Technical communication as design: A design pedagogy study

by

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The student author, whose presentation of the scholarship herein was approved by the program of study committee, is solely responsible for the content of this dissertation. The Graduate College will ensure this dissertation is globally accessible and will not permit alterations after a degree is conferred.

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DEDICATION

To my most compassionate, loving, supportive, and unflappable family, I want you to know that I could not have accomplished this feat without each and every one of you. I dedicate this project to my best-friend and partner, Marci, my creative and wonderful children, Nyxie and Triston, my loving mother, Connie, and supportive father-in-law, Marshall.
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NOMENCLATURE

Design  The purposeful creation of an artifact and the meticulously crafted artifact itself.

Ideation  The formulation of new ideas or concepts.

Ideology  A system of theories, principles, and ideas that form the basis of knowledge and practice.

Intermodal  The interaction of two or more modes of communication (i.e. text, images, audio, electronic) that shape its meaning.

Multiliteracy  The ability to identify, understand, use, and create based on and according to many different literacies (i.e. textual, visual, oral, electronic, rhetorical, critical, social, cultural, and technological).

Multimedia  The act or result of using more than one mode of for expression and communication, especially in computer mediated communication environs.

Multimodality  Communication practices using textual, aural, visual, linguistic, spatial, and electronic modes of exchange and expression.

Prototyping  The act of making a draft version of a communication or product.

Sensorial  Relating to embodied sensation or the senses.

Storyboarding  The act of drawing and describing scenes for a video or chronological interactive communication as a form of planning.

User  A person who uses or operates something (or is intended to do so).

UX  Refers to the characteristics of physical, mental, and environmental experiences of a user who uses or operates something.
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ABSTRACT

This project focuses on the development and empirical study of design pedagogy for teaching and learning communication work in professional and technical communication (PTC) courses. It provides communication design history, theoretical and practical frameworks, and results of a research study on user-experience (UX) with design pedagogy—specifically in technical communication classes focused on computer-mediated communications (CMCs) in a computer integrated program.

In Chapter 1, the historical relationship between communication and design in professional communication work is examined to establish the value that design approaches and practices offer PTC. This work justifies the pursuit of a design-based pedagogy for PTC. After which, Chapter 2 offers a theoretical framework of multiliteracies for developing design pedagogy for multimodal, digital communication and codifies these literacies into seven principles for teaching and learning contemporary communication. Chapter 3 builds upon these principles by defining and describing the tenets of design pedagogy for CMCs in PTC. It establishes the practices for teaching an approach to communication as design and for composing via the design thinking process. Chapter 4 introduces the qualitative, empirical methods used to capture user-experience (UX) data of faculty, students, and the investigator regarding the use of design pedagogy in technical communication courses. The UX results derived from empirical inquiry are reported and discussed in Chapter 5. The results indicate that design pedagogy in technical communication offers faculty and students a radically user-centered approach to communication, an innovative design process for creating CMCs, and a multimodal emphasis for meeting the needs and expectations of 21st century communications in the workplace and beyond. The final chapter offers these major contributions and a few others associated with how
to triangulate UX research methods for studying classroom pedagogy. Also, it provides recommendations from the faculty, students, and investigator for the continued use and improvement of design pedagogy for teaching and learning CMCs in PTC.
CHAPTER 1. BACKGROUND

When I first came to Iowa State University, I was introduced to ISUComm’s W.O.V.E. curriculum. It’s programmatic approach to teaching composition as multimodal, as operating across the written, oral, visual, and electronic spectrum of forms, made real for me on a large scale what I had been trying to achieve in composition courses I taught at Lake Land College since 2013. As a small community college adjunct, I was given a lot of freedom to accomplish broad educational goals in the classroom. I explored new media for creating and sharing knowledge and collaborative composing in computer-mediated environments. I strived to incorporate multiple platforms and modes of communication into my classes to make my students’ work more like what they used in their daily lives. Then I tied their electronic communication experiences to common workplace documents and encouraged them to transfer their preexisting multimodal communication skills. But, once I came to ISU and discovered ISUComm’s robust multimodal curriculum, I knew I had much more room to grow as a scholar and educator. This discovery led me to the topic of my dissertation. My dissertation defines a new design pedagogy for teaching 21st century communication. Further, it provides the design theory and practices necessary for teaching communication as design using the many forms of interaction common to digital culture in Professional and Technical Communication (PTC) environments.

As the treatment of communication as design captured my attention for preparing students and faculty for the digital world, I found that design has been recognized by communication scholars as an important part of making communication artifacts with computers. However, I also discovered that a pedagogy showing instructors how to teach communication design was missing. Coming from a background blending creative writing and rhetoric, I have
long tried to teach students to paint with words particular scenes for their audiences and purposes. However, while at ISU, I realized just how much freedom computer-mediated communication (CMC) affords through the ability to design exchanges using many forms beyond text. Further, I began to note that the rhetorical power of these forms and how they interact with each other remains underdeveloped in our instruction. For both teachers and students, understanding of communication with non-textual forms—images, audio, videos, hypermedia, and interactive artifacts—is underserved by current pedagogical literature and the available research.

To address this gap, I have taken-up the subject of design and its habits of thoughtful practice and defined a new pedagogy that may be used to teach rhetorical communication and composition in the diverse fields of PTC. Also, to provide my design pedagogy with the often-missing evidentiary support, I developed and conducted an empirical classroom study to add credibility to the potential affordances and constraints of my new design theory and practices. Hence, allow me to share with you my vision of communication as design and design thinking that I have researched as a design pedagogy for the purpose of teaching and learning in PTC.

**Addressing the Design Problem**

Addressing today’s communication and composition environment, instruction in the different ways that modes interact—with written, oral, visual, and electronic forms all coming together and influencing each other—to meet users’ needs and desires may be approached via the definition and study of design and design thinking. As a scholar, I have begun the work of developing the theory and practices of design pedagogy and I have defined them for sustained use and the supplementation of our current practice in this project. As a researcher, I am carrying forward the discovery that the processes of composition and design are similar and complement each other (e.g., Buchanan, 2002; Kostelnick, 1989), but herein I am also undertaking the
analysis of a user’s experience as they teach and/or learn via design pedagogy. Recognizing the rhetorical nature of creative acts with purposeful ends, I posit that both designers and authors mirror each other’s labors in thought, practice, and intent in this scholarship. Just as an artist mixes media to shape the viewer’s experience, the rhetorician entwines the modes to persuade the reader. This mirroring is especially true regarding how today’s professional communicators blend the modes available to them in digital spaces to achieve an intermodally developed rhetorical effect (i.e. a persuasive effect created by the interplay of image, sound, text, interactivity, etc.). As such, communication educators should support and examine the use of communication designs using multiple, enmeshed modes for digital forums and teach their rhetorical potential. Thus, I offer design as a concept for communication that weaves together written, oral, visual, and electronic components and I offer a process to address audience needs, and research on design pedagogy user experiences. From the experiences explored in this work, I may reveal how best to teach intermodal rhetoric for multimodal digital PTC environments.

To refine my definition of a design approach for PTC, it may be best described as treating multimodal composing as rhetorical appeals to the senses, as working upon and in-concert with audience ideological perceptions, and as recognizing the responsivity of communication, especially regarding digital environs. From this vantage, design for effective communication is not tacked-on, ornamental, or predominantly focused on persuading audiences with aesthetic appeals. Instead, my concept of design is both the activity of careful, purposeful creation of a sensorial artifact, realizing what each mode brings to a composition, and it is the meticulously crafted and purposeful artifact itself. The duality of communication as design—as act and object—provides an ideological touchstone for how to consider the activity and embodiment of today’s CMCs for user audiences. So, as design is typically used to discuss the arrangement of
many elements into an effective whole, it too defines an approach to assembling the modes with one another in order to create rhetorically powerful communications for users. This belief and its usefulness underpin the contents of my work.

Hereafter in Chapter 1, I have provided an examination of the history of design approaches and practices in PTC. Starting from the post-WWII “creativity techniques” (Cross, 1993, p. 16) used in scientific and technical communication circles of the 1950’s and 60’s and advancing a decade at a time until the present-day, I account for design and communication in the spirit of each successive age. Based on the research ideology of Doheny-Farina’s (1986) micro-macro cultural analysis and Geertz’s (1965) ethnographical methods of cultural inquiry, I illustrate how communication design approaches and practices coincided with changes in society and technology to make design central to PTC. Closing Chapter 1, I provide an understanding of design’s long history as part of our work. I show that this history and calls for sustained attention in and beyond this project. And, I forecast and preview my design pedagogy scholarship.

**Entering Communication Design History**

Historically, PTC placed the highest value on the form and function of written text (Portewig, 2004). However, the visual attributes of documents, text, and images in technical communication have long been an important part of information design for conveying intricate systems, activities, or technologies to those who need it. After World War II, the complexity of emerging technology reached a watershed moment and the need to visually display information challenged text’s dominance in North American technical communication curriculum (Connors, 1982). The ability to “read, write and create visual imagery” (IVLA, n.d.) for relaying information grew exponentially in the fields of scientific and technical communication during the 1950’s and 60’s (Mills and Walter, 1954; Arnhiem, 1972; Cross, 1993). Further, how to teach the use of multiple modes of communication—integrating writing with visual, oral, and electronic
forms—called for exploration into a design-based approach to aid technical writing instructors (Buchanan, 1989; Kostelnick, 1989). But, the history of change toward multimodal, design-based instruction has not been the focus of much study in the discipline until recently.

Although technical communication as a discipline is often difficult to define, its interdisciplinary nature places it between composition, graphic art, engineering, IT, the sciences, and other vocational fields (Dobrin, 2004). For many, technical communication is defined by its function to bridge the gap between complex activities, products, or technology and their user-audiences. So, when looking for design in the activity of our discipline, we find growing focus on visual literacy to address the inclusion of multiple communication modes (i.e. multimodality) to help audiences. According to the International Visual Literacy Association (n.d.), visual literacy’s “‘visual competencies’” are language tools for “communication and interaction,” which support how “we communicate, exchange ideas and navigate our highly visual digital world.” This focus grew—evidenced by their evocation of the digital—from changes in technology and cultural zeitgeists. Each zeitgeist, an era defined by “the spirit or genius which marks the thought or feeling of a period or age” (OED, 2018), manifests itself in the ideas, beliefs, and activities of that time. Further, it can be seen in the approaches to communication practices too. Each successive zeitgeist places new demands on communication because cultural sensibilities and ambitions change. Notably, ambitions after World War II led to rapid industrial and technological growth in the U.S. (Connors, 1982) and brought significant changes to visual language and design in technical communication.

After World War II, Ebbert (2016) posits war-time research practices designing solutions to conflict brought new means for innovation into cultural practice and birthed intrepid ideation. Industry and technology grew and texts in technical communication were not only more
carefully designed, but images were integrated more and more often. Everything from document
design, typographical elements, pictures, drawings, data visualizations, schematics, video, and
electronic artifacts became central design interests (McLuhan, 1964; Tufte, 1983; Schriver,
1997). As such, the multiple modes of communication became inextricably linked in the
discipline and technical documents became pragmatically connected to changes in the common
modes of communication during an era. Thus, multimodal communication design was taken-up
to innovate documentation in technical communication after WWII.

The ascension of design responding to changes in technical communication culture
primed the current subject of study. This chapter examines the changes in multimodal design and
design practices in technical communication and its pedagogy as they correlate with changing
technology and cultural zeitgeists. The purpose of this examination is to illustrate how design
responds to cultural changes, show how design pedagogy may be valuable to the field (despite
some contemporary concerns), and act to justify sustained pedagogical attention and research on
design in technical communication classrooms today.

**Empowering the Multimodal in Composing**

Moving toward a multimodal composing framework—in which written, visual, oral, and
electronic communication modes are melded together—today’s communication literacy required
the field to undergo an ideological evolution. This evolution began in step with the need to
communicate technical information visually as much as textually. As society mechanized, the
users of machines required more modes of communication than writing and more carefully
designed documents for access to necessary information and to improve usability. And yet, in
many traditional English departments, emphasizing written work and text design over
multimodality in technical curricula pervades (Nelms, 2004, p. 3). Despite this fact, multimodal
literacy in composition has become a cultural and professional expectation challenging the
dominance of traditional instruction. It is no longer enough to know how to write a message.
Students recognize that they must be literate in the use of visuals, delivery of presentations, and
deployment of electronic messages. Thus, this cultural challenge serves as exigence to
disseminate the power of all the modes in communication literacy, ergo inclusion in our pedagogy.

Taking up the task of bolstering visual, oral, and electronic modes alongside writing, many scholars have vouched support. Drucker and McVarish (2012), in their design textbook, discuss how visually “literate” communication predate character-based, written language by 31,800 years. These pre-historic visuals provided meaning to the much later systems of text. Ong (1982) on oral cultures and literacy espoused a return to oral communication as a dominate form through broadcast media in our technologizing world. Brumberger (2007), addressing electronic communication, denounces the divisive dual knowledge thesis, which devalued the visual in favor of the written, while enriching our understanding of the integration of multiple modes of communication for digital environments. Together these scholars and others have breathed life into supporting communication design work by recommending we develop the intermeshed, multiple core literacies—written, oral, visual, and electronic—of technical communication (see Figure 1) which are at the center of this current scholarship and will be explored in detail within Chapter 2.
Thus, developing pedagogical practices for PTC using a design process geared toward today’s multiliterate communication may be recognized as a valuable, if not necessary, task.

A Design Process Engaging all the Modes

Since the work of Simon (1969), the study of design for problem solving has been synonymous with communication and innovation. Simon envisioned the design process as a means to devise new ways to address problems via collaboration, observation, foresight, and experiments that may “reframe” our issues and “(re)design the world as it can be” (Dorst, 2010). Since Simon’s work, scholars have sought to refine the process, to distill it for use, and have ultimately arrived at design thinking (Arnheim, 1969; McKim, 1980; Rowe, 1987; Faste, 1994; Brown, 2009; Kelley & Kelley 2013). David Kelley—design author and founder of the IDEO design firm—coined the thinking process which integrated the multimodal nature of the communicative act with production. A businessman, Kelley devised a cognitive, collaborative, and user-centric process for innovating solutions to business and technical issues of
manufacturing, production, and marketing leveraging multiple and varied communication activities.

In brief, IDEO’s design thinking process is comprised of a series of phases that move from defining a problem through implementing a solution. According to Brown—CEO of IDEO—the process is "a human-centered approach to problem solving" (cited in Gobble, 2014, p. 59). It "focuses first on the needs and experience of real people...as a source of inspiration and insight” (p. 59) for creating artifacts that address their needs. Design thinking involves many of the communication literacies and cognitive activities used to solve technical communication issues. It integrates careful sociocognitive analysis—studies of audience information processing, storage, network participation, and application needs and abilities—with scrutiny of the affordances of communication modes available in the environment where authors are composing for end-users. According to Dorst (2011), design thinking of this sort allows for the creation of an exploratory space that provides context control for generating problem-solutions that achieve optimum user effect.

Further, per Tom Kelley, GM of IDEO, the “Design thinking” which creates this space is a recursive, five-part process. It “begin[s] with understanding the client, the market, the technology, and…[the] constraints, and moves through observation of real people in real situations, visualization of possible solutions and users, and prototyping, to end with implementation of the concept” (cited in Gobble, 2014, p. 59). This process, as Kelley describes it, illustrates the contexts and communication processes central to designing effective user-based technical documents. Thus, the IDEO approach to design and design thinking may be suitable for developing technical communication pedagogy, and it’s up-take of sociocognitive influences to offer solutions to difficult problems in communication is highly sought after.
Moving toward Design Pedagogy Via Technical Communication’s Past

As society and economy change, arriving at a design approach to pedagogy in technical communication did not happen overnight. There is a long history of ideological and methodological adjustment influenced by changing cultural zeitgeists that led to the value of multiliteracies and design practices. To outline the evolution of technical communication pedagogy towards design and design thinking instruction, I adopt a perspective from Doheny-Farina’s (1986) research that a micro level examination of key elements can produce cultural insight into the whole. And, from the methods of Geertz (1965), I assume that individual, timely practices can represent the height of a cultural moment. Accepting these views, I map the evolution of key ideologies, principles, and practices in the history of communication design from the mid-twentieth century to the present day (see Figure 2).

Figure 1.2. A timeline showing this study’s central authors and concepts contributing to design evolution in technical communication since WWII.
This chronological tracing is important because it allows the development of design practices and their relationship with technical communication instruction to unfold. Arriving in the present, I consider how design pedagogy is related to technological progress and the ideology of modern innovation centralized in the spirit of our digital age. Also, my final remarks provide a forward look upon design thinking and the future of professional, technical communication instruction, while positing the value of design and justifying our attention.

**Evolving from Text Theory-based to Cognitive User-Based Design Pedagogy**

Until the mid-twentieth century, technical communication instruction was usually text-based and dependent on composition practices. According to technical communication historian Robert Connors (1982), though “technical writing is ancient,…systematic instruction in the methods of technical writing” (p. 4) did not exist until after a pivotal publication by Mills and Walter in 1954. During the post-war era, “technical writing ‘grew up’” (p. 13) alongside scientific communication. Exchanges between these fields began to address visual literacies and communication design practices using “creativity techniques” (Cross, 1993, p. 16), as documented by design historian Nigel Cross. From the cultural zeitgeist of this period—defined by a society seeking creative, technological designs to enhance everyday experiences—the evolution of technical communication away from writing towards early visual and electronic modes began. Instruction in the inclusion of pictures and drawings, alongside emphasis on document design and typography decisions began to take shape. However, even though the change favoring design and multimodality started in this time, resistance was fierce.

Recently as the 1980’s, educators in technical communication clung to textual models of teaching visual literacy and design for multimodal communication. Scholars Buchanan (1989), Kinross (1989), Ehses (1989) and other figures of design discourse were basing visual
scholarship on models of textual rhetoric and semiotics from Barthes (1977), Saussure (2006), and their predecessors. While textually informed concepts of visual rhetoric are still with us (rightly so given the importance of document design and rhetorical figure, situation, audience, etc.), the 1960’s and 70’s Design Methods Movement embraced a scientifically minded and technologically changing climate in technical communication. The movement ushered in pedagogical changes and ideological shifts toward teaching visual literacy and communication design as a systematic, cognitive process.

According to Cross (1993), the 1962 *Conference on Design Methods* held in London—what many consider the inaugural event for design practices as processes—started the Design Methods Movement. This movement articulated a reimagining of design instruction as a “scientific process” for the creation of “new structures,” (p. 18) and rebranded the romanticized labors of the designer as practical, systematic activities—practices relatable to technical communication. This movement and its motivations grew out of an era which had seen “the application of novel, 'scientific' methods” and “creativity techniques [of] the 1950’s” (p. 16). Into the 1970’s, these practices drove the embrace of a creative, albeit empiricist, paradigm from science in technical communication, graphic art, engineering, and architecture.

During the 1970’s, from Alexander and Jones’ “scientifically methodological [design] approach” (Cross, 1993, p. 18) arose an objective, linear process of design. By emphasizing that “[a] design method is a pattern of behavior [systematically] employed in inventing things ... which do not yet exist,” and that this method is predominantly “concerned with how things ought to be” (p. 18), design in this era took on an air of legitimacy and it reached for new idealistic heights. These sentiments recognized the design process movement’s desire for both recognition and change echoing the period zeitgeists anti-establishment fervor within academic and social
environments. Designers at this time believed a scientific process could not only reinvent the methods of their field, but it could also boost their creativity and move them away from traditional artful and intuitive practices. To accomplish these goals, members of the movement applied their forerunners’ approach to design to innovate their praxis.

According to Cross (1993), the pedagogy behind the scientific method of design was conceived to make the work more practicable by providing stages with distinct functions. By staging and externalizing activity, technical communication educators who used the method were afforded means to examine a technical document at every step in its composition and determine if it was achieving its purpose. This externalizing of the design process was an essential component of scientific and technical communication pedagogy of the era wholly supported by the movement. In total, the methodological concept of “scientific design” offered a way to “improve our understanding of design through 'scientific' (i.e., systematic, reliable) methods of investigation” (p. 21). Therefore, from this method’s systemization, a technical writer learned a process for design, what may be achieved from each part of that process, and what successful document components to assimilate into their labors.

Moving into the 1980’s, communication design sought to maintain a systems approach to the process, but also include greater attention to text as visual and rhetorical effectiveness for audiences gravitating toward computer-generated visuals. This motion to broaden “scientific design” (Cross, 1993, p. 21) toward a social-scientific process took shape while the first round of personal computing technology influenced American culture. Because of the start of the personal computer era, popular demand for connections and communication with computers boomed. Academics and professionals quickly assimilated computing technologies into their work for communication purposes including word-processing, imaging, and data visualization to keep
pace with the cyber smitten zeitgeist spurred forward by global fervor to be at the cutting edge of computational machinery. Technical communications scholars Bernhardt (1983) and Barton & Barton (1985) responded to these cultural shifts by addressing how our culture was beginning to see text and the growing need for understanding the “rhetoric of visuals” (p. 126) in the context of both print and computers.

Derived from the works of these scholars, communication design pedagogy during this zeitgeist homed-in on the “spatial appearance” (Bernhardt, 1983, p. 66) of technical communication on the page and screen and its relationship to audience. The way’s text-as-visual and representative imagery were made rhetorically accessible to the American audience writ large pushed them to assume a teaching focus dedicated to “studying and writing texts...[through] their structures” in order to provide a practice for learning the “visual organization” (p. 66) and rhetorical importance for communication design. By attending new rhetorical situations of the page and screen, design pedagogy of this era encouraged recognition of the mediums influence on “texts...shape and structure” (p. 67). To address these situations a process for observing, analyzing, and creating “rhetorical control” (p. 77) tied to the legacy of previous design scholarship was developed to address audience expectations. According to Bernhardt, studying and teaching “naturally occurring [visual] discourse forms” for communication design helps students be successful designers for these contexts. So, to visually organize this era’s technical communications, the practice of using the visual: “gestalt, development, portioning, emphasis, subordinate and coordinate relations, linking/transitional/inter sentential relations, [and] sentence patterns” (p. 76), in terms of creating rhetorical control provided a method for teaching communication design addressing cultural exigency for both a systems-based process and addressing socio-cultural needs. But this practice
had its issues; namely the problem was evaluating the “interaction between text and reader” (p. 75) to build into the design. However, in the 1990’s, this issue in communication design pedagogy began to be assuaged by dissipating barriers between technical communicators and their audience.

As the scientific method of design and increasing attention to public social trends grew for responding to audiences via rhetorical appeals, an analytic, observational approach to teaching visual communication design is offered up that points toward iterations of sociocognitive-based pedagogy for technical communication. Going into the 1990’s, ideology underpinning the field again underwent a pronounced change as the post-industrial era began. In fact, Kostelnick’s (1989) article on the processes of design and composition as “natural counterparts” (p. 267) brought design work and multiliteracy still further into the fields of communication and began to orient them toward readers just as computer-mediated communication took hold in many of our classes. With widening dissemination of the personal computer, and its effect on design and document production, the field was set to change drastically, while social constructionist, audience-centered scholarship and instruction became centralized in communication.

The zeitgeist of the 1990’s in technical communication design is best observed in the scholarship, research, and pedagogy of Karen Schriver. Schriver’s (1997) textbook *Dynamics in Document Design* is an apt lens upon the teaching of visual communication and multimodal design. In the book, she provides scholarship centered upon peoples’ experience with “documents [and] technology” in terms of design quality and response (p. 1). From her work and this era, a participatory focus for communication design develops as a popular component of the methods for design. Schriver provides numerous user-based research studies that impart the
importance of discovering “reader’s needs,” recognizing their “goal’s and values,” (p. 11) and articulating feedback into usable designs. The focus of Schriver’s work on the visual design of technical documentation from the reader’s point of view—the recognition of audience as the primary motivating force for effective communication—defines the zeitgeist of the 90’s and resulted in her pedagogical model for visual communication.

“PAM” or “Protocol-aided Audience Modeling” (Schriver, 1997, p. 475) is a teaching method developed to help students discover reader issues with a document’s design and aid intuiting user-based revisions. With the development of computer-aided communication between designers and consumers in the 1990’s, the importance of utilizing user response for design and redesign steadily increased. To meet demand, “PAM” teaches communication designers to interact with perceived audience problems during document design activity. The primary goal of this instruction is to teach designers to anticipate user problems and resolve them before they occur. To that end, Schriver states that through “PAM” she sought “to improve document designers’ sensitivity to reader’s needs” (p. 475), and her method did so without direct, face-to-face interaction between readers and designers. For example, Schriver’s methodology would be well suited for developing a technical user manual FAQ section, where the communication designer is attempting to provide solutions for problems readers are likely to experience.

Ultimately, the “PAM” method of instruction was a precursory bridge to Brumberger’s (2007) teaching visual literacy of design and visual thinking processes. Two evolving traits that connect Schriver’s (1997) ideas to Brumberger’s practices are the shift in focus from intuiting reader’s needs to open communication of users’ needs, and the development of visual communication practices from a general process of revision to a flexible, demystified problem-solving, design-centric scenario. Thus, endeavoring to teach visual thinking processes to aid
visually centered, audience-based design in the digital era of technical communication, Brumberger’s work exemplifies the practices during the first decade of the new millennium.

In the 2000’s, the zeitgeist in communications culture took on a new dimension. The ideological shift was cemented by significant changes in internet technology and more widespread focus on visual multiliteracy. Brumberger’s (2007) approach aligns with the development of the web 2.0 environment. Internet communication became prominently visual, passive readers became users of information media, and instantaneous, simultaneous communication across multimodal multimedia platforms emerged. Also, alongside communication barriers being reduced, pedagogical exchange between visual disciplines (such as art, graphic design, and engineering) and technical communication were markedly more accepted by institutions because of the increasing multimodality of communication environments. As the result of these changes, the visual became—more than ever before—a culturally significant subject of communication study that could not be easily sidelined by traditionalists.

Additionally, in terms of impact on visual communication pedagogy, whereas Schriver’s “PAM” (1997) sought to educate designers to catch reader problems before they occurred, real-time communication and the desire for instant gratification during the digital zeitgeist worked to eliminate communication latency between designers and users. This caused practices like Brumberger’s (2007) to adapt by incorporating visual design and multimodal training with rapid-critical-feedback exchanges befitting the web-connected classroom and emerging networked audiences. Therefore, in Brumberger’s pedagogy, the new zeitgeist in technical communication played a significant role in how she considered visual communication and design alongside evolving relationships of the designer and audience.
Brumberger’s (2007) pedagogical approach to teaching “visual thinking” processes, unlike Schriver’s (1997), is not focused on learning to intuit readers’ problems in familiar, systemic ways. Rather, her instruction begins by focusing on “demystifying design” (Brumberger, 2007, p. 391). Brumberger defines visual thinking for students—based on McKim’s earlier concept—as “an active and analytical process of perceiving, interpreting, and producing visual messages, an interaction between seeing, imagining, and drawing that is as purposeful, recursive, and sophisticated as verbal thinking” (p. 381). She teaches audience analysis alongside the problem-solving activities many designers use (e.g., drawing, sketching, drafting) during the design creation process (p. 391-2) to enact her demystification. It is compelling to note here, how far reaching these designer activities have become in communications courses. At Iowa State University for example, where multimodal, W.O.V.E. composition practices are used, developing technical writers compose visual communications using these same techniques. As such, they are enhancing their sense of visual design alongside the other communication modes. Hence, Brumberger employs designer-centric activities to teach students how to discover solutions via visualization of communication best suited to addressing design issues for the user’s sake, which is being taken-up by the field.

Last, Brumberger (2007) endeavors in “developing flexibility [of] thought” by “teaching students to look and see in new ways” (p. 394) with real-time feedback from users and by learning the design “tools of the trade” (p. 397). For Brumberger, this means training to work with the audience and preparing the mind and the hand before employing computer-aided technologies for composition. Therefore, Brumberger’s visual literacy and communication design pedagogy moves beyond her predecessor in terms of clarifying design activities and teaching cognitive flexibility for problem solving techniques of the profession. However, the
goal of her visual thinking research was not to articulate design thinking processes as a new pedagogical approach. So, moving from her cognitive insights, communication as design and design thinking practices may bring more aspects of the current communication zeitgeist into play for teaching.

**User-Centric Design Thinking Practices and Today’s Zeitgeist**

In the current era, we have seen technological progress accelerate at its fastest rate ever. Communications technologies seem to come and go with the seasons, each trying to engage all our senses. In the computer-aided design landscape, dynamic changes to communication artifacts occur in a flurry of real-time updates. But, the ideology and methods behind the creation of these artifacts are slower to adapt. Despite this slothfulness, the ceaseless flood of progress is geared toward user-audiences who are ready, waiting, and willing to participate in the development of the communications they want and need. “Innovate! And, design for the user first!” have become the calls to action to address the flood and design thinking processes may answer these calls.

Behind user-prompted interactive tutorials and multimodal hyperlinked training documentation, design processes may aim to bring the technical communicator together with the user and their needs. According to the Design Council (2011), a UK non-for-profit group dedicated to civic improvement through design, design thinking “generate(s) new ideas,” and encourages planning around “user needs.” Further, they nurture the practice as a way to change the social dimension of design by capitalizing on “creative… opportunities” by collaborating with end-users to solve problems in their daily life. To point a fact, technical communication studies in user experience design (UXD), user interface (UI), and user-based planning (UBP) initiatives are developing into centralized forces for change how we approach the activity of
communicating complex materials. Courses on these user-focused topics are even being offered through the Society for Technical Communication (n.d.). This growing innovative force is inextricably linked to the zeitgeist of the online era where individuals’ attentions are focused on the next thing to come out of the design pipeline, how to make it work for them, and how it may improve their experiences of the world.

Aiming to make the keenest iteration of design thinking—and drawing the attention of many user-centric communication studies—the work of IDEO’s David Kelley stands to the fore. His design thinking process defined "a human-centered approach to problem solving" (Gobble, 2014, p. 59) that uses a duplicable process to achieve innovation for our “highly visual digital world” (IVLA, n.d.). It befits our computer-mediated design environments where we are working to meet the needs of today’s “distributed network audiences” (Gallagher, 2019, p. 1) and the artifact’s end-users. Information Technologies specialist Peter Denning (2013) states, “Design [thinking] is a process where we create and shape artifacts that solve problems [for users]” (p. 29). This zeitgeist driven goal is at the center of design as a process. Users have problems and design work may help accelerate savvy, appropriate solutions utilizing the affordances of modern communication technology.

In technical communication, the current dominant ideology sees the creation of communication artifacts as a similar activity to software and product designers as they are developing solutions for their own end-users. Denning (2013) correlates the process of design thinking with developers work stating, "design means crafting software that…does the jobs users want done," (p. 29), a mantra known to technical writers familiar with Patrick Moore’s (1996) view of our work as “instrumental discourse” (p.100). Thus, communication design and design thinking processes in technical communication may borrow from earlier pedagogical emphases
on problem solving (Simon, 1969), user-feedback (Schriver, 1997), and engaging visual literacy (Brumberger, 2007) and multimodal communication for “getting things done” (Moore, 1996, p. 115). To this collection of attributes, design thinking adds a new system of cyclical practices (not unlike writing) aiming directly at discovering innovative ends befitting current communication attitudes.

One usable, relevant design thinking model for communication is IDEO’s five-step practice. In the contexts of technical communication, the model may help make sense of a problem, define and structure response to the artifact in need of attention, aid brainstorming and creation of solutions, support drafting multiple artifact versions for feedback, and culminate in the selection of the best option via review and testing with real end-users. These design-based activities and their non-linear nature are depicted in the following figure. (See Figure 3.)

Figure 1.3. Visualizing design thinking in the terms of technical communication.
This five-phase procedure for innovative design—developing an organic fit with our own discipline through the seeds sown by the Design Methods Movement, Bernhardt, (1983) Schriver (1997), Brumberger (2007), and others—may culminate in an acceptable communication design practice. The IDEO practice my above iteration is patterned upon—mirroring writing activity in its cyclic, recursive nature—already has a foothold in business communication through the use, research, and published studies of a devoted cohort of business scholars.

Business scholars Glen, Suciu, Baughn, and Anson (2015), are avid users of design thinking in their business communication courses. Each use the process to prepare students for workplace-based projects. This preparation happens by equipping learners with multiliteracies and design process skills required to innovate communication designs dependent on the needs of clients and networked end-user audiences. While using the model, students form collaborative design teams to draft problem statements, communicate with design-users, brainstorm solutions to problems, visualize solutions and respond to them, and conduct multimodal prototype analysis, before concluding with presentations of optimum solutions and reasons for implementation. From Glen et al.’s use of IDEO’s five-phase process and attention to teaching multiliteracy and socially informed design skills, technical communication may be well-served by assimilating design thinking for communication design work and user-led innovation.

By adopting practices like Glen et al.’s (2015) into our pedagogical repertoire, technical communication may benefit by designing documents with networked end-users and working together toward shared goals. A Design based pedagogy and design thinking practice adds real-time observation for establishing problems (going past Schriver’s model), and it extends beyond demystifying visual communication and using designer tools (seen in Brumberger) to include
prototyping and real-user network analysis and observations to meet the needs of the ideal triumvirate, “the client, the market, and the technology” (Gobble, 2014, p. 59). Thus, as a pedagogical concept for use, communication design and design thinking offer means for technical writing instruction befitting the sociocognition, intersubjectivity, and multimodality of our field. It not only has links to ideology and methodology already represented in professional communication, but given the attributes of the current zeitgeist, it seems a culturally relevant addition to practice.

**Design Thinking Practices in the Future of Technical Communication**

By incorporating a design approach and design thinking pedagogy in technical communication, scholars may directly address some of the attitudes and ideals of the current era. The pressing importance of multiliteracies and multimodality for communication innovation in our zeitgeist makes design pedagogy a potentially valuable addition. With a focus on distributed network audiences and end-user needs to direct technical document design, cognizant design processes attending these needs may offer a lot to teaching successful communication practice. Additionally, increased critical attention to today’s multimodal, computer-mediated designs strengthens the importance of teaching multiple literacies in the profession and supports the growing value of various communication modes and platforms “as our world changes around us” (IVLA, n.d.).

Furthermore, in terms of design’s suitability, recent research on the processes’ effectiveness shows promise for its prefatory attributes for students entering the workforce. According to Razzouk and Shute’s (2012) article in the *Review of Educational Research*, “Design thinking, systems thinking, and teamwork skills” (p. 2) are foundational topics for successfully introducing today’s students to the demands of tomorrow’s workplace. This
realization warrants the inclusion of these items in technical communication and design instruction. And given how a design approach in thinking and practice compliments the current zeitgeist, it rings true that it is an addition to technical communication pedagogy we must consider carefully; hence, my treatment of it herein.

