored in Amy’s visual journal: “We were all separately confused, but as we all got together, we understood collectively” (Visual Journal Check #2, p. 6). Amy reflection on the individual vs. collaborative approach to the design challenges led her to a realization of the benefits of working in interdisciplinary groups.

The ideas of collective understanding and distributed knowledge were also brought forth by Ethan. He discussed the design studio in his final paper:

The class was very unique because it had students from a wide range of disciplines, including Environmental Engineering, Art Education, and Landscape Architecture.
Together we learned the importance of synthesizing knowledge from different areas in order to produce creative solutions to even the most complex of problems. (Ethan, lines 13-17)

Ethan’s discussion of synthesizing was grounded both in the Root-Bernsteins’ (1999) text and the requirements for the final paper which asked the students to consider how the course fostered this capacity. The Root-Bernsteins described synthesizing as an integration of multiple ways of experiencing and asserted that it is essential to innovation which “is always transdisciplinary and multimodal” (p. 314). Klein (1990) also wrote of interdisciplinarity as a whole cultivating a process through which interpretive synthesis is achieved. Through the ill-structured, open-ended, and transdisciplinary nature of the design challenges, the students began to perceive each other as part of a collective meaning making team and integral to nurturing a synthesizing mind.
Figure 34. “Finally getting to some sort of final idea.” Quentin’s visual journal entry illustrated three chained arrow-like forms (perhaps reflecting his three-person group) reaching towards a vibrantly colored orb labeled “IDEA.”

“Like, we get caught in our own way of thinking in our bubbles, and it is…it’s refreshing to get out of it”: Collaboration and “Real” World Experiences

While finding common ground through shared experiences in the design studio was an important step towards collaboration, students also reflected on the in-between enveloped in transdisciplinary collaboration as a unique and desirable space through which their learning occurred. The collaborative community emphasized in the Transdisciplinary Design Studio sought to (re)consider and shift disciplinary boundaries to align with the interrelated and
“dynamic state of knowledge outside the academy” (Holley, 2009b, p. 99)—a quality which appealed to many students. Tyler referenced his expectations of the professional world as a reason for enrolling in the course itself: “Well, I think it’s interesting, because I know landscape architects work with a lot of engineers and artists, so that’s another reason I took this class, just to kind of learn how all these people think, how they talk” (Focus Group #2, lines 339-344). In this way, the in-between cultivated a space where many student-participants embraced the transdisciplinary nature of the course and saw the tasks as reflecting “real world” experiences.

While interdisciplinarity posed unique challenges as discussed above, Grant, a graduate student in landscape architecture, expressed that working with other students was “very exciting” (Visual Journal Check #2, p. 1). He found the interdisciplinary nature of the course to be refreshing and asserted: “I think that (especially graduate students) students get pushed into thinking in one way--their chosen major--and to remember that there are other methods--purposes + points of view is vital to a Democratic Empathetic Society” (ibid). Contemporary art education theorist, Gude (2009) acknowledged that democratic cultures are comprised of multiple voices. She asserted that a heightened attentiveness to these voices and perceptions cultivates a democratic society “who have the capacity for empathy and for imagination” (p. 10). A more holistic discussion on empathy appears below; however, Grant’s perspective on collaboration and democracy is an important connection to the integrated life that exists outside of the confines of the studio.

Many students, particularly those from landscape architecture and engineering, spoke about interdisciplinary collaboration as cultivating an experience which reflected their perceptions of the professional world. This may, in part, stem from the discussion above surrounding the ill-structured problems omnipresent in the design studio curriculum. What
distinguished these discussions from the previous was that they were not focused on the design challenges per se, rather on the other and how working in interdisciplinary groups made it feel like a “real” world experience. In Ellie’s narrative, she pointed out that working with people from different disciplines was more realistic to her perceptions of the workplace which Tyler also wrote about in his visual journal:

   Today's class period was our group's first time together. 2 grads + 2 undergrads. I'm confident we possess the energy, ability, and will power to accomplish something meaningful. Plus, having three disciplines represented in a 4-person team can only help. Kind of feels like a real world project... (Visual Journal Check #1, p. 2)

Tyler’s description of the first day of group work depicted enthusiasm for the diversity of his collaborators, and he connected this atmosphere with a “real world project.” Working in interdisciplinary teams was a curricular component that Nicki and I adopted from a previous iteration of the Transdisciplinary Design Studio and reflected what Allie et al. (2009) argued in that “the classroom community should provide a realistic representation of the range of identities in the [design] workplace” (p. 362).

   Working with diverse others was an appealing quality of the studio as discussed by several students. Marissa explained, “I really like diversity in like, learning new things from different people just from them talking or explaining something to me rather than having to read everything. I like real-life experiences” (Focus Group #1, lines 23-26). She elucidated that working with the visual artists provided valuable insight on the materials that one might use in the creation of the visual exhibits and her excitement for being pushed to work with new media. Similarly, Marissa’s group member for both design challenges, Tyler, attributed their group’s success to the art education group members, stating:
However, the end product would definitely not have reached the same level of artistic success without the collaboration + knowledge of the Art Education students. In this sense, “the arts” were certainly equally important to the [group’s] dynamics and final product. (Visual Journal Check #2, p. 1)

Tyler’s conclusion reiterated what Jonassen et al. (2006) found in that interdisciplinary collaborations fostered a space where multiple perspectives and varied bodies of knowledge were integral to bringing the group’s vision to actualization.

![Image of a hand-drawn entry in a visual journal]

*Figure 35. Entry from Tyler's visual journal: "Humbled by experiences interacting w/ variety of professionals & tradesmen"*

The diversity of experiences and knowledge embedded in the interdisciplinary collaborations were perceived by many, at least in reflection, to be valuable. Even Christy acknowledged in her narrative in the previous chapter that, while her collaborations might not have been fun, they were beneficial to her personal and professional growth. Notably, the engineering and landscape architecture students were more vocal with their perspectives on collaboration and its relevance to the contemporary workplace which might reflect the current dialogue in their programs of study. For example, ABET, the engineering accreditation board, called for students to possess “an ability to function on multi-disciplinary teams” (2013, p. 3) and
the National Academy of Engineering (2004) asserted a need for “interdisciplinary efforts with nonengineering disciplines” (p. 50). Discussions surrounding collaboration emerged as a vibrant and “real” space through which the student-participants could, together, explore complex transdisciplinary problems.

“I had to think in their shoes”: Empathizing

In their chapter on empathizing, the Root-Bernsteins (1999) explained that “the key to empathizing is learning to perceive the world through someone else’s mind and body” (p. 186). These authors grounded empathy in the imagination where an individual immerses oneself completely into the subject in order to authentically engage with the world as if s/he was that subject—developing not a feeling-for but a feeling-with the other (Noddings⁹, 2010; 2012). This perception of empathy parallels Greene’s (1995) proclamation that: “imagination is what, above all, makes empathy possible. It is what enables us to cross the empty spaces between ourselves and those we teachers have called ‘other’ over the years” (p. 3). After engaging with the Root-Bernsteins’ chapter on empathy, this tool was specifically cited several times by the student-participants (also see Grant and Sara above) as being critical for navigating the studio and their future work while others struggled with implementing this tool. Empathy as feeling-with the other nurtured an in-between space which offered unique perspectives of the other and even insight about participants’ own creative thinking.

As evident in Christy’s narrative in Chapter 4, she attributed empathy as being the “most useful tool” (Visual Journal Check #2, p. 38) as she used it constantly in the design challenges and other contexts outside of the studio. Above, Sara also discussed empathy as a necessary tool for bridging the disciplinary gap and contributing to more effective communication with her

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⁹ While Noddings (2012) notes her hesitancy to adopt the term “empathy,” the way in which she described her ethic of caring closely aligns with the Root-Bernstein’s conceptualization of this thinking tool, particularly with regard to the notion of feeling-with.
group. For many students like Christy and Sara, empathizing was perceived as central in working effectively as a group; particularly, in interdisciplinary groups. An undergraduate Art Education student, Amy, discussed the importance of empathy numerous times in her final reflective paper. She explained, “Our final design project was the perfect example of how everything we were exposed to in class, especially the idea of empathy, came together to create something truly wonderful and amazing” (Final Reflective Paper, lines 13-15). In learning to embrace empathizing as part of the interdisciplinary collaboration in the design challenges, Amy reflected:

I had to let myself feel and understand the design project as the other members in my groups felt and understood it. I had to think in their shoes; I had to loosen up and let a part of my rigid way of thinking go. (Final Reflective Paper, lines 33-35)

Through this statement, Amy referenced the relational tension between herself and the other—in this case her group. Empathizing with her group members impelled Amy to modify her own creative process and let go of her rigid thinking for the good of the whole. Amy’s selfless act of letting go is reminiscent of Noddings’ (2012) concept of the caring relation through which an attentiveness on the part of the carer leads him or her to feel-with the cared for and “her motive energy is directed (temporarily) away from those of her own projects and towards those of the cared-for” (p. 53). Amy’s acknowledgement that her thinking approach was not working for her group led her to become more empathetic towards the other and (re)consider her own process through this caring relation.
Figure 36. Entry from Amy's visual journal: “Walk a mile in another man’s shoes”

In addition, Amy wrote about an instance when the caring relation extended beyond herself and her group and became a shared exercise in empathy:

When it came time to select an actual form, I was surprised at how everyone was able to choose one that related to our project. I felt that everyone tried to stand back from what they aesthetically liked, and stepped into the skins of the people viewing the piece on game day in north campus. Furthermore, I believe that each one of us had to step into each other’s skins to try and work together cohesively. (Final Reflective Paper, lines 46-50)
In this passage, Amy discussed the importance of a type of collective, or group-level empathy, felt by her peers as they all imagined being the audience on the day of the event. It required a social imagination through which the group members sacrificed their individual visions for a collective vision (Greene, 1995). In the business world, Roberge (2013) explored the concept of group-level empathy as a mechanism for increasing group performance on collaborative tasks. Similarly, Amy elucidated that it was this group-level empathy which resulted in the group creating something “wonderful and amazing” for the final design challenge.