Still more, it is important to note that of the three items on Razzouk and Shute’s (2012) list, design thinking is the only one which often involves the other two, systemic cognition and collaborative skills. As a part of client-based projects in technical communication, students learn to navigate the interdependent structures of a dynamic system comprised of “the client, the market, the technology” (Gobble, 2014, p. 59) and project limitations, while collaboratively designing a solution to a communication problem. Regarding teamwork, the design process compliments problem-through-solution learning in educational environments with the development of a team working together leveraging their multiliteracies toward discovering the best solutions to assigned problems. This team dynamic replicates Killingsworth and Jones’ (1989) integrated team concept which optimizes workflow and mimics the design practice workplace environment envisioned by IDEO that has already been taken up by Glen et al. (2015). Therefore, a design pedagogy approach may offer technical communication a tool for teaching practices that nurture problem solving and teamwork for creating communication solutions for digital user audiences (more on this to come).

**Positive Implications of Using Design Thinking Seen from Business**

Adding to the established potential, Glen et al.’s (2015) findings from design thinking research in business communication offer some positive implications for its pedagogical inclusion. According to these scholars, students who learned to use the design thinking process developed skills in four areas important to core competencies in technical communication.
1) Students acquired skills that “dealt with…coping with ambiguity, intense engagement in generating ideas, and the repetitive process of [analyzing] diverging and converging [concepts],”

2) Students learned the “ability to work with multidimensional contexts and solutions” in “active…real world situations,”

3) Students “focused on learning and using specific tools and methods [for communication],” and

4) Students developed “interpersonal skills” (Glen et al., 2015, p. 190),

Therefore, design pedagogy may complement many technical communication goals, while also priming students for a practice they may encounter in the workplace.

Thus, as a form of instruction, teaching and learning about communication as design and design thinking practices may equip students with skills for solving complex communication problems when designing documents for real end-users and networked audiences after graduation. The process itself—when compared to its predecessors—may produce positive results with users through its inclusive strategy. Also, the use of design in established technical communication curriculum may meet many of the learning objectives historically present. Thus, design seems to offer a pedagogical tool for teaching real-world practice that prepares students for addressing complex problems. Also, it provides innovative, workable solutions to communication issues. And, it may be recognized as an on-going, legitimate part of technical communication pedagogy that could help produce multimodal documents for complex, future communication scenarios. But even though there are many positives associated with design and design thinking for use in technical communication, we need to temper excitement by
recognizing the potential for drawbacks that have been identified by some of the most preeminent design thinking proponents.

**Potential Drawbacks of Design Thinking**

Two influential design theorists and design thinking advocates have spoken out not only in support of the practice, but of its potential pitfalls. Author and professor of Innovation and Design at Parsons New School of Design, Bruce Nussbaum (2011) has long advocated for the use of design thinking. But recently he criticized it for obstructing true creativity by creating a regimen for design work that may too easily become “a linear, gated, by-the-book methodology” capable of turning out only “incremental change and innovation.” He offers that if we cannot embrace the messiness that it really takes to be creative with our solutions to users’ problems, then use of the design thinking practice is doomed to fail or will suffer from a “very low” success rate.

Just as scathing, Donald Norman (2010), Director of the Design Lab at University of California, San Diego, tempered his advocacy for design thinking by attacking the fabric of the conceptual process. He claimed that design thinking is a “useful myth” for increasing the cultural capital of designers by revealing some of the processes of design work. Highlighting that there is no magic behind the “mystical, creative thought process” of designers, Norman places the value of design thinking only in its “power to convince people that designers do more than make things look pretty.” Interestingly, this comment echoes the historical struggle of communication and composition educators to be recognized for the work they do “teaching Johnny to write,” as it has been commonly expressed. Norman’s criticism raises the concern that the process itself is nothing more than a gimmick that may lack any real substance. Further, I may add to these criticisms my own concern over the complexity of the design thinking process, and the pitfall of
reorienting students’ preconceptions about writing by introducing communication as designed. But these concerns of Nussbaum, Norman, and myself will be given a full hearing in light of the results from my research in Chapters 5 and 6. For now, we will have to take both the potential positives and negatives for what they are as I continue to refine design and design thinking for technical communication.

**Conclusion and Forecasting the Project**

Redressing the problem that brought design into technical communication—the dominant status of text and the need for multimodality birthed by CMCs—I see communication design pedagogy research and practices as a way we may help balance modal value and teach to current cultural needs and expectations. Also, a communication design philosophy and design thinking methods, evolving from half a century’s zeitgeists seen heretofore, seem to warrant a space in technical communication pedagogy because they respond to the exigencies of today’s technology and age. This chapter only begins to scratch the surface of communication as design and what my design pedagogy looks like for PTC and modern digital audiences. Developing a rich understanding of the multiple literacies involved, a clearer definition of design pedagogy, and discerning the theoretical tenets of communication design requires much more exploration. To that end, the following summaries offer an introduction to my dissertation scholarship hereafter.

**Chapter Summaries**

The following summaries offer an overview of the content and project events that follow in the body of this scholarship, as well as a preview of the research and findings.

**Chapter 2: Theory**

Having validated attention to design in PTC in Chapter 1, I articulate an approach to today’s communication as designed by focusing on the multimodal CMCs in computer-mediated
programs, like the Advanced communication program at ISU where my research took place. I offer a framework of integrated literacies that inform the development of rhetorical communication design theory for digital communications. These literacies—the abilities to understand, practice, and critique multiple modalities, rhetorical attributes, social influences, ethics, and technology—are shown to inform today’s effective digital communications (Cook, 2002), what Hocks (2003) refers to as the practices of “digital rhetoric” (p. 629). Thus, Chapter 2 culminates in a set of principles based on a new network of multiliteracies (previewed in figure 1.1) that I have used to define and outline a rhetorical design approach to CMCs in PTC, and which forms the basis for my design pedagogy in Chapter 3.

Chapter 3: Pedagogy

Based on the nature of CMCs, digital culture, and multiliteracies informing rhetorical design literacy, I articulate an approach for teaching communication as design and a design thinking practice for PTC in Chapter 3. In this chapter, I show the development of my design pedagogy taking shape in response to advancing multiliteracy expectations and calls for “composition in a new key” (Yancey, 2004 p. 321). According to Purdy (2014), as PTC’s contemporary multimodal artifacts—podcasts, videos, websites, and interactive tutorials—"are designed, not written” (p. 613), a design pedagogy is required for effective communication instruction. From this position, I show why and how my design pedagogy addresses communication using three tenants drawn from existing scholarship—that communications (as designs) are sensorial and perceptual and foster responsivity. Further, I explain why and exemplify how my design pedagogy uses these tenets to teach the core literacies and importance of multimodality, how it recognizes fragmented sociocultural influences, and how it encourages the mindfulness of the creator for themselves, their artifact, and their audience(s). Thus, my pedagogy for PTC in the digital era not only befits the “design turn” in our field, it also addresses
the needs and expectations of networked, user-based communications in the digital era. Hence, in Chapter 3 I define and propose a design pedagogy approach for teaching PTC courses and provide the design thinking practice (previewed in Chapter 1) which students may use to structure their communication work.

**Chapter 4: Methods**

Using the pedagogy I developed in Chapter 3, I articulate my design pedagogy research which occurred in Iowa State University’s English: 314, Technical Communication class. Specifically, I introduce the design pedagogy research methods used during a multimodal technical instructions unit. In this unit students designed instructions using computers to integrate multiple modes of communication (see Appendix A for assignment). Then, I provide the following foundational research questions which have guided my project.

1. How does design fit into technical communication?
2. What is design pedagogy’s value in technical communication?
3. What was easy and/or difficult about using design pedagogy?
4. What benefits and constraints characterize design pedagogy?

Then, I provide a description of the research site, the methodological framework, and phenomenological and qualitative methods used, as well as my workflow. Next, for both participant groups, I offer the participant specific research questions, hybridized grounded theory and thematic analysis methods, the sampling and data collection, the theoretically informed procedures for data analysis, and the details of data management and integrity assurance that I used during the project. To close, this chapter summarizes all the information on the empirical study.
Chapter 5: Results

In the fifth chapter, I provide the results of my empirical research. I begin this chapter by reporting how instructors experienced design pedagogy before and after teaching technical communication. Then I show how students faired learning via the pedagogy. Once all results were reported, I cover the discussions and major outcomes that grounded, thematic analyses produced from the accounts of using design pedagogy. I supply these discussions by answering each group’s participant specific research questions. From these answers, I derived four key outcomes which respond to the foundational questions and indicate the user experiences of faculty and students. In brief, the overall findings across both groups are:

1. Design fits well into technical communication.
2. Design pedagogy’s problem-solution focus, attention to users, and design processes are valuable in technical communication.
3. Design pedagogy made teaching and learning multimodal CMC creation easier, but changing terms and processes was sometimes difficult. And,
4. Design pedagogy benefited the transfer between classroom and workplace but working with real users was constrained by the classroom.

These findings were derived explicitly from the experiences of faculty and students who used the pedagogy and are supported with examples and evidentiary support. Hence, the discussion of research findings provided by this chapter illustrates the user experience of design pedagogy for teaching and learning in technical communication courses. And, from the dominant themes illustrating participants’ recommendations, I compiled means for the improvement of design pedagogy and pedagogical research going forward.
Chapter 6: Recommendations & Closing

In the closing chapter, I provide recommendations for design pedagogy and pedagogical research based on my user experience-based (or UX-based), empirical findings. From the perspectives of teachers, students, and myself as investigator (and a fellow technical communication stakeholder), I yield the insights I gained into how we may best teach modern CMCs as designed artifacts for a PTC course like technical communication. Also, I show what design approaches and practices we may recommend for communication assignments in computer-integrated programs. Together, my discernments enable the recognition of the outcomes of using a design pedagogy for PTC. And, I conclude the final chapter by identifying the strengths and weaknesses of a design-based theory of communication, judging its practices, and offering guidance for activities and assignments that may be best served by the pedagogy. Additionally, I felt I would be remiss if I did not close the chapter with a discussion of opportunities for continued research into design pedagogy in PTC, especially in technical communication, and the potential for my methods to be used for UX pedagogical research beyond this project.

So, the chapters outlined above comprise the contents of my design pedagogy dissertation. Let us now turn to Chapter 2 and begin the journey of bringing my theory of design pedagogy fully to light.
CHAPTER 2. THEORY

With the growth of the digital, our culture has come to expect communication today as technologically mediated. According to Selber (2004), computers are commonplace in everyday life and higher education. Recognizing computer-mediated communication (CMC) ubiquity—though no longer news in professional and technical communication (PTC)—it remains relevant to educators in our fields. According to Selfe (1999), this relevance sprang to the forefront of our concern when the US government announced president Clinton’s Technology Literacy Challenge in 1995. This initiative connected technology with education through its call to develop computer literacies for the 21st century. Further, it placed learning technology within the purview of the communication educator’s realm by emphasizing it as developing literacy. Thus, the disciplines of composition and communication (especially technical communication) acquired the command of both “literacy and technology” (Selfe, 1999, p. 3) to provide a new framework for digital communication.

As technology became the *modus operandi* in these fields, various literacies for successful practice developed for instruction. In 1997 Wahlstrom identified the need to integrate literacies “through a complex of classroom goals and activities” (Cook, 2002, p. 6). This new network of course attributes were intended for teaching digital communications in technical writing. For example, increasing use of the visual essay and PowerPoint presentations in course of the 1990’s pushed student learning to address writing, visualization, and document design to meet computer-motivated, multimodal rhetorical goals. Therefore, the thrust for CMC literacy needs came to include the ability to understand, practice, and critique multiple modalities, rhetorical attributes, social influences, ethics, and technology to meet the cultural expectations of
technical communication in the information era. Together, these literacies still inform today’s effective, digital communications and lay the foundation of my communication design literacy.

The core literacies developing during the 90’s and 2000’s arose at a time when a renewed design turn in communication instruction began (Buchanan, 2002). This turn toward design recognized that CMC artifacts “are designed, not written” (Purdy, 2014, p. 613). According to Purdy, web 2.0 communication artifacts such as interactive-videos and hypermedia necessitate literacies for computer-aided communication which traditional written literacy simply cannot fulfill. Thus, increasing interest in computer literacy, multiliteracies influenced by technology, and how these changes aligned with design elicits my attention for teaching digital communication in PTC courses.

Based on multiliteracy needs for CMCs and seeing them as designed artifacts, this chapter offers a framework of integrated literacies that inform the development of a rhetorically influenced, communication design literacy for modern communication programs. Further, I describe a course concept which implements rhetorically informed design literacy from my framework. In what follows, I suggest an approach to layering literacies for teaching CMCs as designed artifacts. Then, I explore past multimodal, rhetorical, sociocultural, ethical, and technological literacies to extrapolate them out into my own framework for a rhetorical communication design literacy. Afterward, I posit a set of principles for rhetorical design literacy which may benefit instruction in today’s computer-integrated programs. I follow this set of principles with an exemplar showcasing this literacy framework in the classroom. Then I close the chapter by reflecting on the challenges and contributions of my framework for teaching in PTC and by reflecting on how the framework for rhetorical communication design literacy prepares us for my theory of design pedagogy in Chapter 3.
New Literacy Layering

Beginning with communication design scholarship from Cope and Kalantzis (2000), complicated changes occurring within global culture resulted in a strong, multidimensional response to communication literacy needs. According to Lynch and Wysocki (2003), the ways we teach literacy need to change to address new global economic and sociocultural situations that are created by technology. Technology, in the early days of the design turn, was seen as necessitating instruction in functional computer literacy—teaching standard practices for using technology to communicate. However, Selber’s (2004) exploration of technology’s multiliteracies—the functional, rhetorical, and critical—indicates there is much more to teaching CMC’s that we need to consider when we are designing technologically-mediated rhetorical communications.

Working from Wahlstrom’s (1997) vision of a complex integration of literacies, Cook (2002) responded with a concept of “layered literacies” (p. 6). Her framework incorporates “six layered literacies: basic, rhetoric, social, technological, ethical, and critical” (p. 5). Together, the six literacies make up a significant part of instruction needed to teach many digital communication skills. They address the CMC’s rhetorical act as a complex interaction of multimodal skills reliant on the user’s ability to navigate composition modes with critical, situational awareness. But, like Selber (2004), Cook mentions the design aspect of communicative work, yet her goal occludes any development of design’s role in communication. Therefore, working from their older multiliteracy frameworks, I extrapolate a new literacy framework for rhetorical communication design to undergird communication design pedagogy.

Beyond Selber (2004) and Cook’s (2002) multiliteracies, my framework recognizes CMC literacy needs and conjoins them with communication seen as rhetorical design—communication as appealing to all our senses, responding to cultural perceptions, and eliciting appropriate
audience responses. Communication as rhetorical design recognizes that design—like rhetoric—intends a particular purpose and outcome. Communication design seeks to move the audience just as an argument does. Thus, as a part of design literacy, rhetoric is essential as it requires us to consider the topic of that design in relation to its audience, context, purpose, and message. In other words, those of Chaim Perelman (1969), rhetorical design necessitates and provides “presence” to figural aspects of value for CMCs in PTC. That is, rhetoric guides and influences design to achieve its end goal for the audience; thus, controlling its power and meaning.

Rhetorical communication design, then, puts that act of communicating effectually in the context of designing CMCs to have a particular effect or impact (Haller, 2000). So, from this perspective and the following literacy descriptions, their attributes and learning objectives, and what each contributes to communication as an act of rhetorical design, I create and inform the principles for rhetorical design literacy. These I intend to show may benefit teaching digital communication programs and courses. However, the following literacy explorations are partial and do not cover each concept fully. To do so is beyond the scope of this dissertation.

**Multimodal Literacy**

Beginning with multimodal literacy, understanding and use of integrated communication modes has developed considerably for a new 21st century CMC framework. This literacy is grounded upon “learning to communicate well and clearly” (Cook, 2002, p. 8) using all available methods. However, diverging from past focus upon prescriptive rules for reading and writing, today’s multimodal literacy involves the ability to comprehend, use, and assess communications comprised of written, oral, visual, and electronic modes responding in unique ways to situated user expectations. This divergence from formality is regularly seen in online business marketing messages that use abbreviated forms of commonplace words and phrases, use emoticons, or digital colloquialisms for specific audiences and contexts. Thus, new multimodal literacy
acknowledges that CMCs are for dynamic, virtual situations where they may often bend the rules to achieve particular rhetorical ends.

Further, working with Purdy’s (2014) recognition of these CMC artifacts as “designed” (p. 613), multimodal literacy relies on one’s ability to design “in any combination of any number of…media” (Marback, 2009, p. 406) while understanding Kress’ (2000) concept of “synaesthesia”—that there exists “transduction of meaning from one semiotic mode to another” (p. 159). Therefore, a multimodal literacy acknowledging CMCs as designed artifacts affords my communication design literacy recognition of 1) CMCs as rhetorical (that is, as interwoven modes of communication designed to communicate persuasively) and 2) that they are designed to function meaningfully between and across modes. This functioning between and across modes is something I have come to call intermodal rhetoric—the way changing one mode effects the meaning and rhetorical power of another mode in the same communication. Thus, like Selber (2004), my literacy theory and view of multimodal literacy goes beyond a functional literacy to enable literate individuals to design rhetorically meaningful, multimodal CMCs in situ which are responsive to the situation, the audience, and the design and/or designer.

Rhetorical Literacy

Turning to rhetorical literacy for my framework, I find it is difficult to create a 21st century communication (or a program for teaching it) that is completely devoid of rhetoric. Despite the fact that some programs do not base their curriculum on understanding rhetoric and its history, the art of persuasion and inclusion of persuasive writing is ubiquitous in American professional and technical communication. Therefore, rhetoric is present. Since Aristotle’s Rhetoric, literacy has involved the ability to develop affective appeals for particular audiences in order to influence their beliefs and behaviors. Even though today’s CMCs have changed the means, methods, and venues of communications, Aristotle’s teachings remain central to
communication design theory and instruction. Yet, the influences of audience and environment have become more pronounced in modern rhetorical literacy.

Bitzer’s (2016) work on rhetorical situation indicates that rhetorical literacy needs pointed attention to situational power. He states, “it is the situation which calls the discourse into existence” (p. 159). Thus, the rhetorical literati are drawn into communicating by the situation necessitating response, just like designs create and embody responsivity. Further, on audience and situational influence, Cook (2002) posits, rhetorical literacy is defined as one’s ability to be able to understand, analyze, assess, and deploy various communication strategies relying on their knowledge of the communication situation, audience, purpose, genre, style, and delivery of information. Therefore, concerning CMC and my design literacy framework, rhetorical literacy adds responsivity and digital techniques and components of the situation influencing effective communication. However, Selber (2004) reminds us via Boyarski and Buchanan (1994), that communication design problems “must always be contextualized in social terms” (p. 145).

**Sociocultural Literacy**

For effective CMC instruction from my framework, sociocultural literacy is key. Sociocultural literacy is actionable knowledge of people as they interact socially, ideologically, economically, and politically. This definition shows the reach and importance of sociocultural literacy for CMC design. Sociocultural literacy addresses all the “‘habits, desires, preferences, and values of the different types of human beings who use computers’ [across human activity systems]” (Boyarski and Buchanan qtd. in Selber, 2004, p. 145). Therefore, in computer-integrated PTC programs, this literacy instruction aims at providing the CMC designer with awareness of social concerns and audience attributes and perceptions with which to inform their rhetorical communication designs. To enact this learning, Berlin (1996) claims we need to teach critical literacy for digital spaces.
Analyzing Faigley’s electronic courses, Berlin (1996) discovered a significant number of problems and difficulties around communicating predominantly through electronic modes. This discovery prompted teaching “the abilities and dispositions to make critical sense of this age of image and spectacle…to understand…daily experience in a postmodern culture” (p. 53). To this end, objectives of sociocultural literacy may be to acquire and use new means for democracy and for collaboration, open-mindedness, and participation in online activity systems by designing communication as “textual actions” (Purdy, 2014, p. 633) that “solve” messy, historically contingent social issues. For example, the campaign to narrow the field of 2020 presidential candidates is complex and historically difficult. So, responding to digital culture, it now involves mass audience understanding and participating in the textual action of submitting their names and zip codes to support a chosen candidate. Then via aggregated user data analysis (of their textual actions), the field will be narrowed for further debates. Thus, sociocultural literacy in my design literacy framework recognizes complex human systems influencing CMC design and contributes critical, humanistic literacy befitting our era to my communication design literacy approach.

**Ethical Literacy**

Given the need for human-centered literacies, ethical literacy is necessary for my framework. Cook (2002) states, “ethical considerations touch many areas in our curricula” (p. 15); this is especially true if a program emphasizes CMCs. CMCs are far-reaching in nature and have the potential for mass-effect via wide dispersal and consumption. In fact, one must look no further than the memes and threads addressing President Trump’s 2015 mocking of a New York Times reporter to see how wide CMCs spread and the ethical impacts they have on sensitive cultural topics like communicating about disability. As such, ethical literacy—understanding and abiding sociocultural perspectives on moral, decorous, and appropriate communication
behavior—should be taught to students. Per Cook, ethical considerations should “influence how we act and make decisions about our documents’ purposes, audiences, contents (both textual and visual), development, and delivery methods” (p. 15). Further, Wahlstrom (1997) adds that ethical principles—legality, honesty, confidentiality, quality, fairness, and professionalism—should inform the goals of our curriculum and be taught to students to make them aware of the ethical implications of their activities. Thus, ethical literacy instruction for CMC design addresses responsible communication practices and attends to situational etiquette requirements. Therefore, ethical literacy in my framework attends to the potential wickedness (i.e. the difficulty or messy social complexity) of CMCs and contributes to designer’s awareness of and responsibility to digital communication suitability.

**Technological Literacy**

The last literacy in my extrapolated design literacy framework is technological literacy. Technological literacy has three major parts relevant to a framework for rhetorically designing CMCs. These parts inform our abilities to understand, use, and critique computers when used for communication purposes. Selber (2004) identifies these three parts as literacies necessary for our computer-integrated programs, and as such, they are important for how computers may be considered within design pedagogy for CMCs in PTC.

The first of the three literacies is functional computer literacy. This literacy combines the ability to use computers with understanding the social conventions of computer use and the language of computers required for discussing and using them. Further, Selber (2004) emphasizes the user’s ability to manage their own digital identity and their means to troubleshoot and overcome technical problems as part of functional computer literacy too. Second is critical computer literacy. Similar to Berlin’s (1996) sociocultural literacy, Selber sees critical computer literacy as being able to question and analyze the dominant perceptions of computers and
computer culture in terms of how they affect enculturation of the user. Additionally, he posits that critical literacy involves understanding the influences of computer use situations and the power of institutions on the use of computers, while promoting our questioning how computers are represented by those institutions and in popular culture. Third is rhetorical computer literacy. Again, per Selber, the use of hyperlinked, mediated, and multimodal CMCs challenge educators to redefine what a text or an author can be because communication via computers requires writers to “function as designers of a spatialized literacy environment” (p. 136). Thus, rhetorical computer literacy requires the ability to recognize the “persuasive dimensions of human-computer” (p. 140) interaction and how digital interfaces and spaces are designed to constrain or direct the user. Collectively, the three multiliteracies of technology enable students to command “a complex set of socially and culturally situated values, practices, and skills involved in operating linguistically within the context of electronic environments” (Selke, 1999, p. 11). So, as part of my design literacy framework, technological literacy contributes a sense of and approach toward the means and methods for making CMCs that define and control essential parts of today’s digital culture and influences directly what it takes to be seen as literate in the modern era of computer-mediated daily and professional life.

Principles of Rhetorical Design Literacy

From the contributions of each literacy, the framework for my rhetorical communication design literacy is formed. Further, seven principles emerge as central ideas within my framework that may inform rhetorical CMC design instruction and lead to design literacy as the foundation for my communication design pedagogy. (*Note: the citation occurring after each principle is the scholarly motivation and/or origin for that principle. It does not indicate preexistence.) These seven principles are:
1. All purposeful communication design is rhetorical communication design that responds to audience, purpose, message, situation, systems of activity, environment, and other traits surrounding the communicative act. (Cook, 2002)

2. Rhetorical communication designs are multimodal. They incorporate text, sight, sound, touch, smell, and/or electronic affordance. (Marback, 2009)

3. Rhetorical design is most effective when it fits the social, ideological, economic, and political culture where it’s communicating and when it fits with society’s greater ethical and moral expectations (but it does not need to agree with the dominant concepts or culture). (Selke, 1999; Walhstrom, 1997)

4. Rhetorical design is not the creation of a lone communicator. Creators are always-already collaborating with previous designs, their own design, audiences, and future users. Further, many CMCs are participatory acts of design with audiences actively co-designing or redesigning communications together but for their own purposes. (Cope & Kalantzis, 2000)

5. CMC as rhetorical design is dependent on technology creation, dispersal, and interaction which supports and limits the rhetoric and design in significant, meaningful ways. (Selber, 2004)

6. Effective rhetorical design is self-aware of how technology limits/affords, excludes/includes, marginalizes/privileges, and otherwise influences designers, designs, and audiences and announces these effects during communication. (Selber, 2004)

7. Rhetorical communication design requires an introspective/reflective designer who is self-critical. (Cope & Kalantzis, 2000)
These principles illustrate the main foci within the ideological framework for my design literacy for rhetorical communication design. They are informed by multiple literacies laminated together, a communication as design approach, and digital culture to suite our CMC teaching needs. Yet, a single course in PTC may not provide sufficient instruction in all literacies or principles. However, I believe a course concept implementing this framework for communication design instruction may help lead to increasing students’ communication design literacy and the effectiveness of their CMCs.

**Design Literacy Course Concept**

A digital communication course concept based on my framework may aid CMC instruction by nurturing a design literacy approach to communication. Starting with classroom ideology, design literacy focus begins with thinking about communication as sensorial, multimodal experience. According to Marback (2009), communication designs are rhetorical artifacts that effect our choices and behavior by acting upon our senses and faculties. In this moment of interaction, we call upon our understanding of the multiple literacies discussed in this chapter to examine the interconnected relationships of “signs, things, actions, and thoughts” in and between communication elements and actors (Buchanan, 2002, p. 10). This ideology must be used to frame the course so that it emphasizes the responsive nature of digital communication activity and its relationships with design (both as noun and verb). Further, another governing focus of the course should be the importance of critically inquiring into how technology shapes responsivity. For example, including lecture-scaffolded activities that have students responding to audience responses to digital artifacts would elicit attention to design responsivity and designing responsibly. This activity may help shape students’ habit of thought regarding how our senses influence our responses and how we react in response to how audiences react. In other words, having students, study how audiences respond to a design, then how we redesign an
artifact in response to the audiences’ response may show students that their creation of a communication artifact is a rhetorical act brought into existence as the current sum of a system of responsivity. Hence, students of this communication design course that nurtures metacognition surrounding design may learn habits of thought from design literacy that make them adaptive to and cognizant of social and intermodal communication needs (Papdementriou & Makri, 2015).

In terms of course objectives and outcomes, a design literacy informed digital communications course may be suited to fostering critical competencies for today’s socially promoted, techno-cultural literacies. These include: “understanding and valuing the uses of common computer applications for generating, organizing, manipulating, researching, producing, and distributing information, discourse, and texts (print, still graphics, and moving images); and using…databases, word-processing packages, multimedia production packages, e-mail, listserv software, bulletin boards, and graphics and line-art packages” with critical attention (Selfe, 1999, p. 11-12). For example, having students analyze how audiences perceive content on different platforms and how those platforms shape the communication designs of users in a course may boost necessary critical and technological literacies necessitated by digital culture. Further, using this critical, design-based approach to CMC and technology encourages rhetorical analysis as part of analyzing communication designs and as a means for designing and discerning the effects technology has on designers, designs, audiences, and redesigns. In this manner, a design literacy approach may meet many modern academic, workplace, and cultural needs via its address of communication and technology.

Last, on curriculum and assignments, a design literacy approach for digital communication courses may employ a curriculum addressing: communication-as-design, multimodality, rhetoric, sociocultural systems, ethics, and technology because each influences
CMCs as illustrated previously in this chapter. Assignments may use and teach the principles of rhetorical design literacy to develop design competency to best meet communication needs for 21st century digital domains (Wahlstrom, 1997). For example, having students make technical instructions for a wikiHow.com page may help them critically analyze online, networked audiences for multimodal communications. Also, Instructors who have students create podcasts for a corporate knowledge management database may ask them to consider what is persuasive and ethical communication of one’s knowledge in a business setting. Or, having students simply draft the ubiquitous professional proposal with mindful attention to genre conventions based in sociocultural systems, geared toward audience responses, and using technologically constrained design choices may encourage them to address multimodal, intermodal communication influences of CMCs while preparing them for PTC careers that are aligning more and more with my framework for rhetorical design and its principles (Lagerwerf & Bossers, 2002; Papdementriou & Makri, 2015). Thus, my framework and principles may inform a PTC digital communication course fit for modern CMC instruction.

Conclusion

The literacy lamination provided herein forms a theoretical framework which PTC instructors may use to address CMCs in their computer-integrated programs and classrooms. Further, key principles of rhetorical design literacy may contribute to reconceiving and teaching PTC or any other digital communication courses. But, from this framework for rhetorical design literacy, I close by reflecting briefly on a few of its potential challenges and contributions.

As there is currently no fully realized design pedagogy for professional and technical communication, this represents a major obstacle. Numerous scholars have hinted at a design-based pedagogy (Buchanan, 2002; Marback, 2009; Purdy, 2014), but the difficulty of defining design—which Buchanan says defies definition due to an inability to “cover the diversity of
ideas and methods gathered together under the label” (p. 5), not to mention teaching it, remains. Also, taking-up technology instruction and multimodality are challenges to many composition and communication instructors who feel their training is deficient in these nontraditional areas. For example, many instructors may feel deficient in their ability to assess multimodal communication because they were mostly taught how to teach and/or analyze written textual products (Jetnikoff, 2015). However, even though there are some obstacles, the contributions to today’s CMC instruction demand attention too.

According to the scholarship informing my framework and principles, basing our instruction around ubiquitous technologies and designing socially relevant CMCs contributes “cultural capital” to digital communication courses and raises teachers’ “value to society” (Berlin, 1996, p. 15). Additionally, teaching courses using design literacy and pedagogy may acknowledge the role our senses, perceptions, and responses play in making communication designs meaningful, personal, and rhetorical (Marback, 2009). In closing, though many of the challenges and contributions of my framework lay ahead in this dissertation, this chapter supports further inquiry into improving instruction and learning for the future of communication in the digital age. In the next chapter, my principles of rhetorical communication design will be put into action to inform the development of a cohesive and complete communication design pedagogy that we may then use in the PTC classroom.
CHAPTER 3. PEDAGOGY

Growing from the digital turn which birthed *Computers and Composition* in the early 1980’s, the link between computing technology and communication garnered mainstream attention in the field of composition. As computers acquired prominent roles in exchanges at work and home during the 80’s and 90’s, communication and composition scholars integrated hardware and software literacy into traditional writing instruction. According to Purdy (2014), alongside this integration the term design, in association with “technology-related work in the field” (p. 614), became a fixture of articles on computer-mediated communication theory and practice.

In 2004 Yancey noted that the centrality of computers to composing—in the workplace, at school, at home, and abroad—was situating “the screen as the language of the [new] vernacular” (Yancey, 2004, p. 305). This new “vernacular,” comprised of text, images, audio, video, and interactive electronic affordances, bespoke a recognition that for composition students “to negotiate through life” they would need new skills for “combining words with pictures with audio and video to express thoughts” (Daley, 2003). However, this breed of composing through multiple modes working together with rhetorical efficacy in specific and multiple contexts is not simply written. Returning to Purdy’s mantra (2014), multimodal artifacts such as podcasts, videos, and websites “are designed, not written” (p. 613). Thus, responding to Yancey’s call, a plausible pedagogical answer is teaching communication and composition as design, especially in the fields of Professional and Technical Communication.

Based on the design turn conceived by Buchanan (2002), developed by Marback (2009), and made “fuller” by Purdy (2014) and Leverenz (2014), I argue that a design pedagogy for PTC, especially in technical communication, may be a response to the needs of composing with
today’s technology. Hereafter, I explain and advance a design-thinking approach addressing composing situations which may meet our computer-based communication needs for multimodal communication in today’s digital society and discipline. In what follows, I begin by defining design pedagogy for communication and composition based on a fundamental theory. Then, design-thinking practices are examined and posited as an appropriate response to technological and cultural shifts. Thereafter, I provide guidance and examples of appropriate instruction and assignments for the PTC classroom. In closing, I offer a reflection on some of the most pressing challenges and contributions of a design approach for today’s technologically integrated PTC field before moving into a discussion of my research intended to address these pressing matters in Chapter 4.

**Defining Design Pedagogy**

From Kostelnick’s (1989) influential comparison of design and writing studies processes, the similarities found between the work of designers and writers has substantiated an examination of design pedagogy as a “natural counterpart” (p. 267) to composition. Further, using the term design as a way of “conceptualiz[ing] composing as multimodal” since “the field turn[ed] attention to video, audio, and embodied texts” (Purdy, 2014, P. 615-616) has prompted many calls for developing a usable design pedagogy for communication and composition. However, Buchanan (2002) noted a major obstacle to this goal: “No single definition of design, or [branch] of professionalized practices such as industrial or graphic design, adequately covers the diversity of ideas and methods gathered together under the label” (p. 5); thus, design is difficult to define. This makes it difficult to use. However, this obstacle may actually be the reason why design can be integrated into the service of communication.

According to Buchanan (2002), design is a flexible activity that may “serve the purpose of enriching human life” by integrating principle components of “human experience” (p. 6)—
language, thoughts, actions, and systems—by designers into artifacts. Because communication relies on these same components, an author’s language abilities, ordering and transferring thoughts, and commanding rhetorical affect for action (all within the contexts of overlapping sociocultural systems), Buchanan’s vision of design appears viable as means for communication and composition instruction, not to mention in PTC. But, to develop a working design pedagogy for composition, we require more than a statement of similarities between these fields. We require a concrete theory of design and how it may be used for today’s computer-mediated communications.

To achieve a design pedagogy for composition, I provide three foundational tenets for my communication design theory in keeping with the needs of modern multiliteracy.

- First, a design approach to communication sees multimodal artifacts as sensorial. Per Marback (2009), designs are geared toward acts of “seeing.” They “make claims on our senses” (p. 402). This first tenet posits that designed artifacts activate our embodied, sensorial means of interaction with the world just like multimodal compositions.
- Second, a design approach to communication relies on the perceptive ability of interactants required for sense-making. Thus, understanding of the interconnected nature of “signs, things, actions, and thoughts” (Buchanan, 2002, p. 10) is necessary for articulating meaning. Further, in articulation theory, meaning is created by forging connections between objects, ideas, and systems of thought intended by design, inherent in objects, and developed by users existing in a web of “social forces” that make perception highly contingent, especially in digital environments (Wysocki, Johnson-Eilola, Selfe, Sirc, 2004, p. 202).
Third, a design approach to communication recognizes that design elicits viewer response. This responsivity is akin to the participatory nature of communication in any computer-integrated composition course. According to Marback, “Artifacts of design—including all document types from student essays to magazine spreads to webpages—appeal to our ability for response” (p. 402).

Thus, based on my basic tenets of communication design theory, a usable design-based pedagogy for today’s computer-mediated composition is invested in teaching: 1) the sensorial nature of communication, 2) the advancement of perceptual acumen, and 3) the rhetorical means for shaping viewer responses to designed artifacts.

Advancing Design Thinking

Extending from my theory of design, design-thinking practices for instruction may attend to the pedagogical needs of contemporary courses and technologies. In these courses, many instructors challenge students to create multimodal artifacts—brochures, e-portfolios, data- visuals, and webpages—using digital composing tools. In these situations, students require a thoughtful approach for responding to complex rhetorical situations which, “have no ultimate or definitive solution” (Wickman, 2014, p. 26). Also, students often need to consider the interconnected nature of modes of communication afforded by computers for making their communication designs. Design-thinking may be an ideal approach for addressing these contemporary communication and composition needs, especially in the computer-centric work of PTC courses and professions.

According to Leverenz (2014), design-thinking is a human-centered, “problem-solving process” (p. 5). Much like composition, which focuses on audience, and rhetoric, which seeks to “solve” the equation of persuasion, design-thinking situates its user as a designer seeking the best way to meet the needs of stakeholders in a messy situation (Buchanan, 2002). Further, design
and communication “are highly dependent on the interrelatedness of [creators], objects, materials, users, and contexts” (Leverenz, 2014, p. 5) in digital spaces. So, with multiple variables and dynamism in variate situations, it is no wonder that design and composition are considered “wicked problems” (Buchanan, 2002, p. 15). Luckily, a teachable framework for design thinking provides a means for attempting to tame the difficult nature of communication.

According to IDEO director Tim Brown (2009) from the Stanford University d.school (or Design school), design-thinking practice aims to address and solve wicked problems through innovative thinking on behalf of and in conjunction with today’s user-audiences. In its most common form, design-thinking involves using a non-linear, recursive design process to achieve innovation which is “like the writing process” (Purdy, 2014, p. 627). According to Purdy, the six steps are: “understand, observe, define, ideate, prototype, and test” (p. 627). These six steps of design-thinking align with the writing processes: beginning by comprehension, researching, analyzing audiences, brainstorming, drafting, and gathering feedback for revision. Other than the starting point for this process—beginning by comprehension—Purdy corroborates the alignment of these steps between designing and writing processes (p. 628). Unfortunately, it would be beyond the scope of this chapter (or even this dissertation) to cover the full intricacy of their interrelated components. So, let it suffice to say that the development of understanding is comprehension, observations are research, defining needs correlates with audience analysis, the creation of ideas stems from brainstorming, prototyping is drafting, and testing a design involves eliciting feedback for revision. Hence, design thinking’s striking similarity to the writing process makes it a feasible approach for instruction in PTC courses. And, its focus on user-audiences, common in today’s digital media, also marks the thinking process as in keeping with the modern professional, technological environment.
Design Thinking Instruction

Moving from my theory of design and the appropriateness of design-thinking practices, I offer an approach to communication instruction which may suit “composition in a new key” (Yancey, 2004, p. 321) in the PTC classroom. As our students wield multimodal literacies to create designed artifacts, the need for teaching a metalanguage of communication modalities is important for understanding sensorial experiences of design. Also, given the wicked nature of seeing communication problems from multiple views, instruction in Buchanan’s (2002) “doctrine of placements” (p. 8) may provide students means to navigate perceptions and to innovate solutions. Further, teaching forms of collaboration in design-thinking may engage students with the responsivity of communication needed for user-centered and rhetoric-focused processes. Although these theory-based approaches to design-thinking instruction represent only a few concepts, they lay a foundation for design-thinking pedagogy in PTC.

Beginning with the need for metalanguage in our design-thinking instruction, educators should start by providing students a system of expression for discussion their learning. The New London Group (1996) first identified this requirement when they considered how to address students’ design literacy needs for diverse communications. My answer, like theirs, is to provide a design-based language for the multiple languages of communication (p. 77). This metalanguage develops comprehension and understanding, which are the first steps of design-thinking that mobilize knowledge. For example, if we require our composition students to design a brochure, instruction in the metalanguage of Gestalt principles of 2-D design—alignment, proximity, grouping, closure, continuation, and figure/ground—enables them to understand and observe these concepts in a brochure’s visual language. Thus, instruction in a metalanguage may aid in understanding sensorial experiences and preparing students for using the first steps of the design-thinking process when composing.
After developing a metalanguage, educators need to teach students how to navigate perceptions (or points-of-view) and brainstorm solutions for complex communication situations. Teaching design-thinking practices based on Buchanan’s (2002) “doctrine of placements” (p. 8) may provide students a process for communication design by defining problems and ideating responses from many perspectives. According to Buchanan, “design areas”—or “signs, things, actions, and thoughts”—afford “placements” (p. 9, 12), positions where designers may mentally place themselves to gain perspective on a problem. Further, design-thinkers may take-up and/or change placements in context to “generate new perception of that situation” (p. 13). Composition teachers may use Buchanan’s doctrine to show students how to see communication design problems from the vantages of symbolism, materiality, activity and use, or complex human-centered systems via thinking critically about design during the third and fourth steps of the process. By seeing from these various perspectives, students may learn to define wicked situations by audience needs and expectations, which may result in numerous ideas for perceptive drafting.

The third component of design-thinking instruction for composition is teaching the forms of collaboration valuable to design process and the scope of responsivity. In the process of design-thinking, collaboration occurs: 1) between creator(s) and previous information/design, 2) between creator(s) and user-audiences, 3) between co-creators, and 4) between creator(s) and their design, as well as its cultural placement. The New London Group (1996) saw these forms of collaboration generating a design’s rhetorical “hybridity and intertextuality” (p. 81) as it responded to complex situations. By teaching students to acknowledge each collaborative form throughout their thinking process—as well as examining the influences of response on the product—designs become the act of co-creative agency, situated in culture, shaped by the
responsivity between designers, artifacts, user-audiences, and human systems “within and across modes of meaning” (p. 82). This “creative synthesis” and “integrative thinking” (Brown, 2009, p. 85) in responding to design’s responsivity makes instruction in the layers of collaboration invaluable for design-thinking. This is especially true when students enter the final prototyping and testing steps where communications are drafted and tested to fit the rhetorical situation and end-users.

**Communication Design Assignments**

Having examined how PTC instruction based on design theory and thinking practices may be employed, I describe what two assignments may look like when they focus on rhetorical design in today’s digital composition environments. To this end, I will examine briefly the objectives, instruction, and activities of a digital new media assignment, then an e-portfolio assignment. I will also reflect on the outcomes of these two assignments to provide a sense of their fitness for the preprofessional classroom.

The first example assignment is a new media composition where students in groups design a Twitter post as part of a mass communication development team for a small videogame company. This assignment works incredibly well for Business Communication courses meeting the needs of both PR and marketing interests. The assignment asks students to practice creating “new media text” to develop skills composing “in digital environments,” to explore interrelationships between “multimedia,” and to increase awareness of designing communication “for presentation and exchange in digital venues” (Wysocki et al., 2004, p. 43). To achieve these objectives using a design-thinking process, instruction must explore students’ knowledge about Twitter. Then, it must provide language for understanding communication modes—concepts of rhetorical typography, visuals, and electronic affordances (hashtags, links, etc.) Next, guided rhetorical analysis of similar tweet designs must occur based on discovering and defining
audience’s needs and expectations, while also looking at responses to tweets. At this point, groups brainstorm ideas for designing their posts and sketch them while attending closely the interrelated modes for new media communication. Once prototypes are in-hand, groups analyze drafts together and select the best for testing with the whole class. Digital versions are then created using the platform and presented, explained, and critiqued for design improvement based on the collective intelligence of the class. The outcomes of this design-thinking process for a new media composition include: increased student interest in composing, better understanding of how multiple modes interrelate, and an improved sense of the value of interpersonal communication.

The second design-thinking based assignment, this time for Technical Communication, is an e-portfolio which asks students to create a professional website illustrating their best written, oral, visual, and electronic artifacts. The objective is that students must design a web-based, multimedia site integrating assignments according to principles of usability to show “the mark of [an] educated student” (Daley, 2003) who is “[a] member of the writing public” (Yancey, 2004, p. 306) and a good fit for their future technical career. Employing design-thinking processes, instruction begins by developing students’ understanding of Krug’s (2014) web-usability principles—reducing user fatigue, making content self-evident, deploying consistent organization, and providing choices, not wordiness. As we know, internet media shapes our communication expectations, so students must observe and define how audiences use e-portfolios, especially those of designers and technical experts (graphic designers, civil engineers, landscape architects, etc.). Fortunately, as teacher-scholars, we may provide audience insight into e-portfolio use and feedback to support students’ rhetorical ideation and content prototyping. However, instruction on using the platform (for drafts and peer-testing) requires teaching the functions of the technology across all three of Selber’s (2004) technological literacies. Regarding
outcomes, students who use this usability-focused, design-thinking process develop professional web-content creation skills and the ability to see their work as a collaborative activity with real people who will respond to their work.

**Conclusion**

In light of my pedagogy discussion, I conclude by returning to the common trope of reflecting upon a few potential challenges and contributions a design approach may afford composing with technology in PTC. Starting with the biggest challenge, teaching Buchanan’s (2002) “doctrine of placements” (p. 8) and Brown’s (2009) “integrative thinking” (p. 85) is difficult because students “aren’t familiar with [these] approach[es] to problem solving” (Leverenz, 2014, p. 6). Because schools compartmentalize learning and seek right answers, trying to integrate multiple perspectives with the indeterminant nature of correctness is a huge ideological stumbling-block. Additionally, the institutional and faculty pushback against these forms of thinking manifests resistances within the field of PTC which has long valued a “right” form of communication and discouraged “rewarding failure as…means by which we learn” (p. 3). However, despite these challenges, clear contributions to today’s courses emerge.

According to design pedagogy scholarship and my experience, there is a pair of common contributions. Beginning with designing multimodal, digital compositions, student “enthusiasm about reading/viewing/interacting with and composing/designing/authoring [these] texts” (Wysocki et al., 2004, p. 44) makes professional communication meaningful to them. Further, the design-thinking process enables them to see their communication designs as “textual action” (Purdy, 2014, p. 633), as doing something and solving problems that may be a central part of their future careers. Also, the elevation of collaborative forms actualizes the value of participatory meaning-making. According to Leverenz (2014), design-thinking for the modern
communication classroom develops teamwork skills and aids student comprehension of composing with and for others (p. 10-11).

In closing, despite the fact that the full spectrum of potential challenges and contributions lay beyond the scope of this chapter, my attention to the relationship between the design and PTC fields will elicit new research and instruction for the betterment of theory and practice of composing using new literacies, “in a new key” (Yancey, 2004, p. 321) with today’s technology. In the next chapter, the design pedagogy developed hereto will be articulated into an empirical research study examining its use and users’ experiences. Specifically, the study will examine the communication design approach for instruction and design thinking practices used by 4 faculty members in Iowa State University’s English: 314, Technical Communication courses. Further, it will address the design pedagogy learning experience had by 211 students via reports from 37 individuals across 9 different sections.
CHAPTER 4. METHODS

Design Pedagogy Research: Introduction

In order to support and develop design pedagogy for technical communication, data from empirical research is required. This project intends to contribute such data via theory driven research in the classroom. While many pedagogical texts, like Tate, Rupiper, and Schick’s (2001) Guide to Composition Pedagogy, supply theoretical means for instruction, they often offer little evidence to support the ideologies beyond examples and single practitioner outcomes. These examples and limited outcomes do not adequately represent the experiences of the two stakeholder groups most impacted by classroom practices—teachers and students. Thus, my design pedagogy project aims to provide empirical data from instructors and their pupils indicating the suitability of teaching design for technical communication. It examines faculty as they teach communication design and students as they learn about it. Through this data, I aim to provide faculty and student insights via their design pedagogy user-experiences. As a result, by supplying findings from end-users, my design pedagogy research may help technical communication faculty and students be more successful in digital PTC environments where design approaches and practices are key components to new teaching and learning activity.

The ubiquity of multimodal CMCs in PTC professions requires learning how to understand and use all modes of communication. So, the ever-present computer technology focused our teaching efforts on multimodal artifacts, but since then we have struggled to answer how best to teach modal integration effectively. Despite this difficulty, many scholars have begun moving from a traditional audience lens toward a user-audience lens in their teaching. This reframes an older passive concept of a technical communication audience with a new active user approach to how we interact with information. Because of this change and the numerous
calls for recognizing CMCs as designed for user-experience in PTC, I elected to examine and offer an answer to the question of how best to approach teaching technical communication—design pedagogy.

My answer, as illustrated in the previous chapters, is a theory-informed framework for teaching communication as rhetorical design work, paired with UX-oriented design thinking. Training faculty and teaching my own courses, I have discerned the benefits of teaching PTC faculty and students to see communication as user-based design work by giving them design practices that address real users, problem-solution situations, and include user-experience testing. So, to support this pedagogical innovation, I have collected phenomenological, qualitative empirical data during my IRB approved study examining both instructors teaching and students learning with design pedagogy in a PTC course.

Guiding Research Questions

Because the purpose of this study is to examine the use of design pedagogy and its reception in the technical communication classroom, I began by focusing on the two core participant groups, faculty and students. I ask these groups questions about their experiences and watch them use design pedagogy in order to provide firm ground for interpreting the potential and the challenges of teaching communication as design. Further, asking these questions provided pedagogical study based on user-experiences, those of the individual using the pedagogy, and thus allowed the teachers and learners a participatory role in the improvement of technical communication education. To accomplish this user-experience research, this study was guided by the following foundational questions:

1. How does design fit into the technical communication classroom?

2. What is design pedagogy’s value in technical communication?
3. What was easy and/or difficult about using design pedagogy based on teachers’ and students’ experience?

4. What benefits and constraints characterize design pedagogy according to teachers’ and students’ accounts?

These four questions, adjusted for each participant group, provide data establishing the role, relationship, and appropriateness of design pedagogy for technical communication, if there is value recognized by educators and future practitioners, what helps and hinders technical communication classwork based on user-experiences, and if design learning and practice are perceived as beneficial or not. Taken together, answers to these questions grounded in the technical communication classroom will reveal the opportunities and limitations of real users who are coping with the communication requirements of a digital age.

**Defining the Situation of Research**

To begin to understand the scope of my design pedagogy study, this section discusses the situation where my research took place. Hereafter, I will provide information about the study site, timing, and training components that comprise the situation of my research.

**Site**

The research situation for my design pedagogy project begins with my study site, ISU’s English 314: Technical Communication. English 314 is an advanced communication class in the ISUComm program that is staffed by instructors who are graduate assistants, lecturers, teaching professors, and all levels of tenure-track faculty. The purpose of English 314 is to prepare students to design technical documents individually and collaboratively, while gaining experience solving workplace related communication problems. Students from agriculture, physical and life sciences, engineering, and information technologies, and their respective departments expect to acquire technical communication proficiency regarding complex technical
topics from the course curriculum for workplace transfer. For my study, I worked with 4 faculty members across 9 sections containing 211 students for my technical communication research site during an instructional design unit while they enacted design pedagogy for teaching and learning in the classroom.

The technical communication site was chosen because some design elements are already included in the instruction unit and it may benefit through more design emphasis. For example, English 314 at ISU provides guidance for making visually integrated documents for professional technical communication environments but is limited by the dominance of print artifacts that may not suit all of today’s users or their use situations. The course assignments include traditional written proposals, new presentation videos, as well as written and visual technical descriptions, instructions, and feasibility reports, as well as a pair of self and peer evaluation reports. As evidenced by the inclusion of video and visuals, some of these assignments include modes of communication commonly discussed in terms of design. Further, as these assignments bring text together with other communication modes (sound, images, graphics, etc.), they and the course provide a suitable space to include and test my design centric approach to technical communication. In this situation, my design pedagogy may take the existing document design instruction in a new direction by focusing more on designing for end users and the rhetorical effect of intermodality through user observation and testing over the more genre focused approach. By doing so, I am working to boost the rhetorical effect of multimodal technical documents that students create and to provide teaching practices for doing so based on methods from industry and needs dictated by modern CMCs in PTC. But to accomplish the study of design pedagogy, I needed to address timing and training concerns impacting my English 314 study site.
Timing

Going into this project, the English 314 curriculum at ISU had been completely redesigned by a faculty committee and the Advanced Communication program administrators overseeing the courses. This meant that all faculty teaching the course in the Fall of 2019 semester were tasked to deliver a new version of technical communication. As such, it was made clear to me that faculty participants in my study may hesitate to make additional changes to the material included in their courses. This turned out to be true. It was reported to me by an Associate Teaching Professor that he elected not to participate in the study because there were already so many new things he had to address in the newly redesigned course. As such, I was encouraged to limit the design pedagogy intervention to just one unit of the course. Thus, I chose to conduct the study during the technical instructions unit.

During the technical instructions unit in English 314, students are asked to individually create a set of instructions that solve a problem for a target audience. The major assignment stipulates students must find a problem and provide step-by-step instructions for solving it based on what the audience needs to complete the procedure (for more information, see Appendix A for the assignment sheet). These instructions must also have at least five major steps and use visuals in conjunction with text. During the unit, the assignment is supported by teaching the instructions and manual genres and how to use visuals. For example, typical students may elect to provide directive step-by-step instructions on how to change a flat tire or how to test a water sample and submit a predominantly text pdf with static visuals. Given this audience focused problem-solution emphasis and multimodal orientation of the assignment and unit, it fit well with a communication-as-design approach and the considerations of the design thinking processes. However, to support professional design work and design thinking, faculty would require initial and hands-on training to use my design pedagogy.
Training

The last major component of my research situation was the training necessary for preparing faculty to use design pedagogy in English 314 during the instructions unit. To prepare instructors to teach communication design and design thinking, I created two faculty training seminars.

The first seminar was delivered opening week of the fall 2019 semester. It focused on introducing faculty to the project, providing them with the theory behind design pedagogy, and on helping them to understanding the relationship between writing and design. For example, faculty members were informed about the multiple literacies discussed in Chapter 2 and how they may inform rhetorical communication design instruction. Also, they were provided with the 7 principles of communication design from Chapter 2, as well as the 3 tenets of design pedagogy covered in Chapter 3 in order to familiarize them with how making multimodal CMCs is design. All of these theoretical concepts were related to faculty members’ preexisting knowledge of rhetoric, multimodality, audience-centered communication and composition. For instance, the relationship between writing processes and design processes were explored in terms of comparison and contrast. That is, I used faculty members’ familiarity with Murray’s (1997) writing-as-process model (i.e. prewriting, writing, and rewriting) and its common activities and techniques to help them understand design thinking’s “understand, observe, define, ideate, prototype, and test” process (Purdy, 2015, p. 627). By providing the faculty with Purdy’s observations on the relationships between writing processes and design processes, I helped the faculty understand not only that these two processes are similar, but also how to see that the value of the design process is provided via the differences. Given that the design process is radically user-centered, open to creative techniques and modes beyond writing, and is driven by problem-solution thinking, faculty saw that these elements of the design process could help
enhance teaching and learning in technical communications courses. Thus, much of the first seminar focused on the definition of key terms and concepts in order to build familiarity via comparison and contrast with preexisting knowledge in order to help faculty become more comfortable with design pedagogy.

The second faculty training seminar occurred a week before the new instructions unit. It provided hands-on experience using design thinking in the classroom and all the materials required for the unit. During the seminar, participants learned about and enacted the design thinking process by using it to interact with a cookie recipe and to redesign that recipe in order to solve user problems they observed. For example, the faculty members, as users of cookie recipes themselves, noted that the lack of images in the directions may lead to users becoming confused about the size of a large bowl or how big a cookie-sized ball of dough should be. Using user observation and empathy, the faculty worked together as a design team to create a new cookie recipe with attention to improving a user’s experience and solving user’s problems. After this design thinking practice, faculty members were then presented with all the materials they would need to enact design pedagogy instruction during the unit. They also received a work plan to help guide them through teaching design topics and practices during the unit. Figure 4.1 illustrates the work plan that faculty received alongside their materials.
Figure 4.1. A diagram showing the order of topics covered during faculty training which mirrors the workplan for teaching design pedagogy in technical communication.

This workplan (alongside lesson plans) helped faculty navigate the 8 key topics and activities illustrated. It directed the teaching and learning of design pedagogy across the technical instructions unit. Implementing the plan, faculty first introduced communication-as-design concepts. Then, multimodality was studied. Next, rhetorical analysis and design critique were modeled. Afterward, audience-as-user and user assessment was explained. Then the techniques for user observation, empathy, and situational context analysis were described and practiced. After which, teachers modeled and assigned design thinking ideation practices like sketching, drawing, and other design methods. Next, students used design thinking to make CMC prototypes and learned about basic user testing using speak aloud protocols and interviewing. Last, user experience feedback was collected and used to revise students’ communication prototypes for submission of the assignment. With this knowledge and direction, faculty were prepared to practice design pedagogy. Each seminar lasted 100 minutes and 150 minutes, respectively, and both were followed by question and answer sessions and additional one-on-one consultations. Attendance and participation were mandatory for participants to enact the pedagogy in the classroom. And, as the primary investigator, I compensated faculty participants.
with $10.00 gift cards to local retailers, while the writing program administrator promised participants recognition of service hours in their annual reviews.

**Methodological Framework**

Generally speaking, empirical data from research studies looking at design in communication and composition is scant. Marback (2009), Leverenz, (2014), and Purdy (2014) each call for more research and data. Further, at the 2018 Conference on College Composition and Communication, each of the 5 design-oriented scholars I spoke with openly acknowledged the dearth of data on teaching communication as (or by) design. Furthermore, no information on faculty and student user experiences (or UX data) with design pedagogy is available to inform the use of such an approach in the field of technical communication. So, to fill this gap I constructed a methodological framework comprised of qualitative interviews, classroom observations, and phenomenological lived experience recreation, as depicted in figure 4.2, to acquire detailed user experience (UX) data.

**Figure 4.2.** Venn diagram illustrating the concentration of methods on user-experience.

As illustrated in the Venn diagram, each individual method discussed hereafter will contribute to understanding user experiences with the new design pedagogy. Therefore, in response to continuing interest from scholars in the field and an identifiable lack of data, my empirical study
of communication design pedagogy for CMCs in PTC is warranted and the methods are relevant to experiential data. Next I provide a briefing on the details of my three-part conceptual framework for user experience focused research methods and information on my workflow while using these methods collaboratively.

**Qualitative interviews**

Faculty and student perspectives and experiences on design pedagogy were collected through qualitative interviewing. The interviews occurred both before and after design pedagogy was deployed in English 314. Faculty were interviewed before, and both faculty and students were interviewed after. The interviews were “intensive” and “semi-structured” (Charmaz, 2006, p 26), using open-ended discussions of participants’ experiences with design during the unit. These semi-structured interviews were a valuable tool for generating rich data, since this method allows researchers to “request clarifying details to obtain accurate information and to learn about the research participant’s experiences and reflections” (Charmaz, 2006, p. 26). Being able to dig into interesting words, statements, and ideas on design theory and practices helped me as the primary investigator to deepen my understanding of faculty’s and student’s pedagogical experiences as individual design-users. Further, alongside this intensive scrutiny of user experiences, these interviews used a common set of questions about participants’ experiences with design integration into technical communication: whether it was easy or difficult, what benefits and detractions manifested, and how participants assessed design’s value for technical communication work (see Appendix B for faculty protocols and Appendix C for students).

All seven faculty interviews were conducted in-person, while 35 out of 37 student interviews were conducted via online conversations, with only two completed face to face. The in-person interviews were all conducted by me as the primary investigator in a small conference room in the English satellite office at Iowa State University. This was done to avoid potential
distractions in a more public space. Faculty interviews lasted between 19 minutes and 38 minutes, with an average time of 33 minutes. Student interviews lasted between 2 minutes and 25 minutes with an average of 12 minutes. Both faculty and student interviews were captured using mp3 audio recording technology and were later transcribed using ExpressScribe. Through the transcription process, I deepened my understanding and familiarity with the experiences and perspectives of the four faculty members and 37 students who took part in the interviews. And, for the purposes of reporting data anonymously, all four faculty and 37 student participants were assigned pseudonyms during transcription which are used later in this study.

Field Observations

Turning to field observations of design pedagogy in technical communication, I used in-person, classroom, and online observations during every lesson on communication-as-design and during the teaching and practice of design thinking processes (see Appendix D for observation protocols). All observations took place in English 314 classrooms (physical or virtual). During observations both faculty and student participants were observed while they addressed or completed work for the technical instructions unit. While observing, I kept anonymized fieldnotes of in-class communication design instruction and practice and participants’ user experiences and statements. Following Tracy’s (2013) guidance for observational research, I defined my classroom role as a “complete observer,” (p. 121) a third-party individual who does not interfere with the activity or behavior of the setting. This was important as I wanted to see the dynamics of teachers and students using the pedagogy and did not want to act as an expert or the person in charge. Additionally, my fieldnotes were informed by Tracy’s concept of “analytic asides” and “memos” (p. 196) that observers may use to recreate the observed situation for critical reflection and to inform qualitative interviews and phenomenological lived-experience
recreation. As such, my notes focused on recording all aspects of faculty and student experiences and perceptions of design pedagogy, which I could call on during interviews.

During observations, I surveilled ten lessons in each of the five face-to-face sections of the course and completed 6 observations of activity discussions on design and design thinking in the four online sections of the course. These totaled more than 40+ hours of observations and over 45 pages of notation. During every observation, I was able to record a firsthand account of how teachers guided students using the new pedagogy. Further, I was able to begin identifying what seems to work and what does not for both participant groups. This enabled me to note any challenges or breakthroughs participants experienced with regards to specific design topics during instruction and learning. Because of these observations, I may provide an account of how well the pedagogy fit into the courses and the curriculum via recorded user experience data and through reconstruction of those experiences using phenomenology.

**Phenomenological Inquiry**

The last component of my methodological framework for studying design pedagogy in technical communication is the use of phenomenological inquiry during the post-pedagogy interviews. During these post-unit interviews, I invited faculty and student participants to re-live their classroom user experiences with design pedagogy. According to Petitmengin (2006), the phenomenological interviewer leads the interviewee in the “‘re-enactment’ of past experience” (p. 244) as opposed to the replication of experience. This activity is deeply invested in the embodied knowledge of the respondent—their experiences in the world that lead them to an interpretative sense-making act—and how their knowing (as a body in the world) is experientially derived to shape their lived-world. This provides my study lived user-experience data as faculty and students are responding to design pedagogy and experiencing the positives and negatives of using design and design thinking. According to Bazerman (2013) on Schultz,
phenomenological inquiry provides researchers “a way to understand how individuals come to act and attribute meaning according to socially constructed ideas and structures” (p. 67). Thus, my phenomenological inquiry affords both the re-experience of using design pedagogy for teaching and learning technical communication, and the individual user’s perceptions of design’s pedagogical value for technical communicators. So, by integrating interviews, observations, and phenomenology, a complete picture of faculty and student experiences may be achieved.

Concluding my discussion of the three methods used, I provide a brief description of my workflow whilst triangulating these methods to acquire UX data. Hereafter, figure 4.3 illustrates my activities during the project. It shows my progression from preliminary interviews and training faculty to using post phenomenological lived experience interviews prior to results analysis. This chart aims to aid understanding of my activities and to act as a guide for conducting similar pedagogical UX research.

**Figure 4.3.** A flowchart illustrating the workflow enacted during my research project in order to acquire faculty and student UX data on teaching and learning via design pedagogy.

Illustrated in the flowchart, I began deploying the three methods by conducting preliminary interviews with faculty participants. These interviews consisted of inquiry into
participants’ teaching and communication design backgrounds, initial open-ended questions about design and design thinking, and then questions about their opinion of design pedagogy after an intervention where it was defined. After the pre-interviews, faculty were trained during two seminars on the theory (seminar 1) and practice (seminar 2) of teaching with design pedagogy in technical communication. Next, faculty and students were observed in the classroom as they taught and learned via design pedagogy. During this phase, infrequent consultations with faculty occurred upon request in the form of question and answer sessions and/or materials support for classroom work. Once the unit where design pedagogy was implemented concluded, I conducted the post pedagogy interviews with students and then faculty. Post-interviews for both groups followed the same organizational structure. They began by using phenomenological lived experience recreation, then transitioned into traditional reflective interviews. After all participants had been interviewed, I conducted grounded thematic analysis of all collected interview, observation, and phenomenological data to provide the faculty and student UX data reported in the next chapter.

Participant Information by Group

Next, I will provide an in-depth look at my approach toward faculty participants, then student participants for my study. This allows specific research questions, data collection methods, participant and sampling information, recruitment, and data analysis information to be clearly tied to each participant group.

Faculty

As the first group of participants, technical communication faculty form the backbone of my pedagogical study whom facilitated my design pedagogy during the technical instructions unit (see Appendix A for assignment sheet). To understand their experiences, I initially examined their existing pedagogy and teaching experiences, as well as their treatment and
knowledge of design for communication; through this examination I obtained data on how (or if) design pedagogy fits into technical communication instruction prior to any design training or use of my pedagogy. Further, after participating in my training seminars and using design pedagogy in class, I acquired data that illustrates what faculty think design pedagogy contributes to technical communication classes.

**RQ’s**

To get the data desired from faculty, the following research questions guided my inquiry.

1. How does design (and its pedagogy) fit into technical communication?
2. What is design’s value to technical communication faculty?
3. What makes design pedagogy easy (or difficult) to use?
4. What are the benefits and constraints of design pedagogy according to faculty?

These queries, adapted from my guiding questions, enabled the acquisition of data illustrating teacher’s design pedagogy user-experience regarding the belonging, perceived value, usability, and benefits and constraints of my pedagogy for technical communication instruction.

**Data Collection**

For empirical study of faculty, I conducted UX-oriented qualitative research to acquire my user data. I used pre-pedagogy qualitative interviews, in-class observations, and post-pedagogy phenomenological interviewing to acquire data and answer my questions on the perceptions and experiences of instructors. All data was collected while faculty were using design pedagogy for CMCs during the technical instruction unit in English 314. When interviewing, observing, and recreating the user-experiences of faculty participants, I used a grounded approach with all user data (Glaser & Strauss, 1967; Charmaz, 2006; Tracy, 2013), a combination of qualitative observations (Tracy, 2013) and ethnographic field notation (Emerson, Fretz, & Shaw, 1995), and phenomenological inquiry for lived-experience recreation.
(Petitmengin, 2006; van Manen, 1997). This research collection triumvirate provided strong, detailed records of significant perspectives, experiences, and responses to design pedagogy from participants. Together, the marriage of data collection practices and approaches provides a robust, teacher-centered sense of the experiential use of design pedagogy.

**Sampling and Participants**

Sampling faculty for this particular project, I targeted instructors with previous experience teaching advanced communication courses, especially technical communication. Preference was given to the full range of instructors (graduate teaching assistants, lecturers, teaching professors, and tenure-track professors) who taught the course the previous year and who were teaching during the Fall 2019 semester. These criteria allowed me to work with instructors who have recently taught the course by more traditional pedagogical methods and to collect observation and interview data ahead of my final semester in the program.

Though I optimistically hoped to enlist 6 to 10 faculty participants, I was only able to secure the commitment of 4 technical communication instructors for my study. Represented among this sample were:

- Paul, a graduate teaching assistant in the Rhetoric and Professional Communication PhD program with one year of technical communication teaching experience both face-to-face and online,
- Cindy, a graduate teaching assistant in the Rhetoric and Professional Communication PhD program with two years of technical communication teaching experience both face-to-face and online and experience on the technical communication curriculum revision committee,
• Tarkir, a junior lecturer with a PhD in instructional Design with less than a year of teaching experience in advanced communication program, both face-to-face and online, who was teaching technical communication for the first time, and

• Pam, an associate teaching professor, recently promoted, who had 11 years of teaching experience in ISUComm, the last five years solely in technical communication both face-to-face and online, and who had experience on the technical communication curriculum revision committee.

This small sample enabled me to work closely with participants during design pedagogy training and afforded the ability to visit almost every single class meeting during which my design pedagogy was in use. Additionally, the small sample allowed me to conduct multiple consultations and extended interviews with all participants during and after the instructions unit in their courses (with the exception of one GTA, Cindy, who was unable to complete a post-pedagogy phenomenological interview). Therefore, the sampling process met the needs of the project timeline, topics of interest, and guidelines for qualitative research regarding experiential data collection.

Turing to faculty recruitment, I acquired information on instructors teaching English 314 during the Fall 2019 academic semester from the advanced communication program administrator. I solicited participation via combined email and face-to-face interactions with those meeting my sampling preferences. As an incentive for individuals not predisposed to communication design to participate, I offered each faculty participant a $10.00 gift card for a local or online retailer at the conclusion of the study regardless of whether they completed their participation. Further, the program director made it possible for participating faculty to count the design pedagogy training seminars toward professional development listed on their annual
reviews. Hence, by contacting all individuals fitting my criteria, developing cordial rapport with them in-person, and incentivizing their participation, I recruited 4 faculty members to participate in my project from varied professional levels of experience who were interested in learning and using design pedagogy for their technical communication courses.

Data Analysis

After collecting traditional qualitative interviews, observational field notes, and phenomenological lived-experience recreations, I used a grounded theory (Glaser & Strauss, 1967; Charmaz, 2006; Tracy, 2013) approach toward participant data to stay rooted in the real, reflective, first-person accounts of design pedagogy user’s perceptions and experiences. This allowed me to code the transcribed interviews, fieldnotes, and the phenomenological experience to discover participant-centric, experiential information. Faculty pre-design pedagogy interviews yielded 19 unique codes, while Faculty post-design pedagogy experience recreation and reflection resulted in 14 codes. (see Appendix E for faculty codebooks). Also, by staying close to the information, I was able to provide rich qualitative descriptions of my findings to use as exemplars which emerge directly from the data (Geertz, 1973). After coding for significant contributions like experience with “communication as design,” the “helpfulness” of design work, and the “professional connections” of design thinking within my subjects of interest regarding faculty, I utilized thematic (Boje, 2001) analysis to discover generalizable assessment of faculty’s perceived value, usability, and benefits and constraints of design pedagogy to answer my research questions. My research inquiry-driven, thematic analysis of faculty contributions resulted in 51 themes including: 25 from the first round of interviews and 26 themes from the second. Thus, this project’s collection and analysis of empirical research data on faculty experiences with design pedagogy addressed many of the interests and needs of scholarship on this topic. The same will be shown to be true for my student participants.
**Students**

The second participant group in my study are the students in participating technical communication sections. This group of stakeholders learned to see multimodal communications as designed and user-focused. Also, they practiced the use of design thinking processes and procedures for composing technical instructions (see Appendix A for the assignment sheet). By examining students learning my design approach to communication and deploying design thinking, I collected information on their reactions, perceptions, and experiences concerning design pedagogy learning. Students’ perceptions of communication as design, their experiences as technical designers, and their use of design thinking afford data on attitudes, challenges, and valuation of design for contemporary PTC environments and CMC artifacts. Thus, the data from students in this study indicates how well design pedagogy is received, what benefits and constraints it presents, and whether or not students recognize design approaches and practices as valuable to their work in PTC.