While Amy’s narrative of empathy was prominent in her final reflection, other students also brought forth valuable perspectives on the topic. Vanessa discussed this creative thinking tool numerous times in her visual journal as it developed into a vital component in her applied research project. Above, Vanessa alluded to empathy as important to the profession of art education and related it to her group experiences. In her visual journal, she also connected the topic of empathy to a book she read for another course and wrote ardently in her final entry: “Empathy learned in [Maxine] Greene but also Sparks has contributed to what I think will be my thesis focus…shown here is a visual form…YAY!!” (Visual Journal Check #2, p. 83). The visual representation (Figure 37) portrays a tree with the names of various educational thinkers and related concepts written on the branches. A quote by Greene adorned the trunk of the tree, physically and conceptually connecting the ideas into an overarching theme. Vanessa’s explorations of empathy were quite different than her art education peers despite the concept appearing to resonate both personally and professionally through her experiences in the design studio.
As evident in the field texts of Christy, Amy, and Vanessa, empathizing was perceived as an important facet of their time in-between. Conversely, Quentin admitted that he sometimes struggled with this thinking tool after a lesson on empathizing:

Empathizing is a hazy concept at times. At certain moment[s] it comes easily and I am able to connect well but at other times I can have a hard time figuring out how to travel in
[another’s] shoes. Connectivity is determined by experiences and […] an understanding of emotion. (Visual Journal Check #2, p. 52)

Quentin’s difficulties with empathizing paint an honest portrait of the complexities embedded in this thinking tool. After the same lesson another engineering major, Ethan, expressed: “It was very difficult for me to empathize with my classmate because I feel like I could not grasp the concept of thinking like her” (Visual Journal Check #3, p. 9). The rich discussions of empathy in the field texts of the art education students compared to the discussions of struggle by the engineering and landscape architecture students posed an interesting juxtaposition that warrants exploration in future research.

**Summary of Findings**

This study sought to explore student experiences in the context of a Transdisciplinary Design Studio which enrolled undergraduate and graduate students from engineering, landscape architecture, and art education. My research questions were:

1) How did students discuss their conceptions of, and relationships between, disciplinary identity and the creative process as they resided in-between?

2) How did students tell stories of their experiences in the Transdisciplinary Design Studio through verbal and visual modalities?

As I engaged with the student narratives, I found that these two questions were interconnected—the relational ways through which students told their stories were intertwined with their conceptions of identity as socially and experientially grounded. While both chapters attended to the ways in which the students presented their data as relational, Chapter 4 was structured around the methodological premise in narrative inquiry of being in the midst (Clandinin, 2013; Clandinin & Connelly, 2000) and the theoretical concept of wide-awakeness (Greene, 1995). The
conceptions of professional and creativity identity were also embedded in both chapters; however, Chapter 4 provided in-depth perspectives of three students through (co)constructed narratives while Chapter 5 explored these concepts across students through their metanarratives. In this section, I will synthesize the findings into a final discussion on transdisciplinarity, creativity, and identity through a proposal for considering future transdisciplinary teaching and learning.

The practice of transdisciplinarity creates a vibrant and evocative learning space but also one brimming with obstacles and discomfort. Students in the Transdisciplinary Design Studio revealed both struggles and successes in-between as articulated in their relational and multimodal narratives. The complex nature of learning spaces like this one invokes both instructors and students to (re)consider self and process as they navigate such a fluid space. As Giri (2002) conceptualized a creative transdisciplinarity, he presented three essential virtues for cultivating such a transcendent space: dialogue, the art of authentic embeddedness, and the courage to abandon. Though these interrelated virtues were not an explicit aspect of the design studio development or curriculum, they resonate nicely with the findings that emerged and serve as a framework for this final summary.

Dialogue is the first virtue on which Giri’s (2002) creative transdisciplinarity rests. Giri explained that “it is the virtue of dialogue which transforms this field of interaction into a relation of transdisciplinarity” (p. 108). In other words, dialogue nurtures the relational tensions in transdisciplinarity—tensions which keep the learners connected to one another. As evident in the student narratives, it was cross-disciplinary dialogue which nudged the students into spaces of reflection and awareness surrounding both their identity and their creative processes. Communication and (mis)communication surfaced as metanarratives through which the students...
discussed their collaborative experiences while empathizing emerged as a poignant result of effective dialogue and understanding. A compelling example of the importance of dialogue was evident in the first design challenge’s group of three (AshLeigh, Quentin, and Sara). Their (mis)communication contributed to a disciplinary divide which prevented the students from finding common ground and creating a successful final exhibit. As an outcome of this experience, each of these three students cited the importance of communication, *transdisciplinary* communication, which would have allowed them to (re)synthesize their knowledge (Giri, 2002) in productive and collaborative ways.

The second virtue, the art of authentic embeddedness, builds off of interdisciplinary dialogue and invokes students to become wide-awake by examining the self more fully through *intra*-disciplinary dialogue. As Giri (2002) pointed out, “A transdisciplinary dialogue and practice enables us to realise that our own discipline has within it multiple perspectives, multiple perspectival universalities” (p. 108). It is through getting to know both the *other* and the *self* that individuals develop more complete understandings of their ever-evolving disciplinary homes and identities embedded in those homes.

In this case, the perception of the self expands so that the individual looks beyond his or her physical self and considers how that self has been (co)constructed through the heterogeneity of their own discipline. The learner realizes that self-inquiry nurtures an awareness of a more authentic disciplinary perspective and, subsequently, a more holistic understanding of transdisciplinarity. An example of this virtue can be found in Christy’s struggle to reconcile her professional experience as an artist within her collaborations in the design studio. Her autonomous working style contrasted the group nature of the first design challenge, and she found herself inquiring deeply into her disciplinary practice in order to understand the nature of
her struggles. Through both self-reflection as well as her dialogue with a disciplinary other, Christy was able to disrupt and reconcile her creative process in order to join her group in their collective pursuit.

The courage to abandon is Giri’s (2002) final virtue in creative transdisciplinarity. This virtue builds upon the other two and calls upon individuals (both teacher and student) to “abandon one’s home discipline in the pilgrimage of one’s quest and research” (p. 109) rather than “clinging to one’s own disciplinary identity” (p. 111). In this way, transdisciplinarity begins to reflect what the Root-Bernsteins (1999) proposed in their perspective of a synthesizing education where “The wider your range of knowledge and feeling, the greater your range of imaginative possibilities and the more synthetic and important your work will be” (p. 326). AshLeigh’s narratives of letting go serves as effective illustrations of courageous abandonment where she set out on her own quests towards a more holistic professional identity and a more freeing creative process. Letting go of old perceptions and ways of creating moved students, like AshLeigh, away from the known and into the unknown. In order for students to fully embrace transdisciplinarity and the opportunities that lie within, they must be willing to move into this new space of meaning making—a courageous letting go must occur.

On the heels of the three virtues that Giri (2002) discussed, I would like to propose one final virtue in this journey towards creative transdisciplinarity: critical reflexivity through multiple modalities (Figure 38). It was through the various field texts which encompassed visual and verbal modes of communication that the students engaged in meaning making and developed an awareness of their identities and processes. Opportunities for reflection impelled students to dialogue, both inter and intra-disciplinarily, and also prompted them to consider moving into a more transdisciplinary space. Greene (1995) pointed out that “self-reflection and critical
consideration can be as liberating as they are educative. They, too, have the potentiality of opening multiple worlds” (p. 22). It was through focus groups, visual journaling, and the final reflective paper that students looked inward as a means of expanding and (co)constructing their outward view. This final virtue of creative transdisciplinarity requires an awareness, a wide-awakeness, to the notion that individuals create meaning and dialogue through a myriad of languages: visual, verbal, mathematic, kinesthetic, musical, and the like. It requires an acknowledgement that critical reflection is meaning making, that meaning making fosters growth, and that growth requires ongoing dialogue and critical reflection. After all, the in-between embraces learning as a relentless pursuit of knowledge.

Figure 38. Inspired by Giri (2002), four interrelated virtues of creative transdisciplinarity

Through the perspectives above, transdisciplinarity is understood as an approach to education which seeks to cultivate more dialogic, authentic, and holistic perspectives of the world. The four virtues presented above might serve as a starting point for individuals who wish
to cultivate, or seek to understand, this educational space. Further, the eleven student narratives appearing in these findings paint a lively, yet unfinished picture, of lived experiences in the Transdisciplinary Design Studio. They are unfinished for our dialogues with the other are “always incomplete because there is always more to be discovered and more to be said” (Greene, 1995, p. 43). Therefore, the dialogue ensues.

**Implications**

The complex nature of the Transdisciplinary Design Studio as well as the various facets of this study leads to multiple avenues through which these findings permeate. In this section, I will describe the implications for this research study in inter- and transdisciplinarity (including STEAM education), creativity, methodology, and the in-between.

**Inter- and Transdisciplinarity**

Overall, inter- and transdisciplinary approaches to education offer immense potential to the pervasive compartmentalized and isolated educational structure in which most students reside (Holley, 2009a). The challenge, then, is to integrate the disciplines thoughtfully and purposefully (Boix Mansilla, Miller, & Gardner, 2000) which takes both time and instructors who are willing to put themselves in these often uncomfortable and tenuous positions. There are also many institutional obstacles that one must overcome (Simpson, Barton, & Celento, 2008). But as the students in the Transdisciplinary Design Studio discussed in their field texts, working in this context allowed them to experience what they perceived the “real” world might be like when they are working with individuals who hold different job titles and carry different life experiences (Remington-Doucette et al., 2012). Transdisciplinarity, then, was understood by many of the students to reflect the professional world in which they would eventually work even as they negotiated their own disciplinary identities. Unpacking this perception of professional
environments and identity warrants a separate focused investigation; however, the narratives in this study touch on the students’ perceived importance of inter- and transdisciplinary approaches to education.

**STEAM (STEM + the Arts) Education.** The emerging push for STEAM, as opposed to STEM, education as championed by institutions such as the Rhode Island School of Design (RISD) provides another lens through which this study’s implications might be explored. The STEM to STEAM movement aims to cultivate art and design integration in K-20 education. Addressing this objective, the Transdisciplinary Design Studio emerged as a STEAM educational initiative where engineering, art, and design education intertwined through a curriculum that prompted students to explore broad questions of sustainability. Sustainability research has been addressed by many as requiring transdisciplinarity (Clark & Button, 2011) as the issues embedded in this realm are complex and require a systems thinking approach (Remington-Doucette et al., 2012). Through systems thinking, an attentiveness to the whole lends itself to transdisciplinarity educational approaches where students bring various knowledge and experiences to finding, framing, and addressing complex social problems (Montana-Hoyos & Lemaitre, 2011). As discussed by many of the students, a distributed cognition or distributed creativity (Jonassen et al., 2006) was a benefit of such an educational approach and often contributed to their success in the design challenges. Further research on STEAM education and distributed knowledge, skills, and creativity would complement the narratives in this study and provide additional insight into the collaborative process.