**RQ’s**

Given the data sought from English 314 students, the following research questions guided my study.

1. What attitude(s) do technical communication students have toward design?
2. What value do students assign to design pedagogy and why?
3. What makes design thinking easy or difficult to use according to students?
4. What strengths and weaknesses are identified by students regarding design pedagogy?

These questions helped to gather user-experience data showing students’ attitudes toward design pedagogy, its usability, and if its approaches and practices may be seen as valuable for computer-mediated professional and technical communications work.
Data Collection

For my project’s empirical study of students, I continued to use my established phenomenological and qualitative research methods. I observed and took notes on students in the classroom while they learned about and used design pedagogy during the technical instructions unit in English 314. Afterward, I conducted phenomenological experience recreation and qualitative interviews to acquire information on their attitudes and experiences with design pedagogy. Also, by asking them to recreate and then reflect upon their work before and after using the pedagogy, I inquired into their assessment of outcomes using their new practices verses their prior approach for composing. To undergird this research inquiry, I again used the grounded theory approach (Glaser & Strauss, 1967; Charmaz, 2006; Tracy, 2013) to information received, and made use of thematic analyses (Boje, 2001) when working with fieldnotes and transcripts. These methodological activities yielded detailed records on significant attitudes, lived-experiences, and personal responses to design pedagogy from student participants. By way of these data collection methods, I provide the students’ experience on using design pedagogy for CMCs in PTC and what they mark as helpful or hinderance to their understanding and learning technical communication.

Sampling and Participants

To collect student data for my study, the sampling was partially dictated by the enrollment in courses taught by my four faculty participants. That is, the student participants for the observations were a convenience sample because quite simply they were present in the nine observed sections. Initially, I visited (physically or electronically) all 9 sections to present information about the study and to acquire informed consent from all interested students. From the 9 sections, I had a pool of 211 students whom I observed and solicited for post-design pedagogy phenomenological interviews (see Appendix C for interview protocols). Of those
solicited, 37 elected to be interviewed. Characteristics of the 37 student participants typically ranged across the following spectrum:

- 20 to 25 years old,
- Sophomore, Junior, or Senior student status,
- Experience in both online and face-to-face classrooms,
- Educational interests in agriculture, physical and life sciences, engineering, and/or information technologies, and
- Some with previous internship or professional experience.

The students taking part in the post-pedagogy interviews self-selected to participate. Students who did not wish to be included in the observational data were not recorded in the fieldnotes. Additionally, students contacted for interviews were not required to participate if they decided not to. There were no consequences for students who chose not to participate in observations and/or interviews.

During student recruitment, I used two different methods to acquire participants and one form of incentivization. First, recruiting students for inclusion in my observational records occurred during my first visit to each section when I introduced myself, the project, and provided informed consent information. Then I explained their ability to opt-out of observational records. In this way, I was able to receive direct notice from those who did not want to be included in my field data. No students opt-ed out of being observed. Second, recruiting students from the 4 online sections of technical communication for observations and interviews was handled via email. For these sections, the email replicated my in-person disclosure. Another email was used to solicit, setup, and coordinate post-pedagogy interviews. This email shared all the information regarding the procedures and activities related to the interviewing and secured informed consent
to meet with those interested in participating. All online student participants elected to electronically.

To increase participation, I used a raffle incentive wherein five gift cards valued at $10.00 each were given to students who took part in the study. Students did not need to participate in both parts of the study to enter. To be eligible, students only had to submit a signed informed consent form. However, students received a second entry for participating in an interview. This incentivized both parts of the study but did not necessitate both parts to obtain a gift card. However, individual participants were only eligible to win one gift card. At the conclusion of the study, all winners were contacted by email and gift cards were dispersed.

Data Analysis

Regarding the analysis of data received from my student observations and interviews, I revisited the grounded theory approach (Glaser & Strauss, 1967; Charmaz, 2006; Tracy, 2013) to remain close to participants’ experiences. I coded my fieldnotes and transcripts based on interpretations of the data to establish thick qualitative descriptions of my findings. Students post-pedagogy interviews yielded 12 codes across two categories (see Appendix F for student codebooks). I then engaged in thematic analysis (Boje, 2001) of each coded term to provide a generalizable appraisal of students’ perceived value, usability, and recognized benefits and constraints of design pedagogy in order to respond to my research questions. My research inquiry-driven, thematic analysis of student analysis resulted in 35 themes. From the sum of this data collection and analysis I was able to identify how well design pedagogy fit into the learning experiences of students in technical communication.

Global Limitations and/or Constraints

Despite the opportunities this study presents, several limitations and constraints exist and shape this research. These constraints are easily understood when categorized under a series of
superordinate terms: people, setting, investigation, and methods. Hereafter, each category’s restrictions and boundaries are briefly explored in regard to my research and each includes what was or may be required (now or in future studies) to address any concerns.

**People**

First regarding the constraints of people involved in my study, the number of researchers, faculty, and student participants all indicate cause for some consideration. And, as the singular investigator, there may be some questions about validity. Though I phrased interview questions not to be leading and was a non-participant observer in the classroom, the lack of secondary or tertiary coder to create reliability or confirm the establishment of themes leads me to desire additional research where more investigators are involved. Also, the lack of a non-investigator interviewer may have generated some issues with social desirability bias when interviews were done face-to-face. Similarly, the small number of faculty participants required acknowledgement. Given that only 4 faculty members participated in the study, the data variance may not be fully representative of full faculty assessment of design pedagogy for teaching technical communication. Thus, despite the depth and richness afforded by working with and probing a small number of faculty, there is room for increased coverage and learning from this participant group. Tuning to students, we see that in the observations and interviews the number of participants was acceptable. But, in future studies, greater incentivization will be required to increase the overall number of participants if quantitative assessment is to take place.

**Setting**

Second, the research site limitations ensconcing my study’s setting are indicative of problems common to these types of time-sensitive, intra-institutional studies for dissertation work. Working within the confines of a year to prepare materials for a unit, train faculty, and conduct primary research across multiple technical communication classes, I experienced time as
a major limiter for this project. Further, the complication of occurring at the same time as a complete curricular redesign made timing even more of an issue by reducing the number of potential faculty participants. Thus, time’s effect on the setting limited the study to less than a handful of faculty users interacting with the new pedagogy for only one unit and one technical genre. Notably, the study also faced the limitation of occurring within a single advanced communication department program. Hence, more time to include more faculty, more units, and more (and varied) institutions of higher education will be required to broaden the setting for my research into design pedagogy going forward.

Investigation

Third, the investigative constraints upon my design pedagogy research are perhaps the most impactful and difficult to overcome. Beginning with personal bias, I have set aside my enthusiasm for design theory and practices in PTC. This involved carefully constructing my interview questions, following mindful and open coding activities, and coming to know that I will learn just as much about the use of design for teaching technical communication via mistakes as I can from successes. Further, I had to temper my spirit with faculty and students to avoid coloring their responses, attitudes, and recommendations when collecting data in person.

The next major investigative constraint stemmed from the study’s inability to include assessment of designed projects. That is, due to the IRB exempt nature of my research, I am unable to impact, influence, or otherwise interact with the grades students received as a result of their coursework. This translated into my study’s lack of consideration for assessment or standardization of evaluation across sections. There was a common rubric that emphasized design learning, but there was not a great deal of training in design work assessment or committee grading or even design critiques that may have additive value in further research.
The last major component indicating constraints on my research was the lack of investigation into technical artifact comparisons. Going into this study, I planned to compare the instructions artifacts from traditionally taught courses with those from the design pedagogy courses. However, this product comparison was complicated by the previous IRB concerns over assessment and made nearly impossible to include alongside the already labor-intensive user-experience research. Ideally, future research will collect assignment products from traditional and design sections and do a thorough rhetorical and quantitative evaluation of the products to determine if there is a substantive and quantifiable difference in the quality of product outcomes. Collectively, these investigative constraints form the major research challenges I had either addressed, or intend to address, as my design pedagogy research moves forward during my academic career. In the future I will:

1) arrange for investigators who are removed and impartial toward the new pedagogy to decrease social desirability bias,

2) develop an IRB approved plan of inquiry which includes considerations for assessment and grading to be done by committee across multiple sections, perhaps even departments or institutions, and

3) team up with other rhetorical and quantitative research scholars to ascertain if the products created by students learning design pedagogy meet or exceed those created by students in more traditionally taught technical communication courses.

Methods

Last, some important research approach limitations exist for my research into design pedagogy in technical communication. As noted in the previous section, rhetorical and quantitative research methods examining the products of students using design pedagogy have not been used for this research project. As such, I cannot speak to whether or not the new design
pedagogy quantitatively improves the products or outcomes for the technical instructions unit beyond what faculty and students offer. As such, this study only addresses the stakeholder groups’ user experiences with the new design pedagogy. Thus, this study presents only the perceived use-value through the interviews, observations, and lived experiences of participants. These initial steps have been taken to improve the pedagogy for further development and to substantiate future inquiry into the assessment and evaluative results of the pedagogy. To acquire this rhetorical and grading-centered data, the future research I outlined at the end of the previous subsection during my professional academic career will be necessary.

This concludes the research methodology for my design pedagogy dissertation project. In the following chapter, I begin by illustrating the means for results reporting. Then I report the results for both faculty and student participant research groups in terms of their interviews, observations, and lived experiences. And last, I immediately follow those results with the discussion of my findings supported by past research.
CHAPTER 5. RESULTS

Having collected design pedagogy user experience data using phenomenological experience recreation, qualitative interviewing, and first-hand observations with faculty and student stakeholders in technical communication, I present and discuss the results in this chapter. Results reporting is followed by a discussion section organized by the major research questions and uses themes from the data to provide answers. Answers directly respond to the research questions of both faculty and student groups and they illustrate the user-experiences of design pedagogy. However, before the discussion of answers and experiential evidence, some additional guidance is necessary to aid navigation of the chapter’s content.

Navigating Chapter Contents

To begin, it is important to note that the data reported in this chapter is organized by three variables. It is ordered by: 1) the time of collection, 2) the research participant group, and 3) the interview question’s resultant codes within each data collection situation (i.e. faculty before using the new pedagogy, faculty after using the new pedagogy, and students after learning via the new pedagogy). Each of these variables scaffold and add depth to the analysis of how technical communication stakeholders experienced design pedagogy for instruction and learning. Therefore, to better understand the data reporting, we shall begin by discussing these variables.

The first variable organizing the delivery of data is the time of collection. During the reporting of results, the chapter begins with faculty’s pedagogical and technical communication background. Then, their experiences with communication design, design thinking, and design pedagogy prior to their participation in this study will be addressed. These initial inquiries provide the base knowledge and experience held by faculty regarding technical communication and the components of the new pedagogy before any intervention. Then, after faculty received
the first intervention in the form of communication design definitions, descriptions, and design thinking models, data will be reported offering their initial beliefs, predictions, and honest opinions about the new pedagogy. This data aims to provide their unbiased, initial impressions of how and what they will be teaching in technical communication during the instructions module. After the pre-design pedagogy training and deployment situation, the results of faculty’s post-pedagogy data collection will be provided. This data will be cross-referenced against the preliminary interviews to determine if the pedagogy confirmed or changed any of the faculty’s initial expectations, hopes, or concerns. Last, the results of students’ post-design pedagogy phenomenological experiences and interviews will be reported. These, too, will be checked against the thoughts and impressions of faculty participants to show where students’ experiences matched or deviated from those predicted and/or experienced by faculty.

As may be observed, the collection of results from multiple participants during the project indicates the need for the next variable, organization by group. The results of this study come from faculty and students using design pedagogy. Since technical communication faculty participated in pre-design pedagogy interviewing, their results are presented first. This not only allows disclosure of their foundational experiences, it also enables me to show what faculty thought that their exigencies and those of their students would be prior to disclosing if their assumptions were accurate. Thus, the reporting of interview data begins with faculty before design pedagogy, moves to faculty after using it, and ends with students’ experiences of design pedagogy after learning through it. Thus, as the participant group results were collected from faculty to students in real time, it is appropriate to progress by looking at the results using the same motion.
This brings us to the last variable, questions and the resulting codes from each data collection situation. During the pre- and post-pedagogy data collection, both faculty and students were asked a series of 9 to 12 questions about their design pedagogy user experiences and about the research topics guiding this project. Thus, as the results of each set of experience and interview data are reported, it is easiest to move through those results question-by-question. This linear motion through each group’s interviews allow for the exploration of the UX data to be richly illustrated through the use of relevant participant examples. Also, it primes the discussion of themes that respond to the principle inquiries of this pedagogical research.

Hereafter, the results of my phenomenological, qualitative empirical research into the user-experience of design pedagogy for technical communication faculty and students are provided and followed by a discussion and assessment of design pedagogy for technical communication.

**Pre-Design Pedagogy Faculty Results**

During the pre-design pedagogy interviews, I asked the 4 faculty participants to provide background information on their teaching experience, as well as their pedagogical approaches. Responses to these questions enabled the study to establish how instructors with different levels of experience and different approaches to teaching predicted their experiences with design pedagogy when compared to later learning and using design pedagogy. After these initial questions, faculty were asked to share their unbiased foreknowledge and experience with design pedagogy and its components. These responses were used to indicate how well-known, understood, and practiced the design-based instructional approach was prior to the study.

Then, after an intervention describing communication as design theory and design thinking practices, faculty were asked to make predictions and to give their unbiased opinions about the theory and practice parts of design pedagogy, focusing on how they felt the parts of the pedagogy would impact technical communication instruction and learning. The predictive data
will be used during discussion to examine if faculty’s user experiences turned out as they anticipated. So, in what follows we will move through these interviews collectively to discover faculty’s initial pre-design pedagogy responses.

**Previous Teaching Experience and Pedagogy**

As mentioned, faculty participants ranged from first time lecturers in the class, to Graduate Teaching Assistants with a few years of experience, to an Associate Teaching Professor with over a decade in technical communication. These individuals reported that they were going to be teaching both online and face-to-face sections of the course using design pedagogy. Also, they all indicated previous experience teaching in these two environments. Thus, the previous experiences of faculty participants indicate different levels of familiarity with the course, but common history teaching in the venues where instruction was going to take place.

In terms of faculty’s classroom pedagogy and treatment of multimodality and multiliteracy, all faculty indicated specific pedagogies and emphases that informed their instruction. Beginning with the most experienced participant, Pam, she indicated use of student-centered learning that utilized “process” and “collaborative” (lines 34-40) pedagogies was the foundation for her classroom approach. Similarly, graduate teaching assistants Paul and Cindy also reported use of these pedagogies, while adding “project-based learning” (Paul, line 54), expressivist interests (Cindy, lines 24-29), and “genre” pedagogy (Paul, line 38; Cindy, 53-54). Further, though having the least experience, Tarkir reported that he utilized aspects of all the pedagogies aforementioned, in addition to “W.O.V.E. pedagogy” and using new media “digital literacies” (lines 108-113). Only after inquiring about multimodality and multiliteracies of the other, more experienced faculty did they report modal-literacy approaches as part of their technical communication instruction—Pam, like Tarkir, discussing the use of W.O.V.E. and teaching digital tools, while Paul and Cindy added they both address document design (Paul, 70-
Therefore, a wide range of pedagogical approaches are at work in the instruction of technical communication courses and many of these are akin to characteristics present in the new design pedagogy.

**Previous Design Pedagogy Connections**

Turning to faculty members’ preexisting knowledge and experience with design pedagogy concepts (Communication-as-design) and practices (Design thinking), the next interview questions preceded the faculty’s introduction to the new pedagogy used in the study. These questions resulted in responses that establish faculty’s existent connections with any design pedagogy components.

**Defining Communication Design**

To begin, all 4 participants provided their initial, personal definitions of communication as design. Both graduate teaching assistants and the junior lecturer connected the concept of communication design to generating communication for users and/or audiences. Tarkir stated that communication design is using “well-structure[d] steps to design a communication toward your defined audience” (lines 158-159). Paul and Cindy stated that communication design related to “user experience design” (Paul, line 104) and fitting a message to audience “contexts” (Cindy, line 75). Pam, on the other hand, did not define the term using users or audiences specifically, but by indirectly implicating them as the locus for creativity. When speaking about the concept, she defined it as “design in order to complete…transactional communication…[and] for engagement” (lines 126-130). Thus, faculty participants see communication design work as the activity of creating a communication artifact that is predominantly focused on the user-audience and their situation.
Communication Design Experiences & Opinions

Starting with Pam, an extensive history of communication design work was discovered. First, while working as a communications specialist for Principle Financial, she reported working on many document design projects related to improving client correspondence (Pam, lines 112-117). Further, she also worked on redesigning the course shell for technical communication classes on the Canvas Learning Management System (LMS). Last, Pam indicated experience with document design and visuals she had while teaching “basic design things…in the classroom” (lines 139-142). Regarding her opinion on communication design, she shared that “it is vital” and that “a lot of the time for students it is an afterthought and it shouldn’t be” (line 109).

Next, Paul, like Pam, reported several experiences using what he defined as communication design. Initially, he described an experience being “a content producer for a freelance marketing service” (line 129). Then, he discussed working an “administrative job at CELT” (Center for Excellence in Learning and Teaching), where he deployed “strategic planning” to produce “web documentation and also in-person workshops” that engaged the target user audience in the new campus LMS (lines 128-148). On the subject of Paul’s opinion on communication design, he stated that “it’s wonderful” because “the planning and execution that goes into developing content and then putting that out for people is an important process” (lines 91-97).

Third, Tarkir also provides strong examples of experience he has had with communication design. Primarily, Tarkir reports that the majority of his design work came from his time in a doctoral-level instructional design program at Iowa State University. “While working as an instructional designer,” he claims, an example of the design work he did was
creating the content interface and elements of a “learning management system’s navigation panel” (Tarkir, lines 186-188). Additionally, Tarkir described designing email content and instructions for students in technical communication by defining user needs and expectations for electronic correspondence. Tarkir’s opinion on communication design activity is that it is important because it provides “a type of layout or roadmap for the designer…[and] for the audience…[so] they can easily be guided through the design I created or provided for the end user” (lines 144-149).

The last participant, Cindy, also had some experience with communication work as design according to her definition of the concept. She reported that she had had experience researching and “trying to make sure that people are able to understand information and…communicate” through “interface design” (Cindy, lines 78-84). Also, she indicated that she had been involved in redesigning content for students on the course shell for technical communication on Canvas. And, not surprisingly, Cindy stated that communication design work is “really important” because of “how it impacts how people are able to use things successfully and pleasantly” (lines 71-72).

**Defining Design Thinking**

Considering the practice of design thinking, 3 of the 4 participants offered an initial, personal definition of the process. Beginning with Pam, it is important to note that she reported that prior to engaging in this interview, she had not heard of design thinking. Therefore, she initially offered the topical, cyclic definition that design thinking is “thinking about design” (Pam, line 169). However, after a few moments, she elaborated saying, “it is…consciously thinking about design while you are working on something” (lines 175-176). This defines design thinking as a dimension of the cognitive process during creation. Tarkir, also seeing design thinking as part of a creative process, defined it as “a process in our mind…a way that will help
the audience or end user…[by] keeping [design] elements always in mind while designing” (lines 255-264). Despite Tarkir’s exaggerated focus on design in his example, his definition of design thinking shares Pam’s emphasis of a process that bolsters creative action while adding an investment in thinking about the user-audience. Last, Paul’s definition, notably one coming from an individual with a lot of design knowledge and experience from Human and Computer Interaction courses, labels design thinking a “popularized framework” involving steps to “emote, conceptualize, prototype, [and] evaluate” an artifact (Paul, 186-187). From Paul’s definition of design thinking we may recognize parts of his colleagues’ definitions, albeit indirectly within his own, and the addition of many facets defined in IDEO’s design thinking model, the same model which was adopted in this study. Hence, a wide range of participant knowledge, from very little to a great deal, is illustrated by the definitions of design thinking. This variable epistemological level and experience is further developed by questioning participants’ experiences using design thinking prior to acquiring their opinions on the process.

**Design Thinking Experiences & Opinions**

Concerning design thinking experiences, I’d like to start with Pam since I mentioned her lack of experience briefly above. Prior to this study, and out of all the faculty participants, Pam was the only one who had neither heard of nor used design thinking previously. Despite this fact, Pam later embraces design thinking in her honest statement on the subject. She proclaims she is excited to use the process as “a new tool” to teach technical communication (Pam, line 354).

Turning to the other 3 faculty, Paul, Cindy, and Tarkir all reported having heard of design thinking before across a series of different contexts. Paul discussed having “seen it a lot” as “the six dots” in popular publications on design work (line 189). Cindy indicated she had heard of it before, possibly in association with “UX stuff thinking about design” (line 105). Tarkir said he was familiar with design thinking from “working…with engineers” and “while I was taking
classes from the School of Education as a graduate student” (lines 242-243). However, despite these 3 faculty participants having heard of design thinking, some to a point where they had significant familiarity, none reported having ever used the process before either personally or during instruction in technical communication. Further, Paul and Cindy both posited reservations about design thinking. Paul said that there were “some iterative design things that [he] found more concrete and useful” (line 193), while Cindy claimed to be having “a hard time understanding how it is different than…[her] UX stuff” (lines 104-105). Thus, experiences and initial opinions regarding design thinking were notably varied.

**Teaching Design Language & Activities**

The last question in the pre-pedagogy interviews prior to the first intervention aimed at understanding faculty’s use of design language and activities in their technical communication instruction before the study. Interestingly, most faculty participants, 3 out of 4, reported little to no design language being taught in their technical communication courses despite half of them recognizing that they should teach more design language. According to Pam, some document design language, “typography, white space, videos, etc.,” is present, but she claims, “I really should bring more of that…into class, but I don’t always, to be honest” (lines 153-154). Cindy also indicated that she only teaches the most rudimentary of document design terms, while Paul and Tarkir pointed out that they do not use terminology outside “the writing process terminology” (Paul, line 154), citing either not “reinventing a standardized class” (Paul, line 171) or wanting “to get the first-hand experience [teaching the course] and then later making some customizations” (Tarkir, line 238). As a result, none of the faculty participants discussed using any design activities that went beyond document design or visual analysis practices outlined in the technical communication textbook prior to participation in this study. After this question, the first intervention of the research project took place.
The Intervention

Mid-way through the pre-pedagogy interviews, all faculty participants were provided with definitions and descriptions of communication as design and design thinking, the two major theoretical and practical components of design pedagogy. Also, they were presented with oral and visual information on the design thinking process. This information was provided in order to enable follow-up inquiries into each faculty member’s expectations for design pedagogy informed by the design theory and practices disclosed. Questions about design pedagogy’s expected benefits and challenges, influences, and impacts on teaching, learning, and assignments, as well as informed opinions were then asked. Answers to these questions will be used for comparisons during discussions at the end of the chapter.

Predicting Design Benefits & Challenges

Beginning with faculty predictions about the benefits and challenges of design pedagogy to technical communication instruction, each faculty member offered different possibilities. According to Pam, since design thinking parallels many of the creative processes of writing, “it would be pretty easy to introduce the concept” (lines 211-212); design thinking, she claims, “mimics much more what [students] are going to be doing in the workplace” (line 216). Therefore, Pam identifies design thinking in technical communication instruction as beneficial for the development of professional skills. And yet, she says that a particular challenge exists within the people—teachers and students—themselves. She states that “people get stuck in their ways” and design thinking involves “not only a new way of thinking for students, but a new way of thinking for instructors” (lines 246-248). This resistance to change is the reason Pam announced, “people are a challenge” for design pedagogy (line 254).

Similar to Pam, Tarkir predicted that design thinking in technical communication courses will help “prepare these students for [the] workplace setting” (line 385). But, he identifies this
potentiality arising from instructors using design thinking to redesign their course’s “readings” and “assignments” by getting information “from professionals in the field” (lines 378-381). Hence, his focus is much more teacher focused, in terms of benefits to technical communication, than student focused. Last, as it concerns challenges, Tarkir did not predict any challenges for teaching with design pedagogy in technical communication.

Shifting to Paul, the faculty member most familiar with design thinking, he offers a trio of potential benefits design instruction may create. First, he claimed, “I think the process [of design thinking] would help students become more user centered or audience centered” (lines 255-255). Second, he predicts that students learning to use design thinking for “technical documentation” would benefit from enacting “the ability…[of] identifying problems” (lines 261-262). Third, he lauds the potential for students to learn how to be “more empirically driven” when making communications “because they are actually interacting with the users [and] getting feedback” while using design thinking (lines 265-266). However, Paul strongly iterates the key challenge to teaching design thinking in a technical communication classroom is making the experience replicate “real life activity” (line 290). He points out that to enact design thinking for a technical artifact, “you need to communicate…to other people,” and in the classroom we often “don’t have users or problems” (lines 276-286). This is the biggest challenge Paul indicates, while saying aside that “you could replicate the same thing,” but to do so you need “time” (lines 285-290).

Closing with Cindy, she too offers a few words on the potential benefits and challenges of teaching with design pedagogy. Regarding the benefits, she identifies user-based planning instruction as the main benefit to teachers and learners. She states that using design thinking helps to teach students to “consider your users and what they need” (line 176). However, she
indicates the perennial challenge facing any new addition to a class, fitting the new approach and content into the existing curriculum. Cindy states she’s worried that “the curriculum right now is not tailored to doing this type of work” (line 177-178), the work associated with design thinking. Therefore, she presents a common challenge many have faced when proposing changes to instruction within a course.

**Contemplating Design Thinking’s Impact**

Segueing from faculty predictions regarding the benefits and challenges presented by design pedagogy, this section addresses questions about how faculty believe design thinking will influence their teaching, students, and assignments. These three areas were singled out as being of great concern to any new pedagogy because they address the major stakeholders and course products.

Beginning with Pam, she revisited her belief that the new pedagogy, especially design thinking, would improve her teaching. Also, she posited that learning the design thinking process will not only advance her students’ professional skills, but it will help them see technical communication as “a worthwhile class” that is “applicable” (lines 274-279) to their work as engineers, more than merely a required course. And, as far as assignments were concerned, Pam expressed some concern about being “a little more open minded to what submissions look like…if [students] are truly enacting design” (lines 306-307), as well as “mak[ing] sure that [teachers] are evaluating it and…evaluating it well” (lines 297-299).

Concerning Tarkir, he indicated that design thinking would likely influence his teaching by increasing his focus on being better able to meet the needs and expectations of professional technical communication positions. He claims that students learning design thinking may become more “aware of what they are doing“ by increasing their “metacognitive thinking” (lines 409-410) while empathizing with user audiences and responding to their problems with technical
documentation. Further, Tarkir points out that the greater focus on forming student groups into design teams may help them collaborate in such a manner that “everybody brings their own strengths…to the project” (lines 415-416). On the topic of assignments, Tarkir offered no response.

From Paul’s perspective, the way design thinking influences his instruction most notably is seen via how the products of his assignments may be impacted. According to Paul, “if you really say okay students, use design thinking to explore some product out in the world and then come up with user documentation…I think there is a wider range of products that will result” (lines 302-304). This was a major concern for Paul as most of his technical communication courses are taught using a product-driven approach, especially online; wherein, he likes to compare his students’ work to preexistent models. Additionally, as far as the impact on students was addressed, Paul also seems to have reservations on their behalf. He claims that the design focus “would change their activities and the processes,” (line 317) all while putting pressure on him to maintain the same learning goals from their assignments. Therefore, the assignments he teaches would be impacted. Working with the new assignments, he says, “I think that [they] would change and be more difficult to grade” (lines 304-305). Hence, Paul raises some important concerns about how design thinking may influence his technical communication class.

Returning to Cindy, she, like Pam and Tarkir, believes that learning to teach design thinking may positively influence her teaching of technical communication. She says, “I think it will be helpful for me overall as an instructor” (lines 183-184). Regarding the impact on students, she believes that “they will like it,” and it may help them work better during “team-based” activities where they may learn “even more [about] coming together in a group” (lines 186-193). But, in terms of the impact on assignments, Cindy, like Pam and Paul, voiced some
concern about the difficulty to “grade this” and how the products “would change pretty drastically” (lines 199-206). Thus, while the potential for improved teaching and learning outcomes are present, concerns about assignments and course cohesion exist.

**Honest Opinions on Design Pedagogy**

Rounding out the preliminary faculty interviews, all participants were asked to give their honest opinions on the use of design pedagogy for teaching and learning in technical communication. Each faculty member offered their candid response on both the topic of the communication design approach and the inclusion of design thinking processes for use in technical communication. Generally speaking, all opinions were positive, excepting Paul’s concerns about design thinking. Here is the gist of their responses.

According to all faculty participants, the use of the communication design approach to teaching technical documentation was met with only positive responses. Participant responses ranged from excitement, to liking the approach, to recognizing it as very important and/or good practice. As a typical example, Cindy stated, “I really like it…I think that it goes well with what I do any way. So, …it is exciting for me” (lines 213-219). Design thinking, on the other hand, yielded a typical response more likely to note how “it seems promising” (Paul, lines 332) for a number of different reasons—it’s “a new tool” (Pam, line 371), “a well-defined method” (Tarkir, line 452), or “exciting”(Cindy, line 219). However, Paul remained concerned “about…the realness of the practice with the time constraints, [and] the realness of the problem” (lines 213-214). Therefore, it is important that we not only keep an eye out for the positive experiences, but also to see if any of the negative aspects of design pedagogy were manifest in the post-pedagogy experience recreation and interviews.
Post-Design Pedagogy Faculty Results

During the post-design pedagogy inquiries, 3 faculty participants first enacted their phenomenological experience of instruction during the design-based unit in technical communication. By recreating faculty members’ lived experiences with design pedagogy, we may get a sense of the relationship between their embodied experiences (mind, body, and environmental) while they used the new pedagogical approach first-hand. Then, faculty participated in a reflective segment of these interviews using their recreated experiences to develop and support their responses, during which they contemplated their individual lived experiences with the pedagogy in order to address a series of questions. First, they addressed questions about how design pedagogy fit within the technical communication curriculum. Second, they answered questions about how they responded to communication design and design thinking as part of their instruction. And last, they discussed how they felt students responded to learning the main components of the new design approach to technical communication via their combined perceptions of how well the class went and what they were able to observe.

Unfortunately, Cindy was unable to participate in the post-pedagogy interviews due to issues with her study-abroad section of technical communication. However, all other participating faculty did recreate their lived experience teaching with design pedagogy and answered questions about how well it fit into their courses, and how it meshed with their teaching, how students responded to it, if they would use it again, and what they would change about it. Answers to each question based on experience and reflection are provided in this section.

Faculty’s Phenomenological Experiences

Beginning with faculty participants’ lived experiences using design pedagogy in technical communication, mental, physical, and environmental impacts were reported. The following provides an account of these brain, body, and environment experiences.
Cognitive Lived Experience

Beginning with the cognitive state of each faculty participant, at the beginning of the instructions unit both Pam and Tarkir experienced anxiety. According to Pam, she was nervous “because ideally, I wanted [students] to feel like this [design content] was coming from me” (line 106). Also, she reported experiencing stress due to lacking the “safety net of knowing,” not only the content, but what she could do “if we run short on time” (line 142). This statement seems to suggest the inclusion of design pedagogy and its content disrupted Pam’s comfort with a course she already knows well.

Tarkir too experienced this form of mental anxiety when starting the unit despite having limited history teaching technical communication. He stated, “I felt sometimes questioning, am I able to convey this information correctly to students? Does it make sense to their minds?” (lines 147-148). Interestingly, Tarkir reported this feeling even though he indicated the design approach “makes sense” (line 136), and it was an approach toward teaching technical communication that may offer him a way “to facilitate the thinking of students” (line 137). Paul, on the other hand reported that teaching with the new approach felt “pretty similar” (line 109) to what he was already doing. However, he did experience “a little frustration because I had to make sure everything was aligned [and] all the readings were there” (line 114-115). Thus, rather than feeling anxious, Paul’s initial mental state was frustrated. But, after these early mental impacts, all three faculty reported quickly becoming optimistic about their inclusion of design pedagogy in technical communication coursework.

As the technical instructions unit progressed, Pam reported being not only excited by “trying something new” (line 141), but elated that her students were “getting it” (line 130). Tarkir felt reassured and excited that the design thinking module was helpful and “the topic seems to be showing some kind of a guideline, a cyclic step, a process that students could think
about” (lines 169-171). Paul reported that he was at first “optimistic and hopeful” and later “excited about a design process…in general” as part of his technical communication course (lines 143-147), citing that it would help his students be more empirical about the way they created user-facing communications. Hence, even though all faculty were at first mentally taxed by incorporating design pedagogy into their course, they quickly became more comfortable with and positive toward its inclusion.

Physical Lived Experience

The embodied lived experiences of the faculty participants teaching technical communication using design pedagogy were markedly different. According to Pam, though at first she experienced the sensation of panic sweep over her at the beginning of the module with the new approach, after a short period using it the first week she said, “I felt better about the way things were going” and this “made me feel a little less sweaty” (lines 122-124). The reduction in acute physical nervousness coincided with increased comfort and Pam feeling like “I have done a better job teaching instructions and their design than I have been [doing] in the past” (lines 479-480). But, not all the embodied experiences reported at the end of the unit were positive.

Despite his growing optimism during the design-based unit, Paul’s initial frustration came back to visit him at the end of the technical instructions assignment. According to Paul’s account of his bodily experience when grading students’ submissions, he experienced “that kind of hollow stomach feeling when you…are in a position where you need to do something but you don’t really think you can do it well or fully” (lines 172-174). This negative bodily reaction to the feeling of inadequacy stemmed from Paul’s worry about being a false representation of the real user audience and his non-identification as a designer. This may indicate Jetnikoff’s (2015) concern that rhetorically trained communications instructors might question their ability to assess multimodal communication designs. In any event, Paul claims, “I think if you are holding true to
a design process, you want real users doing that evaluation…So, I felt pretty hollow stomached about the end” (lines 180-182). Therefore, not all physical experiences were positive, some were negative, and, in the case of Tarkir who reported “I didn’t feel such things” (lines 146-147), they were nonexistent.

**Environmental Lived Experience**

Concluding the phenomenological lived experience recreation, two faculty members provided insight into how their different teaching environments impacted the experience of technical communication instruction with design pedagogy. First off, Pam offered that teaching communication design in the hybrid classroom space led to important CMC discussions. Because her class spent half of the week in a UX inspired computer-lab and the other half in a regular classroom, discussions about students’ instructional artifacts—their appearance, accessibility, and usability—came up regarding how these would be experienced across different devices and platforms. On this topic, Pam indicated that switching classrooms placed constraints on access to technology creating situations where not “all students have laptops, they had smartphones…which led to a discussion about how…[artifacts] look on a smartphone verses a laptop… as something we can think about when we are creating instructions” (lines 185-187). This environmentally influenced discovery, she admits, is an important aspect of technical communication that “I did not really talk about before this. I did not even really think about it to be fair” (Pam 194-195). Therefore, the combination of teaching communication design and the hybrid classroom environment created instruction in an important facet of modern digital communication for Pam and her class.

Shifting to Paul’s environmental experience, he did not report any profound outcome or influence was reported. Instead, Paul indicated that teaching with design pedagogy in his online technical communication setting felt “pretty similar” to his standard practice (line 109). He
pointed out that the activities, materials, and delivery “were very similar to the pacing of the course of previous weeks” (lines 109-111). So, the environmental impact on Paul’s experience teaching communication design and design thinking was null by his account. This concludes the lived experience recreation of faculty, which they next reflected upon to answer my traditional qualitative interview questions.

**Design Pedagogy’s Fitness for Technical Communication**

After completing the recreation of their experiences teaching the design pedagogy unit, all faculty participants were asked to compare and contrast their traditional pedagogical approach with the new one based on their experiences in the classroom. From her experiences, Pam saw design pedagogy as filling a gap she had previously identified in her own technical communication instruction. She stated, “we say that design is important, but we spend a whole lot of time talking about it in one assignment and that is about it” (lines 230-231). So, by introducing the new pedagogy, Pam felt “more confident having this tool” to encourage students to “really think about design more” (lines 229-230). Further, with the new approach, Pam’s experience teaching the class, though similar, was “a little better in terms of engagement and the things that [students] were saying” and doing (lines 386-387). In fact, Pam claimed that the results she was seeing were “so much better” than those afforded by the pedagogies she used during previous units (line 391).

According to Tarkir, his experience teaching design pedagogy “was more like showing the overall big picture” (line 237) for students to consider when designing technical artifacts for a user audience. This conflicted with his traditional approach to teaching similar genres wherein he would “probably…focus more on the instructions themselves…focus[ing] more on the genre characteristics of instructions” (lines 227-234) over the process behind their generation. What this meant to Tarkir is that he felt he did not “take a look at the language features which are
characterizing instructions in more detail” (lines 235-236) and this left him feeling conflicted about the quality of his instruction. However, he did feel that his students did get a useful and helpful process out of the design pedagogy instruction.

On to Paul, he again reported the similarity between how he normally approaches teaching online and how he approached the use of design pedagogy and its content. However, he pointed out that “this new approach lacked the generic artifact for each step” (line 213). This clashed with his “typical approach,” one that “is very artifact and genre driven” (line 212). As a result, Paul criticized design pedagogy activities saying, “if there was a more concrete genre for each one that I could assess…it would fit more seamlessly into how the interactions go in the course” (lines 221-223). Hence, Paul’s product driven pedagogy conflicted with the design approach’s open stance toward artifacts; but, he claimed, “in the future” open-ended artifacts responding to “user interviews and user evaluation…may be the way the field is going, it seems like” (lines 287-289).

After reflecting on their experience teaching previous units in technical communication verses the design-based unit, all faculty offered their assessment of how well design pedagogy fit into technical communication. Pam claimed that she “can easily tie design to what we have already been doing” (line 159). Also, she indicated that the class “[has] already been doing this process, it just, I did not use those particular terms” (lines 290-291). So, Pam’s experience solidifies design pedagogy as a good fit for technical communication saying, “for me, it fit well” (line 290). Tarkir shared the same opinion about design pedagogy’s fitness for technical communication. He stated, “I think in terms of fit, it feels pretty relevant considering that we, for example, empathize for some earlier assignments and audience considerations” (lines 267-268). At length, he adds, “because of the North American tradition, we tend to focus more on the
process of writing...[and] design thinking is also based on the process from start to finish” (lines 276-285). Thereby, he too indicates design pedagogy fits within technical communication. Paul, again an outlier as indicated previously, claimed that design pedagogy did not fit well with his product-centric approach to instruction, but did indicate that the integrations of communication as design and design work may be where technical communication is headed. Therefore, all faculty reported the fitness and/or potential for design pedagogy’s inclusion in the teaching of technical communication.

**Communication Design & Design Thinking Instruction**

Having established the faculty’s stance on the fitness of design pedagogy for use in technical communication, faculty participants were next asked questions meant to examine how teaching communication as design and design thinking went in their classrooms and what they liked or disliked about either the theory or the practice. Starting with teaching a communication as design approach, faculty each reported a different experience. Pam found the approach to be a beneficial tool for teaching the creation of technical instructions for users. Her view of the concept as a tool resulted in her “feeling more confident in teaching technical communication and having more of an ability to talk about design” (lines 258-259). However, Pam was critical of how well she was able to deliver the design thinking process content. She said the delivery “was not the best” despite the fact that “the content was good” (lines 354, 369). In the future, she says, “I would probably do something different to work through that material, but you know, it was the first time” (lines 471-473).

Next, Tarkir was also concerned with the delivery of the design-based module’s content. He pointed out that while he liked “the framework and looking at the big picture [by] considering other constituents like the user, the environment, and the medium,” (lines 255-258) he was “concerned from [his] side” about “making the examples relevant to what [students] do in their
lives; like video production” (lines 155-156). Also, though he liked that “the design thinking process gives students an idea about when to start and which things first they should be looking at” (lines 197-199), he indicated that he struggled to help students connect with some of the multimodal aspects of using design thinking to create communications. He said, “if I were able to show [multimodality] while I was teaching with the design thinking materials, I think it would be much more effective” (lines 220-221). As such, Tarkir came away from the teaching experience liking design pedagogy instruction, while advising some care and caution.

Last, Paul talked about his experiences teaching communication design and design thinking with mixed feelings similar to his peers. Starting off, he indicated that he was very “excited about a design process” for the course and its potential to “bring about people who could think about making communication in a more sophisticated and empirical way” (lines 143-149). However, he did not like that “the discussion artifacts were discussions,” indicating he would have preferred students “write a report on the methods or something” (lines 299-300). Ultimately, Paul indicated a great deal of concern about the amount of time that could be dedicated to using design pedagogy and teaching its concepts. He said, “I do not think there was really space for it… I mean because the discussions are each an activity and then they submit their final draft, and … a draft in between, at no point do they describe their process to me” (lines 256-258). This realization left Paul unsatisfied with the design thinking teaching experience he had provided. Thus, between Paul, Tarkir, and Pam, their reflections on teaching communication design and design thinking are characterized by multiple positive and negative experiences.

**Communication Design & Design Thinking Learning**

After faculty assessed their instructional experiences, they were asked questions about how well their students seemed to respond to communication design and design thinking and what they observed concerning the quality of students’ learning. This resulted in responses that
illustrated faculty perceptions about how well their labor was translating into learning these concepts among students. Also, it will be interesting to note what faculty saw as students’ experiences verses what students report later in the chapter. This may open up an avenue for exploration and discussion about design instruction and learning experiences and how they are understood between these two groups of technical communication stakeholders.

Looking first to Pam’s assessment of her students’ experiences, she describes their attitudes toward learning communication design and design thinking by saying bluntly, “they rolled with it” (line 166). On the whole, when confronted with communication as design, Pam says that “they responded well” because “at this point [students in technical communication] are getting close to graduation and they are getting close to ‘oh no, I am going to have to do this for real’” (lines 317-321). According to Pam, the nearness of the workplace experience made her students realize communication design is “something they will use in the workplace” and that it is “something that can be beneficial to them” (lines 317-324). However, when the material on design thinking became dense or there were not enough practice breaks, she feared students “just stopped listening to me talk” (line 372). But, despite the seeming inattention of students, her final assessment of their learning was that she “did not sense a difference in how they approached it [in class],” but “they spent more time thinking about design [when] they had not in the past” (lines 396-397). Thus, Pam reported an increased attention to communication design based on user needs and expectations. She indicated that this attention made for more pleasing results in the submissions—results that may indicate improved ability to meet learning outcomes.

For Tarkir’s students, the results were less promising. When initially reporting how his students reacted to learning about communication design and design thinking, Tarkir cautiously stated, “I cannot say they were quick to get into the idea,” before flatly offering “at first they did
According to his classroom based-assessment, students’ initial reaction to design concepts, especially design thinking, was that “this topic [is] a little bit time consuming” (line 349). Tarkir claimed his students indicated that addressing “multimodality…text…visuals…referencing” was too much work and this resulted in their reversion “back to the traditional ways [of print communication]” evidenced by their submissions (lines 349-352, 341). However, during the in-class design instruction, Tarkir did observe that students were learning that “they had to think about such things,” (e.g., multimodal designs for solving user problems with instructions) in ways that “forced them to think more outside of the box” (lines 249-250). Therefore, even though students submitted artifacts that exhibited more attributes of traditional print instructions according to their instructor, they had the experience of exercising their thinking processes for the creation of more multimodal materials.

Closing with Paul’s assessment of his students’ learning, he observed some positive results illustrating students were “connected with” communication design and design thinking in his class (line 272). On the subject of learning communication as design, Paul reported that his students had some initial “trouble with terminology” (line 230), but “evidence in the discussions for each activity [showed] that they were doing the activity” and “they were not skimping” (lines 251-275). He recounted that their long discussion posts “indicates at least some level of interest” and “from their…local nature of behavior, the kind of analysis of their own experience identifying artifacts that are close to them, [it] seemed like they had a connection to [the process]” (lines 275-278). In other words, Paul was observing that his online students were invested in the design activities and discussion and were personalizing their use of the design thinking process, illustrating engagement and interest that made learning design meaningful to
them. However, again when it came time for final submissions, his students “defaulted to previous expectations” (line 241) by producing predominantly textual artifacts. About this end, Paul stated, “I think the students need more encouragement or more kind of requirements to go outside of the norm, to go out of the normal process” (lines 237-238). So, yet again, learning was evident, concepts were valuable, but traditional expectations for textual artifacts in a communication class shaped production.

Design Pedagogy’s Future in Technical Communication

With a strong sense of design pedagogy’s fitness for inclusion in technical communication, as well as how instruction and learning played out regarding the approach’s key concepts, faculty were asked if they would teach using the communication as design approach and design thinking practices in their courses again. Additionally, they were encouraged to provide what changes or recommendations they would make with regard to the new design pedagogy. Here is what they reported.

On the subject of using design pedagogy and teaching communication as design in technical communication, all faculty participants indicated that they would indeed repeat the approach in subsequent courses. According to Pam, “it sets the stage nicely to say, ‘yes, we are writing, but we are also designing,’ and it also gives [students] something to [use] and look at” (lines 349-351). Because of the practicality Pam observed, she indicates that in the future she would use design pedagogy as a “framework to the entire class” (line 334). Tarkir also stated that he “would teach it because [of] the focus with multimodality and digital literacies and other types of computer literacies” (lines 329-330). So, the currency and relevance of the design approach to communication was deemed valuable to contemporary technical communication students. And, Paul as well indicated the value to students is “a: ingrained in [learning] the process and b: [the] terminology for user evaluation” (lines 282-283), which he sees as important
to teaching the creative processes behind technical communication work. Therefore, regarding the pedagogy and design approach, all faculty reported they would use them again.

Concerning if they would teach design thinking again, all faculty indicated that they would, but more caution was evident. While Pam and Paul said they would teach design thinking again without hesitation because of how well it fit alongside “the writing process” (Pam, line 380) and provided learners tools “for user evaluation” (Paul, line 283), Tarkir was apprehensive. He said, “I think I would use it probably cautiously” (line 369). He indicated that the use of design thinking would “depend on…my students” and if they were “open” to “use of innovative approaches” (lines 369-373). Hence, though all faculty indicated they may use design thinking in future technical communication classes, there was more pronounced concern about how it may work in relation to students.

Once faculty concluded reflections on if they would use the design pedagogy approach and concepts, they offered experience-driven recommendations for the continued use and improvement of design pedagogy for technical communication. As there were many varied responses to this question that will be discussed thoroughly later in discussion and during the final chapter dedicated to recommendations, I provide only the most often reported recommendations and examples in this paragraph. First, the most popular recommendation conferred by all faculty was to teach using design pedagogy and content throughout the whole semester. This recommendation was made in order to provide more “lessons which reflect multimodality” (Tarkir, line 215), time for “theory and [to] build on it as you go” (Pam, line 435), and “more time for each part of [the design thinking process]” (Paul, line 319). The next recommendation expressed by all participants was for the improvement of delivery mechanisms. Pam indicated that she wanted to use PowerPoints, Tarkir sought more multimedia examples,
and Paul wanted to provide media lessons to support students’ work with non-traditional, non-print technical artifacts. Therefore, as these primary recommendations illustrate, faculty recognized the need for more time and more multimodality to improve design pedagogy instruction in technical communication courses. Responses to this question concluded faculty’s post-pedagogy interviews.

**Post-Design Pedagogy Student Results**

Moving from the faculty to student group, my use of the post-design pedagogy phenomenological experience recreation and reflective interviewing of 37 student participants aimed to reveal their learning experiences during the instructions unit in technical communication. Looking at student’s lived experiences learning communication as design and design thinking, we may see first-hand the relationships between their embodied experiences and their learning via the new pedagogy. Through these relationships, we may come to understand the effect of this new approach on learning technical communication. Then, from their lived sense, they, like their faculty counterparts, were asked to reflect on their experiences to answer a series of traditional interview questions that assist our learning about the attitudes, assessment, impact, and contribution of the new pedagogy.

During initial data collection, students addressed their feelings about their learning experience. These phenomenological discussions allowed them to break down and discuss any mental, physical, or environmental responses they had while learning via design pedagogy and helps us to understand how the learning situation influenced their experience. Second, they contemplated technical communication as design and responded to if they thought technical communications were the result of design work and if their composing practices changed as a result of learning the design approach. Answers to these inquiries may yield information showing not only how students associated communication and design within the technical fields, it may
also indicate if learning via design pedagogy influenced how students actually compose technical artifacts. Next, students turned to a discussion of design thinking by reflecting on their experiences using the process, whether it was helpful or hurtful, and any positive or negative effects it had in use. The students’ answers to several questions about learning and using design thinking are aimed at discovering what impact this practice may actually produce in technical communication students who experience it, getting at a core focus of this project of interest to technical communication instructors at large. Last, students were asked to compare using the design thinking process for composing during the instructions unit to using the traditional writing process (e.g., Murray’s (1997) concept of prewriting, writing, rewriting) used for earlier assignments in their course. This inquiry yielded the strengths and weakness students had using what they learned from design pedagogy via comparative analysis with their previous learning, which also produced discussions of students’ learning experiences during the unit overall. Hereafter in this section, we move through students’ recreated experience and interviews question-by-question to discover what they may have to offer about learning via design pedagogy in technical communication.

**Students’ Phenomenological Experiences**

Starting with capturing data on students’ phenomenological experiences, they were prompted, then guided through recreating their in-class learning with design pedagogy during the technical instructions unit. As a result, students’ mental, physical, and environmental experiences were reported. The following provides an account of students’ typical brain, body, and environmental experiences.

**Cognitive Lived Experience**

When asked to discuss their first reactions and initial feelings about design thinking lessons, 23 out of 37 (62%) students reported that they had a positive cognitive experience to
learning about design in technical communication. Out of the 23 positive respondents, 8 (35%) indicated that they were excited, of which Mohammed provides a typical reaction. He proclaimed, “I was excited to see that we were even talking about [design] as it is one of my favorite parts of projects and only rarely gets discussed” (lines 13-14). Further, 7 more participants (30%) voiced being interested in communication design. Trisha said that design “would be an interesting aspect of the technical communication field because design is not discussed too much in [her] engineering courses” (lines 11-12). However, 5 other students (22%) said that design was important to and familiar from their core curriculum. Participant Corrinia stated that she felt design, “something [she] used…in the context of engineering,” was useful and “can be applied to a lot more” (lines 11-12).

However, not all students appraised their initial mental response in a positive manner. Several student participants, 8 out of 37 (22%), claimed they were uninterested as their initial reaction to learning design in technical communication. For example, participants like Ricky and Ben both reported that they felt no “strong opinions” or “big initial impression” (Ricky, line 10; Ben, line 185). Perhaps worse, a few students, 4 out of 37 (10%) reported feeling confused or worried by the inclusion of design in technical communication. One participant, Jessica, for example, said that she was “stressed [about] how we are going to get graded on it and how much of [the] creativity is going to come back to bite us” (lines 118-120). However, this particular response was an outlier as the number of initial positive responses to the design pedagogy unit outweighed initial negative ones and neutral ones. Out of a total of 57 expressions illustrating students’ reactions to the introduction of design into their courses, 31 were positive, 7 were negative, and 19 were neutral. Thus, the majority of students’ initial expressions about their
cognitive experience of learning via design pedagogy in the technical communication environment was positive.

**Physical Lived Experience**

Regarding students’ physical experience while learning communication as design and design thinking, very few students discussed bodily manifestations that were positive, negative, or neutral. Out of the 37 participants, only 9 provided accounts of their experiences that were related to the body. Among those 9 accounts, the predominate change in bodily states reported by students learning and using communication design and design thinking were: stimulation / excitement (per their mental state), manifestations of stress or fear, and increased comfort or relaxation. Beginning with the physical state of excitement, student participants like Jared described being “surprised that [they] were using design thinking in an English course, but also excited [because they] were comfortable using the processes that entail design work” (lines 11-13). But students who reported the unfamiliarity of design concepts, like Staci and Jason, described being “scared” or “stressed out” (Staci, line 10; Jason, line 8), a typical physiological response to learning new material. However, over time, most participants grew accustomed to the design-based communication instruction and though some may have “felt pretty lukewarm about it” at first (Jessica, line 88), most like Ben and Jared felt physically “relaxed…no high stakes being felt” once they were “comfortable” (Ben, line 70; Jared, line 12). Therefore, the few physical experiences reported by students learning design in technical communication were presumably common classroom bodily responses seen as students engage with new information and learn to use it.

**Environmental Lived Experience**

Concluding students’ phenomenological lived experience recreation, very few students discussed how they experienced learning communication design theory and design thinking
practices in the contexts of the technical communication classroom. Ben, the student with the most to say about his learning environment and how it shaped his experience, reported that “in Durham 141 you are at these tables and you are facing other students, so [there is] more emphasis on discussion” (lines 124-126). Further, he adds that the regular classroom space restricted this aspect of the design team learning experience by having “everyone…facing forward [so] the only face that you really see is the teacher” (lines 127-128). From this student’s experience in the learning environment, it seems that the pod style learning space of the UX centered, design classroom is particularly advantageous for design pedagogy. Meanwhile, the traditional classroom had less to offer to the design pedagogy learning experience. Additionally, Jared offered that by having “design thinking as a part of my everyday life…in my classes, [it was] a great way to get ideas out quickly while being analytical at the same time” (lines 25-27). Hence, learning via the new design-based pedagogy was reported as being valuable in the technical communication classroom environment, especially in UX focused spaces for learning.

**Attitudes toward Design Pedagogy**

Similar to students’ experienced-based reactions to learning about design in technical communication, the first question they were asked to reflect on based on those experiences was how they felt about design pedagogy in general. This inquiry yielded not only meaningful responses dealing with students’ feelings after learning via communication design pedagogy, it also provided insights into how it connected to them and their professional interests.

As students reflected on their experiences using design for technical communication, 33 out of 37 students (89%) spoke about their positive feelings toward design for the purpose of conveying technical information to user-audiences. Of the 33 represented, 18 students (55%) indicated that during the design-based unit, they enjoyed the new approach, found it to be more fun, and claimed that it increased their creativity. Responses like, “I liked it better because I felt
like there was more freedom” (Connie, lines 35-36), “I have an appreciation for the creativity…involved in it” (James, line 8), and “it is kind of a fun thing [to do]” (Jessica, line 113) were frequent and may have indicated that students connected with the new material and practices. Further, another 14 students (42%) out of the 33 positive respondents indicated communication design work and design thinking practices were important to technical communication. Mohammed’s response highlights this common sentiment by saying, “design is one of the most important parts of sharing information and ideas in a modern world that is very full of information and ideas” (lines 8-9). He added, “not only can it catch the attention of readers, but good design helps structure information in a way that makes it clearer than good writing can do on its own” (lines 9-11). This statement and others indicate how strongly students felt about the importance of design, while resonating the established recognition of that importance iterated by the document design community.

However, a small sample of students expressed mixed feelings toward design after recounting their lived experiences. Out of the 37 participants, 4 (11%) indicated that they had experienced stress, discomfort, and/or a sense that design was unimportant to technical communication work during the unit. For example, Jason expressed that “it stressed me out because I want my work to look good” (line 8), while Jim said, “I feel like I have a much better understanding of how design thinking works for communication, but I am not sure that I am completely comfortable using the design methods yet” (lines 8-9). Statements like these may illustrate that though students were concerned about their design work and strived to do well and understand it better, they were not necessarily confident in their abilities after a single unit. Thus, though the majority of students’ feelings about their learning experiences after the design-based
unit were positive toward the approach and practices, there is evidence indicating room for improvement that will be taken up later on.

In any event, students’ feelings toward design—its importance, relevance, and exciting, creative nature—were often reported alongside connections between the new approach in technical communication and their own professional or programmatic experience or interests. That is, though students were not explicitly asked about how communication design or design thinking activity connected to their majors, disciplines, or careers, these relationships were reported by several individuals during interviews. Out of the 37 participants, 18 students (49%) associated design and design thinking with their student and/or professional lives. Engineering students like Abby said that “design is mainly what I would like to do for a career as an engineer” (line 8), and that she “had experience with design thinking in [her] engineering courses as well as some programs [she is] involved in outside of class” (lines 22-23). It is important to note here that 6 of the 18 participants (33%) who connected learning via design pedagogy to other aspects of their student and professional careers were, like Abby, from engineering programs. But, no matter what background the students were from, whether they connected the design approach to courses, majors, internships, or future careers, 15 out of the 18 students (83%) who reported a connection between design learning in technical communication and their lives saw that the communication as design approach and the design thinking practices were important to their future success. Many students like Mick reported that “design is important to the creation of all things [because] it allows for thought to go into many aspects, such as aesthetics, functions, audience, etc.” (lines 8-9); and therefore, Mick and other students like Kim felt that design “is an important skill in research and…in STEM fields [that] will be beneficial to [their] future” (Kim, 21-25).
Responding to Technical Design and Composing

Having reported students’ attitudes toward learning with the new pedagogy, their responses to the next interview questions probed whether or not they felt technical communication artifacts and the work that went into them was really design. From that answer, students were then asked if learning technical communication as design had changed their own composing activities in anyway. Taken together, answers to these questions were evaluated to discover: 1) if the new approach to learning what a technical communication artifact is (i.e., technical communications are purposeful designs resulting from design work) was believable and credible, and 2) if students thought technical artifacts were design, were they willing and motivated to adopt any new design-centered processes into their established composing activity. The intent of these inquiries was to justify the teaching of technical artifacts as design and gauge the rate of acceptance and/or students’ willingness to adopt design thinking for composing technical communications.

Beginning with the question whether technical communication artifacts are designed, students overwhelmingly stated the affirmative. Based on the 36 students who responded to this question, 33 individuals (92%) clearly stated “yes”—that technical communication artifacts are designed—while two said “yes and no,” (Constance, line 13) and one said he was “unsure” (Amed, line 14). The majority of the yes votes (17 out of 33, 52%) claimed that technical communication artifacts are designed because they are the result of careful planning, an activity engineering students associated with the design phase of projects in their own fields. As an example indicating this kind of thought, engineering student Hung stated, “[technical] communications artifacts are designed because they involve a creation process that goes from defining problems, to creating a solution, to testing” (lines 15-16). This claim indicates that there is careful planning during early stages of communication work that is associated with the design
process; therefore, technical communications are designs. Further, of these 17 individuals who focused on the designerly nature of the planning activity which goes into effective technical communication, 7 students (41%) focused the design planning process upon end users, what is known as user-based planning (UBP). User-based planning—like technical communication and my design pedagogy—emphasizes end-users’ needs, expectations, and experiences with an artifact during the planning phase so as to increase the adoption and success rate of that artifact with the target audience. Indicative of this user planning, Sierra and 6 of her peers indicated that “technical artifacts are designed because they are created after careful analysis of the user” (lines 16-17). Therefore, students predominantly reported that they believe technical communications are designed, planned, and focused more often than not on the intended user-audience, which indicates this approach within instruction may be considered credible.

Given that the majority of students indicated technical communications are design, it is important to see how this newfound learning from design pedagogy influenced their actual composing activities. Again, from 36 respondents, 21 students (58%) reported that they changed their composing activity by incorporating what they learned about communication as design and design thinking practices. Of those who adopted new composing strategies, 11 participants (52%) stated that they increased their end-user focus by analyzing “how do I best portray my information to my intended audience” (Ahahir, lines 19-20). Another 6 participants claimed that they adopted new methods or processes of composing from design thinking like, using “empathy” or defining their “audience’s needs and experience” (Hung, line 18; Trisha, line 21). Therefore, the majority of students reported changes to their composing practices due to learning via design pedagogy, and those changes predominantly involved more careful planning based
around increasing attention to end-users, a topic critical to technical communication especially for creating online CMCs.

However, since only 21 students reported changing their composing activities, 15 individuals (42%) indicated that they did not, citing various reasons. Starting with the most commonly reported reason, 5 of the 15 students (33%) claimed that they did not change their composing practices because they were already using aspects of the design approach or design practices for creating their artifacts. Students like Terry often said, “I do not think it has changed how I compose because I have always used a design approach” (lines 17-18). Others, like Jared, pointed out that they discovered that “I have already used some of these approaches without knowing [it]…but [now] I will be able to compose technical documents…in a more professional way than I was able to do” (lines 20-23). Unfortunately, the remaining 10 students (66%) who indicated their composing activity did not change after the design unit did not provide a reason, simply saying “No” in 7 of the 10 instances with no substantive reasoning. Thus, the majority of students who participated in interviews indicated that they not only believe that technical communications are designed, but they also reported many changed their composing activity through increased planning and heightened focus on the needs and expectations of their intended user audiences.

Assessing the Design Thinking Experience

Moving onto how students assessed their experiences with design thinking, student participants were asked several questions about if they experienced design thinking as helpful or hurtful, what positive experiences they had with the practice, as well as any challenges they experienced using it during the instructions unit. Responses to the first inquiry were studied to illuminate reasons why design thinking as part of the pedagogy may be valuable or not to technical communications instruction and if it was, to establish how design thinking is valuable.
The second question about positive experiences with the process probes into what students found easy or useful to technical communication and why. The third question offered information concerning the challenges students experienced using design thinking, which may provide insight into what makes this part of the pedagogy difficult for students to learn or use in the classroom. Overall, students’ responses to these questions may enable evaluation of their assessment as learners using design thinking for technical communication; thus, providing a sense of what may be easy or difficult for students using the design process.

When asked to assess if they thought design thinking was helpful or hurtful to their technical communication learning experience, 32 students out of the 36 responding (89%) reported that they thought design thinking was “helpful,” while 2 (6%) claimed that “it depends on the person” or situation (Cortney, line 20), and 2 (6%) indicated that they either “did not know” or were “indifferent” (Qu Lin, line 22; Mustafa, line 21). Of those who reported design thinking as helpful, 7 (22%) claimed that the new pedagogical practice improved their technical communication products. For example, Ahahir said that “when the process of design thinking is understood and implemented…the results are very helpful to improve the quality of produced technical documents” (line 25-27). A further 6 students (19%) said it increased the scope of their critical thinking. Students like Beth indicated that design thinking “helps challenge thinking” (line 19). Others like Trisha noted that “it helped me become more conscious of my audience and their needs” (lines 28-29). The third most common substantive response was from 5 students (16%) who reported that design thinking provided them with a useful tool or skill for professional and technical communication situations. The most representative coming from Jeff who stated that design thinking and “being able to design an artifact optimally will help gain buy-in from bosses, co-workers, and users” (lines 21-22). Therefore, based on student reports,
design thinking instruction was considered welcome and helpful by students overall and provided a trio of items useful to technical communication in the classroom and beyond. However, despite the repeated helpfulness of design thinking in technical communication, the different positive and negative experiences remain to be examined.

First focusing attention on students’ positive experiences using design thinking in technical communication, 27 out of the 31 students (87%) who responded to this question reported a positive experience with design thinking. While 13 of the 27 responses (48%) were general statements about having a good experience learning and using design thinking, the other 15 students offered three distinct experiences the practice improved. First, 5 (33%) students indicated that learning the user-experience invested approach to creating a technical artifact was positive and improved their coursework and experience. As a typical example of this response, Connie talks about how using the practice helped her by “going deeper and thinking through things to write them for specific audiences” (line 26). A second group of 5 students (33%) claimed the practice had a positive impact on good teamwork and groups’ working environments. Abby pointed out that using design thinking enabled “the experience of working as a team and getting to see how others think, as well as [providing] the opportunity to attempt to cater to their thought process” (lines 30-31). The last group of 5 students (33%) all indicated that the support and examples from their professors as they learned design thinking made it a positive experience, an interesting point given the majority of faculty were concerned about their ability or success teaching the design thinking process.

Turning to the challenges students reported using design thinking in technical communication, even though most indicated positive experiences, a similar number—21 out of 32 students (66%)—also reported having at least one challenge while learning and using the new
practice. The most often reported challenge to using design thinking in the technical communication classroom regarded students testing their designs with real users. On this subject, 6 different students (29%) out of the 21 who experienced challenges made statements like the following from Abby: “given the class proposes hypothetical situations for our assignments, we were unable to get real feedback from a real audience [during testing]” (lines 33-35). This indicates a common difficulty observed in service-oriented classrooms where clients are not present, a concern reported earlier by a faculty participant. Aside from testing challenges, the next most prevalent issue arose from students working in groups. Out of the 21 students who encountered challenges using design thinking, 5 individuals (24%) reported that issues of ideological conflict, procrastination, and/or interpersonal communication created problems during teamwork. Ben, a respondent confronting such trouble, summed up these issues nicely when he reported that “it can be sometimes a little bit difficult when working in a team setting with people with different expectations of what we need to do [and] to get done now” (lines 263-265). This indication of the challenge of working in groups is both a common classroom issue and one experienced when students use design thinking in design teams. The last challenge clearly expressed by students was the difficulty suitting a technical communication artifact to the end-user audience by using design thinking. Despite design thinking’s methods to focus on users, 4 out of 21 students (19%) struggled to develop what they felt was a user-data driven artifact. In part this was due, as Abby indicated, to the lack of user presence in the classroom: even though digital user communities were identified, many students did not interact with those communities. As such, a trio of students indicated, and Jeff reported, it was a challenge to use design thinking for “thinking through our audience thoughts and needs [while] trying to design something that would appeal to them” (lines 27-28). Hence, though design thinking was widely praised as
helpful, making it easier for students to focus on users, work on teams, and to learn technical communication activity from their professors, some common challenges to class realism, teamwork, and making audience-focused products remained.

**Comparing Design-based and Writing-based Units**

Once students completed reporting their assessments about design thinking experiences, they were asked to reflect on both the recent design-based unit and compare and contrast using the design thinking process with the writing process that they used during previous units in the course. By digging into this topic, students’ reporting may show the similarities, strengths, and weaknesses associated with design thinking, and more broadly design pedagogy, when held in relief against the well-known, well-practiced writing process for creating technical artifacts. This comparison may reveal both students’ thoughts about the strengths and weakness of the design thinking practice at the heart of the new pedagogy, And, it may further indicate whether or not they would be willing to move away from any preexisting reliance on writing processes over to design processes.

While examining student responses to comparing design-based and writing-based experiences in technical communication, I identified two clear splits separating the 32 respondents in half and then in half again. The first half of the split is comprised of 15 out of the 32 students (47%) who reported that the design thinking process provided them a better communication experience than the traditional writing process. Three different reasons were used to support their claims. First, 5 out of the 15 students (33%) indicated that the design thinking process was easier to use than the traditional writing process for making a technical communication. For example, Jenny claimed that the ease of use came from “the design thinking process [making] the assignment easier to complete by breaking it up into smaller tasks” (lines 28-29). Second, 5 out of the 15 students (33%) argued that the increased focus on the user of the
communication artifact made it more meaningful. To this point, Kim said that the design thinking process’s focus on the user helped more than the writing process by “ensuring that anyone reading the instructions would be able to perform the intended action” (lines 30-31).

Third, 5 out of the 15 students (33%) reported that using the design thinking process when compared to the writing process produced a better-quality technical artifact. Exemplifying this reasoning, Trisha said, “I think when we included the design thinking processes, we were much more creative with…our final product” (lines 39-40). Hence, some of design thinking strengths indicated by these 15 students are ease of use as a guide for technical composing, increased focus on the end user and purposeful nature of technical communication, and improved ingenuity and engagement of the resulting product. However, this only indicates the comparisons of the first half of participants.

Turning to the other side of the split in responses, 17 of the 32 students (53%) indicated that either the design thinking process and writing process were veritably the same and they blended the two or they opted to stick with what they knew in the form of the traditional writing process. According to 7 of these 17 students (41%), there was little to no difference between the design thinking process and writing process that they used. For example, Remmy stated that “instead of just using the design process, we mixed them, which worked well for us” (line 31). Further, Abby too pointed out these processes complement each other; “they go hand in hand,” she said, in the way that “they place heavy emphasis on effectively communicating with the audience” (lines 38-40). Therefore, students like Remmy and Abby did not see the need to necessarily practice one process over the other but recognized the value that they had together and used both, another strength. However, it seems that 4 or 5 students out of the 32 (13-16%) did not opt to use the design thinking process. Instead, these few students reported sticking to
what they had always done previously. For example, both Qu Lin and Cortney stated that they “wrote the same way I always do” (Qu Lin, line 29) or “things didn’t change much” (Cortney, line 27). Thus, there is some indication that there is pressure to stick with what one already knows (as seen from products submitted that were discussed by a pair of faculty participants), and this is an obvious challenge for design thinking to surmount as a new concept for some students in technical communication. But despite whether students thought the design thinking process was better than the writing process or not, 19 out of 32 students (59%) indicated that they either preferred aspects of it or liked the design process more than the traditional writing process.