STEAM educational initiatives are often grounded in the perceived benefits that the arts and design bring to STEM fields including creativity and innovation. What is important to consider; however, is a reciprocity between the disciplines where the arts gain from STEM just
as STEM benefits from the arts (Bequette & Bequette, 2012). Nicki and I were challenged by this notion and engaged in discussions about fostering both a purposeful intertwining (Boix Mansilla, Miller, & Gardner, 2000) and a dialogic reciprocity amongst the three disciplines enrolled in the design studio (Sochacka, Guyotte, Walther, Kellam, & Costantino, 2013). We, along with our colleagues, have also explored the notion of STEAM as fostering social practices related to environmental sustainability—a topic which proves meaningful across disciplinary lines (Guyotte, Sochacka, Costantino, Walther, & Kellam, in press). Even if in small ways, it was evident in the narratives that all students did gain new understandings from the transdisciplinary and collaborative STEAM educational approach. It is my hope that future research on STEAM education demonstrates an attentiveness to the reciprocal benefits between all disciplines, including the arts, and that practitioners will create curricula thoughtfully with this in mind.

Creativity

Interwoven amongst many of the student narratives were discussions of creativity and the creative process. In *Sparks of Genius*, the Root-Bernsteins’ (1999) presented creativity as transdisciplinary; a concept which was emphasized in the curriculum of the design studio where students engaged in explorations of the thirteen creative thinking tools. The curricular framework of the Root-Bernsteins’ text provided students with a language through which they could consider and discuss their creativity. By providing students a language for discussing these often tacit tools, students demonstrated an awareness of their creative processes and spoke about the ways in which these processes manifested in the collaborative studio environment (Costantino, Kellam, Cramond, & Crowder, 2010). A space emerged where creative reflection was nurtured through visual journaling, reflective focus groups, and course assignments. In this way, both
fostering a creative language and visual-verbal opportunities for reflection were valuable course components for creative awareness.

The deeply reflective and insightful narratives presented by the engineering students emerged as an intriguing facet of this study. The student narratives were often complementary in addressing similar challenges and concepts surrounding creativity. While many of the ideas embedded in these discussions echoed current research on engineering student creativity (Kazerounian & Foley, 2007), this literature is often focused on more holistic exploration of the topic. Future research might explore these narratives more deeply as a means of understanding both the ways in which perceptions are manifested through program-based experiences but also how transdisciplinarity (particularly STEAM) challenges these perceptions.

As evident in the narratives, students found that their reflections on creativity led to insightful knowledge, and many cited how this information guided them as they navigated the in-between and would guide them moving forward. In future research on this topic, interviews might elicit more specific feedback on how the explicit curricular focus on creativity affected student awareness of the creative process. Additionally, researchers might focus specifically on the multi-modal reflections and their impact on student creativity and meaning making.

Methodology

From a methodological standpoint, visual-verbal narrative inquiry and analysis provide another perspective for researchers attending to multimodal data sources. The potential of this analytic method might be explored using visual data in other forms such as photography, video, multimedia, maps, social media, three-dimensional forms, or any combination thereof. Additionally, incorporating more complex data sets into narrative research provides researchers with the opportunity to be more innovative with the interpretation and representation of findings.
including the cultivation of an aesthetic experience for the reader (Mello, 2007). Including multiple expressive modalities like those found in the visual journal permits researchers the opportunity to paint a more complete picture of the “other.” Individuals often tell their stories through avenues other than written and spoken language so employing analytic methods which attend to narratives as complex and multivoiced are essential (Johnson, 2004; Josselson, 2011; Keats, 2009). In this way, the concept of the in-between might be broadened to offer researchers the opportunity to explore visual and verbal narratives as well as the interplay between the two—the visual-verbal in-between.

Further, embracing Greene’s (1995) concept of wide-awareness throughout the research process cultivated a deep and holistic engagement with participant narratives. As I intertwined the notions of wide-awareness with being in the midst (Clandinin, 2000), I attended to the self and the other and found the relational to be an integral aspect of both the narratives themselves and the narrative inquiry process. It was through a consideration of these states of being/becoming that I maintained reflexivity and my research study was subjected to in-process critique and ethical considerations (Guyotte, under review). Additionally, it allowed me to understand the manner in which my presence in the research space was imprinted upon the data collection and analysis process (Squire, Andrews, & Tamboukou, 2008). These qualities of narrative research will inform my future work and might be meaningfully incorporated into the work of others.

Finally, narrative inquiry is a methodology which cuts across both disciplines and professions as it focuses on lived experience (Clandinin & Rosiek, 2007). Experiences as we live them are often not relegated to disciplines but unfold holistically and relationally while continuously springing from our previous experiences (Dewey, 1938/ 1997). Assuming a
narrative lens in transdisciplinary research permits the researcher to attend to the multilayered and social nature of experience while also honoring those experiences as a means of accessing learning, ideas, beliefs, and commitments that are held dear by our participants (Andrews, 2012).

**The In-Between**

The concept of the in-between surfaced from Marissa’s final reflective paper and continued to resonate with me as I engaged in this study of lived experience. Throughout these chapters, I have presented the in-between as a fluid and dynamic concept which might encompass facets of transdisciplinarity, creativity, visual-verbal expression, and narrative methodology. For me, the in-between is a space of being and also becoming, encompassing both the individual and his/her group in their relentless quest for meaning. It is important to note that the construct of the in-between is not relegated to transdisciplinarity, but permeates into all spaces where learning might occur. In this study, I posited the in-between as grounded in the philosophies of Maxine Greene, but I encourage researchers to explore and push the flexible boundaries of the in-between. By not only conceptualizing this space, but also positioning ourselves here, we envision what so many of the students in the design studio articulated. We envision the value of exploring, of learning, of being/becoming as an ongoing process.

**Future Research**

While the implications for this study permeate widely into various fields, I foresee my future research focusing on two distinct paths. The first of these is situated within the methodological implications of visual verbal narrative inquiry. I was captivated by the ways in which student narratives were (co)constructed through this research process and began to envision the potential of implementing such multimodal approaches to other studies of student experience. There are numerous possibilities with the ways that the visual and the verbal might
be attended to in narrative research including both the analytic process itself and the way in which the findings are represented. Future work might encompass explorations of how the visual verbal narratives might be portrayed in venues outside of the traditional dissertation text, perhaps moving into a more arts-informed realm.

The second path extends the notion of the in-between as nurtured in the transdisciplinary STEAM context of the design studio. As inspired by Greene (1995; 2001), the power of aesthetic education lies in helping students to see themselves as in-process beings. In this way, I have been enticed by the ways in which pedagogy and curriculum might be harnessed to move students into in-between spaces. Furthermore, the student’s narratives of what invokes this movement as well as their struggles and achievements as they navigate through this space are compelling voices for such reform. In an educational system which emphasizes product through convergent thinking examinations, the notion of process is often dismissed as unquantifiable and therefore unknowable. Along these lines, questions linger regarding the relationship of the in-between and transdisciplinarity and further research into the factors which cultivate and impede such movement would provide implications for transformative curriculum and pedagogy.

Coda

The process of abandonment in the practice of transdisciplinarity is not devoid of difficulties, pangs and suffering involved in the process of transdisciplinary conversations and journeys. This journey involves moments of despair—the pangs of leaving one’s familiar ground and entering inside uncharted lands. -Giri, 2002, p. 112

The narratives of the in-between revealed both the painful, frustrating moments articulated by Giri as well as moments of clarity and success. Giri (2002) called for the courage “to abandon one’s home discipline in the pilgrimage of one’s quest and research” (p. 109) and, as
indicated above, the in-between embraces this concept of courageous abandonment. More precisely, it calls for a willingness to incessantly abandon as the quest for knowledge is an ongoing process. Some of the students left the design studio entrenched deep in the crevasses of the in-between, attempting to find their way in an uncharted landscape. Others created their own maps and began to feel comfort and familiarity. Regardless of their position at the conclusion of the semester, the narratives of the in-between resemble the essence of this space—they are relentlessly in-process. The in-between is different from a liminal space; it is not a transition that represents a layover as we travel towards our destination. It is our destination. The in-between is what Greene (1995) was referencing when she described learning as “leaving something behind while reaching toward something new” (p. 20). We must always be willing to abandon, to let go as we reach forward. The in-between is where we reside, individually and collectively, during our relentless pursuits of learning.

In a creative writing exercise, Vanessa wrote about landing at the university as an alien and her observations of waste on the campus. Her first sentence read: “I've recently found myself in this new place, in a strange place, a place that is not home…” (Visual Journal Check #2, p. 84). For many of us, the Transdisciplinary Design Studio represented a new, strange place—a place that moved us outside of the comfort of our disciplinary homes. It was a relational and collaborative space and a space that nudged us to (re)consider our perceptions and understandings of what it meant to be/become both creatively and professionally. It was where we learned the importance of communication, finding common ground, connecting to the world outside of the classroom, and learning to empathize. As we moved beyond our disciplinary homes, we moved towards the other, and our experiences intersected, paralleled, and unfolded alongside each other. We all found ourselves in-between. It will, however, take courageous
abandonment for us to reside here permanently as we undertake the search for learning and pause to admire “all the lovely in-between.”
EPILOGUE

By Way of a Conclusion: An Invitation to Reside In-Between

Without living in relation in wide-awake ways, that is, by engaging in narrative inquiry as relational inquiry, we cannot know, feel, understand, and recognize tensions between an individual’s storied life and his or her landscapes, tensions within individual’s storied knowledge, tensions we experience as researchers alongside participants as we live on their landscapes, and so on.

-Clandinin, Murphy, Huber, and Orr, 2009, p. 83

One of the most prominent challenges I faced in conducting and writing up this study was some researchers’ emphasis on narratives as having a beginning, a middle, and an end. As I met my participants in the midst, I struggled with the artificial borders that demarcated these narratives of lived experiences in the Transdisciplinary Design Studio. The temporal and sequential borders of the narratives were omnipresent; however, I also developed an awareness of the borders created by me—the very ones that narrowed the scope of my study to this selected context; the ones that shifted my attention to consider professional identity and creativity. They were also the borders which emerged as I aligned my epistemological and ontological positions within my methodology and my theoretical framework. These borders were of my own construction and, in many ways they were integral to my inquiry. However, I was incessantly aware of their presence and strove to function within these borders in a thoughtful and holistic manner for they could also be detrimental if they became too confining.
In this study, the in-between emerged as a space which both acknowledged and challenged borders—disciplinary, storied, relational, educative, and methodological, to name a few. This construct did not seek to dissolve such borders but provided an opportunity for individuals to move within and through them; to live with them but not by them. We acknowledge that our narratives might be perceived as having beginnings, middles, and ends; nevertheless, these concepts are fluid and exist within larger frameworks of experience. As I (co)constructed the stories of the students in the design studio I tried to remain ever mindful of this fact, reflecting that:

…really, student-participants do not always leave the research context at a concluding point and are sometimes residing in the middle of their stories. Well, let’s be honest, they are always still in the middle of their stories. Why is it, then, that we are so compelled to tie the loose ends together in our presentations of the study? (Researcher Memo, September 25, 2013)

Engaging in this narrative inquiry led me to understand that there is not one beginning to my participants’ stories, but that lived experience is brimming with beginnings. Beginnings are simply a (re)envisioning of the past and present, with an eye towards an inconstant future; they only exist in the relentless middles through which we traverse. In this way, our ends are not ultimate destinations, rather they provide us with opportunities for openness and reflection—moments of pause that reinvigorate us as we move towards yet another beginning.