**Learning Experiences with Design Pedagogy**

The last of the results on students’ learning experiences with design pedagogy reflected upon the experiences they had with design pedagogy in class. Interestingly, students were not asked directly to describe their learning experiences with communication as design theory or design thinking practices directly, but 22 out of the 37 student participants (59%) addressed their learning. Given that there is no single question asking about this experience and due to the individual nature of learning experiences, there is a high degree of variation in reporting. Nevertheless, students’ discussions about their learning experiences during use of the design pedagogy approach and practices may provide important information that could help improve design pedagogy instruction in technical communication going forward. What follows is a brief account of students’ learning experiences as they encountered communication as design and design thinking in technical communication.

Out of the 22 students who reported on their individual learning experiences, three common experiences were recorded. First, 4 out of the 22 students (18%) indicated that they wanted to learn more about technical communication as design work or more about design
thinking practices in general. According to Terry, he “thinks that design thinking should be implemented in all types of writing, not just in technical writing” (lines 36-37). Experiences like those of Trisha support Terry’s desire by pointing out “design and design thinking in this class enhance my skills as a technical writer and will be overall beneficial to me in my future career” (lines 45-46). So, it seems that students feel that their learning experiences and their communication skills (not to mention career prospects) may be improved by more inclusion and learning about design and design thinking. Next, 4 more of the 22 students (18%) indicated that their experiences with supportive professors helped them to better understand and use design in their classes. One such student, Jessica, shared “that we got really good support from our professor” (line 212); and another student, Jeff, pointed out that his “instructor stayed positive with us and offered a bunch of time and examples to help us succeed” (lines 24-25). These students’ learning experiences indicate the necessary level of engagement, support, as well as the effort and time that it may take for an instructor to really help students to succeed and feel confident with communication as design and design thinking. One last shared learning experience, 3 out of the 22 students (14%) voiced a high level of sustained interest in what they learned during the use of design pedagogy. James said the experience was “interesting and he wanted to learn more” (line 10), and Hung offered that it was both “beneficial” and “interesting to be able to learn design thinking from someone who is focused on the field of communication” (lines 39-40). Hence, students, especially those from engineering, science, technology or other STEM fields who already are familiar with design and design thinking approaches are much more interested (and maybe invested) in their learning in technical communication when design pedagogy is a part of their experiences.
Of course, as with any learning experience, not everyone had a positive one. Out of the 22 students who addressed their learning experiences with design pedagogy, 4 students (18%) reported a negative experience. Of these, 2 students pointed out that they were confused about what they had learned. A student, Ahahir, may have put it best when he said, “I wish I had a clearer understanding of how design thinking can be used effectively” (line 43). This may indicate that either instruction on the process in his class or the difficulty of the content is an issue we should consider. Further, another student reported that they were averse to the whole experience of learning about communication design and/or using design thinking. Mustafa said, “for me, design thinking was just something that happened in lecture and didn’t impact me at all” (lines 31-32). At length, he explains that students like himself need “assignments or in-class activities requiring the process,” indicating that the use of the new approach and its practices may need to be monitored through perhaps progress reporting or observing staged activity for students like Mustafa to not “just skip to making the product with whatever way [they] know” (lines 33-35). Last, the final student with a negative experience plainly indicated that they simply “feel indifferent about the design in this course” (Kim, line 8). This seems to illustrate that student apathy may always have an adverse effect on the quality of learning, via design pedagogy or any other approach, in technical communication courses required by their majors.

**Results Reporting Conclusion**

To conclude reporting on both faculty and student design pedagogy experience results, I offer a simplified data visualization showing all participants’ responses recorded in relation to four key UX factors relevant to the main research questions driving this pedagogical study. Figure 5.1 illustrates the number of faculty and student responses, both positive and negative, as they related to how well design pedagogy fit in their technical communication class, what their experiences of the new pedagogy were like, whether or not their use of design thinking went well
or poorly, and if they think design pedagogy improved or worsened their technical communication course.

Figure 5.1. Combined faculty and student results relevant to four key UX factors related to the major research questions.

This chart shows that across both faculty and student groups, design was reported to have fit well into technical communication. Also, design pedagogy was received positively and provided both a good teaching and learning experience to almost all participants. Even the use of the design thinking process, which was labeled by members from both groups as difficult and/or challenging, yielded a predominantly positive experience. And last, based on all coded statements, both faculty and students perceived that design pedagogy improved their technical communication courses. This concludes user experience data reporting from both faculty and students’ who used design pedagogy in their courses. Hereafter, these results will be discussed and thematically analyzed in the second half of the chapter.
Design Pedagogy Results Discussion Introduction

Having reported all faculty and student design pedagogy user experiences collected, I provide discussion of the observable themes derived from the data in this part of the chapter. Based on these themes, data-driven answers will be provided that address each of the four faculty and four student research questions that grounded the empirical research in this project. To that end, the subsections that follow begin by revisiting a research question and its importance. Then relevant user experience-based themes and discussion of those themes take place. These discussions are supported by user evidence, cross-references between pre- and post-pedagogy interviews or between faculty and student accounts, investigator observations, and/or related literature. Afterward, the key takeaway from each answer regarding how it supports or challenges the use of design pedagogy for teaching and learning in technical communication where CMC assignments are used are stated. Last, each subsection transitions to the next question until the fourth question for each group has been answered; where after, a transition to the next major section is provided.

Discussing Faculty Experiences

Beginning with the faculty participant group, my thematic analysis of user experience data will enable a discussion that provides an answer to each of the major research questions. All recommendations for changes and improvement to design pedagogy for instruction in technical communication will be reserved for discussion in Chapter 6.

How does design (and it’s pedagogy) fit into technical communication?

In order to address how well design pedagogy—both communication as design theory and design thinking practice—fits into instruction within technical communication, faculty participants were asked how well they thought design would fit in before using the pedagogy and how their teaching went after the design-based approach had been used. Asking both before and
after faculty deployed the new pedagogy allows us to determine if the pedagogy confirmed or overturned any of the faculty’s initial expectations, hopes, or concerns. This may help us uncover how well it really fit into the course. Discovering if a pedagogical approach works within a specific class is important to teaching because a teacher’s pedagogy dictates how he or she teaches the content of the class to students and if his or her instructional method will mesh well with the course curriculum. Having this kind of information about design pedagogy will enable us to know if it is something we should actually be pursuing as a field. After reviewing the body of collected design pedagogy user data from both participant groups, I discovered a few themes that are relevant to the question of whether or not design pedagogy fits into technical communication.

The first theme comes from faculty’s description of design in technical communication. During their descriptions, all faculty members claimed that design was an important, supportive, and necessary component for good communications. For example, Paul stated that “the research planning and execution that goes into developing content and then putting that out for people is an important process” (lines 91-97). The theme that design is an important part of communication provides the initial indication that design pedagogy may fit well into technical communication during early stages of research.

The next theme, developed after faculty had experienced the intervention during their initial interviews, came from their predictions about design pedagogy in their classrooms. When asked about the benefits design thinking may have for technical communication, the majority of faculty indicated that the new process may help teach students a new process, a process for doing user-centered communication work that half of the faculty said connects student learning to workplace practices. Illustrating this theme, Pam said that design thinking “parallels the writing
process that they are already pretty familiar with, so it would be pretty easy to introduce…[and it] sounds much more like what they are going to be doing in the workplace” (lines 211-213). This indicates that the focus on design thinking in design pedagogy may be both easy for a teacher to include while teaching user-based communication work and more in line with their students’ future jobs. Thus, this theme also indicates that design pedagogy may fit into technical communication instruction.

A final theme comes from faculty’s post-design pedagogy data and corresponds with their earlier predictions about the benefits of the new approach. After using design pedagogy, the faculty indicated that they found it “fit well” (Pam, line 290) with the content and practices already established in technical communication. This confirms their predictions that it would be easy to introduce in their classes. Also, the majority of faculty indicated that the way design pedagogy addressed user audiences helped it to fit in with their audience focused instruction and the unit’s learning outcomes (i.e. providing students the ability to make a set of multimodal instructions for end users to follow easily in a specific situation of use). Proving the theme, Tarkir stated, “I think, for example, identifying with the users using the design thinking, [by] considering their level, their experiences, their needs, needs analyses, in those senses, I think there are a lot of things that are overlapping with what we did in other parts of the class” (lines 271-273). This result also confirms faculty’s predictions about how well the new design pedagogy would work to teach user-centered communication skills. And, notably, during student interviews, they pointed out the same result by a majority when over half connected the user-centered communication design that they had learned in technical communication with their own courses, majors, careers, and/or industry interests in a manner showing that the new knowledge would aid their future success. Therefore, when faculty like Pam stated that design pedagogy “fit
well” after using it (line 290), the pre-pedagogy concerns from Cindy about how design might not fit the curriculum were challenged by the data.

When taken together, the three major themes that emerge across the collected data show that design and design pedagogy are a strong fit for technical communication instruction. Design pedagogy not only fits well with the content of the course, but it’s user-focused guidance for teaching audience analysis is useful for technical communication. Further, after teaching and learning via design pedagogy took place, both faculty and students connected their new communication design knowledge with the workplaces they aspire to work in and the skills they will need for success. This finding mirrors those from business scholars Glen et al. (2015) who found that students learning design thinking for professional communication acquired the important skills of navigating complex situations, using new methods for problem-solving, and for working in teams (p. 190). All of these skills are important to technical communication and were aspects I observed directly in numerous course sections when I watched students analyze situations where their instructions would be used, developed problem-solution statements, and worked as members of design teams to produce submissions. Therefore, design pedagogy fits well in technical communication course instruction and student learning and is a legitimate and practicable method for teaching PTC that warrants further attention. This, of course, prompts assessment of its value to the field according to the faculty who have used it.

**What is design’s value to technical communication?**

Looking to answer what design contributes to technical communication, we must consider both the contributions of the communication as design theory and the design thinking practice—both equal parts represented within the new design pedagogy. The additions of these important parts of design pedagogy, upon examination, illustrate why it may be important to not only invest more time researching design in technical communication, but also it may provide
grounds for the adoption of the pedagogy by more instructors in the field. To that end, several themes based on the contributions of these concepts emerge from faculty’s user experience data and may help answer what they identify as design’s value to technical communication.

The first theme is one which carries over from our previous research question. This theme from both interviews is that all faculty see communication design as being user-audience focused. This attribute of design pedagogy is valuable to technical communication because the most common genres in the field—proposals, definitions, descriptions, instructions, and most reports—are all based on responding to target users’ needs and expectations for a communication situation. It is important to note here the distinct attention to acquiring a heightened sense of the socio-culturally situated user audience. This attention comes from the second tenet undergirding the new pedagogy. Also, the increased attention to a communication’s rhetorical responsivity corresponds to the third tenet of the communication as design theory. Further, when faculty like Tarkir point out that “design itself is communication with or something to [an] end user” and has a clear emphasis on creating a “road map…for the designer…and the audience” (lines 144-149), it may indicate that design can contribute greater attention to user analysis and improve the means to produce more responsive technical artifacts.

A second theme developing from the faculty pre-design pedagogy data collection is that all faculty believed design pedagogy may improve their technical communication instruction, notably via the inclusion of the design thinking process. According to Pam, design thinking gave her the ability to provide her students with the tools to respond to complex client communication situations once they enter the workplace. And, given that design thinking is a human-centered “problem-solving process” (Leverenz, 2014, p. 5), the skills Pam provided her students were the ability to observe and empathize with users’ problems and create multimedia solutions tailored
specifically to them. Additionally, Tarkir also exemplifies how design may help technical communication instruction. He intimates that by using design thinking “we can take a look at, for example, what extent we are able to meet professional expectations. And…we may find better readings…find better assignments…to prepare these students for [the] workplace setting” (lines 380-385). In other words, for technical communication faculty design thinking may provide an instructional tool to help teachers help students be more successful by improving practices and courses, as well as their students’ professional communication skills.

A third theme responding to the question of design’s value comes from after faculty used design pedagogy for the instructions unit. According to all faculty’s lived experience teaching design and design thinking, their use of design pedagogy provided students with important, practical skills for technical communication. An example of such skills for student communication is observed when Paul said, “learning the [design thinking] process…brings[s] about people who could think about communication in a more sophisticated and empirical way” (lines 148-149). To this he adds that students’ work in his classroom showed “there was a good amount of activity [around]…user empathy…which indicated that [students] sort of connected with it” (lines 271-273). Pam too said that her students produced final products that were, in her opinion, “far better than assignments…in the past;” she perceived that these new submissions more readily combined design elements with “direction [and] the content…[because] they spent more time thinking about design [whereas] they haven’t in the past” (lines 394-396). Thus, both Paul’s experiences and Pam’s experiences show that design pedagogy may be helping students develop the skills necessary to study users in order to provide the best communication designs—skills connecting students to user-experience research that they evidently were interested in and engaged readily—to support practical technical communication work.
The fourth and final theme, rather than providing another contribution directly, attests to faculty’s recognition of design pedagogy’s value to technical communication. When questioned about if they would teach communication design or design thinking again, faculty claims were unanimous. All faculty members indicated that they planned to teach using design pedagogy in their future classes. Based on the several students who stated that they wanted to learn more about technical communication as design work or more about design thinking practices in general, this is very good news for students like Trisha who pointed out that “design and design thinking in this class enhanced my skills as a technical writer and will be overall beneficial to me in my future career” (lines 45-46).

Taken together as a response to the question of design’s value to technical communication, the four themes that emerged from faculty experiences with the pedagogy provide an encouraging answer. Based on faculty user experience data, the value of design pedagogy in technical communication is: a user-focused approach to communication that benefits the problem-solution investment of technical communication work for “getting things done” (Moore, 1996, p. 115), a tool faculty may use to scaffold student learning of industry-centric communication skills and to improve their courses based on professional contexts, a means to provide practical user experience research experience and document design knowledge for user-based planning, and a pedagogy that works so well everyone who experienced it—despite the challenges of doing something completely new—wants to continue teaching communication as design and design thinking. Thus, design’s value to technical communication according to faculty indicates that the new pedagogy is not only a desirable, practicable tool for a teacher’s methodology, it is also geared toward the skillset of the industry practitioner.
Therefore, design may aid in both faculty and student professional success if adopted into practice even if they must navigate a few challenges in the beginning.

**What makes design pedagogy easy or difficult to use?**

As is so often the case when we learn something new, there tends to be a steep learning curve while we are becoming familiar with a topic. Faculty’s experiences while adopting design pedagogy into their technical communication courses were no different. For example, Pam, Tarkir, and Paul all indicated that they had some degree of stress, apprehension, or frustration with the new tool. All of these sensations, however, are common symptoms of trying to use a new approach to teaching. No matter the faculty member’s level of experience, all expressed some form of anxiety while they relived their initial design lessons. But, as these faculty became familiar with the new theory and practice of design pedagogy, they were able to pinpoint what made the new pedagogy easy or difficult to use, perhaps even in part owing to the newness of the method which tends to make the experiences (e.g., simplicity or struggle) stand out. Thus, examining the themes in faculty data around their experiences using design pedagogy with ease or difficulty will provide us with an answer to what may make it easy to use and what may make it hard.

Starting with the theme of design pedagogy usability—regardless of the nervousness created by the newness of design pedagogy—all faculty had previous experience with communication design in electronic and professional situations that may have made the use of design pedagogy somewhat easier. According to all faculty, each had experiences with content design strategies and management from working with learning management systems (LMS). According to Pam’s, Tarkir’s, and Cindy’s pre-design pedagogy interviews, each faculty member had either been on curriculum redesign committees and/or worked in an instructional design program on providing content visualization, navigation, and development of LMS course shells.
Paul too had experience working with LMS content and promotional media while working as an administrative assistant for CELT. All of these faculty experiences indicate that they had preliminary knowledge of how to rhetorically design technical communication to be effective for user audiences in electronic environments. Therefore, faculty’s familiarity with CMC design work may have made their use of design pedagogy easier or their uptake of its elements faster in technical communication even though they did not see themselves as PTC designers.

The fact that half of technical communication faculty did not see themselves as having design experience (or even see themselves as designers) defined a second theme. This anti-design association theme may have made it more difficult for faculty to use design pedagogy. During his pre-pedagogy interview, Paul manifested this theme when he said bluntly, “I am not a designer. I do not feel like I embody that process” (line 153-154). Perhaps further complicating faculty’s preparedness to use design pedagogy, every faculty member reported that they had no lived experience using design thinking—the key practice of the pedagogy. The closest of any participant to having experience with the process was Paul, and he admitted, “I am familiar with the stages…[but] I have not used design thinking ‘copyright’” (lines 202-226). So, even the most communication design and design thinking educated faculty member felt disassociated from design pedagogy. Thus, the lack of design as part of technical communication faculty’s self-image and the dearth of experience with a contemporary design process, most faculty, even though they did have design experience of a professional nature from positions at Principle Financial, CELT, OLT, or on curricular committees—they may have had difficulty using design pedagogy because it conflicted with their sense of self and their perceptions of their experiences.

Unfortunately, themes indicating difficulty using design pedagogy do not stop with those from the pre-pedagogy interviews. After technical communication faculty used the pedagogy in
their classes, they reported that there were some challenges using it. Regarding instruction on communication as design and design thinking, all faculty said that these topics need to be taught throughout the semester in order to provide both more time and more scaffolding for students. To clarify, faculty did not indicate that students struggled with the new content but did comment strongly that their delivery suffered as a result of trying to teach design during a single module when “we shouldn’t wait” to teach it (Pam, line 225). This difficulty was one that I anticipated, regrettably, because of the nature of the project occurring during only one unit. But, the unlikelihood that faculty would sign up to teach an entire course using a new pedagogical approach when they were already confronting a new curriculum was, I felt, an impossible thing to ask of my participants. In any event, on the subject of time and delivery, Tarkir said that the addition of more time would allow for “really good examples of such multimodal and design thinking examples, so they can [see] we are already doing this in our daily lives” (lines 345-347).

All technical communication faculty cited more time for better multimedia delivery, and most wanted more lessons on media literacy to further improve the results they saw in their students’ submissions. However, the usability of design pedagogy is not mostly characterized by difficulties: one final theme illustrates the ease of design pedagogy’s use in technical communication, and that is how well it fit into existing course instruction and content.

Faculty participants predicted before they ever used design pedagogy that it would work well in their technical communication classes because “the learning goals are similar, just in design process terminology” (Paul, line 319). This foresight was confirmed afterward as faculty reported that they overcame their anxiety and realized design pedagogy not only fit well into the course, but provided them boosted confidence, a new rhetorical process for students to follow for
creating user-centered communications, and a touchstone that carried forward what they had
taught earlier in the course into the instructions assignment.

Beginning with increased confidence, Pam stated, “it has made me feel more confident in
teaching 314 and having more of an ability to talk about design” (line 258-259). On the utility of
the design thinking process, Tarkir said, “design thinking gave [his students] an idea about when
to start and which things first they should be looking at” when making technical documentation
for a user-audience (line 198-199). Paul added that teaching design thinking was “pretty similar”
(line 393) to previous instruction. In fact, Pam related it back to the audience analysis students
did for their proposal assignment and their work interpreting the needs and expectations of
readers for visuals in the technical description assignment. It is important to stop here and note
that as a third party observer in each of these faculty member’s classes—physical and virtual—I
was able to watch as all of these aspects of this theme were enacted. I watched Pam’s confidence
grow, I saw Tarkir use the design thinking model to scaffold students’ work throughout their
projects, and I read discussions where Paul responded to students fitting design and technical
communication work together. Hence, taken together, this theme and those preceding it show
that, like any classroom pedagogy, some aspects of teaching are difficult; while overall, they
help classroom stakeholders grow as teachers and learners.

Seen collectively, the themes of faculty’s easy and difficult user-experiences with
design pedagogy provide answers to both what may be easy and hard about its use in technical
communication. First, it may be easy to use design pedagogy because many faculty have
experience with design, especially with CMCs in professional situations, even if they do not
realize it. And, it may be easy because it fits so well with previous instruction during the course
and the learning outcomes baked into the technical communication curriculum, as Pam disclosed to me on numerous occasions.

Second, and at odds with design pedagogy’s usability, is that teaching with the new pedagogy may be hard because technical communications faculty do not see themselves as designers and may not recognize design as one of their communication skills. This was particularly stressful for faculty at first as they pressed against the boundaries of their comfort zones. I recall a one-on-one consultation with Tarkir after observing his class wherein we spent an hour looking at multimodal instructions ranging from how-to articles, to recipe videos, to videogame tutorials, talking about how these may be used to teach students to meet the needs of their target users with different forms of technical information delivery. But, as this instance suggests, more time for student scaffolding and lessons on multimedia technical communication artifacts are needed, and the lack thereof made it more difficult to use the pedagogy than it needed to be. So, using design pedagogy in technical communication may be both easy and challenging at times, not unlike what we may frequently observe when new approaches and practices are deployed in the classroom.

**What are the benefits and constraints of design pedagogy?**

Turning to the final faculty focused research question, we are presented with considering what the benefits and constraints of the new pedagogy are for its use in technical communication. Just like any teaching practice, design pedagogy has areas where it may benefit the classroom most and it has attributes that may temper or limit it from being completely effective. This most notably seems to be true in terms of recreating the real world, technical communication experiences that lay beyond the classroom—a common issue with teaching for workplace transfer. But even though there are issues with any approach to teaching a complex subject, it is important to identify them prior to sharing the practice with the field as a whole. This, I believe,
is the responsible thing to do as it may prevent any ill-effects by creating an informed (i.e. prepared) instructional user. So, the last question faculty data corresponds to is what the specific benefits and constraints of design pedagogy are as they were experienced in the technical communication classroom. The following presents a quartet of themes, 2 indicative of benefits and 2 pointing out constraints, that paint a picture of what an instructor may face when first bringing design pedagogy instruction into practice.

Starting with themes that indicate the benefits of design pedagogy, faculty user-experiences and reflective interviews illustrated that the new pedagogy benefited technical communication by 1) improving the faculty’s investment and engagement teaching the course and 2) by improving many aspects of student work for the instructions unit. Attesting to the first theme, Pam stated, “I am [more] invested when I am trying something new;” especially, she points out, when “it is a practical thing that we should be doing” (lines 146; 220-221). This admission of investment by the most senior participant shows that change to our teaching practices may not only be a practical necessity to adapt to cultural communication shifts, but it may also reengage those of us who have been teaching technical communication using the traditional written communication and genre methods. Students also picked up on this new investment via the energy of instruction in Pam’s class. Student participants in interviews from her sections claimed that they “really enjoyed the enthusiasm of the professor” (Kim, line 34) and that the “professor was very supportive, open, and responsive to…design processes” (Rob, lines 24-25).

Next, regarding the theme that design pedagogy improved most aspects of students’ work, each faculty participant provides a piece of evidence to substantiate the claim present in this theme. Cindy said that teaching via the new pedagogy may have helped students “like it
more” (line 186). Tarkir said that his students used “skills in this process which…forced them to be thinking more outside the box” and that they were able to “start” better than during his previous assignments (lines 249-250; 199). Paul, once again, talked about how it made students’ user-based communication work more “sophisticated and empirical” (line 149). And, Pam added that she thought the results of “this set of instructions was far better than assignments I have done in the past” (lines 197-198). And, yet again, this is confirmed by the students’ assessment after learning via design pedagogy, an example of which is observable when Jim says, “design thinking was helpful because it forced [me] to think about writing in very different way…[via] another method of creating documents that might produce better results” (lines 27-29).

But, as the question begot, there were also a pair of negative themes within faculty responses. Two constraints that arose out of faculty experiences and interviews were 1) that there are limiting issues because of the classroom environment and 2) that there was an undercurrent of student concern or fatigue among some members of a few courses. Beginning with the first theme, during pre-pedagogy interviews 3 faculty members pointed out that the primary challenge to design pedagogy (especially design thinking) in their courses was how the academic environment impinged upon the authenticity of the experience itself. Cindy pointed out that she was worried about students working with clients as part of her class. She didn’t want them to end up “causing them more stress” about their communication problems (lines 146-165). Paul too was very concerned about creating a problem in the classroom that students could address that was “authentic enough for the learning experience” (line 293). However, after using the pedagogy, both Cindy’s and Paul’s concerns were eliminated by the availability of virtual communities of instruction users that students could study and even interact with from the classroom with little to no impact on them.
Regarding the second thematic constraint—that there was concern about some student confusion or fatigue—faculty claimed that a few of their students either had reservations about design thinking or that they reverted back to traditional writing processes for the final instructions submission. In both cases these claims may be substantiated by data from a small group of students. First, faculty were correct in their identification of student reservations about design pedagogy. Tarkir said that some of his students “at first didn’t get the idea” and that for others “it was not easy for them to get used to” (lines 317-321). This is supported by a couple of students from his course who said, as Cortney did, that they were initially “confused about the process” of design in technical communication (line 10). Second, faculty were also right about students reverting to more traditional submissions for the instructions assignment. Paul indicated that several of his students reverted to their former composing processes and turned in mostly print documents, about which he said, “I think the students need more encouragement or more kind of requirements to go outside of the norm, to go out of the normal process” (lines 237-238). And, lo and behold, a few students like Qu Lin who were interviewed about their experience using design thinking methods reported that they “wrote the same way [they] always do” (line 29). Therefore, there are a few very pronounced benefits and constraints that must be considered by faculty using design pedagogy in technical communication.

So, answering the question which prompted this thematic discussion, we find there are data-driven benefits and constraints to using design pedagogy in technical communication. The benefits are that both faculty and student work may improve by increased engagement and better practices and results. The constraints are that the limitations of the classroom context may require more work or planning from faculty for teaching and learning, and that the new approach and practice for composing may also place a significant cognitive load for students. As such, at
this point it is up to the individual faculty member in technical communication to decide if they and their classroom may benefit from the positive contributions of the pedagogy or if it may be too much to include in what may be an already complex system of approaches and practices for learning how to communicate technical information effectively.

Collectively, the themes present in the design pedagogy faculty user experience data provide answers to the research questions guiding this pedagogical project. Next, an exploration of the themes present within the student data will be discussed and used to respond to the research questions for their participant group.

**Discussing Student Experiences**

Moving into the student participant group, I will thematically analyze their user experience data and provide a discussion that answers each of the major research questions. All recommendations for changes and/or improvement of design pedagogy made by students will be reserved for discussion in the final chapter.

**What are technical communication student attitudes toward design?**

Beginning with the first research question driving my student experience and interview data collection on learning with design pedagogy, I thought it pertinent to inquire into student attitudes toward design. From past experience, I learned that if a student does not enjoy how a class is taught or recognize the value of course content, then they are unlikely to gain much through the learning experience. That is why I made it a priority to see how typical technical communication students from STEM backgrounds would respond to the class. I knew that if they mostly had positive attitudes toward design pedagogy, then it may be an advantageous approach to instruction worthy of continued research. But, if students are mainly negative toward it, there may be considerable revision required for successful implementation in PTC, for CMCS, or for design pedagogy’s use in any other communication class. So, in order to get at students’
attitudes, I analyzed their experiences and interviews and discovered several themes that may provide an answer to this foundational question.

Upon review of all collected student data, I found that there were three themes that offer a response to the question of student attitudes toward design pedagogy. Two of these themes come from students’ phenomenological experiences of learning with design and their response to it, while the third is born out of their reflections on those experiences. First, and perhaps the strongest theme of the entire study, is the overwhelming positive alignment of students’ attitudes toward communication as design and design thinking in technical communication. As reported, 33 out of 37 students (89%) spoke of a slew of positive feelings toward their learning experiences. These positive feelings ranged from excitement, to surprise, to intrigue, to statements of how much students “liked it” or that it was “my favorite part of [the] projects” (Bella, line 11; Mohammad, line 13-14). This range of encouraging feelings and statements coming out of students lived experiences with the new design pedagogy offers evidence that students are, as in fact one of them explicitly stated, “open to it” as part of technical communication courses (Amed, line 8).

The second theme coming from students’ experiences is that they genuinely felt communication as design and design thinking were important to their learning how to successfully communicate technical information with user audiences. According to almost half of students, design in technical communication is important because it is a valuable skill that is relevant to their future careers and communication work. For example, Ahahir, an IT engineering student, captured this positive sentiment about the importance of learning design when he said, “I think that it is important to my field, especially in regard to making user interface designs, to help make applications the most simple for their purpose so users can easily understand how to
do what they want” (lines 8-10). This statement about Ahahir’s learning experience with the pedagogy indicates that design learning is important because it relates to communication needs within the STEM fields. From his simple statement, we can see that design pedagogy teaches and supports students to focus on digital, user-centered communications like interface design, and it gives students user, purpose, and situation driven process skills to address technical communication needs. Thus, these first two experience-based themes show that student attitudes toward design in technical communication is mostly positive and why.

One final thematic indicator of the mostly positive state of student attitudes comes from their reflections upon whether or not they thought design and design thinking were helpful for them or not. Again, a resounding 32 out of 37 students (86%) claimed that design thinking was a helpful topic for them to be learning in technical communication, especially regarding online CMCs. Students made this claim based on the fact that design thinking gave them a method to make user-focused communications. Also, they claimed that design thinking allowed them to think more critically about their communication work and the designs which resulted from that work. Students indicated that they thought their technical communication artifacts were better, that the designs responded well to their user’s needs, and that they were more aware of the sociocultural situation and how users would respond to their communications. In fact, while I was visiting one of Tarkir’s class discussions, I noted first-hand evidence of students talking about how their artifacts may meet user needs in various environments (on the highway, at home, in high school automotive classes, etc.) while they considered how users might interact with and respond to instructions on how to change a car tire using a phone, computer, or print materials. Hence, the increased scope and attention to end users really influenced how students scaffolded
planning for the artifacts, and by a large majority they found that the helpfulness of this learning provided by design pedagogy made for positive students’ attitudes toward their learning.

So, back to the question of how well students responded to design in their classes, the three predominate themes offer a clear sense of students’ attitudes toward the new pedagogy. In short, they “liked its incorporation into technical writing,” as Remmy stated (line 11). And even though this sentiment was not unanimous, there were 47 separate statements of positive feelings or reactions to learning design compared to only 14 that indicated neutral or negative attitudes toward design. Therefore, the answer to students’ attitudes toward design in technical communication is that they had a positive experience because they saw it as important and helpful to their ability as technical communicators and future STEM professionals. So this indicates that since students like design in technical communication, they stand to gain by its inclusion because they illustrated that they were more engaged and expressed better experience and results via its inclusion. But, to explicitly draw out what students got out of design pedagogy, in their own words, let’s see what value they assigned to the pedagogy and why.

**What value do students assign to design pedagogy and why?**

After determining students’ attitudes toward design in their technical communication courses, the next research question aims to provide insight into the values they attribute to design-based learning and why. This question is important because it allows us to establish what students see as important and valuable to their work as technical communicators, which the new pedagogy supports. Also, it provides students’ reasoning for why communication as design or design thinking are important additions to their knowledge and experiences. Therefore, several experiential and post-pedagogy interview questions probed students’ assessment of the value of learning design in technical communication and encouraged them to compare design learning to
other learning experiences in the course. From these inquiries, two themes emerge from the student data that best illustrate what value students assign to design pedagogy and why.

According to an abundance of data, the majority of technical communication students—33 out of 37 (89%)—see modern technical artifacts as the result of careful planning and design work. Interestingly, this aligns with Purdy’s (2014) belief that today’s technical communications “are designed, not written” (p. 613). According to students who learned via design pedagogy, the new approach and practices offer multimodal technical communication a method, specifically the design thinking process, that helped them to make better human-centered artifacts and to respond to the problematic situations faced by their users with concrete solutions. These important contributions of the valuable design thinking method fit with some of the learning outcomes for technical communication at Iowa State University. These assignment-based learning outcomes include giving students the ability to “analyze” and “adapt” technical information for target audiences and experience crafting artifacts for “human-involved” problem solving (ISU AdvComm, 2020). Therefore, the valuable addition of the design thinking process method as identified by students provides technical communication with means to meet some of its preestablished outcomes, as well as students’ self-identified learning needs.

Speaking of students’ identified needs, the second theme from their collected data places the contributive value of design pedagogy to technical communication within the connections it has to both their core fields of study and their future job opportunities. Out to the 36 student respondents, 18 individuals (50%) said that design and design thinking were a part of their courses, majors, careers, internships, or industry interests. These students cited that the careful planning, user analysis, and focus on critical thinking for human-centered problem solving that they learned from design pedagogy during the instructions unit were invaluable. In fact, of the 18
students who connected design to their fields and jobs, 15 (83%) said that they felt learning about design and design thinking were important contributions to their future successes as technical professionals. An example of this assessment of design pedagogy’s value comes from Abby, who pointed out that her “experience with design thinking” and its connection with her “engineering courses,…[wherein she] often comes up with …systems and solutions to problems [via]…the critical thinking process” was central to performance in her field and “for a career as an engineer” (lines 22-25; line 8). Abby was not the only student who spoke in this manner about the value of learning via design pedagogy for their future career. While observing in one of Tarkir’s sections, I overheard a student’s conversation about working with a user-experience designer during a past internship. This student, later identified as Ahahir, indicated that design learning was important because it was not only was a part of the job he aspires to do, but it also “could be applied to [technical communication]” (lines 12-13).

Therefore, learning design thinking as a user-centered communication design method and the connections between design in technical communication and students’ major fields of study, as well as their professional futures, illustrate the overarching value that learning through design pedagogy may offer to technical communication courses. This provides an evidence-based answer to the question and shows that design pedagogy is not only a useful tool to scaffold students’ technical communication work, as Tarkir reported, but that it also makes the course itself (a required course) seem more “worthwhile” to students because it is “applicable” (Pam, lines 274-279) to their work as engineers and therefore so much more than just another required course. Hence, students themselves indicate that design pedagogy may help them scaffold their communications with users in mind and may help technical communication seem more relevant to their own interests and aspirations.
What makes design thinking easy and difficult to use?

As I hoped to identify what distinct value design pedagogy may offer students, I too wondered what they would find easy and/or difficult about learning and using the new design thinking approaches and practices. It is notable to mention here that, like Norman and Nussbaum, I held some reservations about teaching communication as design and design thinking in an academic setting because of the complexity of the design thinking process. But, despite my reservations and these scholars’ concerns about the “creative thought process” (Norman, 2010) or its potential to become “a linear, gated, by-the-book methodology” (Nussbaum, 2011), it seemed to me that students stood more to gain by the experience than without it. But not wanting to overlook the potential for both the good and the bad of design thinking, I chose to ask what makes design, especially the complex design thinking process itself, easy and difficult for students to learn and use in technical communication.

From their reported lived experiences and interviews, two strong themes emerged, one illustrating what made design thinking easy and one showing what made the process a challenge.

On the subject of what made design thinking easy, students reported that their preexisting positive association and familiarity with the process made its use better in technical communication. As reported, several students had previous experiences with design thinking processes from their core classes in engineering, information technology, and/or industrial design. Students like Jared claimed that “design thinking [was] a large part of [their] everyday life” (line 8). He went on to say, “I am very comfortable with design and design thinking and it is my key way of thinking and working” (lines 8-9). Students like Jared and 10 of his peers all indicated familiarity with design thinking and associated it with doing work required by their future jobs. For these students, a positive association was already ingrained with design thinking, and this made it more valuable to them. But, interestingly, even the majority of students, those
who did not have familiarity with the complex methodology, saw it as important and helpful, as previously mentioned. This positive perception of the practice may have made it easier for students to use because they recognized it as being a good thing to learn with useful and relevant skills. Therefore, student data suggest that many STEM majors in our technical communication courses may have previous experience and positive associations with design and design thinking work that may make it easier for them to use. However, even if students like a practice and are used to it, that does not mean they will not face some challenges while using it.

The principal theme illustrating the difficulty of using design thinking in technical communication comes from a small group of student participants who had trouble with the new process, especially in online courses. According to 8 students (22%) who participated in interviews, design thinking was difficult because the new thought process was complicated or confusing. Students like Beth admitted that they were “slightly confused” (line 10) by the introduction of the new focus into the class work environment. Other claims of confusion, as pointed out by Paul’s experience with his online students, were related to shifts in the procedural language of design thinking as it was integrated into the course where previously writing process language was used. According to Paul, the changing terminology within his class created most of his students’ confusion. He stated, “they are used to calling something a draft, but you could call it a prototype, [thus]…learning the terminology… in the online course,…there was[n’t] enough activity [to show] them the difference between a draft and a storyboard or prototype” (lines 230-235). Therefore, Paul, as well as the other faculty, expressed desire to integrate learning about design thinking and its terms and concepts throughout the entire course (more on this in the next chapter). But, according to students, the biggest difficulty of using design thinking was this
initial challenge to climb the learning curve, not to mention buying into the new approach in the first place, from the very beginning.

Taken together these two themes illustrating the relative ease and difficulty students have using design thinking in technical communication provide a direct answer to my third student research question. Regarding what made it easiest to use design thinking, student participants cited their familiarity with the process and their positive perception of the practice. On the other hand, what made it difficult to use was its sudden inclusion in the course and the strangeness of the new design language being used in relation to existing concepts. As such, for faculty seeking to incorporate design pedagogy into their technical communication courses, especially the practices of design thinking, they may want to consider students’ familiarity and see if a potential touchstone exists prior to integration. And, they may also want to preempt any difficulties by providing additional conceptual scaffolding to support inclusion of both new design practices and new language, especially if they find that their students have less familiarity than those represented in this study (more on this in the Chapter 6 recommendations).

**What strengths and weaknesses does design pedagogy exhibit?**

Turning to the last student research question, I determined that it was important to ask them what they saw as the strengths and weaknesses of design pedagogy based on their learning experiences with it in technical communication. This question intentionally mirrors what I asked faculty about the benefits and constraints of the pedagogy they observed. It is my hope to see if both student and faculty assessments of design pedagogy reveal any distinct similarities and/or differences in the way it impacted CMC instruction in the classroom. These last questions for students and faculty are of the utmost importance because their answers give voice to both stakeholder groups and offer my final piece of teacher-learner user experience data on design pedagogy. Further, their assessments of what works and what doesn’t regarding design pedagogy
in technical communication classes may offer guidance to how we can improve pedagogical approaches in PTC going forward. To that end, two major themes emerge from the body of student experience data offering insights into what are the strengths and the weaknesses of design pedagogy in technical communication.

Starting with strengths, a trio of student subthemes coalesce around the central theme that design pedagogy led toward better teaching of 21st century composing practices for CMCs and users of today’s technical communication artifacts. First, when students worked to define the major components of design pedagogy—communication design and design thinking—they indicated that both concepts involved how to convey technical information, how to plan it according to users, and how to deliver it across multiple situations and modes (Jessica, lines 141-143; Ben, lines 148-173). Adding to this, 21 out of 37 students (57%) reported that they changed how they compose because of learning design pedagogy. These students reported that they increased their user-focus, adopted the new design thinking process for prototyping instructions, and they increased their planning and critical thinking for making technical artifacts. For example, Jessica reported that she and her design team members “were a lot more conscious of thinking ahead [about] how we wanted…things to be more user friendly,” and they used the design process for “outlining it from the start” (lines 152-154; 174).

The last subtheme comes from students when they were asked to compare the design thinking process with their traditional writing process. This question revealed that almost half of students, 15 out of 32 respondents (47%), thought that design pedagogy’s design thinking process worked better for them than the writing process. They reported that it was easier for them to create multimodal artifacts than it was while using the previous writing process during an earlier part of the course. These better experiences are seen in the user-testimony of students like Jill
and were also observed by every faculty participant. Each faculty member reported seeing positive student results from learning design pedagogy in the forms of increased product quality, creativity, attention to document design details, and/or increased engagement with course content. Therefore, the experiential and reflective student data shows that the most notable strength of design pedagogy is found in how it helped students focus their composing processes and how it empowered them to take control above and beyond their previous methods. This led to both much better multimodal results, according to some faculty observations, and actualizing what Yancey (2004) termed “composing in a new key” (p. 321) for modern users and screens alike.

Turning to design pedagogy’s weaknesses for teaching in technical communication, I discovered that some students found it challenging to reach end-users effectively by enacting communication design in the classroom. Notably, I should point out, Paul raised this concern before and after using design pedagogy in his courses. He stated that the classroom user interaction was perhaps not “authentic enough for the learning experience” (line 293). Students too felt that “the largest challenge was creating something that was suited to our audience…[because] we were unable to get real feedback from a real audience” (Abby, lines 33-35). Further, and perhaps because of the lack of audience interaction beyond community observation, some students reported that suiting their technical communication artifacts to end-users was a challenge. “Thinking through our audience thoughts and needs and trying to design something that would appeal to them” was a challenge, according to students like Jeff (lines 27-28). Thus, despite the strengths of design pedagogy for improving the creation of CMCs in technical communication, there remains the trouble of helping students connect those new methods and skills with a real-world audience as they exist outside the PTC classroom.
In any event, these two themes provide an insightful answer to what students perceived as the strengths and weaknesses of design pedagogy. This newfound knowledge is important because, as instructors, we can make sure that we maintain the impactful instruction of design approaches and practices that led these students to adopt composing practices with better experiences and outcomes. And, we may take up the issues of connecting students with real users, helping them to secure meaningful feedback and testing results with their technical artifacts, something I will address further in my recommendations in the next chapter. But first, based on these themes and the eight answers to this project’s faculty and student inquiries, a data-driven conclusion about their design pedagogy user experiences should be described to provide the big picture results gathered from studying users’ experience teaching and learning with design pedagogy in technical communication.

Data-driven Conclusions on Faculty and Student Design Pedagogy UX

As we conclude Chapter 5, I would like to take a moment and reflect on the overall user-experiences of both faculty and students who taught and learned via design pedagogy. According to the Interaction Design Foundation (Mortensen, 2019), attending to the user experience of educational stakeholders “helps place people,” those who matter the most, “at the center of [our]…research.” By doing this kind of work, we are able to make instructional guides “that are truly relevant to [our] users,” “easy and pleasurable to use,” and that may offer the best “return on investment for [the] user” (Mortensen, 2019). Therefore, taking a moment to consider faculty and student experiences with the pedagogy may offer their takeaways thus far and provide a springboard for recommendations for design pedagogy in Chapter 6.

Starting with faculty users, design pedagogy may have been a rollercoaster of both feelings and results, but it ultimately offered more positive experiences than negative ones. Despite concerns about the challenges of the classroom, faculty were able to steer students
toward real-world situations where they could find digital audiences with problems to guide design work. From this point, faculty were able to replicate user observation and empathy activities even though those audiences were only present via virtual communities. While this experience may not be exactly like the workplace, where our students may conduct user testing in person, they were able to practice that activity with each other using moderated interviews, speak aloud protocols, and even in some classes by observing users interact with their instructions in the usability lab and receiving feedback. As a result, even though using design pedagogy was stressful for faculty at first, their optimism and confidence grew during the unit. I personally watched and recorded this journey and the end result was that their students were able to produce user-centered instructions that showed clear understanding of the target audience’s needs and expectations for a particular situation of use. Even the most senior faculty member, who said she had been teaching technical communication for over ten years, said that she had received better results for these technical instructions submissions than she ever had previously—a testament to what the faculty user may experience if they stick with the pedagogy, keep an open mind, and are willing to give it a shot.

Turning to student users, I found that they, like faculty, initially struggled to become comfortable with design pedagogy. Many indicated that they were indifferent or confused at the start. But, despite some initial apprehension, students were surprised and excited by what design was offering them in terms of a new process for communication and a new focus upon creating innovative, 21st century CMCs. As students connected with user communities around their instructional topics, they were quick to engage with them on virtual platforms like YouTube, wikihow.com, and in other online environs. I recall one day in a section of Pam’s technical communication that the whole class was assessing user feedback on a pumpkin pie recipe video
due to the nearness of the Thanksgiving holiday. Both the professor and students discussed how community members posted questions about measurements, the definitions of bowl sizes or information on ingredients, and the appropriate use of humor for recipe delivery. This user-audience engagement provided students’ insight into how they could connect with their own user audiences even when they were not present. Also, it began to give them an appreciation for observing and empathizing with their users in order to meet their needs and expectations via communications. Thus, their initial bumpy experience with design pedagogy began to improve as they gained user-focused skills and methods for assessing users’ responses to both communication artifacts and the situations of their use.

Further, as students participated in design thinking observations and analyses of communities on wikihow.com and then conducted their own assessments of online artifacts using speak-aloud protocols and user interviews, discussions of user feedback about how they respond to directive language, labeling in visuals, and the navigability of linked content modules in digital content prepared students for engaging in user-centered, multimodal technical communication. Because of end-user’s comments on the facets of communication design within technical artifacts, students were able to reexamine their own knowledge of W.O.V.E. from the user experience perspective, rather than from their own perspectives as creators. This completely changed how students composed using multimodality while thinking about the rhetorical relationships between communicative elements—especially the integrated attributes of text, audio, images, video, and hyper-linking—within their communications. So, when students produced their own technical instructions, they not only integrated multiple modes of communication for maximum rhetorical impact, they also kept audience needs and expectations at the forefront of their design decisions by using the design thinking human-centered process.
Thus, students were able to put their users and their goals easily alongside those of the instructions’ purpose and the situation for a design’s use. As a result, students completed their projects methodically and used user knowledge, with their products being some of the best technical communications their professors had assessed. Students reported that their experience allowed them to learn and practice industry skills like design thinking, which left them feeling more prepared to achieve success in their future careers making CMCs in PTC environments. However, as we know, there is always room for improvement, therefore in the next and final chapter I share some recommendations for improving design pedagogy that were provided by faculty, students, and my own observations.
CHAPTER 6. RECOMMENDATIONS & CLOSING

As we near the end of my pedagogical research project, it is important to review where we have come from to know better where we are headed. By bringing all the major takeaways together in this space, I can offer several data-driven arguments to support the claims that I have made thus far. To that end, Chapter 6 will begin with a summary of the project highlighting the contributions of each chapter. Then, I will discuss the research project’s contributions to PTC and pedagogy research. By revisiting my research, I will provide the stage for faculty and students to improve design pedagogy for PTC classes, especially for CMCs in technical communication. Their recommendations will be discussed based on potential impact and feasibility. Thereafter, the implications of this research will be provided, focusing on what it contributes to instruction and learning in the fields of PTC (technical communication), as well as to UX based pedagogical research. Next, the major constraints and limitations of the project will be revisited, and any new insights into the methods or results will be discussed. These constraints and limiting factors will then provide a platform for establishing my future design pedagogy research agenda prior to my closing remarks.

Summary

In Chapter 1, we examined the history of design and design practices associated with communication, especially in professional and technical fields. From WWII to the present day, a strong bond was shown to exist between design and communication processes and purposes during each successive decade—a bond that seemed to strengthen through time via multimodal artifacts and their more creative means of development. Ultimately, Chapter 1 illustrated that design is a part of the work in professional and technical communication and thereby justified research like what I conducted for this project. That is, this project is justified by the recognition
that we should be examining and teaching design in PTC courses; therefore, we need to develop a method for communication design pedagogy.

Throughout Chapter 2, the theoretical foundations of a communication design pedagogy were laid. By examining the multiliteracies needed for CMCs in PTC, communication design pedagogy was provided with a framework of principles to guide how to design and teach multimodal rhetorical communications for digital artifacts and online environments. This provision culminated in a rhetorical, sociocultural, and technological basis for design pedagogy that provides instructors with theoretical knowledge of the literacies involved in today’s CMCs and how audiences interact with them. Also, the framework helps to encourage the integration of multiliteracies into courses and undergirds the communication design pedagogy developed in Chapter 3. All the while, the multiliteracy descriptions and communication design principles from Chapter 2 focused on meeting the needs of computer-integrated programs, digital classrooms, and 21st century professions and workplaces students aspire to join.

Once the multiliteracies connecting design and rhetoric for CMCs in PTC were defined, they indicated a need for a new design-centered approach to communication. Chapter 3 responds to this need by defining and describing my design pedagogy. Based on the nature of CMCs, digital culture, and multiliteracies informing rhetorical communication design, Chapter 3 articulated the tenets supporting teaching communication as design and adapted IDEO’s design thinking practice for use in PTC, especially for technical communication. Further, the development of design pedagogy was shown as a direct response to advancing multiliteracy expectations and calls for new forms of composition and new skills for the era of “digital rhetoric” (Hocks, 2003, p. 629). This focus on defining a new pedagogy that responds to calls
from the field resulted in a teaching tool fit for PTC and the digital era “design turn” in the field by addressing user expectations of the virtual age.

Building upon the previous history, theory, and literature-centric chapters, Chapter 4 offered the methodology for studying design pedagogy in technical communication classrooms. Using a qualitative focus, design pedagogy was studied from the vantages of faculty and students using pre- and post-pedagogy inquiries. The combination of phenomenological lived-experience recreation, qualitative interviewing, and in-class observations enabled the capture of user-experience information in a manner not often recorded during pedagogical inquiry. In fact, this study’s use of methods to examine a pedagogy via UX has never been deployed in this manner to acquire first-person lived experiences from the perspective of both teachers and learners, while also being supported by an observer’s third-person perspective. By interviewing faculty prior to any design intervention, by providing pedagogical training, by watching teachers and their students use communication design approaches and design thinking practices in their classes, and by having all stakeholders re-live and reflect on their experiences, this study enabled a highly detailed inquiry into an emerging pedagogy. Furthermore, it produced Chapter 5’s most important and encouraging results.

After defining my communication design pedagogy and establishing the research methods for its examination, the discussion of results and of the pedagogy’s user-experiences were profound. Via careful reporting and user-experience-based thematic analysis, Chapter 5 indicated that despite the challenges experienced by teachers and students first encountering design pedagogy in their classrooms, almost all saw encouraging benefits. Faculty users experienced improved teaching performance and better multimodal communication results, and they improved their courses’ focus on meeting the needs and expectations of today’s CMC end-
user audiences. Student users gained new practical user-audience based skills for planning workplace-based communications and process methods for composing 21st century CMCs. Also, they discovered the rhetorical potential of integrated multimodal designs for communicating effectively with end-user audiences. Thus, the user-experiences of faculty and students, respectively teaching and learning via design pedagogy, illustrated that design pedagogy research is not only justified, but may be important to improving the instruction and learning of CMCs in PTC, especially within technical communication courses. As such, let’s consider what these chapters offer as the major outcomes of this study.

Contributions

When taken together, the five chapters indicate five important contributions to teaching, learning, and pedagogical study in PTC. First, the historical mapping and analysis of the integration of design and PTC justify the importance of design work and support the development of a communication design pedagogy for instruction in these fields. Second, the redefinition of multiliteracies for 21st century CMCs in PTC environments provides a framework for teaching digital communication for virtual audiences and provides instructors in these fields with a set of governing principles for creating rhetorically effective intermodal communication designs. Third, through dissection and analysis of previous communication and design scholarship, the development of communication as design theory and the adaption of design thinking practices to meet the needs of PTC instruction provides a theoretically and functionally supported design pedagogy. Fourth, the careful consideration and interweaving of phenomenological and qualitative research methods have enabled user-experience inquiry into pedagogical tools for teaching and learning in PTC. And, fifth, through critical reporting and analysis of faculty and student user-experience data, this project illustrated several classroom contributions as proof that we should continue using and researching design pedagogy. However,
as an addendum to these outcomes, we must turn to the recommendations of stakeholders from the research site in order to discover best practices for the improvement of the new pedagogy for sustained classroom use.

**Recommendations**

Beginning with faculty stakeholders, five recommendations for design pedagogy emerge from the data. First, all faculty who used design pedagogy in their face-to-face and online sections recommended that more time be devoted to communication-as-design approaches and design thinking practices. As Buchanan (2002) noted, design is a complicated subject that is difficult to define, despite having broad usefulness and appeal (p. 5). This difficulty, when paired with the newness of design processes for doing communication work, makes teaching and learning via the new pedagogy a time-consuming activity. As such, faculty like Pam indicated that we “shouldn’t wait” (line 225) to teach design in technical communication courses; we should “introduce it early in the…semester and use it throughout” (line 263). The introduction of design pedagogy and instruction early and often throughout a semester long PTC course would potentially improve the learning experience and the impact of the instruction on communication work. Also, given the parallels faculty drew between the foci of their technical communication courses and the skills and emphases of the new pedagogy, it is feasible to integrate these new pedagogical tools seamlessly during preexisting instruction.

The second recommendation from faculty participants is the inclusion of more lessons on multiliteracy and multimedia. This recommendation from both Paul and Tarkir highlights two different needs: 1) students need to be provided more information to increase their understanding of professional CMCs in PTC, and 2) students require more of what Selber (2004) identified as functional computer literacy (i.e., the ability to use and analyze computer-based multimedia tools outside of traditional word processors) in order to make CMCs that are more purposeful and
effective “within the context of electronic environments” (Selfe, 1999, p. 11). The fact that
students in courses facilitated by these two faculty members often defaulted to more traditional
documentation for their final submissions speaks to these needs directly. In order to “encourage”
and “support” students’ development of 21st century communication designs, as Paul suggests,
we need to address multimodal literacies and focus more on teaching multimedia skills. For
example, lessons on why and how professional content creators design web, audio, and video
artifacts for user audiences—paired with instruction on making websites, podcasting, or video
production—could make a big difference. The inclusion of additional multimodal literacy and
multimedia learning would meet students’ need for new 21st century communication design skills
were “combining words with pictures with audio and video to express thoughts” is imperative in
the professional environment (Daley, 2003). These types of multiliteracy and multimedia lessons
would impact the students’ willingness and ability to produce more contemporary digital artifacts
and, with more time and some faculty training, would be a feasible addition to PTC courses.

Dovetailing with the previous recommendation, faculty participants Pam and Tarkir
proposed that the delivery of communication-as-design and design thinking lesson content needs
improvement. Having watched firsthand some students slip into a disconnected state, I agree that
the delivery of design content in the course needs to be improved. Faculty members suggested
that PowerPoints or videos could be integrated to increase engagement. Additionally, with the
allowance of more time, more activities to break up lectures would be advantageous too. Further,
in previous courses where I taught multimodal communication design, I would make the
“assignment sheet” into a podcast or video that both delivered the assignment information to
students and was an example of the product they should make. In all, having more time to
prepare the content of the communication-as-design and design thinking instruction and
following a few guidelines—using engaging, electronic delivery methods; increasing hands-on learning activities; and using multimedia examples to elicit multimedia submissions—would inspire students and faculty alike to transition to “composing in a new key” (Yancey, 2004, p. 321).

A fourth recommendation from faculty is for PTC courses to include design as a central component in assignments based on examining students’ use of design processes or methods and on traditional design work. According to Paul, our ability to observe and evaluate students’ use of the design thinking process may be improved by including a design process report in which students would walk the instructor through the design phases they used, what they did during those phases, why they took those actions, and what the results were. This is a notable recommendation because one student participant, Mustafa, reported that he did not use design thinking during most of the technical instructions assignment because there was no activity tracking and he simply didn’t want to try something new. This student even went so far as to suggest an assignment, similar to Paul’s recommendation, that would enforce the use of the design process because the teacher would be monitoring students’ use of the process. In addition to this progress reporting, Paul also suggested that the classical design critique common to graphic design courses could be deployed (essentially in lieu of peer review feedback) to aid students’ redesign work on their technical artifacts. As both progress reporting and design critiques may offer faculty insight into their students’ work and students’ audience feedback on their communication designs, the inclusion of these genres would positively impact course instruction and outcomes. Also, since these genres have clear parameters and are more traditionally assessable, their inclusion in PTC is feasible.
The fifth faculty recommendation stems from a word of caution expressed by Tarkir and Paul about teaching design thinking in PTC courses. Beginning with Tarkir’s concern, though he indicated that he had plans to continue teaching communication as design, he said that he would consider teaching design thinking as a process only if his students were “more open to those kinds of [innovative] things” (lines 370-371). This hesitance is based on the reaction some of his students had to the new process and its complexity. According to Tarkir, at first his students “didn’t get the idea” (line 317); then some indicated to him that it was too “time consuming” (line 349), and last some reverted to more “traditional” submissions (line 351). Because of this resistance to the new design thinking process for innovating technical communication artifacts for end-user audiences, Tarkir was left somewhat less confident that his future students were up to learning the new method; therefore, he recommends caution. Turning to Paul, his caution stems from the difficulty of assessment. Again, Paul struggled to see himself as a designer. Also, as a non-user of the technical instructions, he saw himself as a less than ideal assessor. This is not an uncommon place for communication instructors who find themselves questioning their ability to analyze a communication from the perspective of a target audience that they do not belong to. Further, given the fact that the products produced via design thinking methods were not based on a typical genre model, Paul expressed dread, manifesting in the feeling of being “pretty hollow stomached,” as he went to evaluate the submissions “at the end” (lines 181-182). Hence, Paul’s caution evokes a lack of confidence in his ability to fairly and appropriately assess these communication artifacts, not unlike the traditional communication faculty’s feeling of assessment deficiency when confronted with multimodal submissions highlighted by Jetnikoff (2015).
Taken together, Tarkir and Paul’s words of caution indicate a final, sensible recommendation. That is, based on these concerns, faculty recommend that design thinking instruction must be carefully planned and prepared for prior to its inclusion and throughout the course. Students need to be introduced to the new design process methods piece by piece and to how that process fits with the familiar writing process, which must be easily accessible to them. Additionally, faculty need to prepare themselves and students for the assessment expectations for non-traditional products resulting from design thinking. The submission of students who truly enact design thinking, as Paul noted, will not always use a particular medium, follow every genre rule, or be easily evaluated via product-centered assessment. Thus, careful planning and preparation are recommended for the design thinking process to have the most positive impact and for strong, purposeful assessment to be feasible.

Switching gears to student stakeholders, I found three impactful recommendations emerge from this project’s empirical data. The number one recommendation directly expressed by several students indicated that they wanted both more time to learn about communication design and design thinking and more learning on these subjects in general. One very outspoken student, Sierra, stated matter-of-factly, “I hope design and design thinking continue to be a part of the technical communication curriculum! I would love to see the topic expanded upon for future classes” (lines 43-44). Additionally, since design deals with communicative response innovation to complex “wicked problems” (Buchanan, 2002, p. 15), it was not surprising to see that some students simply wanted more. A small number of students, on one end of the spectrum, confessed they were still confused about design thinking, and therefore wanted more time with it. On the other end of the spectrum, several students wanted more material because “design and design thinking in this class enhanced [their] skills as a technical writer and will be overall
beneficial to [their] future career[s]” (Trisha, 45-46). Thus, just as the faculty recommended, students also recommend more time and attention to the content and tools of design pedagogy in their PTC classrooms. Not only is this feasible, as indicated in the faculty recommendations, but it will yield the positive impacts discovered in Glen et al.’s (2015) study as well as the contributions found during my research.

The second recommendation derived from student data is that they want learning via design pedagogy to include more user interaction and end-user feedback, both of which are of increasing importance to modern PTC interests in UX research (IDF, 2020). According to Abby, “the largest challenge was creating something that was suited to our audience…[because] the class proposes hypothetical situations for our assignments [and] we were unable to get real feedback from a real audience” (lines 33-35). This indicates that there is a strong need for our PTC courses to give students a service-based or client-centered learning experience whenever possible as a part of learning professional communication design. By having students interact with the real end-users of their technical artifacts, they will be able to recognize their communications as real “textual actions” (Purdy, 2014, p. 633) that address users’ often messy social situations and critical needs. But, as we know from Cindy’s concerns about hampering the workflow of outside professional organizations or companies, there are risks to service and client-oriented classwork. Yet, as Paul pointed out, we may be able to have real user audiences in the classroom if the students are the intended audience for the communication artifact. Thereby, student peer groups could be the real users of the artifacts and provide UX research opportunities to students, like observations, speak-aloud protocol work, and moderated and/or unmoderated interviewing experiences, as well as the provision of real user feedback. Therefore, the recommendation for more user interaction and end-user feedback may be solved through
multiple means—either by engaging outside clients or by modifying assignments toward products with a student audience—which may make design pedagogy learning more impactful and feasible at the same time.

The last student recommendation is the inclusion of an individual design thinking assignment with more instructor oversight. As I mentioned above, one student reported that he did not enact the design thinking process because he felt he did not need to; he felt that his instructor would not know if he did or did not use the new method. During his post pedagogy interview, Mustafa stated, “for me, design thinking was just something that happened in lecture…for students like me, if you wish for us to actually use and learn about design thinking, make required assignments or in-class activities requiring the process…[otherwise,] I just skip to making the product with whatever way I know” (lines 31-34). This student’s recommendation mirrors that of faculty member Paul’s recognition that we need individual students to make design process-focused progress reports. Such an assignment would help us ensure students like Mustafa are enacting the processes we are teaching them. And they would help instructors track students’ activity throughout a major assignment and whether or not they are meeting the new literacy and new media learning goals that will better serve them for today’s CMCs in PTC workplaces. As such, the inclusion of such an assignment would offer both positive impact on student’s and faculty’s’ experiences learning and teaching with design pedagogy and is a feasible addition to a design infused course with an extended time frame for design content delivery.

Last, but not least, I would like to offer my own recommendations for the improvement of design pedagogy for PTC instruction and learning. My recommendations are based on all the first- and third-person data collected during this study and my own experiences with design pedagogy and reflection upon this project as a whole. From these considerations, I have five
recommendations which overlap with those proposed by faculty and student stakeholders. For the improvement of design pedagogy for CMCs in PTC courses, I recommend:

1. Use of design pedagogy throughout the entire semester within a class,

2. Integrating more design-centered assignments into the coursework (design critiques, design process progress reports, UX testing-result reports, etc.),

3. Using multimodal, multimedia delivery for communication design lessons and assignments,

4. Incorporating real user-audiences for interaction, testing, and feedback into classroom structure (either via service-client arrangements or targeting students as real audiences),

5. Including faculty design thinking and multimedia communication assessment training.

All five of these recommendations come from my interaction with students and faculty. Every stakeholder group requested more time for design instruction and learning in their courses. I too hoped for more time, perhaps even a semester-long study. But due to time and participation constraints, a single unit was all that was feasible for this initial case study. Next, the incorporation of more design-based assignments was something I too considered when initially redesigning the technical instructions module. However, since the module was only three weeks long, there was simply not enough time to include more student submissions. As for improving the delivery of communication design and design thinking materials, I initially provided faculty with notes, text and visual guides, and supplementary readings and videos. But many of these materials were passed along to students on canvas or via lecture. Therefore, student engagement was an issue. Fourth, the incorporation of real end-users would most certainly increase the
authenticity of the learning experience and steer the course content toward the professional environment. But, since I could not establish clients for faculty and students to work with, we did the best we could at assuming the role of user audience or analyzing user-audience community data on similar communication artifacts online. Last, though I made a rubric for assessing the results of the design thinking process, some faculty still held reservations about evaluating student submissions. Thus, as an addition to my pre-pedagogy training seminars, assessment must be addressed when introducing instructors to this new focus for communication work. All in all, I believe these recommendations will have a positive impact on the stakeholders of PTC classrooms and their courses, and, if the practices of the design pedagogy described are followed with these addendums, the inclusion of all recommendations is feasible for PTC curriculum.

**Implications**

Based on the research present in this project, both through secondary sources and empirical data, there are several implications relevant to professional and technical communication scholarship and 21st century pedagogical research. First, the historical work that began this study illustrates that design is more a part of our communications than ever before. The ubiquity of CMCs in our daily and professional lives puts great emphasis on improving the teaching and learning experiences that provide the means for producing “digital rhetoric” (Hocks, 2003, p. 629). Further, the results of this study confirm Kostelnick’s (1989) recognition that the separation of design processes from communication processes is unnecessary. Each set of processes mirror the other as a sort of “natural counterpart” (p. 267). And, with regard to today’s multimodal, online, interactive communications, the use of writing and design methods must be integrated to achieve the best possible products. As Purdy (2014) illuminated, since “the field turn[ed] attention to video, audio, and embodied texts,” communications in our classes are now “designed, not written” (p. 613-616). Therefore, a new usable design pedagogy for teaching
and learning composing in PTC courses is essential, and this study defines, tests, and reports on a design pedagogy which has been shown to fit well into the intended curricular environment.

Using the design pedagogy theories and practices outlined and evaluated in this research, faculty and students have confirmed the value and the need for such an approach to teaching and learning in technical communication. This shows us that design pedagogy is an important tool for making today’s CMCs, a tool that all stakeholders connect to workplace communication skills and broader cultural expectations. Further, by looking at these two important groups individually, I was able to show via this study that teaching and learning via design pedagogy is advantageous in very specific ways. For faculty, teaching communication as design and design thinking proved to be helpful for teaching the multimodal artifacts that employers and the public have come to expect. Also, faculty found that both their effectiveness at teaching design and the rhetorical impact of their students’ communicative artifacts better addressed the needs and expectations of target user-audiences, a key focus in technical writing. In regard to the student group, this study provides the field support for student learning focused on communication design and design thinking practices. It illustrates that learning these topics in PTC environments may help professional students better analyze and respond to their users, clients, and customers. Also, the study shows that increasing students’ awareness of multiliteracies and multimodality may produce an equivalent increase in the potency of their communications to achieve their intended rhetorical purpose. Last, and as previously mentioned, learning via the design pedagogy presented in this research resulted in students feeling much more prepared for the workplace through the numerous design-based skills they learned.

The last implication of this study comes from the layering of phenomenological and qualitative research methods to produce a user experience view of teaching and learning with a
new pedagogical tool. By layering phenomenological lived experience recreation, semi-structured qualitative interview reflections, and ethnographically based user-experience observations, this study illustrates the means to study the first- and third-person user-experiences of faculty and students teaching and learning via a chosen pedagogy. Future pedagogical research may integrate these methods as a model for capturing pedagogical UX data that may be valuable both to the field of PTC and beyond.

**Constraints & Limitations**

Having completed this study and as a springboard for my future pedagogical research, I would like to briefly revisit the constraints and limitations of this project. I acknowledge, as stated in the methods section, that there are a number of factors associated with my participants, setting, and investigation which illustrate the limits of this project—limits I hope to overcome going forward.

First, the number of people participating in my design pedagogy research was rather modest. In the future, I hope to include more faculty participants so I may establish more generalizations about instructors’ teaching experiences with the new pedagogy. Though this current study allowed me to plumb the depths of a few faculty members’ experiences, the data may not have indicated the full range of UX variance with design approaches or practices. Additionally, I would like to include more investigators beyond myself. This may allow for the inclusion of other qualitative, rhetorical, and quantitative research partners who may contribute their methods. Also, it will allow for independent coding and analysis of the data in order to establish greater reliability. Further, the inclusion of non-investigator interviewers may decrease the occurrence of social desirability bias when combined with a bias assessment scale. So, the inclusion of more researchers would allow for increased data verification and for the next round of pedagogical inquiry, the ability to address the quantitative elements of assessment and the
evaluation of learning outcomes, and greater control over biasing effects. Last, though the number of students was satisfactory, including more students from more PTC courses would enrich the study in multiple ways. That is, by including students from business, scientific, and healthcare communication courses, we may determine additional areas where design pedagogy may be advantageous.

A second limitation is that the design pedagogy study setting is too restricted. Going forward, the setting needs to be enlarged to include courses beyond technical communication in order to capture data relevant to all PTC environments teaching CMCs. This site enlargement should include different PTC courses, multiple programs, and several institutions. During this study, technical communication was my primary target since I was working alone and with limited resources for research. Also, per my assessment, the course stood to gain, perhaps substantially, through the infusion of more multimodal and design-centric instruction. However, I believe that the study of design pedagogy should take place in business communication, scientific communication, and healthcare communication, as well as English for specific purposes environs. By examining design pedagogy in all of these PTC courses, I may become better equipped to establish more specific results from the inclusion of design pedagogy. And, I also expect that examination of design pedagogy in courses not recently reconfigured may help my movement toward investigating student products.

Third, the methods of investigation used during this study were too limited by the focus on UX inquiry. Therefore, the methods need to be broadened to include other aspects of design pedagogy teaching and learning. For this initial study, I chose phenomenological and qualitative research methods as these coincided with my training and were appropriate for establishing UX data on design pedagogy. However, since the faculty and student user data suggest there was an
improvement in technical communication products, I need to investigate the outcomes of teaching and learning via design pedagogy by assessing student submissions. This means that further investigations need to address grading, use rhetorical and quantitative assessment of student artifacts, and may require committee-based evaluation of work to either confirm or challenge stakeholders’ perceptions of CMC improvement observed during this study. This inclusion of more research methods and a focus on learning outcomes and product assessment moves the inquiry of design pedagogy from UX to numerical results analysis which may better sway potential adopters of the tool. Based on these constraints and limits, I am able to deliver a vision for my future research plan.

**Future Research Agenda**

There are several items currently part of the future design pedagogy research agenda which have arisen as a result of this study. The following list provides a general overview of the primary research plan for design pedagogy after this project.

1. Develop a rhetorical and quantitative research plan for examining the results of design pedagogy in PTC.
2. Prepare new IRB approved studies examining design pedagogy with interested colleagues, broader settings, and new investigative methods.
3. Create new course designs for each PTC environment iterated above that include new materials, assignments, and training for design pedagogy.
4. Recruit PTC program administrators, faculty, and students to participate in researching a PTC course based around design approaches and practices delivered via design pedagogy.
5. Execute a robust research program looking at design pedagogy for CMCs in PTC environs and how they impact faculty and students, as well as product assessment and
learning outcomes, and perhaps even how this learning impacts the professional success of students in the workplace.