Within the beginnings, middles, and ends, the in-between supports the notion of learning—of being—as also a process of becoming. I present this epilogue by way of a conclusion, an invitation to embrace the in-between as being/becoming. I wish to leave some of the ends loose and unraveled and offer this document as reflective of my own in-between. By
residing in-between, learners subject themselves to the enduring pursuit of wide-awakening which Greene (1995) posited:

…is in part defined by the way it always reaches beyond itself toward a fullness and a completeness that can never be attained. If it were attained, there would be a stoppage, a petrification. There would be no need for a quest. (p. 26)

Residing in-between offers individuals the opportunity to engage in the quest of learning and being/becoming attentive to ourselves and the other. It inspires us to conceive of Dewey’s (1938/1997) principle of continuity as embracing plurality: where a beginning becomes beginnings and where the middles cultivate stories of our attempt to reach beyond. As Ellie sagely commented in the first focus group, “It’s more about the process. It’s not actually about the answer” (lines 408-409). This is the essence of the in-between. If students, teachers, and researchers can find the courage to reside in this space, we might uncover incredible insights about ourselves through our ongoing engagement with the other. We might find contentment in our quests as we imagine possibilities for our, and our group’s, becoming. In the words of Greene (2001), residing in-between affords us the option “to refuse always the state of being complete” (p. 146).
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Appendix A

Introductory Design Challenge: “Mission Zero Waste by 2030”

Background:
In November 2010, the Mayor and Commission of Athens passed community wide solid waste diversion goals of:
- 40% by 2015
- 60% by 2018
- 75% by 2020

In order to achieve these progressive goals, the Athens-Clarke County Solid Waste Department has an extensive plan to add several new or improved programs over the next few years. The first program initiated is a Waste Minimization Fee. This fee was passed by the Mayor and Commission in October 2011 and began in January 2012 (see attached information sheet).

Looking to the future, the current Mayor has proposed the goal of “Mission Zero” by 2030. This target has resulted in fierce debates across the community. Many stakeholders feel that a zero waste goal is simply not possible. The Mayor is confident that the goal will inspire groundbreaking design and innovation.

Your Team Task:
Your task is to explore what life at UGA and in the local community might look like if Athens-Clarke County were to achieve the Mayor’s 2030 “Mission Zero” target. You are to present your findings in two different formats. Both of these will be showcased at a local gallery exhibition on September 12th. One is to be designed with the intention of reaching a broader cross-section of the community (i.e. for ease of distribution beyond the exhibition).

Our Expectations
Keep a clear record of your discussions in your visual journal (you can make sketches, drawings, bulleted lists, flowcharts, etc.). Make sure that an outsider can understand your record. You will be required to turn in your visual journal as part of the assessment for this project.

Your Deliverables
Due Date: September 12, 2012
- A problem statement that clarifies the stakeholder perspectives, aspects and sources of the current difficulties.
- A gallery exhibit and broader community initiative.
- Two x 1-pg information sheets describing your gallery exhibit and broader community initiative (to be presented with your exhibits).
- Visual journal documenting creative design process.

Due Date: September 26, 2012
- A 24” x 36” poster that illustrates and discusses both of your pieces of work.

This team project will count for 25% (undergraduate students)/ 20% (graduate students) of your final grade.
Appendix B
Design Challenge: “A water ethic in Athens, GA”

Background:
In her recent book “Blue Revolution: Unmaking America’s Water Crisis”, Cynthia Barnett calls on America citizens to embrace a new ‘water ethic’. Similar to the ‘land ethic’ described by Aldo Leopold in 1949, Barnett argues that a water ethic is needed to help people see their connection to and responsibility for the natural world, in particular our water resources.

Your Team Task:
Your task is to produce two gallery exhibits designed to inspire a water ethic in the local Athens community. One exhibit should draw on the studio techniques, creative thinking skills, and other materials and subject areas we explore during the second part of the semester. This exhibit should involve a sophisticated use of media and a deep conceptual exploration. For the second, we ask you to plan and undertake an activity to inspire a water ethic in the local community. Your exhibit for this activity will entail an innovative documentation of your planning process and execution (e.g. using various media such as photographs and video). Both exhibits, as well as your poster from the Introductory Design Challenge, will be showcased at the end of semester at a public gallery opening.

Our Expectations
We expect you to engage thoughtfully in the task of inspiring a water ethic in Athens, GA. The level of conceptual exploration and creative output should surpass that of the Introductory Design Challenge. We expect that groups will participate in either a newly devised or existing water-based initiative in the local community. Here is your opportunity to bring thought into action. The manner in which the activity is documented should be both informative and innovative. The other exhibition is expected to push the artistic envelope through an advanced use of media and employ an insightful investigation of subject matter. While you are not required to submit a problem statement, we expect you to explore this challenge keeping in mind the ideas expressed in Are Your Lights On?.
We expect you to keep a clear record of your discussions in your visual journal (you can make sketches, drawings, bulleted lists, flowcharts, etc.). Make sure that an outsider can understand your record.

Your Deliverables
- Two gallery exhibits - one documenting your group’s community action and one work of art.
- A one-page information document describing each of your gallery exhibits (to be displayed with your exhibits; in other words, two gallery statements).
- Visual journal documentation of the creative design process.

Due Date: November 28, 201
Appendix C

Visual Journal Guide

1. Visual journal entries are in-process records of your thinking in which content is more important than the final product. Remember that visual journals are for all learners, not just artists.

2. Discovery and exploration are important aspects of the visual journal process. You are encouraged to use a variety of materials and modes through which you express your ideas. Do not be afraid to take risks.

3. Meaningful reflection is an intended outcome of visual journals. Fully dedicate yourself to the process of visual journaling by setting aside time for engagement rather than making it a last minute addition to your schedule.

4. Learning does not always occur during class but can happen anytime, anywhere. Get into the habit of recording “Meta-Moments” in your journal complete with the date, a detailed explanation of what happened, and how you felt.

   Meta-Moment: A moment of clarity when one suddenly becomes aware of one’s own learning and learning processes, when one creates meaningful connections among disparate bits of information, or it can be thought of as an “aha” moment

5. Use your visual journal for everything: class notes, brainstorming, sketches, inquiry, frustrations, successes, and reflections. Carry it with you every day to class and use it outside of class regularly.

   Developed by: Kelly W. Guyotte

Cut out and paste on the front inside cover of your visual journal

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### Appendix D

**Visual Journal Breakdown**

<table>
<thead>
<tr>
<th>Date</th>
<th>Category</th>
<th>Prompt</th>
</tr>
</thead>
<tbody>
<tr>
<td>August 15</td>
<td>Reflection</td>
<td>What are your first impressions of this project? What are your current understandings of waste? Describe or depict three to five everyday experiences that you have with waste.</td>
</tr>
<tr>
<td>August 20</td>
<td>Creative Process-Divergent Thinking</td>
<td>Brainstorm as many problems as you can with regards to the “Mission Zero Waste by 2025” initiative. Try to consider desires and perceptions of as many different individuals and groups in the Athens community as possible. What do they perceive these problems to be? What are the desired outcomes? Don’t limit yourself and be creative.</td>
</tr>
<tr>
<td></td>
<td>1-Minute Paper</td>
<td>What new understandings do you have of the “Mission Zero Waste” initiative?</td>
</tr>
<tr>
<td></td>
<td>Reflection/Reevaluation</td>
<td>What did you learn from our visiting artist? Last class, we asked you to write down your current conceptions of waste. How or have your conceptions of waste changed from last class?</td>
</tr>
<tr>
<td>August 22</td>
<td>Creative Process/1-Minute Paper</td>
<td>Quickly and concisely document your creative process in a vein similar to Goldsworthy’s written diary accounts. Don’t worry about spelling or complete sentences.</td>
</tr>
<tr>
<td></td>
<td>Reflection</td>
<td>Reflect on today’s class. What is the most significant idea you will take away? Why? What is a question that you are still struggling with? Why?</td>
</tr>
<tr>
<td>August 27</td>
<td>Creative Process-Creation</td>
<td>Compose a creative short story in which you describe in detail your observations of waste at the site and how you view it as someone completely unfamiliar with this planet. Feel free to use visual representations.</td>
</tr>
<tr>
<td></td>
<td>Reflection</td>
<td>Write a descriptive one sentence summary of your group’s working process during today’s class.</td>
</tr>
<tr>
<td>August 29</td>
<td>1-Minute Paper</td>
<td>Describe what you found to be the most thought-provoking idea from Part 4 of <em>Are Your Lights On?</em></td>
</tr>
<tr>
<td></td>
<td>Reflection</td>
<td>Take a moment to jot down your impressions of this video in your visual journal. What new concepts did you learn about? How does this video relate to your project?</td>
</tr>
<tr>
<td></td>
<td>Minute Paper</td>
<td>Describe in detail an “a-ha” moment from today’s class.</td>
</tr>
<tr>
<td>September 5</td>
<td>Minute Paper</td>
<td>Describe the peak (high point) and the pit (low point) of Part 5 of <em>Are your lights on?</em></td>
</tr>
<tr>
<td></td>
<td>Reflection</td>
<td>Create a quick visual or visual-verbal representation illustrating your current state of mind with regards to the current state of mind.</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Date</th>
<th>Type</th>
<th>Activity Description</th>
</tr>
</thead>
</table>
| September 10 | Reflection          | Look back on your visual journal entries since the beginning of the semester. Based on the book and your own experiences with the first design challenge…  
- What is the value of problem finding?  
- What are the most significant things you learned from this design challenge experience with regards to problems?  
- How has this knowledge affected the manner in which you perceive or approach problems?  
- How do you envision applying this knowledge to future experiences in your respective profession? |
<p>| September 12 | Reflection          | Create a visual or visual-verbal representation depicting your understandings of waste after the Introductory Design Challenge. Write a brief statement on the back discussing your ideas.                                                                                                   |
| September 17 | Reflection          | Describe when you have encountered educational experiences that resemble/ are antithetical to those expressed in the 8 goals from Chapter 16. What did you learn about yourself through those experiences?                                                                                                    |
| September 19 | Reflection          | The Root-Bernsteins discuss several types of preverbal thinking in Chapters 1 &amp; 2 such as feeling-of-knowing, intuition, and imagining. Describe a time when you experienced one of these preverbal ways of knowing.                                                               |
|             | Reflection          | 6 word memoir: Ask each student to write about themselves using exactly six words. Share with their group as a getting to know you activity.                                                                                                                                                                                  |
|             | Reflection          | Jot down some of the most interesting “What if” statements from the group brainstorming session.                                                                                                                                                                                                                                                   |
| September 24 | Observation Activity| In your visual journal write down or sketch as many objects as you can recall that were just sitting on this table. Include as much detail as possible in your representation.                                                                                                                        |
|             | 2-minute paper      | Discuss your experiences today with the observation exercises. How do your experiences connect to your understandings of the chapter in <em>Sparks of Genius</em>? How is observing an important skill in your profession?                                                              |
| September 26 | Creative Process    | Visual response to Debussy’s <em>La Mer</em>                                                                                                                                                                                                                                                                                                           |
|             | Creative Process    | Written notes based on your partner’s description of their hometown. Based in the description and notes, students will sketch/ paint/ draw the way they envision the location in their visual journals                                                                                         |
|             | Minute Paper/       | Describe what you have learned about yourself and your imaging skills through today’s activities.                                                                                                                                                                                                                                             |
|             | Reflection          |                                                                                                                                                                                                                                                                                                                                              |</p>
<table>
<thead>
<tr>
<th>Date</th>
<th>Type</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>October 1</td>
<td>Minute Paper</td>
<td>What do you know about abstracting after reading the chapter in <em>Sparks of Genius</em>? What questions do you have about abstracting?</td>
</tr>
<tr>
<td></td>
<td>Creative Process</td>
<td>Students will create a wire abstraction of a three dimensional object/animal/figure. They should begin with several continuous contour sketches in their visual journals and explore the image from at least two different perspectives.</td>
</tr>
<tr>
<td></td>
<td>Reflection</td>
<td>Describe any new understandings you have about abstracting or your process of abstracting.</td>
</tr>
<tr>
<td>October 3</td>
<td>Minute Paper</td>
<td>The Root-Bernsteins wrote: “Knowing what you don’t know, knowing the pattern of your ignorance can be as valuable as knowing what you do know” (p. 106). Explain what this statement means to you.</td>
</tr>
<tr>
<td></td>
<td>Reflection/ Creative Process</td>
<td>Look back at your previous visual journal entries and reflect on your creative process. What patterns emerge both from your visual journal and the knowledge you have of this process? Spend the next ten minutes creating a visual or visual-verbal (using innovative materials; something you haven’t worked with thus far) representation of the patterns you notice in your creative process.</td>
</tr>
<tr>
<td>October 8</td>
<td>Creative Process</td>
<td>I : Creative Thinking :: _______ : _______</td>
</tr>
<tr>
<td></td>
<td>Creative Process/ Reflection</td>
<td>Explore the idea of a water ethic through creating a visual metaphor. Be thoughtful and creative.</td>
</tr>
<tr>
<td>October 10</td>
<td>Minute Paper</td>
<td>Spend a few minutes writing about your reaction to the water footprint quiz you took.</td>
</tr>
<tr>
<td></td>
<td>Reflection</td>
<td>Before you leave today, take a moment to consider: •The NEXT STEPS you need to achieve to progress with your community initiative •Any OUTSTANDING issues you need to address, especially those that are time-critical •How Kelly and Nicki can help in terms of materials/resources/contacts.</td>
</tr>
<tr>
<td>October 15</td>
<td>Reflection</td>
<td>After engaging in today’s lesson on Body Thinking, discuss how you see using this thinking tool in your future profession.</td>
</tr>
<tr>
<td>October 17</td>
<td>Minute Paper</td>
<td>Discuss your current thoughts on the idea of a water ethic. What does this concept mean to you? Why do you feel it is important?</td>
</tr>
<tr>
<td></td>
<td>Reflection</td>
<td>Describe in one sentence (or image) your current state of mind with regard to the Final Design Challenge.</td>
</tr>
<tr>
<td>October 22</td>
<td>Minute Paper</td>
<td>Describe how you use transforming in your respective disciplines.</td>
</tr>
<tr>
<td></td>
<td>Reflection</td>
<td>Sketch your favorite part of the space and least favorite part of the space and sketch/write down a</td>
</tr>
<tr>
<td>Date</td>
<td>Topic</td>
<td>Activity</td>
</tr>
<tr>
<td>------------</td>
<td>-------------</td>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td>October 24</td>
<td>Reflection</td>
<td>Describe how dimensional thinking is used in/ applies to your discipline.</td>
</tr>
<tr>
<td>October 29</td>
<td>Creative Process</td>
<td>Brainstorm several different emotions you have felt over the course of today’s class on “Modeling”. Select one and create a three-dimensional clay sculpture which communicates your understanding of the emotion. Begin with sketching in your visual journal as you explore your emotional model and then translate that sketch into a three-dimensional form.</td>
</tr>
<tr>
<td>October 31</td>
<td>Reflection</td>
<td>Describe in detail how it felt to empathize with your classmate and process of creating a “self”-portrait. How did the artistic process engage you through this and other creative thinking tools? What did you learn about yourself and your classmate through this process?</td>
</tr>
<tr>
<td>Creative Process</td>
<td></td>
<td>Spend about 4-5 minutes jotting down a few things that came to mind as you did the Final Design Challenge empathizing exercises.</td>
</tr>
<tr>
<td>November 5</td>
<td>Reflection</td>
<td>Describe how Dr. Bruce Beck’s talk will inspire or challenge your ideas with regard to the Final Design Challenge.</td>
</tr>
<tr>
<td>November 7</td>
<td>Reflection</td>
<td>In what ways would you like to incorporate more play into your field of study and into your life?</td>
</tr>
<tr>
<td>November 12</td>
<td>Reflection</td>
<td>Describe how Are Your Lights On? and the thinking tools from Sparks of Genius are inspiring your thinking and process with the Final Design Challenge. Also, how are these ideas informing other aspects of your life (personal &amp; academic)?</td>
</tr>
<tr>
<td>November 14</td>
<td>Creative Process</td>
<td>What still needs to be addressed in order for your Final Design Challenge exhibits to be successful? How will you ensure that these things will be accomplished?</td>
</tr>
<tr>
<td>November 28</td>
<td>Reflection</td>
<td>Imagine that you are sitting in your office ten years from now and your mind wanders back to your time at UGA. Describe what you will remember the most about this course. Is there anything that you have learned or experienced during this semester that you hope will impact your future self? If so, what &amp; why?</td>
</tr>
</tbody>
</table>
Appendix E

Visual Journals

Students will be required to document their design process in their visual journal. Students must write reflections and sketch their understandings of design, creativity, observation, and modeling as requested. In addition, while working on their design challenges, they will be required to include entries throughout the design process, including brainstorming, reflection, and documentation of the design process.

There will be three journal checks throughout the semester. For the journal checks, students are expected to scan their journal entries and submit their scans in a pdf document file via eLC. Documents must be saved in the following format with no spaces: last name, first name, and journal check number (i.e. SmithJohn1.pdf, SmithJohn2.pdf, or SmithJohn3.pdf). It is imperative that the entire document page is scanned accurately (no cropped edges that cut off entries, no digital manipulation) with an attention to clear, high quality images (approx. 200 dpi Scanned visual journals are due by midnight on the scheduled dates.

NOTE: In addition to the scanned document, student’s visual journal in book format will be turned for the final visual journal check of the semester on December 3, 2012.

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Date(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>In-Process Critiques</td>
<td>September 5, October 31</td>
</tr>
<tr>
<td>Introductory Design Challenge</td>
<td>September 12</td>
</tr>
<tr>
<td>Visual Journal Checks (scanned pdf due by midnight- see syllabus for detailed information)</td>
<td>September 12, October 17, December 3*</td>
</tr>
<tr>
<td>Final Design Challenge / Exhibit</td>
<td>November 28</td>
</tr>
<tr>
<td>Synergistic Learning Paper and Presentation</td>
<td>Draft Thesis &amp; References: September 26</td>
</tr>
<tr>
<td></td>
<td>Presentation: November 12</td>
</tr>
<tr>
<td></td>
<td>Final Paper: December 6</td>
</tr>
</tbody>
</table>
Appendix F

Visual Journal Checklist

Name_________________________ Visual Journal Check #____1____

Requirements:
- Entries are dated
- Visual journal is submitted on time
- Visual journal is appropriately scanned and saved in the required format (see syllabus)
- Contains the 15 required entries included in the “Visual Journal Assignment” handout on eLC
  - (Student completed ______/15)
- Evidence of individual reflection
- Consistent entries from group work activities
- Documentation of the creative thinking process
- Recording of Meta-Moments
- Metacognitive Mentor reflections (graduate students only)

Recognition of Extra Effort:
- Contains unprompted (additional) entries
- Evidence of exploration (risk-taking) through expression and/or media
- Consistent deep, meaningful reflections of learning

Comments:

Visual Journal Checklist

Name_________________________ Visual Journal Check #____2____

Requirements:
- Entries are dated
- Visual journal is submitted on time
- Visual journal is appropriately scanned and saved in the required format (see syllabus)
- Contains the required entries included in the “Visual Journal Assignment” handout on eLC
  - (Student completed ______/19)
- Evidence of individual reflection
- Consistent entries from group work activities
- Documentation of the creative thinking process
- Recording of Meta-Moments
- Documentation of how the creative thinking tools are practiced outside of class (NEW)
- Metacognitive Mentor reflections (graduate students only)

Recognition of Extra Effort:
- Contains unprompted (additional) entries
- Evidence of exploration (risk-taking) through expression and/or media
- Consistent deep, meaningful reflections of learning

Comments:
Appendix G

Final Visual Journal Check

The final visual journal check will be comprised of a holistic look at your work. While we will look to make sure that you have completed the required entries, we are also concerned with how you have engaged with journaling over the course of the semester. For example, if your first entries were not very descriptive but you did a much better job towards the latter part of the semester, we would weight those more heavily. If you remember from the presentation during the second class meeting, visual journals are “records of process” and meant to help you grow as a learner and a professional. We are NOT looking for formal writing (correct spelling, grammar, punctuation, etc.), neatness, or even understanding. Here is what we will be looking for:

- Quantitatively: number of entries completed (participation), design challenge scores which examined the group work documentation, turned in previous visual journal checks on time, pages scanned properly
- Qualitatively: critical reflection, recording the creative process, exploration and risk-taking, growth, personal expression, elaboration of ideas

Since your previous visual journal checks were assessed formatively (in-process), you are welcome to go back and rework and revise any of your previous journal entries. Just make sure that you scan anything that you have changed. Visual journals (scans and hard copies) are due by midnight on December 3rd (you can upload them to Kelly’s laptop in class from 2:30-5:00) and there will also be a box outside of Kelly’s office for after-hours submissions. Visual journals will be available for pick-up beginning December 13th outside Kelly’s office in the art school. We will also send out an email to remind you to pick them up 😊
Appendix H

Focus Group #1: Transdisciplinary design studio

Read over the following statements several times and take a few notes about what happened in this situation you are reminded of:

“I found working with students from other disciplines very exciting/challenging. I remember this one time…”
“When they handed out the project my first thoughts were, open-ended? Try to hold back from solving the problem?”
“There was this one time when I saw how something we were discussing in this class related to another part of my life/another course…”
“At first I wasn’t sure how the visual journal would be helpful to me in this class. But now I think…”
“In one of the classes/guest lectures/readings it suddenly clicked and I saw how some of this stuff is connected.”

What was the most exciting / the most frustrating moment in the first few weeks of this class?

After the focus group discussion:

Take a few minutes now to start writing a reflection about one of the situations that were most meaningful to you. Focus your description on how you reacted to the situation, what you felt at the time and how that changed over the course of the project:

- Recount the situation (Situation)
  - Be specific, give details and focus on your experience.
- How you felt about it (Affect)
  - What was your immediate emotional reaction?
  - What was that influenced by?
- Why you think it happened this way and what you learned or realized (Interpretation)
  - Why do you think the situation turned out the way it did?
  - What role did others play?
  - What caused you to see things differently?
  - What were the things that influenced the situation?
- What did you learn from this experience (Decision)
  - If it was a positive experience what would you do in the future to make this happen again?
  - If it was a negative experience what would you do next time to avoid it/deal with it better?

Homework: Complete this reflection in your visual journal.
Appendix I

Focus Group #2: Transdisciplinary design studio

Read over the following statements several times and take a few notes about what happened in
the situation you are reminded of:

“The most important/revealing/useful thing I’ve learned this semester about my own creative
process is…”
“As I’ve spent more time working with students from other disciplines, I’ve realized that…”
“The thing I’ve enjoyed most/least about the final design challenge is…”
“I’ve found having to keep a visual journal a rewarding/challenging experience. In particular, I
have learned that…”
“There was this one time when I saw how something we were discussing in this class related to
another part of my life/another course…”
“In one of the classes/guest lectures/readings it suddenly clicked and I saw how some of this
stuff is connected.”
“I remember this one time when I noticed one of the instructors discussing/modeling synergistic
thinking…”

After the focus group discussion:

Take a few minutes now to start writing a reflection about one of the situations that were most
meaningful to you. Focus your description on how you reacted to the situation, what you felt at
the time and how that changed over the course of the project:

- Recount the situation (Situation)
  - Be specific, give details and focus on your experience.
- How you felt about it (Affect)
  - What was your immediate emotional reaction?
  - What was that influenced by?
- Why you think it happened this way and what you learned or realized (Interpretation)
  - Why do you think the situation turned out the way it did?
  - What role did others play?
  - What caused you to see things differently?
  - What were the things that influenced the situation?
- What did you learn from this experience (Decision)
  - If it was a positive experience what would you do in the future to make this
    happen again?
  - If it was a negative experience what would you do next time to avoid it/deal with
    it better?

Homework: Complete this reflection in your visual journal.
Appendix J

Being…in the Midst/ Wide-Awake/ In-Between: An In-Process Reflection on a Narrative Inquiry Study

Abstract
This paper presents the author’s theoretical inquiries and ongoing reflections as a narrative researcher in the midst. Drawing on Jean Clandinin’s conceptions of narrative inquiry and Maxine Greene’s writings on aesthetic education, narrative inquiry is explored as a methodology where being in the midst requires wide-awakeness to ourselves and the other—it is a space of discomfort yet possibility. The intersections between Clandinin and Greene are invoked through an in-process narrative study on student experience in a Transdisciplinary Design Studio, co-taught by the author as a practitioner researcher. By considering narrative inquiry as an active, relational, and incessant process of meaning making, the author comes to find comfort in the discomfort and embraces the midst, wide-awakeness, and in-between as essential and interconnected states of being/becoming.

Keywords: narrative inquiry, in-process, methodology, relational, transdisciplinarity, practitioner researcher
Appendix K

Researcher Memo 8.27.2013

Over the past few weeks, I have resumed my work with data analysis and organization. The summer months proved busier than I anticipated and I found myself working on other projects and taking the time to spend with my daughter and husband, who is a teacher, was out for the summer. Since the fall semester began, I have implemented a new data organizational system which spawned from my dissatisfaction in working with NVivo during spring semester. I found that NVivo had many capabilities which were helpful when I explored grounded theory in my QUAL Data Analysis course but that it didn’t serve me well for the purposes of a narrative inquiry study. I found myself constantly wanting to “step back,” as it were, and see the data more holistically. I also wanted to see the visual and the verbal in tandem and make sense of these texts in relation to each other and as separate entities. NVivo was not meeting my needs and I began exploring alternatives which would afford me the opportunity to work more effectively.

The methodologist on my committee has always encouraged me to work with tables and Excel spreadsheets as a way of organizing and making sense of research components. As I mulled over the challenge of working with both visual and verbal data in my narrative study, I conceptualized a process through which I could organize the field texts into an Excel workbook. My idea has been to create a different “sheet” for each of my participants and consolidate the different data sources (field texts) into these sheets. Therefore, each sheet is dedicated to a participant and contains relevant texts (visual and verbal) that are perceived to be important to my study. As new information arises or I (re)engage with certain texts, I can add this information into the designated sheet. Each spreadsheet is also organized into columns with the following headings: “Participant; Data Source; Pages or Lines; Speaker; Text; Image.” These headings permit serve as organizational labels for the content and provide me with easy access to where the text derives.

I believe that the Excel format will be helpful for several reasons. First, I am able to see both image and text together in one space. Pasting images into the spreadsheet allows me to visualize the relationship, or sometimes lack thereof, between image and text and to begin to construct narratives based on the holistic perspective I am afforded. Even as I type content into the spreadsheet, I am often struck by a connection that is sparked by seeing image and text together. Another reason that I believe this format will be beneficial is that it will allow me to easily access and look across participants. A quick search will allow me to find keywords and examine the data intertextually, moving across participants and field texts.

Thus far, I have input data from four participants into the Excel workbook. At this point I wanted to document a few ideas that have stood out that might be worth exploring further as I continue to engage in data analysis. This is the first time that I have really looked in depth at Sara and Ellie which is why I have spent more time discussing them here. I have explored AshLeigh and Quentin, or parts of their narratives, previously in my QUAL Data Analysis course and already have memos and documentation as reference.

Sara:

- What is visually interesting about Sara’s visual journal is the prevalence of visual/concept maps. The reason this stood out to me is that she discusses in her final paper that
she never really understood concept mapping or realized that she created them until she took the design studio. She wrote, “However, I have recently discovered that I create concept maps all the time. Somehow, in the past few months, I have come to understand the purpose and function of a concept map” (lines 13-20). This surprised me to read as in looking at her visual journal, Sara used concepts maps constantly. The pages are full of arrows, lines, and other connective symbols which allow her thought process to be made visible. Sara explained that she “gained a new perspective of how I think, process, and sort information” which was fostered by the synthetic thinking in the course.

- Sara also wrote explicitly about the creative process in her final paper. One of my favorite passages is, “I hold firm to the theory that every person is capable of creative thought and processing. Creativity is like a muscle – it needs exercise to function at its optimum level. I have found that, like the first trip to the gym, the first dive into creative exploration is quite intimidating. Individuals who do not engage in creative exercise frequently are timid, shy, and oftentimes afraid of failure” (p. 79-83). I really love the simile and metaphor that Sara uses to describe creativity. She described listening to her engineering peers describe themselves as uncreative but “It was through low-risk activities and a little bit of creative freedom that we all became comfortable enough to stretch our creative muscles” (lines 92-93). She distinguishes between the art and engineering students specifically here, noting a distinct disciplinary difference.

- Play was an important idea to Sara as described in her final paper as it allowed her to make more risks and “enjoy the process of printmaking” (lines 93-96) during one of the grad presentations.

- From a disciplinary standpoint, Sara was in the same design group as Quentin and AshLeigh for the first design challenge. She wrote in her visual journal and in her final paper about the challenges of working with other disciplines and trying to get everyone “on the same page” (p. 11). There is a great concept map on p. 22 of her visual journal which represents her thinking with regard to the first design challenge along with this passage: “My issue: The group wants to go straight to product. They just blaze past the process. Maybe I'm the one who's completely messed up in my thinking. Most likely, that's the case. I thought we were supposed to reach the conclusion of their [sic] being no ideal solution, but that the thinking about waste needed to change. I'm just afraid that this plan of attack will only "pass the blame" to the manufacturers rather than our society as a whole. I just want viewers to reach the same conclusion as me...” (p. 22). This is very telling both about Sara’s perception of her group experience and that she wants the viewers to reach the “same conclusion” as her. She also writes in her final reflection that “I count my work done when the viewers are making the same connection I made before” (line 77ish). Admittedly, I find this a little problematic as she is negating the fact that viewers have different lenses through which they view artwork and will likely draw different conclusions based on those lenses. Sara’s perception is that visual
communication should be straightforward, or at least communicate her ideas clearly to the intended audience.

- Sara made some specific references to her perceptions as an Art Education major in the first focus group and the disparities she perceived between Art Ed and Engineering. She explained, “I made the connection with this assignment and that it’s designed to be open-ended to stimulate the thought process, and that was fine. I understood that as an Art Education Major, but I felt that other members of my group ... Wanted to jump straight to final product” (153-165). The fact that she saw her group members as wanting to jump to final product was problematic for Sara as she didn’t want to “skip vital details” (153-165). She uses interesting words during these discussions such as jump, skip, straight to fixing/product. These are very strong ways to describe her peer’s actions perhaps denoting a sharp contrast with her own desires to engage more in the process.

- Sara put herself in her Engineering peer’s shoes and said that she understood why they chose to focus on the solution: “That ability to think like they think, to understand where they're coming from that they want to go straight to product because that’s...Why would you have a problem if you didn't initially solved it? That's the reason you have a problem. You solved it because there is a problem and the problem solving process is not necessarily the focus” (176-192).

- Sara explained her thought process (an interesting insight and conflicting perspective to AshLeigh and Quentin’s narratives of the conflict) in the first focus group: “It was difficult, that times because I felt ... I knew what ... You see I had this wild idea about half way to the project that it was not at all about our [00:20:00] product. That the purpose of the project was to get us to think differently, to challenged people to think differently than in their problem solving. I got really hung up on that thinking that thinking that, ‘Okay, well ... My group is not thinking differently.’ We're still going straight to product. I kept trying to ask my group member, ‘Hey, what is ... What is the problem that we’re trying solve?’” (197-205). She stated that she played devil’s advocate and pushed her group members to think deeply about their problem and problem solution. She began to make this realization during one of the lessons: “We were given an assignment to go around campus and look at things as if we were an alien. It's about that time when I realize that our perception of the problem was the issue, not necessarily identifying the problem, but how we look at the problem, and that there was no ideal solution for anything” (231-242).

- In having this realization, Sara tried to communicate her concerns to her group which she stated “did not go well”. In her eyes, they were on the same page, but she saw her peers’ thought process as still going to solution. She makes meaning of this situation through her role as the only Art Ed student in the group: “I guess maybe they were just ... Maybe they just sat there and pretended to understand, because they were tired to listening to the Art Major ramble on about this big lofty ideas...” (263-276).
In the end, Sara resigned herself to the fact that she wasn’t going to end up with a good grade on the design challenge but shifts blame to the fact that she “did not know what was expected to me from day one” (281-286). She elaborated, “There's no way that I can fulfill that expectation. Like she said, “We didn't know.” There's no way that we can fix it. I might as well just go ahead, give up on that idea, just learn what I can from the situation, and try again next time” (281-286). It’s interesting to see her shift blame from her miscommunications with the group members to the misunderstandings of the project as a whole. Perhaps she is just overwhelmed and frustrated with the situation as a whole and is ready to just move on to the next project.

In her visual journal, Sara wrote: “Are we trying to convey a specific message with 1,000 leaflets that one moment can achieve? –[Quentin]. Snap! Quentin’s sounding like an art major!” (p. 19). An interesting reference to the different types of disciplinary thinking.

Sara expressed frustration with the way visual journals were implemented in the studio. She did not like the time constraints and longed for the opportunity experiment and play (see above). The fact that the journals were part of the data for the course and were subject to analysis was also disconcerting to Sara and noting an “underlying tension” in the second focus group with wanting to self-express but feeling a little inhibited. She notes specifically how other disciplines may feel this tension even more.
Appendix L

Researcher Memo 10.08.13

In fact, one of the lines in Marissa’s final paper resonated with me and I used it to tie together a presentation I did at NAEA. She wrote, “From meeting new people from art education, landscape architecture, graduate school and undergrad like me, to the books we read and design challenges we created and all the lovely in-between…” (lines 111-123). I fell in love with this idea of the in-between, especially because it represents the interdisciplinarity of the design studio and our curricular focus on process, not product. It seems like every time I revisit this concept, I uncover more layers of it which is why I am exploring it once again in a paper I am writing for my QUAL class this semester.

Researcher Memo 10.20.2013

Today I was thinking about how to frame the narratives of experience from the interdisciplinary design studio. Since this past spring, when I was writing my presentation for the NAEA conference, I have played around with the idea of the in-between space in this course, my research design, and my own role in the course as a practitioner-researcher. This phrase derives from Marissa’s final reflective paper: “This class was more like an experience than a class, and that’s how I feel college should be. I should be able to say, “I did this…and I did that…I know this… because I did that”. From meeting new people from art education, landscape architecture, graduate school and undergrad like me, to the books we read and design challenges we created and all the lovely in-between; without knowing it at the time, my synthetic understanding was forming” (111-123). Inspired again by Marissa’s words, I am currently writing an article for my QUAL 9400 course which explores the in-between as a multifaceted experiential space in a narrative inquiry methodology.

I keep coming back to this idea because it continues to resonate with me and it struck me that perhaps I should write about how each participant came to conceptualize, explore, and perhaps even resolve the in-between within the context of the design studio. I was thinking about Vanessa as hers were the last field texts I examined and put into the spreadsheet. For her, the in-between was returning to graduate school and learning to integrate her knowledge as a practitioner into a very theoretical course load. Her strategy of seeking connections between the disciplines and with her own experiences in teaching allowed her to resolve the tensions she was feeling as a first-semester graduate student. While these are just my initial ideas surrounding Vanessa’s narrative texts, I think it might be interesting to view and develop understandings of the participants’ experiences through this lens.
Appendix M

AshLeigh’s Narrative Construction Chart

<table>
<thead>
<tr>
<th>Source</th>
<th>Text</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final Reflection 7-12</td>
<td>Prior to taking the Art Studio, I can personally admit that I was very shallow about how I thought about non-science majors. While I knew the class would be interdisciplinary, I did not know that each person, having their own experiences and backgrounds, would be able to contribute so much to my learning in the course and in my life. Along with the students I was able to take this class with, the readings and lessons helped me learn a lot about myself both good and bad.</td>
<td>Non-science majors; preconceptions; where she was; interdisciplinarity (Abstract)</td>
</tr>
<tr>
<td>Final Reflection 13-22</td>
<td>Walking into the studio for the first day was particularly awkward for me. I felt unsure about how the course was going to go and I had my ‘engineering persona’ on display. I developed my ‘engineering persona’ while at UGA. This persona is overly confident and borderline cocky but the reason I think I had this persona on display was because I did not want anyone to assume I was anything other than an engineering major and I did not want people to think I was not smart. Reflecting back, I feel very foolish in the way I was thinking. While it may not have displayed to the class, I thought engineering and science majors were better and smarter than art majors. I even remember feeling a little offended during the first week when we were asked to make connections between engineering and art.</td>
<td>Engineering persona; engineers are smarter/ better than art majors (Orientation)</td>
</tr>
<tr>
<td>Visual Journal, p. 90</td>
<td>Prompt: The most important/revealing/useful thing I've learned this semester about my own creative process is... I'm scared of making mistakes. ie. I am a perfectionist. By learning this about myself I am able to relax and realize it is ok to make mistakes. There was a day in class that I saw [Ellie] create an image in her journal. I admired how she was not afraid to take a risk with her piece and it inspired me to try. I learned to take risks and that it's ok if I mess up. (11/14/12)</td>
<td>Mistakes; perfectionism; Ellie’s journal; relaxing (Evaluation)</td>
</tr>
<tr>
<td>Visual Journal, p. 59</td>
<td>I: Creative Thinking::Leaves: Trees Sometimes I'm there sometimes I'm not Either way, I am always changing growing &amp; adapting to creatively thinking (10/8/12)</td>
<td>Metaphor; “growing and adapting”</td>
</tr>
<tr>
<td>Visual Journal, p. 76</td>
<td>Aside: I am terrified of making mistakes. I try too hard to make my journal perfect so I'm going to try being looser (10/29/12)</td>
<td>Mistakes; perfect; “try to be looser” (CA)</td>
</tr>
<tr>
<td>Visual Journal, p. 81</td>
<td>Try to make pieces perfect cause almost everything in my life seems so screwy (10/31/12)</td>
<td>Perfect; life seems so screwy (Evaluation)</td>
</tr>
<tr>
<td>Visual</td>
<td>I learned (had a metamoment) that I am truly a product of my life</td>
<td>Product of life</td>
</tr>
<tr>
<td>Journal, p. 83</td>
<td>experiences and so is my art. I try to make everything perfect because my life was so far from perfect. Its a little depressing but true.</td>
<td>experiences; life far from perfect</td>
</tr>
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</tr>
<tr>
<td>Focus Group #1, 335-338</td>
<td>I would say this one’s a little different because I care about this one. The other studios, hate to sound so blunt about it, but they were just kind of … Help me… Yes, write about your feelings and … I don’t know, this one is, I care about what we’re working on, so I care about my notebook and what I put into it.</td>
<td>Care about visual journal and what she puts into it</td>
</tr>
<tr>
<td>Focus Group #2, 428-461</td>
<td>…So I think it is challenging for me in that I’m a perfectionist, and I hate doing things that look bad, so I’m always scared to, like, take a risk on a drawing or something, because I don’t want it to turn out ugly, so I … I don’t know, through visual journaling, I’ve learned to, like, try to loosen up a bit and use more color and take some risks … risks. So that’s the rewarding part, but it’s hard, because I don’t like messing up. No. I mean, sorry, yes. I was … [Ellie] is in my group, and [Ellie’s] an engineer, but she’s really artistic, and she always does these weird drawings in her journal, but she’ll smudge them at the end, and they’ll still look nice, like, when she’s done, and I don’t understand how she does it. But, like, she doesn’t care about messing up, because she’ll just, like, make the mistake work in her journal, so it was … I don’t know. She kind of inspired me, I guess.</td>
<td>Perfectionist; risks; scared; loosen up; Ellie; “doesn’t care about messing up”; inspiration (Orientation/ Evaluation)</td>
</tr>
<tr>
<td>Final Reflection, 23-28</td>
<td>Well, I still don’t try stuff, because I just … No. Like, I’ve only used this much, and I only do what’s assigned. Yes, it’s like, and I don’t want to mess it up.</td>
<td>Don’t want to mess it up (CA)</td>
</tr>
<tr>
<td>Final Reflection, 29-37</td>
<td>I still vividly remember the first day of class and a comment that [Christy] made. She was talking about how a city was built and I was utterly amazed about how detailed she was in her experience. She related the way people respond to a city to the wind, the buildings, and sound. This was my first insight that artists and art majors have a much more in depth understanding of life and its surrounding than I thought.</td>
<td>Developing respect for Art Ed; challenging preconceptions of art majors</td>
</tr>
<tr>
<td>Final</td>
<td>There were other experiences in the studio that allowed me to completely let my engineering persona go and I developed a genuine respect and appreciation for difficulties that other art majors faced. Just watching [Amy, Sara, Christy, and Vanessa] work in their visual journals was inspiring. We discussed their classes and how challenging what they do is. I felt bad that I used to think these same people were lazy for not majoring in science but now I feel like they are brave. Few students have the courage to step into a field such as theirs. I still remember wanting to major in music but I was discouraged because the field is so uncertain. Now, I have genuine respect for those who were far braver than I was.</td>
<td>Letting go of engineering persona; art majors as brave; desire to major in music</td>
</tr>
<tr>
<td>Final</td>
<td>Art students were not the only people to have an impact on me in</td>
<td>Ellie; pretty/</td>
</tr>
</tbody>
</table>
the class. [Ellie], an environmental engineering student, was probably the most influential person in helping me learn more about myself. At one point in the semester, I would just watch [Ellie] work in her visual journal. Her art was pretty but I noticed she was never scared to make it ugly. She poured whatever she wanted onto the page and by the end of she was happy with her results. I have personally always struggled with being a perfectionist and this class really brought that issue to the light. I was scared of making mistakes and I admired that Julie never cared. Her free personality is what allowed her to make such fascinating images in her journal. So, during the middle of the semester, I thought I would try to take more risks with my journaling. I still have not been able to let go all the way of wanting things to be perfect but I do think the changes I have made so far have made not only improve my art but also my problem solving.
Appendix N

Hi Ellie,

I hope this email finds you well and that you had a relaxing and enjoyable break :) I would love to hear how you are doing and what is new in your life if you are interested in grabbing coffee sometime. Hopefully I will see you at some of the research meetings this semester.

As you probably remember, I was conducting research in the design studio for my dissertation. Attached is a copy of one of my chapters on which I would very much like your feedback. The document is quite long as I included the introduction, discussion, and summary sections; however, the highlighted sections are most important to read if you have limited time (as we all do!). I am very interested in your story, your experience in the studio, and I have constructed the italicized story from various documents you created in the course including your visual journal, the focus groups, and your final paper. You can see the rough, uncut data in the chart at the end of the document. My goal was to piece together a narrative which focuses on your professional identity and your ideas about creativity. I have deleted the other two narratives in this chapter as I am currently eliciting their feedback as well.

I would greatly appreciate you reading this document at your convenience and providing feedback, including areas for improvement and/or clarification. If there are any sections that make you uncomfortable or you would like changed, please let me know and we can work together in the editing process. Also, pay attention to the images and let me know if you feel like they are located appropriately in the text. Finally, feel free to add comments, questions, or edit the document itself using these functions in Word and do not worry about hurting my feelings as I really want this narrative to ring true to your experiences :) 

It was such a pleasure engaging with these various documents and learning more about your experience in the course. I truly appreciate your willingness to be part of this study as I know that it will help myself and others who are interested in interdisciplinarity to create meaningful learning experiences for future students. Of course, please contact me if you ever have any questions or concerns.

Best wishes for a wonderful semester!

Warmly,

Kelly

Kelly Guyotte
Ph.D. Candidate, Art Education
Lamar Dodd School of Art
The University of Georgia
Appendix O

Informed Consent to participate in study

I, __________________________________, agree to participate in a research study titled "Making Connections: A Theory of Synergistic Learning in Engineering" conducted by Joachim Walther from the Faculty of Engineering at the University of Georgia (706-542-0313). I understand that my participation is voluntary. I can refuse to participate or stop taking part at any time without giving any reason, and without penalty or loss of benefits to which I am otherwise entitled. I can ask to have all of the information about me returned to me, removed from the research records, or destroyed.

The purpose of this study is to investigate the ways in which students make connections between disparate aspects of their learning and prior as well as current life experiences with a particular focus on creativity.

The benefits that I may expect from my participation are an increased awareness and understanding of my own learning experience in the Studio Class and how this fits with my overall learning at university.

If I volunteer to take part in this study, I will be asked to do the following:

- Participate in all regular class activities, including reflective focus groups and reflective writing exercises, class discussions, and team project. The participation in the study will not increase my workload beyond the normal participation required for this class.

I will not receive any compensation or extra credit for my participation.

No risks, discomforts or stresses are expected from participation in the study.

Any information that is obtained in connection with this study and that can be identified with me will remain confidential and individuals won’t be identified in any reports of the study. The focus group discussions will be audio recorded and transcribed. As a participant I have the right to review or edit audio and video recordings made as part of this study.

Upon request, I will receive my scores for the two creative thinking tests.

Only study personnel will have access to the data collected, which will be kept in a locked filing cabinet on a secure business premises for a period of three years, with no other person able to use or access the data. Electronic files will be stored on the password protected computer of the Principal Investigator or secure servers.

The researcher will answer any further questions about the research, now or during the course of the project, and can be reached by telephone at: 706-542-0313.

My signature below indicates that the researchers have answered all of my questions to my satisfaction and that I consent to volunteer for this study. I have been given a copy of this form.

Joachim Walther
Telephone: +(1)706-542-0313
Email: jwalther@enrg.uga.edu

______________________  _______________  ___________  
Signature                        Date

______________________  _______________  ___________  
Name of participant                        Signature                        Date

Additional questions or problems regarding your rights as a research participant should be addressed to The Chairperson, Institutional Review Board, University of Georgia, 629 Boyd Graduate Studies Research Center, Athens, Georgia 30602; Telephone (706) 542-3199; E-Mail Address IRB@uga.edu
Appendix P

Subject: The goals of STEAM education
Date: Wednesday, October 17, 2012 4:24PM

Dear Kelly,

I am intrigued by the “empathetic, or caring, nature of art” you described in your last email. In particular I am curious as to how this aspect of art and Art Education might contribute to an interdisciplinary context, such as our class, and, more broadly, to STEAM initiatives across the country.

After receiving your email last week, I searched the internet to try and find out if the empathetic and caring aspects of art are part of the mainstream STEAM conversation. I found many websites which describe the need for STEAM education (see for example: http://steamnotstem.com/about/ and http://stemtosteam.org/), as well as numerous newspaper articles (see for example: http://www.edutopia.org/blog/stem-to-steam-strengthens-economy-john-maeda, http://blogs.scientificamerican.com/guest-blog/2012/08/22/from-stem-to-steam-science-and-the-arts-go-hand-in-hand/ and http://www.pbs.org/newshour/rundown/2012/07/the-movement-to-put-arts-into-stem-education.html). Surprisingly, however, I read very few comments regarding the contribution the arts could make to STEAM in the sense of fostering a more holistic, empathetic and care-based education. Instead, the focus seems to be almost entirely centered on the understanding that incorporating the arts into STEM will promote creativity, thereby spurring the innovation which will ensure America’s future economic well-being. See for example the following excerpt from http://steam-notstem.com/about/:

“The future of the US economy rests on its ability to be a leader in the innovation that will be essential in creating the new industries and jobs that will be the heart of our new economy. Where the US has historically ranked 1st in innovation it now ranks between 3rd and 8th depending on the survey. We have taken steps to reverse this slide by embracing and funding the much needed improvements in STEM (Science, Technology, Engineering and Math) education. STEM is based on skills generally using the left half of the brain and thus is logic driven. Much research and data shows that activities like Arts, which uses the right side of the brain supports and fosters creativity, which is essential to innovation. Clearly the combination of superior STEM education combined with Arts education (STEAM) should provide us with the education system that offers us the best chance for regaining the innovation leadership essential to the new economy.”

Below is one of the few comments I found which, I feel, at least touches on aspects of care and empathy (see in particular the bolded text):

“What does it mean to turn STEM to STEAM? The problem-solving, the fearlessness, and the critical thinking and making skills that I see every day in the RISD [Rhode Island School of Design] studios are the same skills that will keep our country innovating, and their development needs to start in the K-12 schools. Design creates the innovative products and solutions that will
propel our economy forward, and artists ask the deep questions about humanity that reveal which way forward actually is.” http://www.edutopia.org/blog/stem-to-steam-strengthens-economy-john-maeda

Reflecting on these quotes and the underlying purpose of integrating the arts into STEM education led me to another interesting point you raised in your email – the concept of a third, or hybrid space, “a place where disciplines might overlap, enmesh, and amalgamate”. Thinking about this hybrid space took me back to a Wednesday afternoon class in the fourth week of semester, one week before the deadline for the introductory design challenge. During this particular class, one of the three interdisciplinary groups was having difficulties progressing with their gallery exhibits. More specifically, the two engineering students in this team both were of the understanding that they had completed the process of brainstorming and coming up with the two ideas for their exhibits. The Art Education undergraduate student, however, was suggesting that now it was time to “dig deeper” and further engage and explore their two ideas. At this point in the team discussion the engineering students became frustrated and said to the Art Education student something to the effect of “you’re the Art Education major, how about we just build it and you make it pretty”. If you recall, this comment effectively led to a complete breakdown of communication and the group sat in almost total silence for the remaining hour of the class. During the next class meeting, the Art Education student attempted to get the project back on track and led her group in a visual mapping exercise that sought to examine the relationships, connections, and assumptions underlying their ideas. Despite these last minute efforts, it was evident to us both that the group’s two exhibits lacked cohesiveness in the gallery show. While each exhibit posed thought-provoking questions about waste, they did not come together as the group envisioned.

So what does all of this mean for the hybrid space we are currently in the process of both creating and witnessing? At this point I can’t say I’m entirely sure. What I do want to express though is my increasing discomfort with the two apparent front and center goals of STEAM, those being, first, to stimulate creative thinking and therefore innovation to ensure our future economic well-being, and second, to attend to the aesthetics of design (as demonstrated in the account above). Based on our early observations in this class and the struggles our students are experiencing negotiating their own ‘hybrid spaces’, I feel this is an area that we need to dig deeper into.

I would be very interested to hear your views on this subject.

Kind regards, Nicki

It is indeed interesting that STEAM initiatives seem to focus very narrowly on how the arts can contribute to STEM education. I find myself wondering why this narrow perception exists and what circumstances are fostering the pervasive structure of creativity= arts. Through Sparks of
Genius, we have explored thirteen creative thinking tools that have been found in individuals from a wide variety of disciplines. The problem posed by the authors is that our current educational systems from K-16 and beyond are not cultivating creative minds because of a lack of inter- or transdisciplinarity approaches to curricula. Creativity, then, is not equated with the arts but is something that transcends disciplinary boundaries.

Given this information, it seems as though some STEAM advocates may be misunderstanding the essence of the arts and what the arts may offer to science, technology, engineering, and mathematics. It is this very problem that surfaced in your story about the Art Education student and the engineering students when the engineering student said something to the effect of “you’re the Art Education major, how about we just build it and you make it pretty”. I remember that day as the group sat silent for the last portion of class and the Art Education student stayed after class to discuss her frustration with this experience. If STEAM initiatives are to fulfill their potential, there must be more than a superficial arts incorporation—there needs to be a thoughtfully planned arts integration. With this in mind, the arts must also visualize what it is that STEM might offer at this deeper level where all five of these disciplines might stand on equal ground.

In reference to your comment about empathy and caring being absent from the STEAM conversation, the authors of Sparks of Genius present “empathizing “ as one of the thirteen thinking tools of the most creative individuals from across disciplines. Recall that we also found that Howard Gardner and Daniel Pink discuss empathy as they envision the necessary minds of the future. Is it that our society (or maybe STEM education) does not value this type of creative thinking? Or is that most people do not think of the ability to empathize as a creative thinking tool? Your thoughts?

Finally, I thought that I would readdress this idea of the third, or hybrid, space of which I spoke in my first email. I was thinking back to our class on “Abstraction” on October 1st and an interesting comment I heard one of the environmental engineering students bring forth. Let’s call this student, Ethan. Ethan had just completed his wire sculpture, a simplified abstraction of a buck (male deer). As he stood up at the end of the studio portion of class, he stated that he was not able to add a lot of detail to his wire sculpture as the wire did not permit him to work in this way (my paraphrasing). What Ethan pointed out is a unique quality of Art Education. When students work with a medium, they learn what the medium affords the artist as well as its limitations. Elliot Eisner[16], eminent scholar of Art Education, discusses that an attention to the constraints and affordances of a medium “requires a sensitivity to nuanced qualities” (p.80) which is a cognitive act. Ethan’s comment struck me as he was thinking like an artist, thinking in qualities. It seemed coincidental that I happened to overhear Ethan make this observation and it made me wonder if other students were beginning to develop such habits of mind—whether they be arts-based, design-based, or something else? This is one of our limitations. How will we know about the hybrid space unless students somehow make these realizations known?

I would be interested in hearing your perspective.

Warmly, Kelly