As this research agenda matures, future findings may be published to point researchers in new pedagogical and empirical directions for their own teaching and field work. Additionally, with the UX methods used in this study other pedagogical tools may be assessed (e.g. digital-collaborative pedagogy, service-learning pedagogy, new media pedagogy, etc.). It is my hope that with these UX methods we may discover what teaching methods work best for different kinds of institutions, programs, faculty, students, and courses in PTC where CMCs have become ubiquitous and where the workplace communication of the future may be addressed today.

Closing

In closing and as promised, I would like to provide my final thoughts on the challenges and strengths of design pedagogy and offer a few words on the project as a whole. The research conducted during this study has illustrated that design pedagogy may offer a great deal to PTC courses teaching students the knowledge and skills they need to create appropriate, purposeful CMCs for end-user audiences. Despite the challenges faculty and students confronted—issues with time, unfamiliarity, delivery, assessment, and multimodality—this new design pedagogy was shown to provide numerous benefits indicating its strengths as a teaching and learning tool.

Design pedagogy fits into the topics preexisting in technical communication courses. The pedagogy created a positive and valuable teaching and learning experience according to participants that correlated with what faculty and students saw as improved results. Teachers felt more able and prepared to teach CMCs, user-audience analysis, and workplace communication based on their training and use of design instruction. Students felt they were better able to address users, use multimodal communication with a rhetorical purpose, and felt like they had acquired new, important skills for their future workplace environments. And, the method used
for studying design pedagogy itself could provide a foundation for continued pedagogical inquiry that may illustrate the challenges and strengths of other teaching tools and their impact on PTC and beyond. Thus, based on the data from this study, design pedagogy research offers communication as design theory and design thinking practices that are valuable additions to communications instruction and learning. Also, the research offers a method for pedagogues to continue their research and to utilize and improve their craft. Yet, there is much work that remains to be done with regard to design pedagogy. It is important that we continue in the directions described heretofore so that we may keep pace with the rapid changes of the workplace and virtual communication landscape.
REFERENCES


Instructions

Learning Objectives

- Identify the purpose and multimodal elements of the instructions genre
- Plan & use instructions to address an end-user problem with a solution illustrating knowledge form observation and empathy
- Identify and define document design based on the instructions genre and end-user needs and expectations
- Create step-by-step instructions for humans completing a task using design thinking
- Implement principles of effective document design in the display of quantitative and qualitative data

Purpose and Description

At some point in your life, whether it be in your professional or personal life, you will be asked to provide an audience with multimodal instructions for completing a task. It could be teaching your teenager to drive, showing a substitute what to do when you are gone, or demonstrating how to use software to a group of colleagues. For this assignment, you will work as a group to find a problem and draft a procedure using original step-by-step instructions for solving it. Your instructions must be comprehensive, using major and minor steps and plenty of visuals to clearly explain to the target user-audience how to complete the procedure.

The choice of topic for this assignment is up to you, though it should address a specific problem a target audience is experiencing and be something that’s relatively inexpensive and straightforward to complete. Some topic ideas include:
- A recipe for a complex dish that requires multiple major steps or stages
- An art or craft project
- A step-by-step walkthrough for a software function or video game
- A home improvement or small building project
- Etc.

This instructions assignment will provide you the opportunity to:

- Use team based, problem-solution communication.
- Analyze a user-audience to determine their needs and expectations to inform your rhetorical strategies.
- Include effective media that partner with text to provide the user with effective directions.
- Include effective tips, results, and safety information to supplement the action-oriented steps.

**Expectations**

An effective set of instructions will:

- Include at least 5 major steps (each composed of multiple minor steps).
- Employ imperative/command mood in the text to create action-oriented steps.
- Integrate effective original media like photographs, screen captures, diagrams, or illustrations with textual instructions (use media with every major step).
- Demonstrate goodwill with the user-audience and use appropriate design language, grammar, spelling, and mechanics.
- Clearly state the user-audience you’re addressing and why. Reflect the audience’s needs through your chosen content, organization, style and delivery.
- Be carefully designed as a multimodal communication directed by user audience perceptions and how well they respond and channel response to the problem.
- Be submitted as a PDF file.
The assignment rubric also provides detailed evaluation criteria for this assignment. Consult the rubric closely as you’re composing and revising.

**Audience**

Your primary audience for this proposal is your targeted user-audience and your instructor. Your secondary audience is your classmates who then might select your instructions to test for the feasibility report assignment.

**Supporting Materials**

- *Chapter 10: Instructions and Manuals*
- *Chapter 15: Visuals*
- A Guide to Design and Design Thinking
- Lecture videos from Module 5
APPENDIX B. FACULTY INTERVIEW PROTOCOLS

This appendix contains both the pre- and post-design pedagogy faculty interview protocols that were used during the study.

Pre-design Pedagogy Faculty Interview Protocol

1. Tell me about your history and experience teaching English 314?
2. What pedagogies inform your teaching practices, especially for technical communication?
3. How do you treat multimodality/multiliteracy in your English 314 classes?
4. What are your thoughts on design, as in communication design?
5. What are your experiences with communication design?
6. Have you used design language or activities in your technical communication classes? If so, how? If not, why?
7. Have you heard of design thinking? If so, what have you heard? Have you used it? If not, what do you think it is?
8. Based on a definition/description of design thinking, ask:
   a. What benefits/challenges do you think design thinking presents English 314 instruction?
   b. How do you think design thinking will affect your teaching? Students’ learning?
      Assignment submissions?
9. At this point, what are your honest thoughts on treating communication as design (especially CMCs in PTC) and the practice of design thinking for student composing?
Post-design Pedagogy Faculty Interview Protocol

This post-pedagogy protocol begins with the phenomenological lived-experience recreation, then illustrates the reflective interviewing used.

Phenomenologically informed qualitative teacher interview for post-design pedagogy.

(Trying to recreate the first-person lived experience to confirm/redress observation data.)

“What I’d like to do is get a sense of what you experienced as you Taught using design pedagogy. I’m trying to get at the experience itself, not the content of what you taught, or your evaluation of your teaching, or what shaped your teaching practices, or even generalizations about or interpretations of your teaching process. I’m trying to get at your state of mind, the feelings, the mood, the emotions. How your body felt, any smells, sounds, movements. Just what you experienced first-hand, for now at least. We will then come back in reflection later.”

So, lets practice this kind of experience recreation together. Let’s start with something easy. I’d like you to think back to eating breakfast this morning. Can you describe the experience from the time you sat down? What happened first, second, third. What are the feelings, smells, sounds (from outside your head or inside your head), tastes, etc. What were you thinking, feeling, or experiencing inside and out?

Okay. Thank you! It sounds like an interesting meal.

(F2F:) Now, let’s put you back in your classroom. You’re in the DUX Lab, the lights are bright. The screens are on and the students are on their phones. A faint plastic and coffee aroma are in the air. You set up your computer and are beginning todays lesson for the instructions module…

1. How do you feel about the lesson? What are you thinking about? About yourself? About class? About the Design lesson? Are there any parts that you are nervous about? Is there anything you are excited about? How does the environment influence your feelings? Your feelings about design and design thinking? Do you have any bodily experiences you associate with the design or design thinking lessons? Any thoughts? Tell me about your experiences as you are teaching design and design thinking using the new pedagogy? Anything else you want to add about your experiences?
Reflective interview questions.

Now that we’ve recreated the lived experience of your first-person teaching with the new pedagogy, I’d like you to reflect on that experience as a whole and answer a few questions.

1. How did teaching communication as design fit into English 314?
2. How did using design pedagogy compare to your normal approach?
3. How did students respond to learning communication as design for a technical artifact?
4. Would you teach communication-as-design for technical CMC again? Why/why not?
5. When you provided instruction on design thinking, how did it go?
6. Did students respond positively or negatively to design thinking practices? How so?
7. Would you use design thinking again? Why/why not?
8. Compared to your previous teaching experiences, how did teaching this unit compare?
9. What did you like/dislike about the design approach and/or design thinking practices?
10. How would you improve the design approach and/or design thinking for English 314? For technical communication? For CMCs?
APPENDIX C. STUDENT INTERVIEW PROTOCOLS

This appendix contains post-design pedagogy student interview protocols that were used during the study.

Phenomenologically Informed Qualitative Student Interview Protocol-Post-design Pedagogy

(Trying to recreate the first-person lived experience to confirm/redress observation data.)

“What I’d like to do is get a sense of what you experienced as you learned about design. I’m trying to get at the experience itself, not the content of what you learned, or your evaluation of your learning, or even what shaped your practices, not even generalizations or interpretations about your learning process. I’m trying to get at your state of mind, feelings, mood, and emotions while you learned design. How your body felt, any smells, sounds, movements or other experiences. For now, I’m only interested in what you experienced first-hand when learning design. We will come back to your reflections on your experiences.”

So, let’s practice this kind of experience recreation. Let’s start with something easy. I’d like you to think back to eating breakfast this morning. Can you describe the experience from the time you sat down? What happened first, second, third, and so on. What are your feelings, the smells, sounds (from outside your head or inside your head), tastes, and other experiences you had? What were you thinking about, how were you feeling? Tell me about what you were experiencing inside and out?

Okay. Thank you! It sounds like an interesting meal.

(F2F:) Now, let’s put you back in the classroom. You’re in the computer Lab, the lights are bright. The screens are on. A faint plastic/marker smell is in the air. The floor creaks as people walk around. You set up your device and are beginning today’s lesson on designing technical instructions…

1. How do you feel about the lesson? What are you thinking about? About yourself? About class? About Design? Are there any parts that are confusing? Is there anything exciting? How does the environment influence your feelings? What are your feelings about design and design thinking as you learn about them? Do you have any bodily experiences you associate with the design lessons? Any thoughts? Tell me about your experiences as you
are learning design processes in relation to writing processes you know? Anything else you want to add about your experiences?

Reflective Interview Questions

Now that we’ve recreated the lived experience of your first-person learning about design, I’d like you to reflect on that experience as a whole and answer a few questions. (Remember: There are no wrong answers!)

1. How would you define communication design?
2. What was your initial impression when it was introduced?
3. How do you feel about communication design after learning about it?
4. So, based on your experience, are technical communication artifacts designed? Can you explain why/why not?
5. Has the design approach changed how you compose? If so, what changed?
6. Turning to the design thinking process, describe your experiences with design thinking.
7. Do you see design thinking in English 314 as helpful or hurtful? Explain.
8. Was there anything that made design thinking a positive experience?
9. What challenges arose when using design thinking?
10. How would you compare using the design thinking process for the instructions assignment to using the writing process for previous assignments?
11. Is there anything else you would like to add about your experiences with design and design thinking in English 314?
APPENDIX D. OBSERVATION PROTOCOLS

This appendix illustrates the observation protocols for this research project. In what follows, I present who was observed, where the observations occur, when these observations took place, what was observed, and how the observations were recorded.

Observation Participants

Participants in this research study are English 314: Technical Communication faculty and students. Observations of faculty and students were central to collecting the pedagogical data sought by this study. Faculty with various levels of experience teaching English 314, who are teaching the class face-to-face and online during the Fall 2019 semester, and who were recognized as appropriate for teaching English 314 at Iowa State University were included. Additionally, only students in participating faculty’s English 314 courses were observed. Faculty and students who did not meet the above criteria were excluded from this study.

Observation Locations

All locations where research observations took place were English 314 classrooms on Iowa State University’s campus. Both faculty and student participants were observed in their regular classroom spaces during regular class meetings while they were addressing or completing the technical instructions unit in the course.

Timing of Observations

Observations completed for this study occurred during regular class meetings. Specifically, observations happened during the unit of the course focused on composing technical instructions artifacts. This unit lasted approximately three to four weeks from week 10 through 14 during the fall term. During these classes, faculty were introducing the fundamentals of communication design, teaching the principles of communication design, and providing
instruction in design thinking processes. All these interactions were observed. Further, classes wherein students were learning about or using these components of design pedagogy were observed, special care was taken to attend all technical instructions assignment workshops.

**Focus of Observations**

The focus of this study’s observations is best observed by splitting them along participant groups. For observations of faculty, I aimed to record a firsthand account of how teachers orient students to communication design pedagogy—identifying what worked and what did not. I focused on any challenges or breakthroughs that occur with regards to instruction. Additionally, I noted how well the pedagogy fit into the teachers’ courses and the curriculum. For observations of students, I focused on how students came to understand design pedagogy and how they put design thinking to use. These insights helped me identify what attributes of the pedagogy work and what did not work from the perspective of learners. Also, I focused on how well the pedagogy fit the needs of students’ coursework and their expectations for the curriculum and assignment outcomes.

**Observation Practices**

In terms of informed observational practices, for this study I used observations and kept anonymized fieldnotes during in-class communication design instruction and practice. Following qualitative research scholar Sarah Tracy’s (2013) guidance for observational research, I defined my classroom role as a “complete observer,” (p. 121) a third-party individual who does not interfere with the activity or behavior of the setting. The complete observer exists on the periphery of the environment and is fully dedicated to watching and noting all activities relevant to their study (in this case relevant to design pedagogy teaching and learning). Additionally, my plan for taking fieldnotes was informed by Tracy’s concept of “analytic asides” and “memos” (p.
that observers may use to recreate the observed situation for critical reflection and to inform interviews. As such, these notes focused on recording all aspects of faculty and student experiences and perceptions of design pedagogy.

**Closing**

In this appendix I have provided an overview of the observation protocols in place for my design pedagogy dissertation research project. These protocols were established to ensure that best practices were observed, and that consistency is maintained between multiple observations sites and study participants.
**APPENDIX E. FACULTY DATA ANALYSIS CODEBOOKS**

**Table 1.E. Faculty: Pre-design Pedagogy Interview Analysis Codebook.**

<table>
<thead>
<tr>
<th>Category</th>
<th>Abbrev.</th>
<th>Code</th>
<th>Definition/Explanation</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Background-Experience</td>
<td>SAT</td>
<td>Faculty Status</td>
<td>Faculty ranking information</td>
<td>Participant faculty report their faculty ranking information</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PRG</td>
<td>Programmatic Experience Programs faculty have experience teaching within</td>
<td>Participant faculty discuss the Programs they have experience teaching within</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PGKN</td>
<td>Pedagogy Knowledge Preexisting pedagogical knowledge and approaches to teaching</td>
<td>Participant faculty discuss their preexisting pedagogical knowledge and approaches to teaching</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TCE</td>
<td>Tech Comm Experience Tech Comm teaching history</td>
<td>Participant faculty report their tech comm teaching history and experiences</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PED</td>
<td>Tech Comm Pedagogy Preexisting pedagogies for teaching tech comm</td>
<td>Participant faculty discuss their preexisting pedagogical approaches to teaching tech comm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MUL</td>
<td>Multimodal / Multiliteracy Instruction Experiences and approaches to teaching multimodality and multiliteracies</td>
<td>Participant faculty discuss their experiences and approaches to teaching multimodality and multiliteracies in tech comm</td>
</tr>
<tr>
<td>Pre-Intervention Design / Design thinking Understanding</td>
<td>DES</td>
<td>Design Thoughts</td>
<td>General, unbiased thoughts on Design in Communication</td>
<td>Participant faculty provide their unbiased opinions and thoughts about design as part of communication</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DEF</td>
<td>Communication Design Definition Individual’s definitions of the term</td>
<td>Participant faculty offer their own definitions of communication design and discuss its attributes</td>
</tr>
<tr>
<td>DEXP</td>
<td>Communication Design Experience</td>
<td>Participant faculty explain their experience with communication design based on their definition of the concept</td>
<td></td>
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<td></td>
<td>So, the first unsuccessful one [laughs] would be that I tried to be a content producer for a freelance marketing service… (PAUL, 128-148)</td>
<td></td>
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<tr>
<td>DLNG</td>
<td>Design Language</td>
<td>Participant faculty discuss their pre-study use of design language and concepts in tech comm instruction</td>
<td></td>
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<tr>
<td></td>
<td>Yes and no. I mean not, I would say, that I don’t use it as much as maybe I should. But, then again, you also run that balance of, with engineers, if you haven’t laid the ground work that design is important, they are like, this isn’t a design class. (PAM, 149-154)</td>
<td></td>
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</tr>
<tr>
<td>DTEXP</td>
<td>Design thinking Knowledge / Experience</td>
<td>Participant faculty discuss their previous knowledge and experience with the Design thinking process (if any)</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>I have heard of design thinking, uh, as I said while I was working with especially with engineers…[BUT] No, I didn’t use it. (TARKIR, 241-252)</td>
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<td></td>
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<tr>
<td>DTDEF</td>
<td>Design Thinking Definition</td>
<td>Individual’s definitions of the term “Design thinking”</td>
<td></td>
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<tr>
<td></td>
<td>I guess I would say that it is, um, like consciously thinking about design while you are working on something, thinking about it instead of just putting the words out there, ya know. Yeah. (PAM, 169-177)</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Post- Intervention Design / Design thinking Contemplative Analysis</th>
<th>ETB</th>
<th>Expected Benefits (of Design / Design thinking)</th>
<th>Participant faculty discuss the benefits they expect Design / Design thinking to have for them in tech comm instruction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Potential Benefits of Design /Design thinking in Tech Comm</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>…design thinking, I think it is more comprehensive by coming from the problem, then trying to find something that will definitly remedy that problem and then maybe coming up with a product and those other things. (TARKIR, 341-343)</td>
<td></td>
</tr>
<tr>
<td>ETC</td>
<td>Expected Challenges (of Design /Design thinking)</td>
<td>Participant faculty discuss the challenges they expect to encounter as they provide Design / Design thinking instruction in tech comm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Potential Challenges of Design /Design thinking in Tech Comm</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>…the curriculum right now isn’t tailored to doing this type of work. (CINDY, 177-178)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DTT</td>
<td>Design / Design Thinking influences on Teaching</td>
<td>Participant faculty offer their thoughts on how they believe their tech comm instruction will be influenced by Design / Design thinking</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Potential teaching influences</td>
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<tr>
<td></td>
<td>I mean it would change the activities and the process. So, you know, instead of having a prewriting activity, you are going to have a problem definition activity. Um, so yeah, I think it would change the day to day. (PAUL, 317-321)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DTS</td>
<td>Design / Design Thinking influences on Students</td>
<td>Participant faculty offer their thoughts on how they believe their tech comm students will be influenced by Design / Design thinking</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Potential learning influences</td>
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<tr>
<td></td>
<td>when you have a group of students looking at you they are busy, they have internships, they are juniors and seniors, they don’t really want to be there, if you can make those connections to what they are doing in their desired fields then it makes it more applicable for them. (PAM, 288-293)</td>
<td></td>
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</tr>
<tr>
<td>DTA</td>
<td>Design / Design Thinking influences on Assignments</td>
<td>Participant faculty offer their thoughts on how they believe their tech comm assignments will be influenced by Design / Design thinking</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Potential submission influences</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The evaluation, I think, is going to be…you know, if we put more emphasis on it, we need to make sure that we are evaluating it, and that we are evaluating it well and writing effective feedback. Instead of just, oh good. (PAM, 297-299)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HON-D</td>
<td>Honest Opinion on Design</td>
<td>Participant faculty provide their honest opinions on Communication Design Pedagogy for Tech</td>
<td></td>
</tr>
<tr>
<td></td>
<td>I really like it… its, um, I really like it. Uh, and I think that it goes well with what I do anyway. So, any excuse to implement it before I am able to build my own 314 curriculum is exciting for me. (CINDY, 213-219)</td>
<td></td>
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</tr>
</tbody>
</table>
Table 2.E. Faculty: Post-design Pedagogy Phenomenological Experience & Interview Analysis Codebook.

<table>
<thead>
<tr>
<th>Category</th>
<th>Abbrev.</th>
<th>Code</th>
<th>Definition/Explanation</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Phenomenological experiences</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FEL</td>
<td></td>
<td>Feelings</td>
<td>General thoughts and Feelings about Design/Design thinking for tech comm</td>
<td>I was worried about how I could do it. How I could show the connections between...[design and tech communication] that created apprehension, a feeling. (TARKIR, 143-144)</td>
</tr>
<tr>
<td>REA</td>
<td></td>
<td>Reactions</td>
<td>Participants’ first reactions to teaching Design/Design thinking in tech-comm</td>
<td>…It was like, oh, you are getting it. Okay, cool. [laughs] And then it, um, [the anxiety] eased…that panicked feeling only lessened. It did not get worse. It was at its height right before that class started. (PAM, 130-133)</td>
</tr>
<tr>
<td>LVD-EXP-D &amp; DT</td>
<td></td>
<td>Lived-Experience Teaching Design &amp;/OR Design Thinking</td>
<td>Recreation of participants’ lived experiences in the classroom regarding instruction on communication as design, design thinking processes in tech comm</td>
<td>[Relieved,] At least this design thinking process gives them an idea about when to start and which things first they should be looking at. (TARKIR, 197-199)</td>
</tr>
<tr>
<td>LVD-DXP-E</td>
<td></td>
<td>Lived-Experience of Environment</td>
<td>Recreation of participants’ lived experiences of the environment and its influences on teaching Design/Design thinking in tech comm</td>
<td>…there were not differences, there were advantages to both…having the TVs verses forcing some of them to use smartphones instead. (Pam, 182-195)</td>
</tr>
<tr>
<td><strong>Curriculum</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FIT</td>
<td></td>
<td>Design’s Fit</td>
<td>Examining design’s fit in tech comm</td>
<td>I can easily tie [DESIGN] to what we have already been doing…So, I think if I wouldn’t have been able to make those connections, they might have been like where is this coming from. (PAM, 159-163)</td>
</tr>
<tr>
<td>PRE</td>
<td></td>
<td>Previous Units vs. Design Unit</td>
<td>Comparing the instruction of previous units in tech comm to teaching the design infused unit</td>
<td>Um, pretty similar. I would say. (PAUL, 293)</td>
</tr>
<tr>
<td>REC</td>
<td></td>
<td>Design Recommendations</td>
<td>Recommendations for teaching of Design and Design thinking in tech comm</td>
<td>I feel like we wait to talk about design really until the instructions and that is crazy. We shouldn’t wait to do that. (PAM, 224-225)</td>
</tr>
<tr>
<td><strong>Teachers</strong></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
Design pedagogy is compared/contrasted with traditional tech comm pedagogies used during past experience. (TARKIR, 226-228)

**CD?** Teach Communication as Design Again? Faculty respond to if/why they would teach communication as design in tech comm again. Participant faculty respond to if/why (not) they would teach communication as design in tech comm again. [Yes,] I think it sets the stage nicely to say yeah, we are writing, but we are also designing… And it gives them something to look at. (PAM, 349-351)

**DT?** Teach Design thinking Again? Faculty respond to if/why they would teach design thinking in tech comm again. Participant faculty respond to if/why (not) they would teach design thinking in tech comm again. Um, yeah…Um, I mean the most valuable thing that I see is that it’s a: ingrained in the process, and b: they have terminology for user evaluation. (PAUL, 280-283)

**D/DT-LD** Design / Design thinking Likes & Dislikes Faculty share what they like and dislike about teaching design / design thinking. Participant faculty share what they like and/or dislike about teaching design / design thinking for tech comm. I liked that you did have some, not really user interaction, but user artifact interaction, like those content threads. (Paul, 304-305)

**DTI** Design thinking Instruction (Assessment) Faculty assess their design thinking instruction and how their teaching went. Participant faculty assess their design thinking instruction and their feelings about how their teaching went. We just I don’t think there was really a space for it…I mean because the discussion are each activity and then they submit their final draft, and I guess they submitted a draft in between, but at no point do they like describe their process to me. (PAUL, 256-258)

**Students** SCD/DT Student Response to Design / Design thinking Faculty share how their students responded to Design / Design thinking instruction. Participant faculty share how their students responded to Design / Design thinking instruction. I think they first react to this topic a little bit like time consuming. (Tarkir, 349)

**DTL** Design thinking Learning (Assessment) Faculty assess their students’ design thinking learning and how that learning went. Participant faculty assess their students’ design thinking learning and their feelings about how that learning went. …from what I have seen, this set of instructions is far better than assignments I have done in the past…Like far better. Because they were thinking about design more. We were talking about it more. It is not, I don’t know what I did in previous units…[laughs] (PAM, 197-201)
## APPENDIX F. STUDENT DATA ANALYSIS CODEBOOK

Table 3.F. Student: Post-design Pedagogy Phenomenological Experience & Interview Analysis Codebook.

<table>
<thead>
<tr>
<th>Category</th>
<th>Abbrev.</th>
<th>Code</th>
<th>Definition/Explanation</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phenomenological experiences</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FEL</td>
<td></td>
<td>Feelings</td>
<td>General thoughts and Feelings about Design / Design thinking</td>
<td>I feel open to it. I don’t exactly know what design is, in regard to technical communication. (Amed, 8)</td>
</tr>
<tr>
<td>REA</td>
<td></td>
<td>Reactions</td>
<td>Initial, embodied (physical, mental, environmental) reactions to Design / Design thinking</td>
<td>I like design and have an appreciation for the creativity and thought involved in it. (James, 8)</td>
</tr>
<tr>
<td>LVD-EXP</td>
<td></td>
<td>Lived-Experience</td>
<td>Recreating the experience (physical, mental, environmental) of Design / Design thinking instruction and learning</td>
<td>In this class through many of the assignments we were solving problems (i.e. giving instructions, describing a process, etc.). During this class we looked at many tasks or methods and wrote about how to do it or solve a problem. (Connie, 19-21)</td>
</tr>
<tr>
<td>Qualitative User Reflections</td>
<td>PROF</td>
<td>Professional Ties</td>
<td>Connections between Design / Design thinking and careers, industry, programs, and core coursework</td>
<td>I saw it as something I’ve used, with slightly different terminology, in the context of engineering design, but that can be applied to a lot more. (Corrinia, 11-12)</td>
</tr>
<tr>
<td>COMP-ACT</td>
<td></td>
<td>Composing Activity</td>
<td>Reflections on if/how Design and/or Design thinking influenced composing activity</td>
<td>Yes. It made me think more critically on how to compose my writing and making my craft more easier to read and beautify it. (Bella, 17-18)</td>
</tr>
<tr>
<td>TCD</td>
<td></td>
<td>Technical Communication as Design</td>
<td>Are technical communications designed? Why/why not?</td>
<td>Yes, communications artifacts are designed because they involve a creation process that goes from defining problems to creating a solution to testing. (Hung, 15-16)</td>
</tr>
<tr>
<td>ASS</td>
<td></td>
<td>Assessment</td>
<td>Is design helpful/hurtful</td>
<td>I think it plays an important role in how we communicate visually and communicate ideas. In writing, we need to think through words and visuals. (Mick, 24-25)</td>
</tr>
<tr>
<td>POS</td>
<td></td>
<td>Positives (of D/DT)</td>
<td>Good attributes of design and/or Design thinking</td>
<td>Yes, noticing the improvements in my final product was very satisfying. (Ralph, 24)</td>
</tr>
<tr>
<td>CHG</td>
<td></td>
<td>Challenges (of D/DT)</td>
<td>Difficulties Design / Design thinking posed</td>
<td>We were uncertain exactly what each step entailed, and it was also difficult to wrap our heads around a very new way of thinking. (Jim, 33-34)</td>
</tr>
<tr>
<td>DT/WP</td>
<td></td>
<td>Design Thinking vs. Writing Process</td>
<td>Compare/contrast Design</td>
<td>I say the design thinking process is a little bit of a slower process, but the end goal is more developed, and the potential of the document</td>
</tr>
</tbody>
</table>
| LRN | **Learning Experiences**  
Sharing about the learning experience of the Design infused unit | Participants provide insights into their in class learning experiences as their instructor taught Design / Design thinking in tech comm | My group mates and professor were very supportive, open, and responsive to my thoughts during the design processes. (Rob, 24-25) |
APPENDIX G. IRB RESEARCH APPROVAL LETTER

Date: 04/10/2019

To: Philip Gallagher Stacy Tye-Williams

From: Office for Responsible Research

Title: Using Design Pedagogy in Technical Communication

IRB ID: 19-124

Submission Type: Initial Submission

Exemption Date: 04/10/2019

The project referenced above has been declared exempt from most requirements of the human subject protections regulations as described in 45 CFR 46.104 or 21 CFR 56.104 because it meets the following federal requirements for exemption:

2018 - 1: Research, conducted in established or commonly accepted educational settings, that specifically involves normal educational practices that are not likely to adversely impact students’ opportunity to learn required educational content or the assessment of educators who provide instruction. This includes most research on regular and special education instructional strategies, and research on the effectiveness of or the comparison among instructional techniques, curricula, or classroom management methods.

The determination of exemption means that:

- **You do not need to submit an application for continuing review.** Instead, you will receive a request for a brief status update every three years. The status update is intended to verify that the study is still ongoing.

- **You must carry out the research as described in the IRB application.** Review by IRB staff is required prior to implementing modifications that may change the exempt status of the research. In general, review is required for any modifications to the research procedures (e.g., method of data collection, nature or scope of information to be collected, nature or duration of behavioral interventions, use of deception, etc.), any change in privacy or confidentiality protections, modifications that result in the inclusion of participants from vulnerable populations, removing plans for informing participants about the study, any change that may increase the risk or discomfort to participants, and/or any change such that the revised procedures do not fall into one or more of the regulatory exemption categories. The purpose of review is to determine if the project still meets the federal criteria for exemption.
• All changes to key personnel must receive prior approval.

• Promptly inform the IRB of any addition of or change in federal funding for this study. Approval of the protocol referenced above applies only to funding sources that are specifically identified in the corresponding IRB application.

Detailed information about requirements for submitting modifications for exempt research can be found on our website. For modifications that require prior approval, an amendment to the most recent IRB application must be submitted in IRBManager. A determination of exemption or approval from the IRB must be granted before implementing the proposed changes.

Non-exempt research is subject to many regulatory requirements that must be addressed prior to implementation of the study. Conducting non-exempt research without IRB review and approval may constitute non-compliance with federal regulations and/or academic misconduct according to ISU policy.

Additionally:

• All research involving human participants must be submitted for IRB review. Only the IRB or its designees may make the determination of exemption, even if you conduct a study in the future that is exactly like this study.

• Please inform the IRB if the Principal Investigator and/or Supervising Investigator end their role or involvement with the project with sufficient time to allow an alternate PI/Supervising Investigator to assume oversight responsibility. Projects must have an eligible PI to remain open.

• Immediately inform the IRB of (1) all serious and/or unexpected adverse experiences involving risks to subjects or others; and (2) any other unanticipated problems involving risks to subjects or others.

• Approval from other entities may also be needed. For example, access to data from private records (e.g., student, medical, or employment records, etc.) that are protected by FERPA, HIPAA or other confidentiality policies requires permission from the holders of those records. Similarly, for research conducted in institutions other than ISU (e.g., schools, other colleges or universities, medical facilities, companies, etc.), investigators must obtain permission from the institution(s) as required by their policies. An IRB determination of exemption in no way implies or guarantees that permission from these other entities will be granted.

• Your research study may be subject to post-approval monitoring by Iowa State University’s Office for Responsible Research. In some cases, it may also be subject to formal audit or inspection by federal agencies and study sponsors.

• Upon completion of the project, transfer of IRB oversight to another IRB, or departure of the PI and/or Supervising Investigator, please initiate a Project Closure in IRBManager to officially close the project. For information on instances when a study may be closed, please refer to the IRB Study Closure Policy.

Please don’t hesitate to contact us if you have questions or concerns at 515-294-4566 or IRB@iastate.edu.
APPENDIX H. DESIGN PEDAGOGY RESEARCH INFORMED CONSENT LETTER

LETTER OF INTRODUCTION
Using Design Pedagogy in Technical Communication

The purpose of my study is to examine the use of communication design pedagogy in Technical Communication courses that include multimodal, computer-mediated assignments. In order to participate, you must meet these criteria: (1) you must 18+ years old and (2) you must be ENGL 314 faculty with experience teaching the course or a student in a participating ENGL 314 class. The information provided hereafter will help you make an informed decision on participation. If you have questions, please ask. Going forward, it is important to know that the subjects used and observed in-class and discussed in interviews should cause you no more discomfort than daily academic experiences. However, to protect your safety as a participant the following steps will be taken: (1) you are free to leave the study or decline participation at any point, (2) no identifying information about you, your grades, your course, or institution will be included in any final research materials.

Your participation is voluntary. You will be asked to participate in classroom observations of your design pedagogy instruction and learning in ENGL 314. Also, you may be asked via email to participate in interviews where you will respond to questions about design pedagogy experiences. All interview questions are open-ended and may be answered in as little or as much detail as desired. Participation in this study will require you attend your ENGL 314 class during design pedagogy lessons and activities being observed, and, if participating in an interview, an additional 30 to 60 minutes of your time. You may choose not to be discussed in observational fieldnotes and you may elect not to be involved in any interviews or answer any question(s) you do not want to answer. You are free to stop participating at any time.

Possible benefits to participants may include: faculty participants may learn about design approaches to teaching technical communications. They may use this knowledge to supplement teaching. Further, faculty will be introduced to a design thinking process they may use to teach student writing. Last, participating faculty may treat study training as professional development hours for annual reviews. Student participants will benefit by learning how to purposefully design relationships between words, images, audio, and computer affordances to improve digital communications. They will also learn principles for writing to user-audiences. Last, they will acquire a new way to think about writing and a new writing process to help technical communication skills.

To ensure confidentiality, the following measures are taken. Though the results of the study may be published or presented at conferences, no materials will reveal the identity of the participants, class sections, or institutions or programs. Any records identifying participants, classes, and institutions or programs will be kept confidential to the extent allowed by laws and regulations and will be securely discarded after being anonymized. No records will be publicly available. However, federal government agencies, auditing departments of Iowa State, and the ISU Institutional Review Board (a committee that reviews and approves research studies with human subjects) may inspect and/or copy records for quality assurance and analysis.
You may ask me any questions concerning this study and have answers before agreeing to participate or during the study. If you have any questions please feel free to contact me at philip@iastate.edu or my supervising faculty, Dr. Stacy Tye-Williams, at styewill@iastate.edu. If you have questions about your rights or to report any concerns about the study, you may contact the ISU Institutional Review Board at (515) 294-4215. You are free to decide not to participate in this study or to withdraw at any time without adversely affecting your relationship with the researcher, the supervisor, faculty or peers, and/or Iowa State University.

You are voluntarily making a decision to participate in this study. Your signature/verbal/written consent certifies your willingness to participate, that you are 18+ years of age, and an ENGL 314 faculty member/student.

Philip B. Gallagher, MA, GTA, Iowa State University        Email: philip@iastate.edu

Signature: Group (faculty or student): Date: