WOMEN IN THE INTEGRATED CIRCUIT: A STUDY EXAMINING THE
INTERSECTION BETWEEN TECHNOLOGY, SUBJECTIVITY, AND THE ACADEMY

A Dissertation
by
LISA ANN MCNEAL

Submitted to the Graduate School
at Appalachian State University
in partial fulfillment of the requirements for the degree of
DOCTOR OF EDUCATION

December 2013
Educational Leadership Doctoral Program
Reich College of Education

WOMEN IN THE INTEGRATED CIRCUIT: A STUDY EXAMINING THE
INTERSECTION BETWEEN TECHNOLOGY, SUBJECTIVITY, AND THE ACADEMY

A Dissertation
by
LISA ANN MCNEAL
December 2013

APPROVED BY:

_____
Alecia Youngblood Jackson, Ph.D.
Chairperson, Dissertation Committee

_____
Martha McCaughey, Ph.D.
Member, Dissertation Committee

_____
Geri Miller, Ph.D.
Member, Dissertation Committee

_____
Vachel Miller, Ed.D.
Interim Director, Educational Leadership Doctoral Program

_____
Edelma D. Huntley, Ph.D.
Dean, Research and Graduate Studies

Abstract

WOMEN IN THE INTEGRATED CIRCUIT: A STUDY EXAMINING THE
INTERSECTION BETWEEN TECHNOLOGY, SUBJECTIVITY, AND THE ACADEMY

Lisa Ann McNeal
B.A., Samford University
M.S., Florida State University
Ed.D., Appalachian State University

Chairperson: Alecia Youngblood Jackson, Ph.D.

Much research focuses on how faculty and students use computers in the classroom,

women's reticence toward technology, and women's negative experiences in male-dominated

working environments; however, there is limited research about how women faculty navigate

different technology discourses. The purpose of this study was to better understand the

complex role of technology in the lives of women faculty in higher education. This

qualitative case study was situated at the intersection of feminist critiques of technology and

feminist endorsements of technology, with attention to the postmodern concepts of

subjectivity and agency.

The study participants were five full-time, tenure track women faculty from diverse

academic fields with various attitudes toward technology adoption. In this qualitative case

study, multiple methods were used to understand how computer technology shapes the

professional, personal, and socio-cultural experiences of five women. The study's methods

included in-depth interviews, observations, document analyses, and tours of technological

objects. The research questions were: 1) How do women faculty navigate and put to use

different technology discourses? 2) How are their technology practices contextual and fluid? and 3) How does technology shape their subjectivity and produce agency?

This sonata-form case study featured interplay among dominant and tonic themes that represented each participant's typical (dominant) and unexpected (tonic) approach to technology. The sonata-form case study allowed the researcher to shift among several different themes, explore emerging tensions, and creatively present the findings. Additionally, each woman was assigned a metaphorical musical instrument to highlight her relationship with technology. Data from the in-depth interviews, observations, documents, and tours of technological objects were also analyzed theoretically. Data analysis was guided by theories that informed the study. Four key concepts were discussed: interruption, resistance, submission, and tension. These key concepts or theoretically rich words served as conceptual anchors and were used as the framework for analysis. The key concepts were informed by the theories from the research literature and the participants' stories. Implications for university administrators, information technology leaders, and faculty development staff are included along with suggestions for future research.

Acknowledgments

I wrote this poem after reading *The Radicant* (2009) by philosopher and art critic Nicholas

Bourriaud.

> Berries sprout new runners
> Radicant roots
> Shooting in different directions
> Attaching and advancing
> Feeding on the host soil
> Negotiating and navigating as semionauts point the way
> Along precarious paths
> Problematizing, questioning,
> Stringing together thoughts and pearls
> Creating new kind of necklace
> A conceptual archipelago
> Suddenly the pavement cracks
> And something new emerges
> Look what grows in between!

In the spring of 2013, I was working full time, conducting fieldwork, and preparing

for two conference presentations. This stressful time reminded me of my angst during the

summer of 2008. During that trying time, I read this passage from Ecclesiastes 3:1-2 (The

New International Version): "There is a time for everything, and a season for every activity

under the heavens: a time to be born and a time to die, a time to plant and a time to uproot."

In July 2008, I disrupted my comfortable, quiet life in Birmingham, Alabama, and moved to

Boone, North Carolina. After 20 years in Alabama, uprooting was difficult, painful, yet

necessary. During the past five years, I have encountered some rough roads, but family,

friends, and mentors helped to smooth my path. My mother and brother have been amazing.

proofreading. You made my writing sparkle. Additionally, I want to recognize the wonderful members of Cohort 17 for their friendship and encouragement during our two years together. The memories of that time warm my heart. I am grateful for my soul sisters, Dee Pellicco and Aleema Fuller. Dee, you showed me how to color outside the lines. Aleema, your strength and work ethic inspired me. I want to recognize my wise friend, Dr. Elaine Gray, who supported me in good times and bad. Elaine, thank you for encouraging me to teach first year seminar and shake the dust off my flute. I also want to thank Connie Woolard for making music with me. You warmly invited me into your home and life. You are a talented musician and a loyal friend. I also want to thank my friend Kris Dearmin for encouraging me to avoid superfluous stress.

I greatly appreciate my colleagues and mentors in the doctoral program. First of all, I wish to acknowledge Dr. Jim Killacky for his leadership, support, and kind words. I admire your thoughtful, gracious leadership style. I also want to thank Dr. Vachel Miller. Vachel, your passion for social justice shines vibrantly in your teaching, scholarship, and the core of your being. Thank you for encouraging me to produce my mini-documentary about African beads and for understanding when I declined your kind suggestion to continue my research in Africa. Thank you, Dr. Kelly Clark/Keefe, for encouraging me to write with feminist fire and to incorporate music into my writing. In 2011 you invited me on a transformative 12-hour road trip to Illinois for the International Congress of Qualitative Research. That trip changed my life and ignited my passion for qualitative research. I also want to thank the extraordinary, radicant women: Jessica Gilway, Emily Miller, and Susan Reed. Your passion and creativity inspire me to take risks with my scholarship. I am honored to work and write alongside you. I hope our fruitful collaboration continues to grow and bloom for many years.

Dedication

This dissertation is dedicated to my mother, Mary Manter McNeal. Thank you for showing me how to write in journals, laugh with friends, pray often, work hard, and treat people with kindness. Throughout my childhood you nurtured my love of reading, music, and school by taking me to libraries, bookstores, museums, and concert halls. You faithfully attended hundreds of band concerts and accompanied me on dozens of visits to college campuses. As a computer programmer, you demonstrated that a woman can be smart, tech-savvy, and successful. Most importantly, you told me I could be anything I wanted to be. Thank you for believing in me.

Table of Contents

Chapter One: Introduction

An Autoethnographic Vignette

As an instructional developer at Appalachian State University, I help faculty to integrate technology into their teaching. I often lead workshops about features of AsULearn, the university's course management system (CMS), and I teach faculty how to build surveys, create videos, and design online courses. Working one-on-one with faculty is a rewarding part of my job because I never know what will unfold during a consultation: tears, laughter, resistance, frustration, excitement, fear, gratitude, and occasionally, gifts of chocolate or a coupon for a free cup of coffee. I have another role at Appalachian: doctoral student. While taking classes and delving into new philosophical territories, I began to see the connections between my daily interactions with faculty and my growing interests in feminist and postmodern theories. Here in this introduction, I present two encounters that illustrate some of the ways faculty use technology and how they connect to feminist theories of the gender-technology relationship.

James Smith (not his real name) meets me in my office to learn how to use the group features of AsULearn. Smith, who teaches several sections of an introductory, general education course, wants to combine the sections into one *meta course* and then divide the students into groups. My role is to show him what button to press and how to divide the students into two groups: one for each section of his course. With a confident smile, I explain how to click on a name and then the "add" button. Smith balks. I can almost see him doing the math in his head: 2 clicks x 100 students = 200 clicks. He says, "This is a lot of

work. Can't you just do this for me?" I quickly explain that my role is to teach people how to use the technology—not to do the work for them. Unsatisfied with my answer, he leaves; I roll my eyes. Does Smith see the work of organizing the students into groups as a task that is not suitable for someone of his status or gender? His reaction makes me wonder. Did he schedule the appointment with me, rather than one of my male colleagues, because he secretly hoped I would do the work for him? Some feminist scholars (Cooper, 2006; Leonard, 2003; Rosser, 2006) have claimed that this is an example of how technology is used to uphold the division of labor in the workplace. In other words, men perform the interesting, high-level, high-paying tasks and delegate the mundane, repetitive work to women.

Later the same day, Stephanie Joiner (not her real name) arrives with the same request for assistance with creating groups. Like Smith, Joiner teaches introductory courses with high student enrollments. I explain the process and suggest we work together; she quickly agrees. She reads the names and I start clicking. *Name, Add, Name, Add, Name, Add, etc.* In less than 20 minutes, we sort the students into groups. Unlike her male colleague, Joiner readily works with me to put the students into groups in order to get the added functionality that groups provide. From my point of view, Joiner recognizes this form of technology as a tool that can improve her productivity. Additionally, her approach to the task of dividing her students into groups raises several questions. Does her gender have anything to do with her willingness to complete this mundane task? Why was her reaction different than that of her male colleague? Why was I more willing to collaborate with her? Like liberal feminists (Leonard, 2003; Rosser, 2006) who viewed technologies as neutral

artifacts, does Joiner see technology as merely a tool? This encounter raises many questions that I explored in my study.

Definition of the Issue

Information technology (IT) is integral to the daily operations of most modern universities. IT can be found in almost every corner—in classrooms, libraries, offices, residence halls, and other spaces. Classrooms often extend beyond brick walls into cyberspace (Palloff, Pratt, & Palloff, 2007). Recent reports indicated that more than 6.1 million students took at least one online course during the fall 2010 semester, an increase of approximately one-half million more than the number reported in 2009 (Allen & Seaman, 2011). The definition of *classroom* has expanded to include course managements systems, asynchronous and synchronous communication tools, social media, and 3-D virtual worlds. Technology is not limited to virtual spaces; Smart Boards, YouTube videos, and other technologies abound in the physical classroom. Information technology is woven into almost every part of a professor's day, from teaching, to research, and to service. Rather than focus on how technology was used by faculty (e.g., technology as a tool), my study examined the connection between technology and women's subjectivity, or what is commonly known as self-concept or identity. There is the need to critically examine technology from a feminist perspective because women's voices and perspectives have been historically absent from many technology studies, and despite many strides, women remain underrepresented in technology professions and experience tensions both in technology-heavy working environments and with their daily encounters with technology.

Conceptual Framework

My work is situated at the intersection of feminist critiques of technology and feminist endorsements of technology, with attention to the postmodern concepts of subjectivity and agency. While there are diverse positions and theoretical orientations within feminist research, as well as many ways of conducting feminist research, feminist research centers on the lives of women (Reinharz, 1992). Additionally, a feminist position is a critical stance that challenges current norms within society and brings to the center issues that have been traditionally pushed to the margins (hooks, 2000). I agree with other feminist researchers that gender should be used as "a lens that brings into focus particular questions" (Fox-Keller, 1985, p. 6). Like Lather's (1991) description of feminist research, I want my research to be corrective and consciousness-raising. Lather wrote, "The aim of research is to correct both the invisibility and distortion of the female experience in ways relevant to ending women's unequal social position" (1991, p. 71). In this study, I paid attention to women's perspectives on computer technology within an academic context. Additionally, I challenged the common way in which technology is portrayed as a neutral tool.

Feminism and Technology

There are many feminist discourses about women's use of technology, ranging from critiques to endorsements to the cyborgian perspective, which represents the middle course between outright critique and endorsement of technology (Graham, 1999). Some feminist scholars (Cooper, 2006; Cowan, 1983; Foor & Walden, 2009) asserted that technology reinforces gender stereotypes and emphasizes the sexual division of labor. This is consistent with the critiques of socialist feminists who claimed that technology reinforces inequities such as the wage gap between men and women and sexual violence toward women (Leonard,

4

2003; Scholz, 2010). Another feminist critique posited technology as a neutral tool and focused the critique on the culture and practices associated with the technology, such as practices within the field of engineering (Foor & Walden, 2009; Sappleton & Takruri-Rizk, 2008). On the other hand, some feminist scholars endorsed technology. For example, Daniels (2010) and Everett (2004) pointed out that technology can be used to build community, push political agendas, and express creativity. This perspective is consistent with the agenda of cyberfeminists who argue that technology offers possibilities, as well as perils, for women. This concept builds upon the work of Donna Haraway (1991) who presented the cyborg metaphor to explain women's relationship with technology as situated and fluid. Haraway's (1991) cyborg is a powerful metaphor that represents the boundary between organisms and machines. Within this lived reality of new technology, Haraway called attention to struggle between wholesale adoption and rejection of technoculture (Senft, 2001). She pointed out the importance of understanding both perspectives at once; Haraway (1991) wrote, "[E]ach reveals both dominations and possibilities unimaginable from the other vantage point" (p. 122). Looking at both perspectives is important because academic women often inhabit both positions: adopting and rejecting technology, seeing it as having both promises and perils. Building on this argument, I discovered in my research that academic women experience both frustrations and possibilities as they use computers.

Postmodern Perspective

Several ideas and concepts from the postmodern perspective inform my research. According to Weedon (1997), subjectivity is "the conscious and unconscious thoughts and emotions of the individual, her sense of herself and her ways of understanding her relation to the world" (p. 32). In other words, identity is not fixed but "precarious, contradictory, and in

5

process" (Weedon, 1997, p. 32). The concept of agency goes hand-in-hand with subjectivity. Postmodern feminists, influenced by theories of Foucault and Derrida, define agency as something that is "discursively produced in social interactions between culturally produced, contradictory subjects" (Weedon, 1997, p. 176). In this sense, agency, like subjectivity, is not fixed but fluctuates as an individual interacts with the world and experiences different positions. For example, a woman could be positioned as an authority figure in the classroom and then experience resistance when positioned as a customer asking for assistance at a hardware store.

Connection to My Research

Academic women use computers in multiple ways within different contexts. Their technology use does not fit neatly into established categories put forth by feminists who tend to critique technology, classify it as a neutral tool, or point out its possibilities. Similar to the nomadic figuration described by Braidotti (1994), women go back and forth between these technology perspectives, navigating between these different discourses about technology. I assert that new things about women and technology can be discovered by examining technology from a feminist perspective using qualitative methods. In my literature review, I examined feminist critiques of technology, feminist endorsements of the possibilities of technology, and the postmodern concepts of subjectivity and agency. These theories inform my research design, interview questions, and data analysis procedures.

Purpose Statement

By describing how women negotiate and navigate between different technology discourses, I gained a better understanding of women's relationship with computer technology and its connection to subjectivity and agency. The purpose of my research was to

better understand the connection between computer technology and subjectivity. In this study, *computer technology* refers to computers found in typical faculty offices and mobile technology devices, including smartphones and iPads, rather than discipline-specific technology such as an electron microscope used by a scientist. In this qualitative case study, I used the methods of interviews, observations, and document analyses to understand how computer technology shapes the professional, personal, and socio-cultural experiences of five women faculty.

Research Questions

My study focuses on the intersection of women's subjectivity, computer technology, and higher education. The following questions guide this study:

1. How do women faculty navigate and put to use different technology discourses?

2. How are their technology practices contextual and fluid?

3. How does technology shape their subjectivity and produce agency?

Significance of the Study

My study is significant because it has the potential to take the discussion about women's technology use in higher education in a critical direction. This study informs those who want to critically examine the complex, multiple roles that computer technology plays in the lives of academic women. Furthermore, this study contributes to the scholarship on gender and technology.

Personal Connection: Working in a Different World

I bring a unique perspective to this research. Since 2000, I have taught faculty how to use different types of technologies, including computers, video cameras, scanners, projectors,

and other devices. During my work at two different universities, I have noticed the emotions that emerge during technology use as well as the complex, contextual, and multiple ways in which technology is used. Additionally, I have experienced what it is like to work in the male-dominated field of IT.

A masculine organizational culture often includes dialogue peppered with sports or military terminology (Comeau & Kemp, 2007; Linn, 1999). Spavold (1990) described how this terminology can affect women's perception of computing. She proposed that terms such as *abort, thrashing, execute, head crash*, and *kill* promote an undercurrent of violence that is contrary to women's social conditioning. Cole and Conlon (1994) found that the historical language of computing, with "words such as abort, kill, and execute, has been generated mainly by males, and as such tends to embody traditional male values and attitudes which are sometimes gender biased and occasionally downright offensive" (p. 6).

When I worked at an IT help desk, I learned a new language, filled with words with military connotations. For example, I described the process of reformatting a computer as *blowing it away* and used the term *dorm storm* to talk about the strategy for helping the freshmen configure the computers in their rooms. During this time, I also added masculine—borderline violent—words to my vocabulary such as *terminate* and *wipe out*. As Eagly and Carli (2007) indicated, women can learn this masculine language but operating in this environment is more effortless for men.

As for me, I learned to speak the language, but the consistent use of male language and jokes that went over my head were subtle stabs in the back because they reminded me that I was different. Linn (1999) recalled a similar experience when she wrote:

When I sign on the university's server, I am forced to relive memories of the Vietnam

War, as my request may be answered by servers named choplifter and battlezone.

These are small irritants, but they remind me that the creators of this cyberspace are

not like me, and that perhaps I don't belong. (p. 18)

Time after time, this discourse told me that women were the exception and men were the

norm in the field of IT (Drury, 2011). This type of language made me question whether or

not I belonged in this environment. When I started my doctoral studies, I recalled how I

questioned whether I belonged in IT, and this questioning sparked my desire to learn more

about how women feel when using computer technology.

Organization of Chapters

In Chapter One, I introduce my study's conceptual framework as well as how

feminism, technology, subjectivity, and agency fit into the study. I also present the purpose

statement, research questions, significance, and my personal connection to the topic. In

Chapter Two, I review the literature focused on feminist critiques of technology, feminist

endorsements of the promise of technology, and postmodern concepts of subjectivity and

agency. Chapter Three is a description of the qualitative data collection techniques that I

used to complete my study. Also in Chapter Three I include an overview of the

characteristics of qualitative research, features of the case study method, and the

distinguishing features of the sonata-form case study. Chapter Four consists of findings from

data collection. Chapter Five is an analysis of the study findings, guided by the literature

from Chapter Two. Chapter Five also addresses the limitations of the study as well as

possibilities for further research.

Chapter Two: Literature Review

In this chapter, I present foundational concepts related to gender and technology, and introduce feminist critiques of technology, classic studies, and the postmodern concepts of subjectivity and agency. Additionally, I explain how these concepts, theories, and studies inform my research on how women faculty use technology in multiple, complex ways in higher education environments and how it shapes subjectivity and produces agency.

Key Concepts

The concepts of gender, stereotype, technology, subjectivity, and agency are relevant to my research and appear frequently in the literature on gender and technology. (See Appendix A for additional key terms). I will present and discuss these foundational concepts before progressing to the research literature. In my research, I adopt the sociological definition of *gender* as cultural or social construct rather than a biological determination (Kimmel, 2011). In other words, *sex* refers to biological as well as chemical and anatomical differences between males and females, whereas *gender* refers to the "meanings that are attached to those differences within a culture" (Kimmel, 2011, p. 3). Gender and technology scholars wrote about the problems that resulted from negative stereotypes about women and technology (Cooper, 2006; Selwyn, 2007; Spertus, 1991). Therefore, I paid close attention to issues related to gender stereotypes and technology. In this study, I used the definition of *stereotype* proposed by Eagly and Carli (2007):

Ideas about social groups grow from the experiences that people have with these groups, either directly through personal contact or either indirectly through the media,

and cultural traditions. These beliefs constitute stereotypes and become part of a

society's shared knowledge. (p. 84)

I used this definition because stereotypes related to women and computing may arise from

different sources. I was sensitive to how these stereotypes shaped how the participants felt

about their computer technology use.

Gender stereotypes. Gender stereotypes are one part of this multilayered picture of

the complicated relationship between women and technology. For example, one stereotype

portrays women as inept with computers and men as computer experts (AAUW Educational

Foundation Commission on Technology, Gender, and Teacher Education, 2000; Cooper,

2006). Gender stereotypes related to computing and technology can be harmful for several

reasons. For example, studies have shown that if young girls believe negative stereotypes,

then they may experience negative feelings and perform poorly when using computers (Cole

& Conlon, 1994; Cooper, 2006). Not only can stereotypes lead to poor performance, but also

some women feel that stereotypes limit their career choices (AAUW Educational Foundation

Commission on Technology, Gender, and Teacher Education, 2000; Scholz, 2010). Gender

stereotypes surrounding technology are limiting to women because they frame expectations

about "appropriate" leisure activities, academic choices, and career paths (Anderson &

Buzzanell, 2007; Cooper, 2006; Selwyn, 2007). This subconscious behavior is often rooted

in outdated stereotypes of what constitutes appropriate work roles for men and women.

Wajcman (2006) wrote, "The association between technology, masculinity, and the very

notion of what constitutes skilled work was and is still fundamental to the way in which the

gender division of labor is reproduced" (p. 85).

In the 1990s, Spertus wrote extensively about women computer scientists and gender stereotypes. Spertus (1991) noted:

> If [person] A does not provide the information, [person] B will usually guess the default pronoun from what is known—e.g., 'he' for a professor, and 'she' for a secretary. Most often, this is done subconsciously, showing the speaker's preconceptions. … [T]hey will subconsciously conclude that a man's being a scientist, for example, is normal, while a woman's being a scientist is unusual. (p. 38)

More than 13 years later, scholars are still writing about what happens when women use male-identified tools. For example, Njambi and Sprenkle (2004) wrote about what happens when an African-American woman used a machete to perform yard work in a predominantly White, suburban neighborhood. In this feminist critique of technology, Njambi and Sprenkle (2004) discovered that using male-identified tools disrupts "the unspoken rules about women and technology and reveals the persistence of gender stereotypes at work" (p. 123). Additionally, Selwyn (2007) has shown that gender stereotypes still influence how people perceive and use technologies.

Lerman, Oldenziel, and Mohun (2003) noted that *technology* needs to be considered in historical, anthropological, and social contexts. They wrote:

> In colloquial English, 'technology' has come to refer most often to computers and their networks, but the historian interested in discussing telephones or steamboats uses technology in a broader and more anthropological sense. Thinking about technology as people's ways of making and doing things allows the term easily to encompass stone age tools and space age instruments, sewing and cooking and driving cars and programming computers. (p. 2)

This is aspect of technology is also important because, as a qualitative researcher, I attended to the different contexts in which the participants use technology. Moreover, this definition is critical because it supports the feminist arguments that 1) technology should be considered in a broader sense and that 2) tools historically associated with women, such as vacuum cleaners and stoves, are also technology (Cowan, 1983; Lerman, Oldenziel, & Mohun, 2003).

Subjectivity. In using the term subjectivity rather than identity, I join other postmodern thinkers (Braidotti, 2006; Weedon, 1997) who revised the concept of identity to allow for the dynamic, non-linear concept of subjectivity. In the tradition of modern philosophers and psychologists, identity is the product of psychological and cultural processes by which people freely express their sense of self (Myers, 2008). In this tradition, identity is seen as stable and fixed. According to Weedon (1997) subjectivity is "the conscious and unconscious thoughts and emotions of the individual, her sense of herself and her ways of understanding her relation to the world" (p. 32). In this sense, identity is not fixed but both "precarious, contradictory, and in process" (Weedon, 1997, p. 32). The main distinction between subjectivity and identity is one of philosophical perspective. Philosophers and researchers writing from a modern perspective use the term *identity* when referring to a person's inner stable core. In contrast, postmodern philosophers and researchers use the term *subjectivity* and stress the process of becoming. Feminist philosopher Rosi Braidotti (2006) built on the concept of subjectivity, which she christened *nomadic subjectivity*. Like Weedon (1997), Braidotti (2006) wrote about *in process* subjectivity. Braidotti (2006) presented a nomadic, non-unitary vision of a person who is not a wanderer, but a purposeful zig-zagger. According to Braidotti (2006), subjectivity is always in motion, moving in a nomadic yet purposeful fashion. This concept relates to my

13

research because I discovered that the participants used technology in ways that were fluid and contextual. For example, one woman saw herself as an expert in video editing but rarely used technology while teaching.

Sociologists Ellis and Flaherty (1992) asserted that subjectivity has been neglected as a topic of inquiry because it is deemed as too unpleasant and emotional. Ellis and Flaherty (1992) urged scholars to embrace a more comprehensive understanding of subjectivity and adopt research methods that include attention to the inner self as well as emotional experiences in the world. They recommended studying the emotional lived experiences of participants. Ellis and Flaherty (1992) wrote that they hope to "invigorate the investigation of subjective experience" by demonstrating how subjectivity can be incorporated into research. However, while their edited volume about subjectivity featured a wide range of topics (e.g., abortion, poetry, traveling to the Grand Canyon), the examination of technology was notably absent.

The concept of subjectivity was important to my study for several reasons. First of all, like Donna Haraway (1991) who wrote that women hold multiple roles just like multiple functions on the integrated circuit, my study pointed to the multiple and contradictory ways in which women faculty use computer technology. Secondly, I wrote about technology use within everyday experiences. I investigated how the women's technology use fluctuated, which helped me to better understand how their subjectivity was shaped by different technology discourses. Given my approaches, my study was unique in that it was focused on the relational aspects of computing, and how computing was related to subjectivity; this was not another "technology is a tool" research study.

Scholars have begun to make the connection between subjectivity and technology. Examples include Angelone's (2010) study about the blogs of women doctoral students, Rickman's (2012) presentation about how adolescents use social media sites to "create who they wanted to be" (p. 3), and Noble and Lupton's (1998) research about computer use by staff and faculty and its effect on subjectivity. These studies served as examples of best practices and informed my research design. Recent studies (Angelone, 2010; Rickman, 2012) help me refine the interview questions and confirmed my decision to focus on computer technology rather than social media. However, two of these investigations focused on the experiences of adolescents not adult women. My research differed from these studies because it concentrated on the experiences of adult women faculty in the context of higher education. Additionally, my research differed from Noble and Lupton's (1998) study because I focused solely on the experiences of women faculty rather than faculty and staff of both genders.

Agency. The concept of *agency* goes hand in hand with subjectivity. Postmodern feminists, influenced by philosophers such as Foucault and Derrida, define agency as something that is "discursively produced in social interactions between culturally produced, contradictory subjects" (Weedon, 1997, p. 176). Agency indicates the ways that people situate themselves in relation to power and position (Litosseliti, 2006, Weedon, 1997). In other words, agency describes how people are subjected to forces such as societal expectations, cultural traditions, politics, biology, etc. In this sense, agency, like subjectivity, is not fixed but fluctuates as an individual interacts with other people. This is different from how modern philosophers view agency. In the modern tradition, agency is commonly referred to as the capacity of people to act independently and make choices. For example,

Eagly and Carli (2007) wrote that argentic associations convey an individual's ability to act in ways that are "forceful, self-reliant, and individualistic" (p. 86).

The concepts of *discourse* and *position* are also related to agency. Litosseliti (2006) noted that "discourses construct or give meaning to how we see the world" (p. 49). Litosseliti explained,

> Discourses represent ways of seeing the world and they articulate, maintain, represent, reconstitute, negotiate, and even resist some of these ways. Discourse is a potential site of struggle, and participants are neither helplessly controlled by the dominant discourse, nor rational individuals that make free choices. (p. 49)

Litosseliti (2006) described how "positions are created and social power relations are acted out, as well as challenged through discourses" (p. 49). Francis (2007), referring to Foucault (1980), clarified the concept of positioning and discourse. Francis (2007) wrote:

> The self is passively positioned in certain discourses but is at the same time active in positioning in other discourses. According to Foucault (1980), wherever there is a discourse, there is resistance. For instance, if self is positioned as powerless by one discourse, it is possible that s/he may position her/himself as powerful via an alternative discourse. Moreover, discourses themselves are not static but alter over time as the social institutions that produce them change. (p. 80)

The concept of discourse was key because I asked the women about different technology discourses and how they navigate them. In my study, the participants resisted and submitted to some of the dominant discourses that appeared in the research literature about women and technology, such as "technology is just a tool" or "technology is promising."

16

According to philosopher Bruno Latour (1996), objects as well as humans have agency. Latour is best known for the Actor-Network Theory, which was created to understand the processes of innovation in science and technology (1996). One of the unique contributions of his theory is the idea that material objects, like humans, have agency. The term *network* is used because it is not a hierarchical system but a multilayered map. According to Latour, actors are both human and non-human, and the network takes shape by what they do by virtue of their relationships with each other. Latour's theories have been used by other researchers who study the human-technology relationship. For example, when Downy (1998) studied engineering students, he also reported about the agency of the machines. The concept of agency is crucial to Downey's analysis of the body/machine interface in an ethnography of computer engineering students. Downey (1998) wrote:

> [E]ngineering students no longer entered the CAD/CAM Lab expecting to achieve control over the technology. Sandy Poliachik no longer sought to manipulate the system, and Eric Schardt no longer hoped for a simple tool that he could turn to when he needed it. They both accepted an initial submission to the technology as a first step in building the agencies of the CAD/CAM technology into their lives and selves. (p. 245)

According to Downey (1998) *agency* meant being able to exercise will in a conscious, deliberate manner. Downey (1998) noted that machines do not have consciousness, yet the humans working within the machines would "subject themselves to the machine" (p. 237).

Building on Latour's work, Barad (1998) analyzed how the sonogram is used to observe the development of a human fetus. Barad's (1998) analysis is an approach that brings together the technological aspect of the sonogram, and the political identity of the

fetus, as well as other elements such as scientific, political, legal, and technological elements. Barad brings together multiple elements from distinct realms to describe a particular phenomenon as well as how they interact. According to Hekman (2010), what is unique about Barad's analysis is the interaction among the fetus, the technology (sonogram), the science, and other elements such as the politics surrounding women's reproductive rights. Hekman (2010) concludes, "What is powerful about Barad's analysis is her insight that the scientist/technician cannot 'see' the fetus on the screen of the sonogram without at the same time 'seeing' it as an autonomous identity" (p. 78). In my study, I considered the agency of the participants, the agency of the computers, and the interaction among them. Thus, I discovered that technology use did not occur in a vacuum; technology use occurred with and around people and material objects. My study challenged the way women thought about gender and technology and how it connected to subjectivity and agency.

Feminist Critiques of Technology

In addition to the foundational concepts of gender, technology, stereotype, discourse, subjectivity, and agency, I used a range of feminist literature about gender and technology to frame my study. In my research, I described and critiqued how women faculty use computers by adopting an ethnographic, qualitative approach typical of socialist feminist approaches to critiques of engineering cultures (Cohn, 1987; Foor & Walden, 2009). Montuori (2005) defined a literature review as a dialogue between the researcher and the research community. Therefore, I point out that my research conversation is informed by feminist critiques of technology, feminist endorsements of technology, and postmodern philosophies. Specifically, I review at (a) socialist feminist critiques of technology, (b) liberal feminist critiques of technology, and (c) cyberfeminist endorsements of technology.

Technology Sustains Inequity

One feminist critique shows that technology sustains historical inequities experienced by women and results in more work for them. Socialist feminists argued that technology reproduces the gendered division of labor (Rosser, 2006; Wajcman, 2004). Examples include the scholars who have written about the use of technology in everyday life such as Cockburn's (1983) study about the changes in Linotype technology and Cockburn and Ormrod's (1993) study about the conception, consumption, production, and marketing of the microwave oven. For example, the findings from Cockburn and Ormrod's (1993) classic study showed that new inventions, such as the microwave, were marketed to women and reinforced the stereotype that women should do most of the cooking for the family.

Wajcman (2004) believed that scholars who wrote about the social shaping of technology fell under the umbrella of socialist feminism. Others wrote that that socialist feminism brought class as well as gender into critiques. A classic example of the social shaping of technology was described by Winner (1986), who wrote about how engineers in the 1950s purposely limited the heights of overpasses along the way to beaches and parks. This decision had many consequences; as Winner (1986) pointed out, the height of the overpass prevented access for those who used public transportation. At that time, only the wealthy had cars. So, only the well-to-do car owners were able to travel under the overpasses and access the beaches and parks. The design of the overpass limited how the roadway was used and by whom it was used. Therefore, Winner's (1986) critique supported the socialist critique of technology. In a similar vein, Ruth Schwartz Cowan's (1983) classic work suggested that creation of electronic appliances such as the dishwasher and the vacuum has resulted in "more work for mother" (Cowan, 1983, p. 201). Cowan (1983) wrote:

The advent of the washing machines and dishwashers has eliminated the chores that

men and children used to do as well as the accessory workers who once were willing

and able to assist with the work. The end result is that, although the work is more

productive and less laborious than it used to be, for most housewives it is just as time

consuming and just as demanding. (p. 201)

More recently, Leonard (2003) wrote about the persistent inequity of women despite

technological advances in office technologies, reproductive technologies, and household

technologies. She noted that although technology has brought improvement for some

women, it "has not resulted into social equality" (Leonard, 2003, p. 52). Similarly, Cooper

(2006) wrote about the unequal advantages offered by technology. Cooper asserted, "The

advantages that technology provides are conveyed disproportionately to men in modern

society. Women are being disadvantaged in the process" (p. 320). For example, Cooper

(2006) found that educational computer games with sports and war themes benefited boys;

however, for girls, playing the games resulted in lowered interest, negative attitudes, lowered

performance, and computer anxiety. Other disadvantages that sustain inequity include the

continued wage gap between men and women and the male-dominated creation of new

technologies, such as those used for space exploration (Rosser, 2006; Wajcman, 2004).

Rosser (2006) wrote, "Although technologies designed for military uses are sometimes used

in civilian life, these tools and systems tend to be more useful in the male sphere" (p. 16).

Studies have shown how new technologies such as Internet access at home can

maintain gender inequities. Star (2000) wrote that some technological advances are

problematic and reinforce hidden assumptions about women's work. In other words, Internet

access at home makes telecommuting a possibility for some women, although it has negative

consequences such as isolation. Some studies indicated that women who conducted

computer work at home reported feelings of isolation and boredom (Matters, 1983; Star,

2000). More importantly, some women put up with long hours, low wages, no paid vacation,

and no sick leave in order to have the flexibility and convenience of working at home (Boris,

1994; Christensen, 1989). Leonard (2003) added to this critique by challenging the link

between technology and progress in an examination of how office technologies are used by

women. In the book *Women, Technology, and the Myth of Progress*, Leonard (2003)

examined technology through "the lens of social inequality" (p. 2) by questioning who

benefited from technology and whether technology altered the status of women or merely

reinforced social inequality. Leonard (2003) argued that technological innovations tended to

maintain current distributions of power and patterns of behavior. This conclusion was

important to my study because the participants said that technology often increased their

workload and contributed to other forms of inequity.

Technology Is a Neutral Tool

Another feminist critique posits technology as a neutral tool and focuses the critique

on the culture and practices associated with the technology, such as practices within the field

of engineering (Foor & Walden, 2009; Sappleton & Takruri-Rizk, 2008). According to

Scholz (2010), liberal feminists cite society as a source of oppression, and these liberal

feminist scholars classify technology as a neutral, taken-for-granted aspect of today's society.

Liberal feminists (Faulkner, 2001; Foor & Walden, 2009) critique the unequal relationship

between gender and technology by offering correctives such as policies to encourage

technology education for all or outreach programs to encourage girls to take more math and

science courses. In this tradition, technology is often seen as a good idea and classified as

merely a tool. Technology fields such as engineering, science, and math would draw more women if socialization practices (such as giving mechanical toys to girls) changed (Faulkner 2001). Liberal feminists point to the problems that result when women are left out of the design process. For example, air bags in U.S. cars were found to cause injury and death to small women and children; from a liberal feminist perspective, engineers should have recognized that an airbag that used the male body as a norm would be harmful when used by smaller individuals, such as women and children (Rosser, 2006).

Technology Is Promising

Another debate, best articulated by cyberfeminist scholars such as Rosi Braidotti (2005), Elaine Graham (1999), and Sadie Plant (1998), reveals that new technologies, especially Internet technologies, offer possibilities for empowering women as well as transforming gender relations. *Blogs*, which are Web sites that serve as online journals that are shared with others, are one example of new technologies that women use (Merriam-Webster, 2002). Daniels's (2010) work about blogging conferences was a good example of how computer use can be critiqued and understood from multiple perspectives. Daniels (2010) noted that blogging is used as a way for women "to transform their material lives in a number of complex ways that both resist and reinforce hierarchies" (p. 30). For example, blogging allows women to build communities and challenge the dominant representations of motherhood. However, Daniels (2010) also found that gender inequity was being reproduced in the following ways: women's contributions to blogging were minimized by the mainstream media; advertisers ignored ethnic bloggers; blogging and other technologies were used to maintain the emotional labor of the home.

The Million Woman March (MWM) organizers also credited computer technology for their success in 1997 (Everett, 2004). Everett (2004) noted, "Cyberspace was a solution for the MWM's publicity vacuum caused by the mainstream media's lack of interest in the yearlong planning campaign for a political march implemented by Black women who interact on grassroots and global levels" (p. 1280). Promoting a political event through a Web site is just one example of the potential of cyberfeminism. Everett (2004) continued by describing cyberfeminism as "a promising new wave of feminist practice that can contest technologically complex territories and chart new ground for women" (p. 1281).

Postmodern Perspective

Wajcman (2004) described Haraway's cyborg as a way to "bridge the gap" (p. 8) between these two discourses about technology (e.g., technology as sustaining inequity and technology as promising), which are often presented in opposition. In contrast, in my research I showed that this is not an either-or argument. I demonstrated that women experienced both inequities and promising potential while using computers; academic women practiced both resistance and compliance. I agreed with Wajcman (2004), who wrote that it is vital to heed the warnings given by feminist technology scholars because gender stereotypes still shape how women use computers.

The postmodern research on computer and subjectivity within the context of higher education is limited. Noble and Lupton (1998) conducted a study in which they examined the interplay between subjectivity, technology, and work. In this study, the researchers examined how the introduction of the personal computer connected to the shaping of a "professional self and a sense of self drawn from the non-work realm" (Noble & Lupton, 1998, p. 803). Noble and Lupton (1998) concluded that computing changed ideas about

23

skills and professional boundaries, and more studies about technology and subjectivity were needed. In a recent study, Angelone (2010) analyzed the blogs of women doctoral students. For Angelone (2010), using a critical poststructural stance helped her to "understand the ways in which these women represented their subjectivity in this medium as part of learning their identities" (p. 2). She wrote about the value of this approach:

> This online space could be a place for resistance of dominant discourse or a place for the reinscription of the dominant discourse and by asking questions and looking closely, we can remain critical of the way technology shapes us and we are shaped by technology. (p. 32)

Angelone (2010) continued:

> Researchers should be tracing subjectivities in these [online] spaces, exploring how power/knowledge networks are changing and staying the same. Students should be learning how to pay attention to how they are representing themselves and what sorts of discourses they are contributing to and undermining. Both of these practices have implications for the continued work of feminism and educational technology. (p. 32)

Wajcman (2000) agreed with this approach to research. She explained, "[I]t is in this computer mediated world that people experience a new sense of self that is decentered, multiple, and fluid" (p. 458).

A Critical Perspective

Postmodernism is more than a perspective because it offers a different way of performing critique, one that is more suitable to the complexity of life in the 21st century (Braidotti, 2006). As Clark/Keefe and Miller (2012) wrote, "[P]ostmodernism signals an expressed dynamic aimed at undoing, shaking-up, or otherwise calling into question taken-

for-granted assumptions about the objective nature of knowledge and truth" (p. 4). In my study, I used the postmodern concepts of subjectivity and agency to call into question taken-for-granted assumptions about the women faculty and their use of technology. In this study, I implemented a postmodern critique to extend the critiques offered by feminist scholars of gender and technology.

Women faculty are surrounded by technology and, more importantly, technology discourses, cultures, and practices. However, many studies focus on technology's promises, pitfalls, or neutrality. The discourse of "technology as a tool," whether that is a neutral tool or a gendered tool, still dominates much of the literature on gender and technology. This is dangerous because characterizing technology as a tool is narrow, limiting, and inappropriate for the complex, interrelated, hybrid lives women faculty lead. Haraway (1991) compelled us to think differently about our relationships with each other, as well as our relationship with technology. She wrote, "I want the readers to find an 'elsewhere' from which to envision a different, less hostile order of relationships among people, animals, technologies, and land" (Haraway as quoted in Wajcman, 2004, p. 80).

As radical as Haraway's words sound, these words ring true and should be investigated within the context of academia. Building on this concept, several studies by Turkle (1995, 2007, 2011) have focused on the growing, intensive relationship between humans and machines. Turkle also raised questions of morality, ethics, and emotions related to the use of computing that need to be addressed in academia. Her extensive studies have shown that technologies are far from mere tools. Turkle's (1986, 1995, 2011) work showed that people are in a complex relationship with technology; this has both moral and ethical implications. For example, in one study (Turkle, 2011), children were asked how they would

feel if their babysitters were robots rather than humans. Turkle (2011) found that the robots magnified the children's wants. She wrote, "Children imagine sociable machines as substitutes for the people missing in their lives. When the machines fail, it is sometimes a moment to revisit past losses. What we ask of robots shows us what we need" (p. 87). In other words, the technology amplified the children's emotion. Additionally, the results of another study (Turkle, 2007) showed that objects, including technological objects, evoked emotion and meaning and power. She wrote, "There is the power of boundary objects and the general principle that objects are active life presences," (p. 9). After reading Turkle's studies (2007, 2011) about the emotional sides of computing and boundary objects, I added interview questions about the emotional aspects of computing and technological objects to better understand how technology blurs boundaries in women's lives.

The lines between human and machines are blurring. Donna Haraway's classic *Cyborg Manifesto* (1991) presented a theoretical and philosophical stance about the blurry boundary between humans and machines. Haraway presented a framework for analyzing the different ways women work in the integrated circuit. An integrated circuit is "a tiny complex of electronic components and their connections that is produced in or on a small slice of material" (Webster's online dictionary). Integrated circuits or microchips are used in computers, mobile phones, and other devices. Today's integrated circuits function as amplifiers, timers, counters, memory, and microprocessors. Haraway (1991) argued that like the integrated circuit, women have multiple functionality. She proposed that the integrated circuit works as a network that "suggests the profusion of spaces and identities and the permeability of boundaries in the personal body" (Haraway, 1991, p. 136). She employed the integrated circuit metaphor to critique private/public distinctions, such as home and work.

Similar to Haraway's critique of public and private domains, I witnessed multiplicities at work as well as the boundaries that blurred as women used technology.

Some studies that have been conducted are broad, such as Turkle's (2011) study about children and robots, and not limited to age or gender. Other studies that have investigated technology and subjectivity have focused on college students or graduate students (Angelone, 2010; Rickman, 2012), not faculty women. When Angelone (2010) analyzed the blogs of doctoral students she found that the women were using the online space to construct their identities, and often, that identity was a traditional, feminine one; however, there were some indications that the blogs gave the women opportunities to push aside traditions notions of femininity. Similarly, Rickman (2012) discovered that adolescents used Facebook to perform traditional, feminine gender roles, such as posting pictures of themselves in pretty outfits, as well as asserting their independence. This new literature about technology and relationship is scant and rarely focuses on women. My study exclusively focused on women within the context of higher education.

The research literature that I reviewed focused on feminist critiques and endorsements of technology. This early gender and technology literature is significant because it changed the way people define technology. This literature is also significant because it opened the door for feminist critique of the way technologies are designed and consumed. Other strengths from the research literature include the detailed ethnographic studies by Downey (1998) and Turkle (1995, 2011). Their studies were significant because they showed how qualitative methods can be used to study technology and they wrote extensively about the effect of technology on subjectivity, emotion, and agency. However, there are some weaknesses in these studies. For example, the studies performed were

conducted on a wide range of demographic groups rather than solely on women. Additionally, these studies failed to address concerns raised by feminist scholars of gender and technology.

Gaps in the Research

There are several gaps within the research literature that my study addressed. First of all, there are many studies about how technology is used by women (Comeau & Kemp, 2007; Foor & Walden, 2009) as well as women's reticence toward technology (Turkle, 1986), but there are few studies about the connection between technology and subjectivity. Secondly, studies (Angelone, 2010; Rickman, 2012) that have been conducted on subjectivity and other relational aspects of computing have focused on new technologies such as social media networking sites (i.e., Facebook) rather than computers. Also, these types of studies have been conducted with adolescents and/or graduate students, not working adults. My study was different because it focused on women faculty who were more likely to be affected by gender roles and stereotypes than undergraduates (Selwyn, 2007). This study was further focused because occurred in the context of higher education.

Cockburn (1992) wrote, "Technology itself cannot be fully understood without reference to gender" (p. 32). In my research, I addressed the gap in the research literature by exploring the gender-technology relationship within the context of higher education. Like Graham (1999), who urged science and technology scholars to take the middle road between outright endorsement and rejection of technology, I examined the different ways in which women faculty use technology and how it produces their subjectivity. In my study, I discovered that the participants confirmed many of the findings in the research literature. For example, Leonard (2003) argued that technological innovations tended to maintain current

distributions of power and patterns of behavior. Some of the participants said that

technology problematic for them and increased their workload. Additionally, two

participants tended to view technology as a neutral tool, which was consistent with the liberal

feminist perspective. In my study, the participants also used technology in a way that was

promising by expressing creativity and resistance. By describing how women negotiate

various technology discourses, I gained a better understanding of women's ways of

computing and contributed to the scholarship on gender and technology.

Chapter Three: Methodology

In this chapter, I provide a detailed look into qualitative inquiry with an emphasis on the sonata-form case study (Sconiers & Rosiek, 2000). I include a description of how I designed my research as well as the ways in which I collected the data. Additionally, I address concerns with researcher-participant relationships, trustworthiness, and ethics.

Characteristics of Qualitative Inquiry

The purpose of my qualitative study was to better understand the contextual, shifting use of technology by women faculty at a university in central North Carolina and how it shapes subjectivity and produces agency. In my qualitative research, I studied full-time, tenure track women faculty from diverse academic fields with different attitudes toward technology adoption.

The history of qualitative research is extensive and multi-disciplinary; qualitative research methods are often employed by scholars in the fields of anthropology, psychology, sociology, philosophy, history, political science, nursing, social work, and education (Denzin & Lincoln, 2003; Glesne, 2011; Marshall & Rossman, 2011). Qualitative methods are aligned with my study's research purpose and feminist stance as a researcher who studied the daily experiences of women. In addition, qualitative methods were best suited for my study because my research questions were based on assumptions about gender stereotypes, technology use, and relationships, and contain variables that are "complex, interwoven, and difficult to measure" (Glesne, 2011, p. 9). Moreover, using qualitative methods provided a rich, in-depth representation of how the participants used technology and shed light on the

complexity of their subjectivity. How women use technology is a complicated, contextual practice, without a one-size-fits-all solution, without simple yes and no responses, and is suited to qualitative inquiry.

Qualitative inquiry is described as interpretive, contextual, naturalistic, and people-centered (Bryman, 2004; Denzin & Lincoln, 2003; Glesne, 2011; Marshall & Rossman, 2011; Merriam, 1998). In the next section, I will expand upon the four characteristics of qualitative research that were germane to my study.

Qualitative research is interpretive. Rossman and Rallis (2012) emphasize that qualitative research is built on description, analysis, and interpretation. As a researcher, I sought to understand and interpret the stories told by the participants in interviews and journals. Rossman and Rallis (2012) wrote, "Field notes and snippets of interview transcriptions do not speak for themselves. They must be interpreted in ways that are thoughtful, ethical, and politically astute" (p. 9). I interpreted by asking questions: "What does this mean? What does this tell me about the nature of the phenomenon of interest?" (Patton, 2002, p. 477). Patton (2002) noted, "In asking these questions, the analyst works back and forth between the data or story and his or her own perspective and understandings to make sense of the evidence" (p. 478). I made sense of the data by asking questions such as: "How is the participant positioned in this story? What does this quote illuminate about her subjectivity?" Then I compiled the answers, weaving together my interpretations with the women's stories. I practiced the "the interplay of writing and thinking from the beginning of the inquiry" (Knight, 2002), while writing journals, notes, and draft chapters.

Interpretation is making sense of data, attaching significance, offering explanations, drawing conclusions, and finding ways to make connections that are meaningful for the

researcher and the readers (Glesne, 2011; Patton, 2002). I began interpreting the data by reading and highlighting what drew my attention, noting tidbits that were "interesting, potentially relevant, or important to [my] study" (Merriam, 1998, p. 181). I compared what the participants said with the research literature reviewed, using theory to provide structure and guide my analysis (Jackson & Mazzei, 2012). Interpreting is important because as a feminist researcher, I brought a critical perspective to my research, exploring technology in ways that seem unconventional, focusing on women who have been left out of some dominant discourses surrounding technology use. Additionally, as a feminist researcher I questioned "conventional, categorical thinking, and [blurred] boundaries" (Boxer, 1998, p. 20) throughout this study. For example, while some participants talked about their computers as tools, which is consistent with a liberal feminist view of technology, other participants spoke about how the computers were intricately linked to their relationships. The participants often talked about how the computers blurred lines between home and work, interrupting family time, eating out with friends, meetings, and classroom discussions. I examined these moments of blurriness and interruption, and then compared and connected what the participants said to what the research literature has taught me about subjectivity, agency, gender, and technology. These connections were the basis of my interpretation. As a researcher, I disrupted the dominant discourse of how women are often perceived in technology discourses. I examined the historically male-dominated field of information technology and rethought it in "terms of women's experience" (Reinharz, 1992, p. 248) by questioning whether gender stereotypes were reproduced or challenged.

Another characteristic of qualitative research is attention to context. Most qualitative studies are conducted because a problem or issue needs to be explored within the social

context in which it occurs (Creswell, 2007). I looked for a detailed, contextual understanding of how women faculty use technology and how it shapes subjectivity and produces agency. Qualitative inquiry was suitable because I sought what Maxwell (2005) calls a "contextual understanding" (p. 80) of technology use by women academics. I brought context into my study by including details about the participants as well as their offices, classrooms, computers, cell phones, and iPads. I included details such as dust on a computer in one classroom to show how technology was not a part of one woman's teaching style. Crucial details (such as a dusty computer) are important to qualitative studies because such details provide additional insight into the study's context. Bryman (2004) explained, "However, these details are frequently important for the qualitative researcher, because of their significance for their subjects and also because the details provide an account of the context in which people's behavior takes place" (p. 280). In this situation, the dusty classroom computer indicated that the professor's computer use was fluid and contextual. She said she used her iPhone and computer constantly at home, checking Facebook and news headlines before she got out of bed. However, while technology was part of her daily routine at home, as well as an essential link to family and friends, technology was notably absent from her classroom.

A qualitative approach is also naturalistic. Rather than bringing participants into a scientific lab or another artificial environment, qualitative researchers go into the field to gather data, usually by talking to the participants in their typical setting, such as a high school in Southern California, an engineering class at a university, or an HIV support group at a clinic (Bettie, 2003; Downey, 1998; Lather & Smithies, 1997). In addition to interviewing participants, qualitative researchers often observe what their participants do over a period of

time. Going to the participants' everyday location is important aspect of qualitative research because seeking a "close involvement" with the participants in their typical environment helps the researcher understand the phenomena under study through "the eyes of the participants" (Bryman, 2004, p. 287). In my study, I conducted two interviews and observed the participants for a three-hour period in their work setting. I collected data from February 2013 to May 2013, visiting the research site every other week. As Merriam (1998) pointed out, qualitative researchers engage in fieldwork to become "intimately familiar with the phenomenon being studied" (p. 7). In my study, I achieved familiarity by going to the participants' professional setting (e.g., a university) to conduct interviews and observations.

Qualitative research is described as a people-centered research method that "respects the humanity of the participants in the study" (Marshall & Rossman, 2011, p. 2). Throughout the study, I treated the participants with respect even when I disagreed with what they did. For example, one participant accepted Facebook friend requests from undergraduate students. I disagreed with this practice but did not talk with the participant about it; I respected the participant's decision to use Facebook with undergraduates rather than inflict my views on her. Additionally, feminist research is "rooted in the very real lives, struggles, and experiences of women" (Hesse-Biber & Leavy, 2007, p. 3). As a feminist researcher, I agree with Reinharz (1992), who wrote:

> One shared radical tenant underlying feminist research is that women's lives are important. Feminist researchers do not cynically 'put' women into their scholarship as to avoid appearing sexist. Rather, for feminist researchers, females are worth examining as individuals and as people whose experience is interwoven with other

women. In other words, feminist are interested in women as individuals and as a social category. (p. 241)

Qualitative research is also focused on the meaning that the participants hold about a problem or issue (Creswell, 2007). Qualitative inquiry was appropriate because I wanted to understand women faculty's relationship with technology from their perspective. Like Bryman (2004), I was committed to "viewing the events and the social world through the eyes of the people being studied" (p. 279). In other words, I learned how the participants made sense of the ways in which technology, subjectivity, and agency were connected. This form of inquiry was appropriate because one of the characteristics of qualitative research is that it focuses on the participants' perspectives and their subjective views (Creswell, 2007). During the interviews, I assured the participants that this study was grounded on how they experienced technology, not on how I, the university, or their students expected to them to use technology. I listened to their accounts and represented their views, not the official technology policies posted on the university's Web site.

Throughout the study, I thought about how qualitative research is interpretive, contextual, naturalistic, and people centered. For example, after collecting data I wrote reflectively, noting ways I could interpret what I had seen and heard. In one journal, I wrote:

Today I am thinking about this quote: 'Tools are not passive instruments but have a life of their own. Our tools are not always at our beck and call. The less we know about them the more likely it is that they will command us rather than the other way around' (Cowan, 1983, p. 10). Cowan's work may be more than 30 years old but this quote speaks to me today and reminds me of what she said about not understanding what a solid-state hard drive is. Is her computer really at her beck and call?

35

In terms of context, I spent many hours in the participants' work settings. I walked around campus, explored buildings, observed classes, hung out in the campus coffee shop, and wrote in the library. I interviewed the participants in their offices and other campus locations. I ate in the cafeteria and sat on benches in the courtyard, constantly watching and listening to the students and faculty around me. I took a people-centered approach when setting up times to meet with the participants. For example, one participant walked around campus every day during her lunch hour. So, we spent part of the interview outside, walking around campus, rather than sitting in her office. Taking a people-centered approach also meant that I established "collaborative and nonexploitative relationships with the participants," and "placed myself within the study," (Creswell, 2007, p. 26) viewing the women as subjects, not objects, of my research.

Introduction of the Participants

The five women participants were full-time, tenure track faculty at Piedmont University. All participants had teaching responsibilities; however, three faculty had additional administrative roles, such as department chair, program director, and associate dean. All study participants were White women between 44 and 63 years of age. They worked in the following departments as pre-tenure and tenured professors: marketing, chemistry, communication and media studies, education, theatre and dance. The women in this study were not representative of all women in higher education. However, the stories told by Elizabeth, Lee, Michelle, Priscilla, and Violet provided insight into the intersection of technology, subjectivity, and higher education. Elizabeth, the youngest participant, was in her mid-40s and took herself, her profession, and her family responsibilities seriously. Her approach to technology was businesslike, which was not surprising, because she was a

professor and an associate dean in the school of business. Priscilla was a seasoned veteran who radiated strength. She was proud of her work as a professor of education and her high-tech skills. She was the oldest participant yet expressed the most confidence in her technology skills. Like Priscilla, Lee has worked as professor for more than 15 years; however, her slim frame, long hair, and stylish clothes made her appear younger than she was. She blended in easily with the students on the day I watched her conduct a chemistry lab. The lab was an odd blend of high-tech equipment, old-fashioned beakers, and gas burners; this lab represented Lee's middle-of-the road approach to technology. Lee's laboratory was filled with chemicals, but Michelle's laboratory was the silver screen. Michelle, a professor of media studies, was relaxed, laid-back, and warm, like the light gray shawl draped around her shoulders. She sat at the front at the classroom, occasionally glancing at her notes and sipping a Diet Coke. Her class, like her personality, was more of a conversation than a lecture and reflected her attitude toward computer technology—it helped her connect with the important people in her life. The last participant, Violet, was petite and vibrant. Her light green eyes danced and her hands moved when she talked. She held a hybrid position at the university, and her technology use was complex and varied. She resisted conforming to technology's expectations and often challenged her students to use technology in creative, critical ways. See Table 1 for a listing of the five participants and their demographic information.

Table 1

Participant Profiles and Demographic Information

Participant	Title	Tenure Status	Highest Degree	Age, Race	Department	Metaphor	Technology Adoption Level**
Priscilla	Professor	Tenured	Ed.D.	63, White	Education	Bass Drum	Innovator
Michelle	Professor	Tenured	Ph.D.	51, White	Communication and Media Studies	Flute	Early Adopter
Violet	Senior Lecturer, Associate Director, Creativity and Innovation	Pre-Tenured	M.F.A.	55, White	Theatre and Dance, Program for Creativity and Innovation	Voice	Majority
Lee	Professor, Department Chair	Tenured	Ph.D.	46, White	Chemistry	Viola	Majority
Elizabeth	Professor, Associate Dean of Research	Tenured	Ph.D.	44, White	Marketing	Trumpet	Laggard

**Technology adoption level as reported by the participant on the demographic survey.

Strategy for Site and Participant Selection

According to Maxwell (2005), researchers using qualitative methods should consider the following components when designing research: site and participant selection, data collection, and data analysis. Each of these components will be addressed in this section.

I sought five participants for this study. This number was based on my experience with my pilot study, which showed me that studying a few "information-rich cases" (Patton, 2002, p. 230) could yield great insights and in-depth understanding. Limiting the participants enabled me to do lengthier, more extensive interviews with a small number of participants and led to richer data. A small group such as five women was suitable because it allowed for deep exploration of a complex social phenomenon (Yin, 2009, p. 32). Additionally, five participants was an appropriate number because it allowed for some variety in terms of academic field and was feasible number for cross-case comparison (Yin, 2009).

My selection criteria began with the following: full-time women faculty with different attitudes toward technology adoption. This was my starting point because of my experience working in IT with faculty. I wanted to interview faculty with a range of views on technology not just the faculty who were technology experts. Thus, I employed the *technology adoption lifecycle model*, which was developed by Beal, Bohlen, and Rogers (1957) and has been adapted by other researchers to describe how new technologies spread in business as well as health services (May, 2009; Moore, 2002). This model consists of four levels: innovators, early adopters, majority, and laggards. According to the model, the first people to use a new technology are called the *innovators*, followed by the *early adopters*, those who adopt a technology before most of their peers. Next come the *majority*, and the

last group to adopt a technology are called the *laggards* (Rogers, 1995, p. 262). Selecting

participants from the different levels provided balance and variety, which are important

characteristics of a case study (Stake, 1995).

The technology adoption lifecycle model was problematic because I asked the women

to select one of four options: innovator, early adopter, majority, or laggard. I invited the

participants to pick one way to describe their technology adoption level. Although I

requested the participants choose their level rather than assigning a level to them, I suggested

the participants to fit themselves in a rigid, fixed model. The technology adoption lifecycle

model was masculine because it restricted the women to four options. Hesse-Biber and

Leavy (2007) write that mainstream theoretical and methodological frameworks often prove

"ineffective and fall short of fully reflecting women's perspectives" and feminist scholars

should "rework traditional theoretical and methodological techniques" and create "new

research models altogether" (p. 6). I sought a feminine technology adoption model that

allowed for a more fluid and contextual conceptualization of technology and self. However,

I could not find a feminine technology adoption model so I used the problematic technology

adoption lifecycle model in order to have a starting point for selecting participants.

In order to gain a diverse sample of women who classify themselves at different

levels of the technology adoption lifecycle, I conducted a survey to identify participants (see

Appendix B). The survey was distributed via Select Survey, an online survey tool available

at Appalachian State University. Seven faculty were interviewed. However, I selected five

participants to represent the different levels of technology adoption and a variety of academic

disciplines. First, I emailed women faculty at the research site and invited them to participate

in this study. Then, I contacted women who responded to the initial call for participants and

sent them a survey. The survey identified the participants' level of technology adoption (e.g., innovator, early adopter, majority, and laggard) as well other demographic information. I also gathered demographic information such as age, race, academic rank, and academic discipline.

This survey allowed me to gather a "purposeful sample" (Patton, 2002, p. 40) of faculty that was diverse in terms of technology adoption, age, and academic field. According to Patton (2002), purposeful sampling is one of the defining characteristics of qualitative research. Patton (2002) wrote, "Cases for study are selected because they are information rich and illuminative, that is, they offer useful manifestation of the phenomenon of interest; sampling then, is aimed at insight, then about the phenomenon, not empirical generalization from a sample to a population " (p. 40).

Participant Recruitment

Lee, Priscilla, and Violet responded to the initial recruitment email that I sent to all female faculty at Piedmont University on January 21, 2013. I recruited Michelle and Elizabeth by contacting professional colleagues with connections to Piedmont and asking for recommendations for potential study participants. After I recruited the participants, I emailed each participant and asked her to respond to a short, demographic survey (see Appendix B). I used email to arrange a time and location of the first interview. Additionally, I emailed the lay summary (Appendix C), which introduced the participants to the purpose of the research, and the consent form (Appendix D). I received written consent from all participants. I used the interview questions in the research protocol during the first interview (see Appendix E). At the end of the first interview, I arranged for the time and date for the second interview, object tour, and observation. I followed research protocols during the second interview,

object tour, and observation. I based each observation according to the schedule of the participant. Over the course of the semester, I observed classroom lectures, conference presentations, and multi-media presentations. I also talked with the participants while walking around campus, drinking coffee, and dining at local restaurants. The details that I gathered from the observation sessions helped me write the participant descriptions and choose a metaphor for each participant.

Research Site

The research site was a university in central North Carolina, located 80 miles from my current residence. Piedmont University is a private, liberal arts university founded in 1834. Total enrollment at Piedmont University is 7,400; approximately 5,000 are undergraduate students. Piedmont University employs approximately 500 full-time faculty, 5 of whom were study participants. The campus is located in a suburb, 10 miles from a metropolitan area. During my first visit to Piedmont, I noticed how the campus blended into the adjoining residential neighborhood. As I approached the campus, I noticed a red brick wall with the name of the university in black wrought-iron script. Behind the bricks, tall trees formed a green wall, a living gate, keeping traffic out, concealing students and faculty inside. Suddenly the traffic light turned green, and I drove into this manicured forest. I parked my car in one of the visitor parking lots on the edge of campus. Waiting for the interview with the first participant, I noticed the wide-eyed students carefully navigating the grassy courtyards trimmed with terra cotta bricks, yellow pansies, and fire-engine red tulips. I consulted the campus map, and then went to the coffee shop to meet the first participant.

I selected this research site in order to free me from the temptation of working in my own "backyard" (Glesne, 2011, p. 43) and to avoid any ethical problems that interfere with

effective data collection. Selecting a site near my home was necessary because I wanted to spend an extensive, prolonged time in the field. It was feasible for me drive to the site, conduct interviews, and then return home in a reasonable time. Additionally, the university was large enough to provide a sufficient pool of participants. More importantly, I wanted to position myself in the field as a qualitative researcher—not a technology expert or faculty workshop leader. Stepping away from my role at my current university was a deliberate choice because I am associated with AsULearn, the course management system at Appalachian State University. In fact, when I run into faculty at the grocery store, many of them naturally ask me questions about AsULearn, tell me they liked a particular workshop, or complain. I did not want this type of conversation to creep into my research or influence the participants' tendency to direct the conversation to the course management system by assuming that it was the focus of my research.

Research Questions

The purpose of this research was to better understand the connection between computer technology and women faculty's subjectivity. The study participants were full-time women faculty at Piedmont University from diverse academic fields with a range attitudes toward technology adoption. In this qualitative case study, I used the methods of interviews, observations, document analyses, and object tours in order to understand how computer technology shapes the professional, personal, and socio-cultural experiences of five women faculty in higher education.

My guiding questions were:

1. How do women faculty navigate and put to use different technology discourses?

2. How are their technology practices contextual and fluid?

3. How does technology shape their subjectivity and produce agency?

Secondary questions included:

1. How do women describe the role of computer technology in their daily lives?

2. How do they describe their relationship with computer technology?

3. What emotions do they associate with their computer technology use?

4. What have they learned about themselves as a result of using computer technology?

Case Study Design

Case study is an approach to qualitative inquiry that is bounded, in depth, and uses multiple data sources. The case study approach was a suitable research design for my study because of the type of research questions I posed. Yin (2009) explained, "The more your questions seek to explain some present circumstance (e.g., 'how' or 'why' some social phenomenon works), the more that the case study method will be relevant" (p. 4). I was interested in better understanding how and why women use technology in different contexts, as well as how this connects to their subjectivity and agency. Therefore, this research method was appropriate.

Another distinction of case study is its focus on a *bounded system* (Stake, 1995) such as an individual, group, or community. In this study, the bounded system was a group of women faculty at the same university. Miles and Huberman (1994) provided a visual description of the bounded nature of case study by writing, "The heart is the focus of the study, while the circle defines the edge of the case: what will not be studied" (p. 25). The

heart of this study was faculty women and their use of technology. This case study was bounded by time (four months of data collection) and place (a single university campus).

Yin (2009) defined case study as "an empirical study that investigates a contemporary phenomenon in depth and within its real-life context" (p. 18). In order to discover the complex, contextual relationships women faculty have with their computer technologies, I needed to spend time with them, talk with them, and observe how they used technologies in their offices, classrooms, and social situations. Additionally, I wanted to hear their perceptions of how they used technologies with different people, including family, friends, students, and colleagues. I wanted hear how computer technology intertwined with their lives, affected their relationships, and connected to their self-concepts in order to describe the complex, intimate, nuanced relationship women have with technology. I looked for deep rather than shallow explanations to complicated questions about the role of technology in the lives of women faculty. I sought reflective answers to my research questions by gathering data from five women, using multiple methods, over a period of four months. These types of thoughtful responses could come only from a qualitative study such as mine, not from a multiple-choice survey or 30-minute discussion that generates only superficial responses. According to Creswell (2007) and Yin (2009), case study researchers gain an in-depth understanding of an issue by collecting data from several sources, such as interviews, observations, and document analyses. The case study method was fitting because I collected data from multiple sources, such as the participants' written and spoken words, and employed multiple methods, including interviewing and observation.

Rationale for Research Design

In this qualitative case study, I conducted in-depth interviews with participants to better understand the connection between technology and women's subjectivity and agency. By recording and analyzing the stories of selected women, I sought to understand the complex experiences of women academics from their point of view. My research questions required an extensive and in-depth description of a contemporary phenomenon. In this study, I conducted a detailed analysis of five cases to show the different ways in which computer technology is used by women faculty. Also, I sought deep understanding of a particular issue: the complex ways in which academic women use technology and how technology shapes subjectivity and contributes to their agency. The case study method was fitting because I collected data in multiple ways to provide an in-depth picture of the issue. As Yin (2009) wrote, case study is an appropriate research method when a research question is seeking to explain a present circumstance. The case study method was suitable because my research questions required an extensive and thorough description of the contrasts and tensions surrounding the women's technology use. Additionally, this method was ideal for my study because the participants described different ways technology is used within different contexts; however, case study was a way to "preserve the multiple realities, the different and even contradictory views of what is happening" (Stake, 1995, p. 12).

Sonata-form Case Study

I used the sonata-form case study as introduced by Sconiers and Rosiek (2000). The sonata form is a specific type of case study, inspired by composers who wrote songs, piano concertos, and symphonies using the sonata form. Musicians performed sonatas during the Baroque and Classical eras; however, the period from 1760 to 1850 was known as "the

46

golden age of the sonata" ("History of the Sonata," 2003, p. 1). Eighteenth-century composers Franz Joseph Haydn, Wolfgang Amadeus Mozart, and Ludwig van Beethoven popularized the sonata form through their music ("History of the Sonata," 2003). Beethoven's *Fifth Symphony* is a well-known example because of its distinctive four-note theme (e.g., three short notes followed by a long note), which is repeated throughout the piece (Webster, 2012). One characteristic of the sonata form is that two themes are presented in contrasting musical keys: dominant and tonic. The sonata form is characterized by two contrasting keys, which make it appropriate for musical and literary works in which the composer or author wants to express tension and conflict. When a sonata-form piece is performed, the two themes flow back and forth, and the two different keys (dominant and tonic) go back and forth in a contrasting dance. Similarly, in a sonata-form case study, two or more stories go back and forth in order to represent the phenomena being expressed.

The sonata form has been adopted by qualitative researchers as an innovative way to present case study findings (Sconiers & Rosiek, 2000; Searby & Collins, 2010). Sconiers and Rosiek (2000) followed a sonata-like format to represent the sense of conflict between the educators' practical knowledge about teaching and the reality of teaching students with diverse needs. For example, one teacher wrote about how his instructional philosophy came into conflict with his students' life experiences as speakers of English as a second language. In another article, two professors used the sonata-form case study as a way to represent complex emotions that surfaced in their cross-cultural mentoring relationship (Searby & Collins, 2010). Similarly, during my study, the participants told of conflicts, contrasts, and tensions when using technology. For example, one participant said her iPhone sustained her relationship with her husband who lived in another state; however, when they vacationed

together she wanted to throw his iPhone out the window because he constantly talked on it.

Two participants talked about the double bind of email. In other words, the participants

talked about how email increases the speed and frequency of communication but also

heightens expectations about how quickly to respond to emails. The sonata-form case study

was suitable because it allowed me to shift between several different themes, explore

emerging tensions, and creatively present the findings. Additionally, I used the sonata-form

when writing about the tensions I felt in the field as a researcher. In one journal, I wrote

about experiencing conflicting emotions after the first interview. I wrote about the sense of

wonder I felt when listening to one woman's story as well as my longing to blend into the

campus setting and my desire to be taken seriously as a qualitative researcher.

Data Collection Procedures

According to Maxwell (2005), using multiple sources of data collection gives

credibility to research studies. I collected data by observing the participants, reading their

technology journals, and conducting in-depth interviews as well as a tour of technological

objects.

Interviews. I interviewed each participant twice using Seidman's (2006) structure

for a series of interviews. This method was appropriate for qualitative studies such as mine,

integrating my strength of considerable experience in conducting interviews, both as a

journalist and a qualitative researcher. As Seidman (2006) advises, my task during the first

interview was to put a participant's experience with technology into the context of her life

history. At the same time, the goal of the first interview was to establish rapport and build

connections by listening with intent (Reinharz, 1992). As Glesne (2011) wrote,

"Interviewers are listeners incarnate; machines can record but only you can listen" (p. 118). During the interviews I listened and looked directly at the women. I sat beside the participants, next to their desks. If the office contained a table and chairs we sat at the table. I took a few handwritten notes during each interview, writing down questions so I would not interrupt the participant.

During the second interview, my purpose was to "concentrate on the concrete details of the participants' present lived experience in the topic area of the study" (Seidman, 2006, p. 18). Eliciting the details of how participants experience technology was the focus of this interview. As Seidman (2006) recommended, I asked the women to reconstruct daily events and share stories about their technology experiences. I invited the participants to reflect on the meaning of their experiences with technology. In this situation, *meaning* is tied to intellectual and emotional connections between the participants and technology. During the interview, I asked questions to help the participants "make sense" of their interaction with and relationship to technology (Seidman, 2006, p. 27).

Tour of objects. Additionally, I asked the participants to give me a tour of technological objects they regularly use. This concept was inspired by the work of Turkle (2007), who interviewed people about their connections with personal computers and other devices. Qualitative researchers Adams and Thompson (2011) argued for interviewing technological objects to bring them "out of the background and into critical inquiry" (p. 747). I began the tour of objects by emailing participants, asking them to bring one or two special technological objects to the second interview. In the email, I shared two examples of object tours to clarify my expectations. The first example was a journal reflection about my broken iPod. In my journal I wrote:

When my iPod died, I felt like I had lost trusted friend, someone who knew how and why I became a runner. I put off returning the iPod, telling myself I was too busy to deal with it. Then I realized that the iPod was tied to becoming a runner and my friends who witnessed that transformation. My iPod had become a palm-sized piece of techno trash, but I didn't want to let it go because it seemed like I was erasing all those memories.

I also shared an example about a professor who was reluctant to get rid of the computer on which she wrote her dissertation because it was tied to becoming a professor (Susan Nordstrom, personal communication, March 5, 2013). I shared the two examples with the participants to inspire them to think deeply about a technological object and how it connected to their subjectivity. Then I asked questions about their objects at the second interview. Object interview questions were informed by the work of Adams and Thompson (2011), Nordstrom (2013), and Turkle (2007). (See Appendix G for object interview questions).

Although I adhered to the two-interview structure, I allowed for flexibility within this structure. I laid out tentative plan but left open the possibility for revision during the semi-structured interviews (Maxwell, 2005). For example, after reviewing additional literature about technological objects, I added several questions to the tour of objects. Additionally, if a piece of technology in a participant's office or classroom drew my attention, then I asked about it in the next interview or via email.

Observations. In addition to conducting two in-depth interviews, I observed each participant for a three-hour period of their choosing. Elizabeth, Michelle, Lee, and Priscilla allowed me to observe their classes. Michelle and Violet invited me to observe scholarly

presentations, including a campus presentation and a conference presentation in a nearby city. Observations also included sharing meals, coffee, and walks around campus.

Observation was beneficial for several reasons. First of all, observation enabled me to gain insight into how the participants interact with technology and question actions that participants may be unwilling to share in an interview (Maxwell, 2005). Secondly, observations allowed me to record events as they occurred and note unusual events to explore in later interviews (Creswell, 2009). For example, after observing one woman who used many technologies while teaching yet employed few technologies in her office and at home, I paid closer attention to how all of the participants used technology in different contexts. Throughout the study, I observed participants' daily activities, such as attending meetings, visiting the campus coffee shop, conducting research, presenting research, and teaching classes. My observation and my field notes helped me to understand the participants' contextual and varied use of technology, informed future interview questions, and helped me describe the participants in vivid detail.

Journals. Asking participants to keep a journal is a common practice for researchers studying technology and culture (Downey, 1998; Turkle, 2011). Downey (1998) found that journal keeping was essential to his study of the cultural boundary between humans and machines during the development of Computer Aided Design/Computer Aided Manufacturing (CAD/CAM) technologies. Downey (1998) reported that his participants had difficulty "overtly, explicitly, and routinely naming, describing, and mapping ways in which learning CAD/CAM technology connected to who they were as people" (p. 188). Downey found that reading the journals provided insights into his participants' thoughts and feelings in relation to self and technology. In more recent studies, Turkle (2007, 2011) asked people

to write about their relationship with technology. For example, she asked children keeping electronic pets to write about their experiences. The children's "robot diaries" were a key part of her study and helped her to better understand how people think about and relate to new technologies (Turkle, 2011, p. 56). Therefore, I read the participants' journals. I asked the participants to complete two journal entries, sending journal prompts by email. This served as another form of triangulation and added credibility to my study. However, only three of the five participants returned journals to me. After reminding the women to complete the journals twice, I decided that it was more important to maintain rapport than to prod for the journal entries. Additionally, all participants provided rich data during the observations, interviews, and tours of objects so I did not press for the journal entries. Journal entries from those who responded are incorporated in Chapter 4. (See Appendix F for journal prompts.)

Data Recording

I collected data by taking notes using Microsoft Word and recording interviews with a digital voice recorder. While observing each woman, I took descriptive notes, focusing on dialogue, physical setting, appearance and dress. Later, I reviewed the notes and added reflections, impressions, questions, and speculation about emerging themes. The goal of my notes was to "set the scene" and portray the context in which my study was occurring (Glesne, 2011, p. 74). Demographic information, such as time, date, place, and participant pseudonym, was included at the top of the notes. Within one week of the observation, I reviewed the notes and added reflections to begin to "dive beneath the surface" of what I saw and heard (Glesne, 2011, p. 75). Taking field notes also helped my creative process as a researcher. For example, after reviewing one set of field notes I wrote about how the campus

reminded me of a popular song. This line of thinking encouraged me to incorporate musical metaphors as a way to creatively present the research findings.

I used a digital voice recorder to capture all interviews. Interview questions are in Appendix E. I relied primarily on the recorder; however, I took minimal notes by hand. This protocol allowed me to maintain eye contact with the participants, pay attention to non-verbal communication, and jot down follow-up questions. The interview protocol was informed by Seidman's (2006) advice about designing effective questions, listening, and eliciting stories. After each interview, I made two copies of the recording; one copy was saved on my laptop and the second copy was saved on a removable, external hard drive. I employed an assistant experienced with qualitative research to transcribe the first two interviews. However, the assistant was unable to continue with my study. Therefore, the remaining interviews were transcribed by employees of GMR Transcription, a professional transcription company recommended by my advisor.

Data Analysis

I began analysis by organizing the data, which included Microsoft Word documents containing interview transcripts, field notes, observations, reflections, and other notes. First, I sorted the documents on my computer and organized them into folders: interview 1, interview 2, field notes, participant journals, object tour, reflective journals, and other notes. Then I uploaded each document into Dedoose, a Web-based qualitative data analysis program. As I read and re-read each document, I carefully used Dedoose as tool to sort, organize, and manage the data, but not as a substitution for an analytic strategy (Yin, 2009). I read my notes and interview transcripts several times. Within Microsoft Word, I highlighted quotes that were striking as well as "surprising, unusual, or conceptually

53

interesting" (Saldaña, 2009, p. 18). The quotes that were conceptually interesting were the ones that connected to or contrasted with the research literature. For example, I highlighted a passage where a participant talked about subverting the conventional use of technology because it reminded me about how blogging can be used as a form of resistance, a point often raised by cyberfeminists (Daniels, 2010). Similarly, I highlighted passages where the participants talked about learning computer skills from men because this practice is aligned with literature regarding gender stereotypes about technical expertise (Linn, 1999).

I attended to what MacLure (2013) calls tensions, unsettling moments, or "hot spots" in the data that drew my attention. For example, any time a participant used the term "interruption," I highlighted it. Additionally, any time a participant cursed, I marked it, because this was unsettling and atypical for an academic setting. Then, I assigned an initial code to these quotes, using Dedoose, a type of qualitative data analysis software. Although some researchers (Glesne, 2011; Merriam, 1998) critique qualitative data analysis software, I proceeded with this choice because I was confident in my ability to use the software for organization and management and not rely on the software to do the analysis for me. I read through each document line by line and circled and passages that were striking, unsettling, or conceptually interesting, and then loaded this information into Dedoose. I started with the following codes:

1. Agency

2. Behavior and Habits

3. Embodiment

4. Emotional Responses

5. Fluidity

6. Gender Inequity

7. Loss

8. Presence

9. Positioning

10. Productivity

11. Relationships

12. Subjectivity

13. Technology Discourses

14. Tool

15. University owned machine

16. Hot spots and surprises

Merriam (1998) describes qualitative data analysis as an iterative and comparative process. Therefore, I revisited the initial codes, made adjustments, and coded all the remaining interviews. At this point, I began to see connections and patterns developing while reading through the first draft, so I began what Marshall and Rossman's (2011) referred to as "creating categories of meanings" (p. 159). First, I revisited my research questions as well as literature reviewed. During this process, I selected some codes because they were phrases that were often found in the research literature reviewed. I selected other codes because they were words that kept coming up in the interviews. This is aligned with Marshall and Rossman's (2011) explanation of how *theoretical codes* are inspired by the literature and *vivo codes* emerge in real-life data. So, I refined and tightened the initial codes and continued with analysis. I created the following revised codes:

1. Fluidity

2. Navigating Discourses

3. Positioning

4. Productivity

5. Promoting Agency

6. Subjectivity Shaping

7. Tension

I repeated this process for the rest of the data, including field notes, observations, and journals, and incorporated what I found into the first draft of Chapter Four. Then I worked on creating categories. According to Merriam (1998), the researcher must construct categories or themes that "capture some recurring pattern that cuts across the data" (p. 179). Merriam (1998) wrote, "Devising categories is a largely intuitive process, but it is also systematic and informed by the study's purpose, the investigator's orientation and knowledge, and the meanings made explicit by the participants themselves" (p. 179). The themes I selected were interruption, resistance, submission, and negotiation. I will explore these themes in Chapter Five.

Throughout this process, I connected the interview data to the theory in conducting this analysis. Rather than thinking of data and theory as separate, I used theories in my literature review to "think with theory" (Jackson & Mazzei, 2012) and draw connections between the new data and existing theory. For example, like Gough (2009) who wrote about subjectivity within the context of father-son relationships, I began my data analysis in a traditional way by looking for themes, and then examining the themes theoretically, drawing from the theories that informed my study. Gough (2009) described his method by saying, "I made links between the themes and developed clusters of themes, or higher order themes,

and began to think theoretically about these, drawing from both discourse and psychoanalytic theory" (p. 535). In my study, I made connections between the collected data and the feminist literature about technology as well as the literature about subjectivity and agency.

Role of the Researcher

In this section I first address my relationship with the participants. My relationship with the participants was characterized by intimacy, trust, and reciprocity (Lawrence-Lightfoot & Davis, 1997). Often I was surprised when the women revealed details about their personal lives. For example, I asked Michelle about her first computer. She said her ex-husband taught her how to use a computer but she did not remember the details because wanted to forget everything about her ex-husband. I showed the women I trusted them by sharing professional details about my life, including why I decided to conduct research at Piedmont rather than at Appalachian State University and my career goals. I demonstrated reciprocity by attending Violet's and Michelle's scholarly presentations.

My relationship with the participants was guided by my feminist belief that researchers and participants are equal, active partners in the research endeavor (Wolf, 1996). During the interviews, I was attentive to their responses and added some interview questions based on their suggestions. For example, one woman shared a memory about her first computer. Her response suggested this experience shaped her view of computers as merely tools; thus, I asked the other participants about their first computer. Like many feminist researchers (Hesse-Biber & Leavy, 2007; Wolf, 1996), I view research as a shared process between the researcher and the participants. Working together, we pursued answers to my research questions. Even though I designed the initial questions, I was open to the participants' suggestions and let the conversation flow by asking open-ended and probing

questions such as, "Tell me more. Is there anything else you want to add about your technology use?" Therefore, by adding open-ended questions to the interview, and allowing time for additional responses, my research was "co-created" by the researcher and the participants (Guba & Lincoln, 2005, p. 195). If the interview generated new questions, then I posed those questions to the other participants in interviews or via email.

I often thought about the interplay between power and my position as a researcher. Wolf (1996) explained, "Feminist dilemmas in fieldwork revolve around power, often displaying contradictory, difficult, and irreconcilable positions for the researcher" (p. 1). In some ways, my research experience contradicted what I had read about feminist research and power (Hesse-Biber & Leavy, 2007; Reinharz, 1992; Wolf, 1996;). I felt vulnerable—not powerful—while in the field. For example, I gave up my role as a technology expert by selecting another research site. At Appalachian State University, I am positioned as a technological expert with access to all the equipment and resources that are available to faculty, staff, and students. As an instructional developer in Learning Technology Services (LTS), I have privileges afforded only to those who work in the department. For example, I can log on to the course management system and access any faculty member's class, at any time. Additionally, I have access to the expertise of dozens of technology specialists via phone or email. Because of my role in LTS, when I email another technology specialist, I can rely on my emails and phone calls being returned in a prompt manner. On the contrary, I relinquished most of my technological privilege in the field. I went from being a technology expert to someone who had to show a driver's license to gain access the Internet. While letting go of my technological privilege was difficult, I am thankful that I decided to temporarily give up this privilege because it made me more sensitive to those who do not

have technological privilege. Moreover, putting aside my privilege helped me to better understand technological hierarchies that exist on college campuses. Although this shift in privilege was temporary, going from a technology expert to a campus visitor heightened my awareness of the hierarchies, privileges, and restrictions that abound within technology services at universities.

The researcher-participant power dynamic shifted when I returned from the field to write up my research. I was concerned with what Wolf (1996) described as the post fieldwork power dilemma in representing the participants' stories. As I learned from conducting pilot studies, I often wondered if the participants agreed with my representation of their stories and worried if they agreed with my conclusions. In order to deal with this uneasiness, I periodically shared transcripts and drafts of the research findings with the women. I emailed Violet's transcripts upon her request. She thanked me via email and said the transcripts were accurate. I asked the other women if they wanted their transcripts; however, they declined. I emailed the first draft of Chapter 4 to all participants. I invited them to email any comments or corrections to me within two weeks. I wrote that I valued their opinion and gave them opportunity to review, comment, and suggest corrections. Lee and Priscilla replied saying they agreed with how I represented them and the choice of musical metaphor. Priscilla requested changes to two adjectives. Michelle thanked me but did not offer any corrections. Violet and Elizabeth did not respond to my email.

As a researcher, I agree with Reinharz (1992) who wrote that the feminist research problem is a "blend of an intellectual question and a personal trouble" (p. 260). I am drawn to feminist research because of the intellectual challenge of pursuing research questions with no easy answers. Also, I enjoy challenging the status quo by conducting rigorous research

and bringing perspectives of women to the forefront, especially in fields such as higher education and IT that have traditionally been dominated by men. Considering multiple viewpoints, especially the female perspective, may be more challenging but it is greatly needed to bring up perspectives that may have been ignored or pushed to the margins.

My "personal trouble" (Reinharz, 1992, p. 260) is my background as a woman in IT and my experiences and emotions during research. So, I did include personal reflections and emotional reactions such as anger, outrage, and confusion during the research process. As Jaggar (1996) recommended, I reflected on emotions such as "puzzlingly irritability, revulsion, or fear" (p. 181) and wrote about these emotions in my research journal. I poured my reflections and emotional responses into my research journal. In March 2013, I wrote about a three-day field visit marred by car problems. After observing one participant, I drove to meet two participants at a conference 40 miles away. During the trip, I ate an apple and thought about how smoothly the research was going. After finishing my snack, I lowered the car window and threw away the apple core. To my horror, I pushed the button and the window did not rise! I was torn between my commitment to meet the participants and my fear that my suitcase, laptop, and other valuables would be stolen. I drove to the conference, parked the car, and prayed no one would notice the broken window and steal my belongings. Miraculously, no one stole anything from my car. As a result, I extended my field visit, stayed the night in a hotel, and spent the next day writing in the Piedmont library while the car was repaired. I was frustrated and emotionally drained after the broken window incident; however, I became more determined to proceed with my research. This event reminded me of Priscilla's view of technology problems. She often said, "This is not going to beat me!"

Once I got so caught up in the interview that I misplaced my digital recorder. I was so amazed by how Priscilla said she was treated by the department chair that my body was on autopilot after the interview. After gathering my belongings, I left Priscilla's office, went to lunch, and then drove to the friend's house where I was staying. Later that evening, I frantically looked for the digital recorder and I began to panic. My data! My dissertation! Oh, the horror. I searched the guest room and my car but could not find it. The next day, I went to the deli where I had eaten lunch and checked with the campus police to see if anyone had turned in a digital recorder. Twelve hours later, I was surprised to find the recorder in the side pocket of my laptop bag; however, I do not remember putting the digital recorder in the laptop bag after the interview. It was as if someone else had put it there.

On the other hand, some surprises were pleasant. For example, one morning I listened to Michelle leading a class discussion about a postmodern film critique of Spike Lee's film *Do the Right Thing*. I felt that I hit the jackpot because the participant and I shared similar beliefs about the role of postmodernism in research and teaching. I nodded when she said,

> Postmodernism is the collapse of the grand narratives. I think of it as an absence of fixed meaning. Little truths with a little 't' rather than big Truths with a big 'T.' The postmodern age calls into question science and religion. It is not absence of truth but little truths. An absence of fixed meaning; commonly accepted truths are challenged.

I knew that her postmodern perspective would help me challenge some of the commonly accepted truths about women and technology.

Ethical Considerations

I engaged in ethical research practices throughout this study. First, I submitted this research proposal for review by the Institutional Review Board (IRB) at Appalachian State University. Permission to conduct research was received on December 18, 2012. Permission expired on December 18, 2013. Furthermore, I submitted the research proposal to the IRB at the research site. Permission was granted by the IRB at the research site on January 17, 2013. Permission expired on January 17, 2014. I asked the participants to review the lay summary (see Appendix B) and sign an informed consent form before the research began (see Appendix C). The informed consent form contained information about the purpose of the study, the benefits as well as risks, and the assurance of confidentiality. Throughout the data collection process, I took steps to ensure the participants' confidentiality by using pseudonyms in all written documents. The women selected their pseudonyms. In addition, I created a pseudonym for the university that served as the research site. This step added an extra layer of security because all participants were from the same institution. For added security, the document linking the participants' names with the pseudonyms was stored on my computer, which was password protected.

Similarly, I anticipated what kinds of ethical issues might arise. For example, I was sensitive to issues of power relations between the participants and me. Although Wolf (1996) wrote that a researcher must be sensitive to the power she has over the participants, I felt like I was in a vulnerable position because I was dependent on the participants to participate in the study. After the initial email to recruit participants, only three women responded. Then I turned to network sampling, also known as "respondent-driven sampling" (Bernard, 2000). I asked participants to recommend other participants and was able to recruit

the remaining participants. Five people agreed to meet with me and learn more about my study; however, when two turned me down, I felt unimportant and powerless.

Once the women were recruited, I experienced other types of power dilemmas (Wolf, 1996). For example, I had to submit to the participants' schedules. On some days, I had to schedule back-to-back interviews because those were the only times the faculty were available. I would have preferred to take a break between interviews but had to adhere to the women's schedules. Additionally, I lacked power because of my position as a campus visitor. I had to park my car on the visitor lot about a half mile from the main campus. Fortunately, I did not have to pay money to park but I paid in other ways. I had to carry everything with me during the day, or make several trips back and forth from campus buildings to my car. Each field visit was both emotionally and physically exhausting. Parking was not the only resource that was limited because of my low status as a campus visitor. If I wanted access to the Internet, I had to go to technology services, wait in line, show my driver's license, and sign a confidentiality agreement. Then I received a computer-generated password that lasted for three days. I visited Piedmont University every other week so I had to request a password every visit. I endured these small irritants but they reminded me that I was temporary visitor and a "professional stranger" (Agar, 1980). I was not a member of the Piedmont community.

I followed the campus rules about parking and Internet access throughout the study, yet often felt pushed to the margins because I had to park on the fringe of campus and show an ID to access the Internet. Wolf (1996) wrote extensively about power and the unequal balance between the researcher and the participants. Yet, I often felt like the participants and

the university held some power over my study. I wrote about this power dilemma in my journal:

> I am the one who is vulnerable. I am sure the balance of power will slip and slide during the study but for now the participants hold all the cards. I guess this will make me appreciate the participants but I am afraid someone will drop out! I feel like the participants hold all the power. They can choose to participate and have the option of leaving the study. My study is in their hands, and I don't like it.

Even after the women signed the consent forms, I did not feel in control of my research and constantly worried that one might leave the study. I assured the faculty that interviews and observations would start and end on time. I also let the participants choose the interview location, even if it was not ideal for me, to be sensitive to the multiple demands on their time. For example, I interviewed Elizabeth in the lobby of the fine arts center while her daughter attended ballet class. I knew a lobby was not ideal for recording an interview but agreed because she suggested this location. At one point in the interview, I gently asked students in the lobby to move because their voices were overshadowing the interview. Violet requested meeting at restaurant because she had back-to-back classes and often skipped lunch. The restaurant was noisy, and I was concerned about the audio quality, but I put her needs above my own. In both cases, the digital voice recorder picked up some background noise, but her audio was clear enough for transcription. Another ethical question I considered was whether my research could harm the faculty. The professors risked feeling that they were not adept with technology and some expressed embarrassment and reluctance. For example, Violet said she did not want me to observe her class because she did not use

much classroom technology. Instead, I observed Violet at a conference. Throughout the study, I protected the women's identities and adhered to ethical research practices.

Creditability and Trustworthiness

In this section, I illustrate how I checked for credibility or what Lincoln and Guba (1985) call the "trustworthiness" of my study. I used several strategies to add to the credibility and trustworthiness of my research. Like Creswell (2009), I believed that using multiple strategies enhanced my ability to assess the accuracy of my findings and convince others of that accuracy. I will describe four strategies commonly used by qualitative researchers in the next section (Creswell, 2009; Glesne, 2011; Maxwell, 2005; Whittemore, Chase, & Mandle, 2001).

First, I triangulated my data. According to Glesne (2011), triangulation is the practice of relying on multiple methods as well as the incorporation of several kinds of data sources. First, my data sources included five women academics, and my multiple methods included interviews, observations, and document analysis (i.e., examining the participants' technology journals). This strategy reduced the risk of biased conclusions and safeguarded against the limitations of a singular source or method (Maxwell, 2005). Second, I used member checking (Maxwell, 2005) to reduce potential bias and check for accuracy. Periodically, I shared preliminary findings with the women. Additionally, I sent short emails if I had follow-up questions after an interview. For example, at the end of an interview, Lee described her computer as an "omnipresent beast." She had to leave for a meeting, so we did not have time to talk about this description. So I emailed Lee and asked her to tell me a little more about why she described her computer in this way. This practice gave the participants opportunities to comment on the findings as well as check my observations and conclusions.

My third strategy was using rich, thick description, which contributed to the trustworthiness of my study (Creswell, 2009). Adding detailed descriptions of the settings and participants in Chapter 4 made my results rich, realistic, and credible. I relied on interview transcripts as well as my detailed notes from observations when writing up the findings. I also referred to the women's journals for additional details.

Finally, I wrote reflective journals to address my bias. I acknowledged that my conclusions were shaped by my gender, race, socioeconomic status, and work experience in IT. For example, in one journal I wrote about how I benefited from technological privilege. During one interview, I was tempted to help a participant with her printer, but I did not interfere because I wanted to observe the way she experienced technology snafus. This incident made me aware of how easily I can adopt a patronizing stance, feeling both helpful and superior because of my technical expertise. In this study, I resisted my impulse to rush in and fix technological problems and, instead, I stood by quietly, reflecting on what the problem might mean for the participant. Moreover, I brought my awareness of gender inequities into this project. I was aware that my feminist sensibilities could lead me to false assumptions about gender bias, discrimination, or stereotypes. In order to keep this bias in check, I engaged in reflective writing throughout the study. I monitored my own subjectivity through the use of reflective writing, recognizing that this strategy did not eliminate my biases but rather helped me to address them by acknowledging them (Maxwell, 2005). I wrote reflectively to examine what was surprising, troubling, and intriguing and began the process of interpretation.

I was surprised by what troubled me during the study. I was shocked by the difficult process of participant recruitment. I managed my frustrations through reflective writing and

communicating with the members of my dissertation committee. Additionally, I was anxious about the reliability of my digital recorder. Even though I had used the digital recorder for prior projects, I worried that the recorder would malfunction and I would lose precious interview audio. As soon as each interview ended, I walked to a quiet location and copied the interview onto my laptop, even if I was hungry, thirsty, or tired. I was also surprised by the intense emotional impact of the interviews. At the end of each research day I was emotionally and physically exhausted. I poured these emotions into my research journal.

Throughout the process of data analysis, I strove for a healthy tension between rigor and creativity (Whittemore, Chase, & Mandle, 2001). The four strategies described above gave credibility to my research but not at the expense of creativity. Therefore, during my research, I adhered to these strategies as a framework, a container for the amoeba-like nature of feminist research (Reinharz, 1992). Yet, as Patton (2002) explained, qualitative work should be highly creative as well as analytically rigorous and explicit. Therefore, my goal was to emulate Whittemore, Chase, and Mandle (2001) who wrote, "Elegant and innovative thinking can be balanced with reasonable claims, presentations of evidence, and the critical application of methods" (p. 527). In order to address my need for rigor, I engaged in the four well-documented strategies for increasing trustworthiness; however, I indulged my creative side by looking to Patti Lather's notion of rhizomatic validity (1993). Lather (1993) wrote, "Rather than a linear progress, rhizomatics is a journey among intersections, nodes, and regionalizations through a multi-centered complexity. As a metaphor, rhizomes work against the constraints of authority, regularity, and commonsense and open thought up to creative constructions" (p. 680). For example, after writing up field notes, I often thought of a song that reminded me of a participant, campus setting, or emotion. Then I would look up the

song and listen to it on YouTube, a video sharing Web site. I included these musical

musings in several of my journals, and they helped me select metaphors to represent each

participant's relationship with technology.

Therefore, I allowed myself the freedom to explore intersections and nodes in my

journals, as I reflected on issues of trustworthiness, knowing that what may appear to be a

"tangled mass of ideas" will eventually turn into a dissertation (Pefanis, 1991, p. 22). One of

the unexpected fruits of this process was collaborating with peers on a presentation for the

International Congress of Qualitative Inquiry in May 2013. This presentation gave me the

opportunity to share some preliminary findings with the scholarly community and

experiment with poetry and performance. Combining traditional and innovative techniques

added to the credibility, trustworthiness, and creativity of my research. These methods were

suitable for my research, which has both traditional and postmodern elements. Additionally,

presenting the initial findings was another form of triangulation because I got feedback from

my co-presenters and the conference attendees about my research.

Reciprocity to Participants and Institutions

Study participants committed approximately three hours for interviews. The women

benefited by having the opportunity to tell their story about their relationship with

technology. Furthermore, the women seemed to enjoy venting about their frustrations with

technology. Lee and Priscilla were not familiar with qualitative methods and told me that

they enjoyed learning about this approach to research. The women also benefited by helping

me and others better understand the complex role of technology in the lives of women

faculty. The participants in this study gave me a valuable gift: their time. I showed my

appreciation for this gift by listening carefully and thanking each woman verbally and with a

note. Each woman received a small gift constructed out of discarded computer parts (see Appendix G). After the study concluded, I mailed each woman her computer gift and a thank-you card created with Microsoft Publisher. The card included a graphic of a cyborg women and a short excerpt from my dissertation proposal (see Appendix H). While I performed these small gestures of thanks, I did not feel that I came close to reimbursing for the time they spent participating in my study. I felt as if they had treated me to a five-course meal at a fine restaurant and, in return, I gave them a small piece of chocolate. My gestures were sweet but did not seem adequate for what the participants gave to me: their time and their stories. My study would not exist without them, and I am in their debt.

Chapter Four: Data Presentation and Interpretation

Introduction

The purpose of this dissertation was to examine the connection between technology, subjectivity, and agency in the lives of five faculty women. The following questions guided this study and provided insight into how technology shapes the professional, personal, and socio-cultural experiences of women in higher education:

1. How do women faculty navigate and put to use different technology discourses?

2. How are their technology practices contextual and fluid?

3. How does technology shape their subjectivity and produce agency?

In Chapter Four, I provide a richly-detailed description of the research findings. This chapter contains five sections, one story for each woman. In each section, I report stories from the personal interviews, object tours, journals, and observation sessions. Each story is presented as a sonata-form case study that highlights the participant's connection to computers and other technological devices. The sonata form allowed for the presentation of a range of tensions and unsettling moments or "hot spots" (MacLure, 2013) within the tonic section and examples of the women's typical approach to technology in the dominant section. I use the concept of an orchestra and assign a metaphorical musical instrument to symbolically represent each woman's relationship with technology. An *orchestra* is a musical ensemble "consisting of multiple strings plus an assortment of woodwinds, brass, and percussion instruments" (Helsby, 2007, p. 7). In ancient Greece, the word *orchestra* meant the space in

front of a stage where the singers and instrumentalists performed; however, by the 18th

century, the word had evolved to mean the performing musicians (Helsby, 2007).

Having read Sconiers and Rosiek's (2000) journal article titled "Historical

perspective as an important element of teachers' knowledge: A sonata-form case study of

equity issues in a chemistry classroom," and being a lifelong musician, I was inspired to use

the sonata-form case study to present the data in a creative format. Similarly, I was drawn to

the concept of transposition, which has a rich history in the field of music. For musicians,

transpose means to write or perform a musical composition in a different key (Merriam-

Webster, 2002). However, for feminist philosopher Rosi Braidotti (2006), transposition is

not a word but a way of life. Braidotti (2006) wrote,

> Transpositions indicate an intertexual, cross-boundary or transversal transfer in the
>
> sense of a leap from one code, field or axis into another, not merely in the quantitative
>
> mode of plural multiplications but rather in the qualitative sense of complex
>
> multiplicities. (p. 5)

Inspired by scholars (Braidotti, 2006; Bresler, 2009; Sconiers & Rosiek, 2000) who

incorporated musicality into their research, I brought musical elements into this study by

presenting and analyzing the data to highlight the different ways in which women use

technology and its connection to subjectivity and agency. The concept of the orchestra is

used as a way to bring together the stories of the participants and highlight the "complex

multiplicities" (Braidotti, 2006) within each woman's story. Selecting a metaphor is a

literary device that is often employed by feminist researchers (Reinharz, 1992) and used in

dissertations to present findings in a creative format (Ross, 2011; Smith, 1999; Yarborough,

2012). Additionally, music provides "powerful and rich models for perception,

conceptualization and engagement for both listeners and performers to cultivate the processes and products of qualitative research" (Bresler, 2009). Moreover, the five musical metaphors comprise the orchestra, which is symbolic of the individual and collective approaches to technology.

I selected a musical metaphor for each woman after reading through her transcripts and analyzing her personal characteristics as well as her relationship with technology. I also thought about the sound of her voice, appearance, and demeanor as well as how she described her technology use. I developed a list of possible instruments based on my first impressions. Then I researched several instruments and selected the one that matched the woman's approach to technology. After thoughtful reflection, I decided that Elizabeth was most like a trumpet, Lee reminded me of a viola, Priscilla resembled a bass drum, Michelle was like a flute, and Violet's instrument was her voice.

Elizabeth's Instrument: The Trumpet

I selected the trumpet to represent the first woman in my study. Elizabeth, efficient and focused, reminded me of this polished, practical instrument with its single chamber and three keys. During each interview, her dress, hair style, and accessories were simple yet sophisticated. Her voice and demeanor were purposeful and professional. Like a polished brass trumpet, Elizabeth shone in her professional and personal life. Her office—filled with plaques, diplomas, certificates, framed photographs, and her daughter's crayon drawings—reflected her many accomplishments in academia as well as relationships with her husband, daughter, colleagues, and former students. Elizabeth, age 44, served as a professor of marketing and the associate dean of research in the school of business at Piedmont

University. She was married and had an eight-year-old daughter. When asked how technology was part of her daily life, she responded,

> The iPhone keeps track of my daily existence. The calendar is absolutely the heartbeat of my world because I've got three people's calendars to map in my household. And this is where it all intersects. It keeps me in touch with the moment-to-moment of what's happening with my child. And with an eight-year-old, that can change on a moment's notice.

This simple description was typical of Elizabeth's view of computers as a utilitarian tool, a viewpoint claimed by liberal feminists who see technology as a neutral tool (Faulkner, 2001; Foor & Walden, 2009). For Elizabeth, the iPhone was a useful tool because it connected her to family. Elizabeth's practical view of computers went back to her memories of college, where she lived in dorm with a computer in every room. She reminisced,

> I hated my roommate because I had the desk that was taken up with the computer, and I had absolutely no appreciation for how lucky I was, and it was the old kind with the old floppy discs. For a semester it just gathered dust, and then [my roommate] gained a boyfriend, and I remember him sitting there teaching us how to use it. I'm always the person who once I see what it does for me, OK, I'll go there, especially if I have some help. But barring that—it will collect dust.

This story was important for two reasons. First of all, the boyfriend taught Elizabeth and her roommate how to use the computer. This is consistent with the literature about gender stereotypes that portray women as inept with computers and men as computer experts (AAUW Educational Foundation Commission on Technology, Gender, and Teacher Education, 2000; Cooper, 2006). This event sets a precedent. Elizabeth said she often

looked to men, especially her husband and the technology expert in the school of business, for help with her computer and iPhone. This story pointed to her tendency to ask for help, especially from men. Second, this story indicated that Elizabeth tended to view computers as mere tools; she used them only if they did something for her.

More than 20 years later, Elizabeth still asked for help when using technology. She admitted that she used technology in class but said that she was "not a good operator of technology." She continued, "And so there's always a little bit of anxiety when I'm dependent on it." Elizabeth had different strategies for dealing with her anxiety around classroom technology, such as practicing a three-way conference call with her husband and her assistant, or asking a technician to check the Web conferencing software before class. She admitted she is not an expert; she was in a vulnerable position within this technology discourse because she often relied on others for help. She did not resist using technology with her students but cautiously navigated this discourse and reduced her anxiety by asking for help and planning ahead. Her reaction was consistent with the findings by Cooper (2006), who found that "computer anxiety has disproportionately affected females in the past and continues to do so in the 21st century" (p. 321). When I asked how technology helps her understand herself, Elizabeth stated,

> One of the things I think sending emails from a restaurant conveys about me is not
> something I mean to project but I think I do, which is, I'm constantly thinking about
> work and what's going on at work. My type A personality comes out. It
> communicates it whether I mean for it to or not.

Turkle (1984) pointed out,

> Mirrors, literal and metaphorical, play an important role in human development. In literature, music, visual art, or computer programming, they allow us to see ourselves from the outside and to objectify aspects of ourselves we had perceived only from within. (p. 155)

Elizabeth referred to this concept when she talks about sending out emails while at a restaurant. Her iPhone was a mirror, reflecting back to Elizabeth, and to the world, her type A personality and expectations about quickly responding to email. Elizabeth was often reluctant to use technology without help; however, sometimes she assumed an assertive position. She explained,

> [Technology] is an assistant. Not a playmate, not so much a fun thing. Definitely work-oriented; there has to be a purpose to it. It's almost like a hired administrative assistant following me around. I like my iPhone mainly because, in addition to keeping track of my daughter, it keeps my calendar accurate, and it does help me get where I need to be.

In this scenario, she saw herself as dominant and technology as subordinate. When I asked what technology did to her, Elizabeth stated that technology stirs up complex feelings. She elaborated, "[E-mail] does evoke the guilt factor that we need to be responsive to whoever chooses to put a message in our inbox at any given moment." Cowan (1983) saw the invention of vacuum cleaners and dishwashers as improvements, yet often these inventions increased workload and raised expectations about the quality and frequency of the cleaning. In a similar vein, Elizabeth talked about the endless cycle of email. She said that the iPhone was an enabler and contributed to her busyness because it was present with her "all the time"

and allowed her to check email and do other work. The iPhone was the 21st century equivalent of "more work for mother" (Cowan, 1983, p. 12) because it allowed her to extend her work day.

  Her object: The abused iPhone. During the object tour, Elizabeth showed me her iPhone, which she called "a poor little phone." She said that her husband joked that it is an "abused phone" because she used only the basic functions and did not take care of it. The iPhone had smudged makeup on the glass cover and a torn, black plastic case. When I asked what the object said about her, Elizabeth responded,

> In this day and age, a phone says a little bit about the way you operate. Mine clearly
>
> says I've got too much going on, and I'm not careful enough with my personal
>
> possessions. You also notice that the Otter case, which is supposed to be
>
> indestructible, I have, in fact, destroyed. There was an ill-fated moment around
>
> Christmastime when we had a device that you could put the iPhone in, and it would
>
> sync and play music. And it didn't fit well, so we were trying to [make it fit] my
>
> husband kept saying, 'Don't shove it. Don't shove it.' And I said, 'Yeah, you know
>
> what? It will fit' I tried to make it fit and that part ripped off.

She added that she loves her "abused" iPhone because it kept track of her family, but she did not love the fact that the phone worked both ways. She elaborated, "The phone is always able to track me" and there is "a little bit of a guilt factor because you're never out of touch." She experienced guilt during a vacation to a ski resort in an area without cell phone reception. At first, she enjoyed being unconnected to the world during the ski vacation until cell phone service was restored on the way home and she was bombarded with text messages from family and friends. Family and friends could easily access Elizabeth via her iPhone.

She said that when she did not respond quickly to their calls or texts, they thought something was wrong. This accessibility is one of the downsides of always-on technology (Connelly, 2010).

Dominant notes: Working, questioning, asking for help. In the dominant section, I comment on Elizabeth's typical approach to technology. Most of the time, Elizabeth used her computer for work; however, she was not afraid to ask questions or question how technology interrupted her life. Thus, her dominant approach to technology was working, questioning, and asking for help. Like her attitude toward the computer in her college dorm room, Elizabeth's pragmatic approach to technology carried over to her work as a professor. When she saw the value of technology, she used it even if she needed help. For example, she often asked "Waylan the Webex whisperer" to help her with Web conferences. She acknowledged that computer technology facilitated her calendar and her communication with her family, colleagues, and students. She also stated that it brought possibilities into the classroom, such as guest speakers from other parts of the country. She readily acknowledged her "weakness" with technology and her tendency to turn to technology experts, who were usually men. She did not talk about the genderedness of her decision to bring in experts but, instead, she spoke about it terms of her strengths and weaknesses. She said,

> I do not feel that [using technology] is a strength. I do not feel that students should be caught in the crossfire if I make some kind of a mistake. And so I bring in somebody who's an expert. It communicates to the world that I have weaknesses, and I acknowledge the weaknesses. And I am happy to turn over control in those cases.

"Turning over control" was a key phrase that indicated her willingness to let go and assume a subordinate position. Her response reflected that she is comfortable in her role as a professor

and administrator, both powerful positions, in which she has authority. Yet, when it comes to technology, she was comfortable relinquishing some control.

Although brass instruments such as the trumpet are part of modern orchestras, this instrument was originally used in military contexts (Helsby, 2007). As early as the 18th century, trumpets awakened soldiers, and songs such as "Reveille" signaled troops into battle (Randel, 2003). Furthermore, like her counterpart instrument, the trumpet, Elizabeth was quick to sound the alarm if an aspect of technology disturbs her. She elaborated,

> When we go to dinner with another couple, if we have a wine that we like, some of
> our best friends are very iPhone happy and so they'll snap [a photo of] the bottle of
> wine, and before we've finished the appetizer course, they know the top five places
> to buy it online and how much it costs. On one hand I get a little irritated and think,
> 'Is nothing sacred? We are out to dinner; put the phone away!' On the other hand, I
> feel a little left out, maybe that's part of it, too, but not enough to actually sit down
> and figure out how the snappy thing works.

Elizabeth experienced several emotions in the above scenario. She was disturbed that the iPhone interrupted the evening out with another couple. Her reaction to technology as an interruption was echoed by Turkle's (2011) commentary on technology interrupting family time around the dinner table. Elizabeth also felt left out because she did not know "how the snappy thing works." She said,

> And I think it also goes back to the cult of technology. It kind of positions me a bit of
> an outsider because it's just not my thing. I wish that I wanted to sit down and play
> games on my computer. I just don't; so I feel, like, I'm missing out on a piece of pop
> culture that's just passing me by.

Tonic note: Creating music. At times, Elizabeth's technology use differed from her regular, or dominant, use. In the tonic section, I discussed one surprising moment about her technology use. In contrast to the frustrations Elizabeth described while using technology at work and with friends, she named one exception with her favorite hobby: composing music on the piano. She recalled her old way of composing music, scribbling out the notes by hand, until her husband suggested she buy an electronic keyboard and composition software. For Elizabeth, this was a "braver than usual step" and an example of a positive interaction with technology. She stated,

> The first software I got was called Music Creator, and it really was like going from a tin can to a phone. It made that big of a difference. When friends or family members get married or have a christening or something, my gift is I will write something for them. And it's a much nicer presentation than my scribbled little things. When you put it through the software and it comes out, it's very professional-looking and it's a nice presentation.

However, Elizabeth pointed out that using musical composition software was the exception rather than the rule in terms of her interactions with technology. For her, composing music was the tonic voice in the symphony of her life. Yet, composing music with an electronic keyboard and special computer software was an important part of who she has become. She stated, "Music is my happy place."

Priscilla's Instrument: The Bass Drum

Priscilla represents the bass drum in the orchestra. A member of the percussion family, the bass drum provides a strong, steady beat, helping all the players keep time with the music (Hausherr, 1992). Like the bass drum's solid beat, Priscilla's confident,

determined approach to technology has been consistent throughout her academic career.

Priscilla was a 63-year-old professor of education, with a focus on math education and technology. Prior to her 22-year teaching experience at Piedmont University, Priscilla taught K-12 for 13 years. Her small office was located on the second floor of an older campus building. Bookshelves lined each wall; each shelf was filled books, three-ring binders, and mementos from friends and former students. She once told people that she liked Elvis Presley, so many of the knick-knacks reflected her affinity for the "King of Rock and Roll" (Tracy, 2007, p. 137). When invited to pick a pseudonym for the study, she laughed and replied, "How about Priscilla Presley?"

Dominant notes: Pride and problem-solving. In the dominant section, I comment on Priscilla's typical approach to technology. Priscilla said her computer played a big role in her life, and she thought of herself as a problem-solver. In graduate school, she saw the connection between math and computer programming. Encouraged by her advisor, she selected computer science as a minor and wrote about the connection between computer programming and problem-solving in her dissertation. Her early experiences with computer programming bolstered her self-confidence and shaped her academic career. Like many women who found success in the world of computing and engineering (Spertus, 2006), Priscilla was encouraged by a mentor. This concept aligns with liberal feminists (Faulkner, 2001; Foor & Walden, 2009) who critiqued the unequal relationship between gender and technology by offering correctives, such as outreach programs to encourage girls to take more math, science, and computing courses. Priscilla explained how technology connected to her identity,

I think, way back when, when I fell into the computer world, and I realized I was good at it, I think it probably built my confidence, and that has changed everything that I've done since. I'm a first-generation college student in my family. So, I didn't have that push, you know, that extra little buildup from home. I went to a small, rural high school, so I was pretty surprised to find out that I was really good at something because you kind of expect not to be. I think it's made a huge impact on everything else I've done since then.

As a graduate student, she worked at a summer computer camp for children. With pride, she recalled fixing the director's printer. She remembered telling him,

'When you come back on Monday, the printer will work.' I don't even remember now what kind of computer it was, what kind of printer or anything. I spent all day Sunday [working on the printer]. And I don't mind tinkering and tinkering and trying, and I'm kind of a problem solver, and I made that damn printer work. And I was very proud of that because I had a male friend, another grad student who was with me. And he just looked at it for five minutes and said, 'Well, I can't do it,' and he walked away. And I said, 'You go watch TV. I'm gonna do this.' And I did, and I was very proud of myself.

Priscilla's take-charge approach to technology began as a graduate student and overflowed to her work as a professor. During each interview, she spoke proudly about her work as professor and expressed confidence in her technical abilities. She has been a technology leader in her department and in university-wide initiatives, such as working with the provost as one of the grant directors for the Computer Enhanced Learning Initiative. Additionally, for 10 years she led summer workshops for secondary teachers about best

81

practices on teaching with technology. She spoke strongly and confidently about using her technical skills in different contexts: directing a grant, leading workshops, teaching students, and negotiating with educational software companies.

Priscilla also spoke affectionately about computer technology. She referred to Excel as her "best friend" because of the many ways she used it and called one of her laptops "her baby." She clearly defined her relationship with technology. She stated, "I like [technology]. We're friends but I'm the boss. I know you're a smart thing over here, but I'm the boss, and I will be the boss, and you will do what I say to do."

She admitted that she could not live without technology and that it plays a "very big role" in her life professionally and personally. She described technology as a communication tool, information tool, teaching tool, and an entertainment tool, occasionally using the social networking site Facebook to keep in touch with former students. Just like the bass drum that provides a consistent beat through a musical piece, Priscilla's technology use is steady.

Her object: The pink netbook. When I asked Priscilla to bring a technological object, she showed me a light pink netbook, a lightweight laptop the size of a paperback novel. She purchased her netbook because it was ideal to bring into schools and type notes while observing student teachers. Although she bought the netbook for practical reasons, she quickly grew attached to it. She added that her "cool little computer deserved a classy case" so she searched the Internet and bought a special zipped case, made out of a cable knit sweater. She primarily used the netbook to take notes during student observations. However, when the pink netbook drew attention, she took advantage of the opportunity. Priscilla said,

Almost every time, if I'm in a new class, some young woman in that class will come

over to me and say, 'Is that a girl's computer?' And I'll say, 'Yes, it is. Wouldn't

you like one?' And I think it's a really good model for them, and it's not frou-frou.

It does all the same things my big computer does. But I think it's really cool for those

young women to see you can be a girl and a technology expert.

Talking with the students about technology and gender roles was important to Priscilla.

When she saw the pink netbook she reflected about her role in education. She boasted,

I really like modeling that for those young women that I see in schools. If they're 15,

and they see that it's okay to be a girl and do technology well, I think that's

important. So, even when I'm not in a school, when I just think about it, it makes me

smile, just because that combination is really important.

Additionally, the pink netbook reminded of her identity as a teacher, role model, and

feminist. She claimed,

I think [the pink netbook] tells me that I'm very much a feminist, and I may not be

active, out in the street, burning my bra, but I think this is a way of going in that

direction of being a little bit proactive in trying to push those young women towards

STEM (science, technology, engineering, and math) careers.

Although the pink netbook was a small piece of technology, Priscilla was using it in a big

way, not only to take notes but to show girls that they can be technology experts, too. Like

the advisor who encouraged her to take more computer courses, Priscilla was using the pink

laptop to talk to the girls and encourage them to take more math courses and consider STEM

professions. As Cooper (2006) wrote, there is still a digital divide based on gender, and

teachers and other role models play a key role in helping "girls to see women as successful

computer experts" and diminishing "the stereotype that computers are the sole province of boys" (p. 332).

Tonic note: Unrecognized expertise. In most contexts, Priscilla's attitude and approach to technology contributed positively to her subjectivity, as demonstrated by her problem-solving spirit and her playful, yet powerful pink netbook. However, even though self-described as an "innovator and early adopter of technology," Priscilla has experienced tensions with technology, especially in the education department. The following story that took place when Priscilla was preparing for the 2008 accreditation report represented the tonic refrain, expressed her tensions with her role as a technology expert and contrasted with the examples in the previous section.

Early in the accreditation process, Priscilla realized there was a problem with the mountains of data collected and recognized the data had to be adjusted to fulfill accreditation requirements. She volunteered to devise a system to convert the data into a useable format, even though she knew she probably would not get compensated for this difficult work. The main issue was that most of the assessment data, such as the faculty ratings of student work, was scored on a one-to-four Likert scale, with one indicating a poor performance and four as an excellent performance. When Priscilla plugged the numbers into Access, a database program, she needed to convert the averages to percentages. Priscilla explained,

> What Access wanted to do with that data was give me a mean (average), and I didn't want a mean. I wanted percentages. I wanted to know what percentage [of students] had a one, what percentage had a two, a three and a four.

She asked for help converting the numbers to percentages, but no one in the department or the university technology support center could assist with this project. Feeling frustrated

with the lack of university resources, she bought a "big, thick book called *The Access*

Programming Bible." Using the *Bible* has her guide, she worked diligently during Christmas

break, approximately 12 hours a day for a month, programming Access and converting the

data into a usable form for the accreditation report. Priscilla described the process this way:

> It about killed me getting that done, but by God I did. I made the damn thing do
>
> exactly what I wanted. I wrote a gazillion formulas. I can't even tell you how many
>
> hours went into that. I don't think anybody but me knew what an achievement that
>
> was. But I didn't care if anybody knew. I knew. I beat the damn thing again. It did
>
> what I wanted it to do. And what we needed it to do. And when we had our onsite
>
> visit in 2008, we passed our assessment system with flying colors.

Completing this monumental task was satisfying but lonely work. She added,

> And that was very much personal satisfaction, but it was a department task. You
>
> know, everybody should have been working on that. Nobody was because nobody
>
> knew how, and they weren't even supporting me awfully well.

After spending all of her Christmas break on the accreditation project, Priscilla recalled

attending a luncheon with her colleagues. During the luncheon, the department chair made

an announcement and called her name. She continued,

> So, we came back to school in January, and we had a meeting or something, and then
>
> we went to lunch. For all those thousands of hours, they gave me a basket of soap.
>
> They did. A basket from Bath and Body Works or whatever. They gave me a little
>
> basket of soap.

She admitted she did not have a contract for the accreditation project but hoped for a bonus

or some recognition. However, despite her expertise, Priscilla's work was vastly

undervalued. In fact, this was a stark example of how technology maintains and magnifies the division of labor in the workplace (Leonard, 2003). She stated that the chair did not respect the accreditation process and did not care about her work. As a result of this fiasco, her perspective on her position and identity within the department changed. She bragged,

> I do what the hell I want to do, and they better not mess with me. And I do all the
> right things, and I do what's expected, and I do the right things for kids, and I do my
> job in spades. I would say I have good relationships with my colleagues, but still,
> they still owe me. They will always owe me, and I will do what I want to do because
> of that. Yeah, I will never forget that, the soap, the soap. I still have the basket.

Furthermore, she noted that a nearby university hired someone to develop their accreditation system, similar to the one she created. She critiqued, "They paid them something like fifty-thousand dollars. And I thought, 'Oh, I got a twenty-dollar basket of soap.' "

For Priscilla, this experience was a powerful wake-up call that changed her thinking about herself. She lamented,

> For a long time, you feel flattered, I guess, because you can do all that, and people
> come and ask you to do things like that. And, after a while, you get past that feeling
> flattered and feeling good about it, and you feel like you're a slave to their needs.

Priscilla said the incident did not bother her any more, but it changed her perspective about her role as the technology expert in the department. Although her work had gone unrewarded in the past, she would to no longer let her colleagues or department chair take advantage of her technological expertise. She asserted, "I've gotten over it, and I'm at a

different place. And I'm pretty much the senior person in the department, and I do what I want to do. They don't mess with me."

Like low notes of the bass drum that provide a strong and steady beat for other musicians to follow, Priscilla's expertise with technology served as the foundation for her successful career in academia. The bass drum, which is played by striking the surface with a mallet (Helsby, 2007), is a fitting metaphor for someone who does not let technology beat her. Instead, Priscilla was the driving force, a woman who tackles technology problems through skill, hard work, and sheer determination. She was a confident technology user, yet her tune has changed over the years. She has realized the dangers of doing too much and is ready for other faculty in the department to take on more work. Now she has focused on the projects that are most meaningful to her, such as learning new software, serving as a role model, and mentoring student teachers.

Lee's Instrument: The Viola

The third instrument in the orchestra is the viola. This musical metaphor represents Lee's approach to technology. Slighter larger than a violin and smaller than the cello, the viola is considered middle voice of the string section in terms of size and sound (Hausherr, 1992). In terms of pitch, the viola is tuned to a perfect fifth below the violin and one octave above the cello (Helsby, 2007). Like the viola, Lee described her approach to technology as middle of the road. She said, "I'm very much in the middle. I really value what I can do with computers for my research and teaching, but I do not make up uses for them."

Lee, age 46, was in her 16th year in the chemistry department at Piedmont University. She was a professor of chemistry and the department chair. When teaching students in the chemistry laboratory, Lee donned plastic safety goggles and a white lab coat with a red

button that reads, "Science is Fun." Underneath the lab coat, she wore a gray wool dress trimmed in black. She confidently glided around the lab in glossy black patent leather high-heeled shoes. Wajcman (2010) wrote that masculinity is so strongly associated with technical prowess that entering technical domains "requires women to sacrifice major aspects of their feminine identity" (p. 145). However, Lee projected femininity, technical expertise, style, and a sense of humor as she navigated among the students, computers, and tables cluttered with spectrometers, bottles of bleach, and glass beakers of eye-popping cobalt blue food dye.

Lee was married to an "at-home dad" to their 16-year-old-son. When asked about her daily technology use, Lee said that she and her husband are accessible via landline phones and email and do not need cell phones, although they did purchase one for their son. She admitted, "Our life is very simple. So as a result of that, I'm not enthralled with being constantly online or available. Technology has not become a part of the way our family lives."

Dominant notes: Teaching and research. Though Lee did not use technology at home, technology was essential to Lee's interactions with students and colleagues. In the context of higher education, her computer use was varied and sophisticated and was essential to her teaching and research. Not only did she use her computer, a tablet personal computer with a stylus, for writing emails and balancing budgets, but also she used the computer deliberately with students. Lee intentionally selected a tablet PC so she could face the class during lectures. Using a tablet PC that she holds in front of her allowed her to look up and engage with the students while writing equations, rather than turning her back and writing on

a chalkboard. In addition, she used the stylus with the tablet to provide "handwritten" feedback on student papers. She justified,

> It's just my personal style. I find that margin comments can more easily be interpreted and acted on in a written or narrative style than in a little box that someone has to click on to open up to read what my comment was. I sense that in my interactions with students, handwritten comments can be better, so [the tablet PC] allows that kind of thing.

Similarly, computer technology facilitated her research because she could share data via email with colleagues in Japan. She recalled how this differed dramatically from her work as a Ph.D. student in the 1990s, when she mailed her data to her advisor, who divided his time between research appointments in Canada and Australia. The turnaround time could be as long as a month because of the time it took for international mail to cross continents. Computer technology benefited her research in many ways. Lee stated,

> The progress that can be made with computers controlling instruments, robotics, acquiring data, digitizing signal, smoothing signal, processing signal, all of that has really improved the science side. So the technology helps that side of things.

Her object: The broken microchip in the rowing machine. When asked to bring a technological object that was part of her life, she responded by describing the computer inside her rowing machine that measures strokes per minute, resistance, and distance. Recently the computer in her rowing machine broke; however, Lee continued to use it daily. Instead of relying on the computer, she used her watch and tries to time her strokes. She was frustrated because the computer made her life more convenient, giving her a way to measure her strokes per minute. She said her attitude toward the broken rowing machine was

reflective of her high tolerance for "a pretty low quality of performance by technology." Lee confessed, "I've come to accept some inadequacy on the technology side of things. So I think that is sort of keeping with my expectations with technology." Additionally, she admitted that the broken rowing machine showed how she "unconsciously relies on technology." She observed,

> I think that [the rowing machine] is a sort of commentary on the fact that there are little bits of technology, small bits that are inserted in lots of aspects of our life that we're sort of not aware of. And you don't miss it until it's gone because it's just sort of an integral part in what you do.

Lee's comment about technology being an "integral" part of life was an example of what Adams and Thompson (2011) described as "background relations with technology, where they function transparently and essentially unnoticed in the disappeared, taken-for-granted background that is our lifeworld" (p. 740). As Adams and Thompson (2011) pointed out and Lee observed, the problem occurs when background technologies malfunction. Adams and Thompson (2011) explained, "The more intimately we embrace and become intertwined with a technology, the more vulnerable we are to its breakdowns, and to it responding otherwise than our desire" (p. 741).

Tonic notes: Interfering and increasing work. Throughout the majority of the interviews, Lee spoke about how she integrates technology with her teaching and research. However, she also talked about her tensions with technology, especially when technology interrupted classes and meetings or caused more work. She described her computer as an "omnipresent beast." In her journal, she wrote:

The 'omnipresent' modifier is just a natural when we are talking about technology these days—technology is present everywhere, all the time, and in so many different forms—from the obvious (our computers and the wireless routers blinking on the ceilings above us) to the less obvious (temperature sensors and gas sensors in our offices and laboratories and classrooms) to the more obscure (embedded chips in credit cards; air pressure sensors in our car tires. Second, the 'beast' subject perhaps betrayed some aspect of my personal relationship with technology. I see technology as strong and a bit imposing, like a beast. It is something that you [sic] are constantly working to achieve a peaceable relationship with.

She also reflected on how technology interfered with class and meetings. She described her reaction to students using phones during class as full of tension. She complained,

I will stop a lecture and say that I'm finding it really rude to look up in the classroom and see people looking down at their phones. And I know that's old-fashioned, and I understand that manners are old-fashioned. But I feel like technology has sort of a no rules, no manners surrounding it, and I regret that. I think there can be some politeness, and I'm very open with my students about that, and they think it's either quaint or old-fashioned and curmudgeonly. I'm not sure which. I feel like [the students] need to respect the human interaction, the face-to-face interaction, and technology needs sit and wait.

Similarly, Lee noticed a no-manners approach to technology at faculty meetings. She critiqued,

I'm often at meetings, and again, this sort of manners thing, and people pull out their phone. They have one ear at the meeting and one ear on their cell phone, and I

91

understand these are busy people and they have important things to do, but if the meeting is important enough to go to, then you should be committed to it. It saddens me that people are not entirely present. If you have a device, it's much easier to and much more tempting to leave your present place.

Like the other women, Lee spoke about how technology increased workload, similar to Cowan's (1983) more-work-for-mother argument. She recalled asking her dissertation advisor how he wrote a thesis without a computer. He replied that people were less likely to fix mistakes when using a typewriter and carbon paper. He said, "If a typo didn't change the scientific content, then why would you engage in the time of retyping the entire page?" Lee said,

We had made a lot of work for ourselves because we had the ability to 'quickly' fix things, quickly format, quickly send a communication, quickly make a sketch, quickly do whatever it is, but as a result, we end up doing a lot more than is absolutely necessary so I think that's why we have not, in fact, saved ourselves time. We've just re-proportioned time, so what has it removed?

Although Lee voiced concerns about technology interfering with class lectures, meetings and feeling like she was "competing with devices," she admitted it was essential to her work as a professor. She stated,

I have ushered in the use of personal computers, and used them almost always for sort of work-related, school-related functions. I was not resistant or scared of them. I've just had a very utilitarian view of computers. I think it's essential to my work. I don't think I could do what I do without it in terms of data analysis, presentation, publication, data collection down in the lab.

She also noted that her approach to technology was reflective of her patient personality. She continued,

> [Learning how to use new technologies] is a part of what we do. It doesn't make me especially happy, like I don't get especially excited or joyous. I'm also a very patient person by nature, so when I'm rebooting my computer for the third time in a day, I don't get especially mad. I'm not short-tempered by technology's short fallings.

Like the middle voice of the viola, Lee approached learning new technology in a level-headed, mellow manner. She admitted,

> I am open to learning new technology. I'm not worried we're moving to Windows 8 in the Fall and people, I think, are a little nervous because it's a very different platform. It looks very different, but yeah, I just think, 'Whatever, that's okay.' It's like when you buy a new car, you get used to a new clutch and you get used to where the new controls are for the heater. It's like not a big deal so I'm not intimidated in any way. I'm just not enthralled.

Michelle's Instrument: The Flute

Michelle reminded me of a flute. Members of the woodwind family, flutes are often featured in classic and romantic pieces, as well as popular music, such as the 1960s folk ballad "California Dreamin' " (Phillips & Phillips, 1965). With delicate and beautiful tones, the flute blends easily with other instruments. This instrument is featured in many musical genres: classical, Celtic, jazz, folk, rock and roll, and contemporary dance music (Helsby, 2007). Like a flute that mixes easily with other instruments, Michelle's approach to technology was blended and varied. When asked how technology blurs the line between home and work, Michelle stated she did not have firm boundaries. She explained,

I don't really make a line between my personal and private self. I kind of feel like they're fused. And I think that may be because so much of the relational stuff we're talking about is with students or colleagues who are friends.

Michelle described herself a "relational, family-oriented" person who enjoys the flexibility of her job and hobbies such as reading novels and knitting. During the first interview she wore a dress accented with her own knitted creation, a turquoise shawl that complemented her bright blue eyes and hot-pink lipstick. Michelle, age 51, was a professor of media studies and women and gender studies, serving in her 27th year at Piedmont University. Michelle, who was divorced and has a teenaged son, lived in a small town 22 miles from Piedmont. Even though she had a long commute, she enjoyed living in a town where she could walk to the post office, bank, or her mother's house.

On a typical morning, Michelle said she used her computer to read the newspaper, check Facebook for birthdays, and email colleagues and students. She described technology use in her classroom as limited; however, she frequently used technology for communication and scholarship. She clarified,

> I'm a media studies professor so watching and accessing films [is important]. Access is key and what you're able to have with cable and Netflix. I have access to more than I can possibly view. It's good now that I've let go of some of the frustration about not being able to keep up and be more selective. The major frustration used to be the lack of access. So, for example, all these films are nominated for Oscars. Well, I don't live in New York or Los Angeles. So, that's one thing I wanted to reinforce that technology provides so much access, which overcomes one frustration,

and if you can just manage your frustration about not being able to do all of it; then

that's a plus. Because there's so much out there it can be overwhelming.

Furthermore, Michelle said she loved using technologies that let her "connect and share"

with people. She explained,

> I do love my smartphone. I like that it fits in my purse. It just makes me feel more
>
> secure because you know, you can call AAA if your car died or you can text your
>
> son. Again, it's about what it does for me and who it connects me to.

She said that she enjoyed interacting with students via Facebook, even though she critiqued it

as a "superficial sort of connection." For example, a former student sent her a Facebook

message asking for her address for a wedding invitation. She said, "So, you just dash off

your address. I love that. I love that. But it's the sharing. It's the connecting and sharing."

When I asked what emotions she associated with computers, she replied, "Gratitude."

She elaborated, "You know, having spent a chunk of my professional life without computers

I still marvel at how much more efficient it makes things." She said she was grateful for how

computers improve her writing. She continued,

> It's so much easier to edit at your fingertips. And you can play with things because
>
> you have your dictionaries right there and just the editing. And it's faster, too. I can
>
> hardly write anymore with just my hands.

Her object: The silver laptop. The technological object that was important to her

was her silver laptop, a MacBook Pro. She said her computer was both functional and

relational. She clarified,

I think about my computer more in terms of what it does for me. It connects me to

people and to information. I think about it in a relational way. I don't think about it

as hardware and software. I think about what it actually can do for me.

She explained that thinking about her computer in a "relational way" is a change from her

previous thinking. She stated, "I used to feel very differently about my computer. I used to

feel like I was connected to the computer. Now I feel like the computer is just a way to

connect me to information and things." She said that this shift is linked to knowing that her

"stuff" is backed up in the cloud or an external hard drive. She no longer worried about

losing information or someone stealing her computer.

In additional to connecting people, using a computer allowed Michelle to manage her

schedule and spend time on her "own terms." She elaborated,

It's because I am very relational, and I like to communicate with people. It makes

things so much more efficient. I really value efficiency because I like to take an hour

and a half lunch with [colleagues] and talk about online education, [which is]

something new to me. I like to do that. But I want that to be on my terms.

Dominant notes: Producing, connecting, controlling. Michelle's typical approach

to technology is utilitarian, emphasizing what it can do for her such as improving her writing

or instantly connecting to her son. Most of the time, she spoke positively about her computer

because it allowed her to connect with people and helped her be "efficient" and "productive"

as a writer and film scholar. Additionally, she shared how the technology of the digital video

recorder, a device with a hard drive that is connected to a television (DVR, 2006), has

"revolutionized" her life. She explained,

It's great to be able to sit at home and do your work and have all this at your

fingertips. I think about this actually a lot; I think that in terms of media studies, it's

interesting how computers make us producers. If you want to have a playlist you go

to iTunes, you pick out your songs, and you make your own playlist. You can do that

with videos or what you want to watch. You can go to Netflix. Because you [have]

become an active consumer.

Michelle also talked about how using a computer to work at home makes her feel. She

stated,

You're efficient, there's a lot more work to do, and you get more done, but I do feel

like I'm more in control of my work than my work is in control of me because of the

flexibility. And of course, I was able to feel like I did everything that I needed to do

today, but I worked at home until my two o'clock [class]. But yet I was constantly

engaged.

For Michelle, working at home is beneficial and she feels in control of her work. In this

situation, she is in a powerful position within the work-at-home technology discourse.

Tonic notes: Learning, deleting, working. While Michelle stated that her computer

enabled her to connect with others and helps her work more efficiently, she also mentioned

tensions related to learning new software and deleting email. She said was "a little nervous"

about learning Final Cut Pro 10, a type of video editing software. She reflected,

I don't like to just plow ahead and figure things out. I want to know how to do these

things. But I'm not very patient. I don't like to just look around and play and fiddle.

I wish I knew a lot more, but I don't have an affinity for it like some people can sit

down and they just kind of understand how it all works. I don't think I'm like that. I

97

kind of have the sense that if I get in a little bit, there will be this moment where it

kind of shifts and it starts to make sense. But I'm not there.

She also spoke about her changing attitude toward email. She said,

It's evolving to wanting to tame it. I'm trying to not have such a sentimental

attachment to my email. [The] written word is the most intimate type of

communication because it has a precision and a permanence. I can't just wholesale

chuck out 23,181 emails. I can't because there would be some small fraction of those

that I would need. But the idea of trying to think about it in terms of being present

and not trying to either undo the past or recreate the past or project into the future but

just sort of be with the here and now and accept that. And in terms of detaching from

outcomes it's about releasing some degree of control. So the more you try to control

stuff sometimes you figure out you're really limited in how much you can.

Using a computer made Michelle feel more "in control" of her work. At other times,

she struggled with releasing control and deleting thousands of emails. Despite some tensions

with learning new software and deleting email, she spoke positively about how she used

computer technology. She explained, "In terms of my creative work and my scholarly work,

yes. I mean it's a huge improvement. Because I'm just able to do so much more and have

information at my fingertips."

Michelle felt tensions about technology related to multitasking and expectations. She

expressed,

Nobody's linear any more. Nothing is linear except I'm a knitter that is linear. And

that may be part of the appeal of it, frankly. Everybody's multitasking which I think

it's not good in the conventional way we think about it but it is good in the sense of

98

having multiple projects in the pipeline. But then you just figure discreet times to work on each one, not trying to literally to work on them at the same time. I think it has changed expectations. Yeah, on the one hand that's great. My output is greater. On the other hand the expectation is higher. Is that good for everybody? I don't know that it is. I don't know. I think we live in a very fragmented world where I think a lot of people are not all that happy. And I think that fragmentation is a big part of that. I do think technology plays a role in that but I'm not a social scientist so that's not really what I study.

At times computers helped Michelle work more efficiently; however, she questioned the connection between computers and workload. She critiqued,

I think as these things become easier and you're more efficient there's more to do. So it is this kind of never ending cycle and I wonder sometimes, I mean they pile up assessments and all this other stuff you have to do. It's burgeoning. I do wonder sometimes how much of it really improves things and how much of it is just more. Like when I started teaching 100 million years ago we had to turn in two things a year. At the beginning of the semester you turned in a copy of your syllabus. And the end of the year you turned in an activity report listing everything you did. And that was it. That was all. That was totally all. Now the paperwork is just kind of endless. I don't know that those things are actually improvements.

As well as talking about how computers are part of her daily life, Michelle also wondered about the future. She explained,

I was actually thinking about when will the day come when we don't—

thinking about the carbon footprint—we don't go to conferences. When we all phone

it in. And something will be gained and something will be lost. And that's kind of

the whole deal.

When asked about how technology is connected to her subjectivity, she replied,

Well, I think technology use is the right term because I don't really feel like

technology is a big part of my identity because it's more instrumental for me. It's just

what it does for me. I'm a scholar, I'm a filmmaker, I'm a writer, I'm a teacher, I'm a

knitter, I'm an occasional gardener. Some of those things rely on technology, but the

technology is a mechanism for those things. It's not the primary identity. I drive a

hybrid [car] because I want cleaner energy not because it's a newer technology.

Like the flexible flute that crosses musical genres, Michelle shifted in the multiple ways that

she used computer technology to connect with students, colleagues, friends, and family. A

flute is small instrument that easily separates into three pieces and fits into a slender carrying

case, weighing less than three pounds (Hausherr, 1992). In a similar fashion, Michelle

carried portable technologies, including her smart phone, Kindle, and laptop, with her as

while navigates between home, work, and other places. She naturally used technology in

multiple contexts because her documents, projects, and emails live "in the cloud." Like the

flute, her technology use was portable; she accessed it wherever she went.

Violet's Instrument: The Voice

According to music historian Helsby (2007), composer Richard Strauss once

remarked while rehearsing an opera, "The human voice is the most beautiful instrument of

all" (p. 152). The human voice, also called "the most precious instrument" (Hausherr, 1992,

p. 34) accompanies other instruments in the orchestra; vocal solos add dramatic flair as well

as sweet layer atop the instrumental voices. For example, Ludwig van Beethoven's Ninth Symphony ends with "Ode to Joy," sung by soloists and chorus (Helsby, 2007, p. 153). Beethoven was the first composer to use the human voice on the same level as instruments in a symphony (Kerman, 2012). Within this metaphorical orchestra, Violet was the soloist because of how she used her voice as performance artist as well as the multiple ways she used technology. When I asked her to select a pseudonym, Violet responded ironically, "I'm definitely not a shrinking violet! That will be my name." This petite woman moved and talked quickly. She often gestured with her hands; her slim fingers rose and fell in a lively dance, punctuating her words. Violet had short, spikey, blond hair and vivid green eyes, accented by the lime-green scarf around her neck, a birthday present from her mother. Violet, age 55, served in a hybrid position at Piedmont. She was a senior lecturer in the department of theatre and dance as well as the associate director for the program in entrepreneurship and creativity. She said her role is to teach students how to "unpack [their] preconceptions about creativity being only in artistic domains."

Like vocal chords that are sensitive to warmth and cold ("Singing and Song," 2013), Violet was aware of the perils and potentials of technology. She said, "I'm very much involved with my computer in one way or another every day, for many hours every day. And this is both fortunate and unfortunate." During the interviews, she talked about the convenience of working from home. However, she also spoke about physical problems that accompany computer use as well isolation that can occur while working at home, a risk pointed out by Star (2000) in her feminist critique of telecommuting. Violet explained, "That's sometimes a very uncomfortable feeling for me. As much as it appears to be a comfort because I'm home. I'm comfortable in my clothing. I have my food and can

replenish and so on and so on. But the cycle of production ends up being a rather sort of closed and enclosing circuit."

Her object: The standard, university-issued laptop. Violet selected her black, Lenovo laptop as her technological object. Piedmont had a contractual arrangement with Lenovo, a well-known computer manufacturer. The Committee on Information Technology was comprised of faculty, staff, and administrators, and determined the model as well as what software was loaded on the laptop (Piedmont University, 2013). As part of this program, every student, staff member, and professor gets a new laptop every two years. Some faculty asked for different laptops, such as Lee who requested a tablet PC to draw chemical equations and Michelle who wanted a Macintosh for video editing. Yet Violet had a "the standard, university-issued laptop" that the school "delivered" to her. The verb "deliver" was significant. This indicated that the laptop was given to her by the university. She passively positioned herself as a recipient of the "standard" laptop. She had no role in the decision-making process and did not reject the standard laptop or request a different laptop. She was positioned within this patriarchal technology discourse, which implied that the committee knew best and selected the standard laptop for all university employees and students. At times, she critiqued the committee's choice and complained about the poor design of the laptop—but she still used it.

Violet called her laptop a "big gathering device" and described it as "the container, the archive, repertoire, and the engine" that held her audio files, text, images, and other documents. I think it is significant that she referred to the laptop as a container as well as an engine. While a container has a passive connotation, a receptacle that holds things that others put into it, an engine implies movement. Later in the interview, she said she moved in

and through the laptop, similar to the how the engineering students moved within the CAD program in Downey's (1998) study. Violet explained that she moved through, along, and across various technological platforms as well as disciplinary domains. However, sometimes she described this movement as circular and restrictive. She said,

> When I go into the world, i.e., surf the Net, or have a communication with another person, there's a looping that happens. There's a recursion to the processing so that it always comes back and moves out again, so it's just a common bipolar. It feels like I'm the circulator; I'm the hub. I refuse to let that be the hub. That's just a new insight for me.

Unlike the engineering students working with CAD (Downey, 1998), Violet is in a position of control and power as she moved within her laptop. She recognized that the laptop provides great opportunities for creative expression and communication. She refused to let the laptop be the hub of her world. Violet said the laptop is vital to her scholarship and teaching, but she also recognized its limitations. She lamented,

> How I use [the laptop] most brings me always in touch with the duration and the intensity of the use on time and how I do or do not respond to the need to shift that relationship. That would probably be the biggest ongoing lesson, which in a way is a kind of a battle to allow myself to get consumed in its lair, in its lure, but also as a mechanism to make sure that I'm taking care of all aspects of myself. The utility of my eyes can only go on so long.

She noticed the "seductive potential" of the laptop but did not let the laptop control her. What Violet called the "seductive potential" of the laptop is similar to Bennett's concept of "thing power" (Bennett, 2010). Bennett (2010) wrote, "Thing power is curious ability of

inanimate things to animate, to act, or produce effects, dramatic and subtle" (p. 6). Violet recognized the subtle power of the laptop to seduce her into working more and for the laptop to remind her to take care of her physical body. Additionally, Violet said that her laptop is an uneasy mixture of work life, creative life, and personal life. Like an uneasy hybrid that occurred when women shifted between different class positions (Lucey, Melody, & Walkerdine, 2003), this negotiation between the body-machine was unstable. The body-machine intersection was a site of constant negotiation between the desire to work, the lure of the laptop, and the limits of her physical body.

Dominant notes: Functioning, creating, reflecting. Computers, video cameras, and other high-tech equipment have been part of Violet's professional practice since the 1980s. Like the other women, she said she used computers in a functional way, such as emailing students and taking notes using Microsoft Word. She also created artistic works and recorded audio journals with the help of her computer. As a trans-disciplinary media artist, she said she brought her laptop and a microphone into the studio. She confessed,

> I open my mouth, whatever comes out comes out and then I would let it go. I don't
>
> even worry that it's recording. And it takes in everything—my whole vocal life—
>
> including sputters, stumbles, rhythms, automatic speaking, as I call it, songs,
>
> extended singing, vocal technique—all of it. [The computer] is just a big gathering
>
> device.

With the help of her computer, she created her latest scholarship piece, a collection of multi-media poems that include audio clips from recordings of live opera performances as well as her voice, nature sounds, texts, and moving images. Additionally, Violet recorded audio journals on her laptop. She said,

You know the deal is the technology became a mirror that reflected back to me what would have heretofore been a fleeting experience, an ephemeral experience. So, in a way, it's almost like the tool itself must have some kind of deeply meaningful reflective capacity and validity in terms of how I use it.

The idea of technology as a mirror often comes up in technology studies, such as the one conducted by Turkle (2011), where she found technology served as both a reflection and magnification of children's emotional needs. In this scenario, Violet used the computer in a reflective, intimate way, as she developed her creative works, such as the online poetry book. The laptop was essential for writing and capturing her voice. Her online poetry book and audio journals were examples of how technology is tightly integrated with her scholarship. This integration reminded me of Haraway's (1991) explanation of the integrated circuit, when she wrote about the breakdown of distinctions between public and private domains, such as work and home. Haraway (1991) argued the integrated circuit suggests "the profusion of spaces and identities and the permeability of boundaries in the personal body and in the body politic" (p. 170). Violet's laptop was the site of integration; the boundaries between home and work do not exist on the laptop. When I asked about how she used the computer at work, she said, "The notion of 'at work' is not operative for me." In other words, for Violet, the lines between home and work blurred to the point of non-existence. She was living and working within the "integrated circuit" (Haraway, 1991, p. 170).

Tonic Notes: Embodying, subverting, hunkering. At times, Violet's technology use differed from her customary, or dominant, use, creating tension. Most of the time, Violet said the technology helps her to be creative and productive; however, she also acknowledged

some of the negative aspects of computing, such as physical discomfort and text messaging. She continued,

> I sometimes get sickened by the constancy of the screen. You can't quite place your finger on it, but it, yeah, it's definitely a visceral thing, a visceral reaction. Yes. Yes, I hate the way the laptops are set up, where you put your ball of your hand—it's hot. It's a terrible design.

Her reaction to the poor design of the laptop reminded of me the body-machine-interface that Haraway (1991) and Lupton (1995) describe. Lupton (1995) wrote, "Rather than the computer/human dyad being a simple matter of self versus other, there is, for many people, a blurring of the boundaries between the embodied self and the PC" (p. 478). Violet used the technology to extend her body, especially her voice, as she employed audio editing software to magnify, edit, and change her voice. Adams and Thompson (2011) said that embodiment relations are a type of human-technology relations. Adams and Thompson (2011) wrote, "Embodiment relations occur when a technological artifact is 'incorporated' as part of our bodily experience, beocming an extension of our corporeal self" (p. 740). Violet used her laptop to extend herself, especially her voice, in ways that were not humanly possible, such as creating song with three-part harmony by making three recordings of herself singing three different parts. Although the computer allowed her to extend her body, spending time on the computer made her more aware of the limitations of her physical body. Violet was keenly aware of what she described as the "sweet" features of latest laptops as well as how typing on the laptop strained her neck, hands, and eyes. Her tensions made me wonder about the people on the committee, who selected the laptop, as well as those who designed and manufactured this laptop.

In addition to her laptop, Violet talked about email and reading the news on her iPad. Recently she stumbled upon another use for the iPad when the word "pad" disappeared from the automatic email signature. The email signature changed from "sent from my iPad" changed to "sync from my i." She said she decided to invent new email signatures such as "Sent from my infinitesimally irritating body machine" and "Sent from my interiority externalizer." She said that these "endless, variations on this 'i-whatever' theme speak to this sort of complicated interaction between body and machine." As well as pointing out the complicated interaction between body and machine, Violet said that her customization of the "i" tagline is subversive. She said she undermines the power of the Apple company when she revises "i" tagline. Violet said she is deconstructing and or appropriating the authority of the iPad as a brand on every single piece of communication she sends. She explained,

> The expectation is that every customer that buys an Apple product will call it by its branded name and they will not alter it. Every single person could but they don't even think about it. So I'm really thinking about how to create an exhibition and maybe even like an online piece or even a Web site, like even sort of an 'anti i.'

This small gesture was profound yet went unnoticed by many of her colleagues. This was small example of how technology companies insert themselves into our lives, often in insidious ways.

Violet does not send many text messages but is bothered by students with their heads buried in their phones. She said, "It is absolutely critical to get them off of the constancy of the device. Yeah, hunkering. The hunker mode." Like with the manipulation of the "i" tagline, she took an assertive role in subverting the use of technology by assigning a project called the technology transformative practice project. She explained:

It's not simply sort of removing something or doing a self-improvement thing. It's actually to supplant it with something that is creatively developed. It's the introduction of a new practice that has a transformative potential—transforming self, transforming relationship with the thing, transforming the thing itself. It becomes transforming the object itself, then transforming behavior.

For example, one student decided to communicate with his parents through handwritten letters rather than calling or texting them. She said the goal was "to get the students to understand that they can be creative agents and rather than just receiving this as some sort of neutral device, upon and through which they can know and in fact, quasi-control the world. They start to actually sort of critically look at it and also creatively interact with it." Violet said her students know they are losing something important in terms of human interaction and engagement with the world around them. She concluded, "For me, that reinventional piece is always hugely important as a response to these displays and wrestling matches."

In the first interview, Violet described her voice as an instrument that she used with a looper, a device for audio recording and mixing in theatrical and musical productions. She said,

My looper, which I use to create my works and use in performance, is a technological device which captures [my] voice, in a short layer, a short phrase that you can layer on top of. So, I can build multiple versions of me, multiple pilings, I can do other kinds of simple effects like echoing.

Just as the vocal cords produce multiple kinds of sounds such as talking, singing, sighing, laughing, and crying, ("Singing and Song," 2013), Violet said she used technology in ways that were multilayered and complex. Her vivid insights about technology reminded

me of a guest soloist in a fancy dress who contrasted with the instrumentalists in their black attire. She used her voice and computer to produce scholarship that was creative, and at times, subversive.

Concluding Notes

The stories told by Elizabeth, Priscilla, Lee, Michelle, and Violet were examples of the multi-faceted ways in which computers intersect with daily life, especially in relationships with family, friends, students, and colleagues. The women told how their technology use often shifted while navigating among positions such as mother, wife, daughter, friend, colleague, professor, scholar, and administrator. For example, Elizabeth approached technology in a no-nonsense, businesslike manner; she was quick to sound an alarm when technology interrupted time with family and friends. Like Elizabeth, Lee was often bothered when technology disrupted classes and meetings. In contrast, Priscilla tended to see people, rather than technology, as a source of interruption. Michelle, a professor of media studies, valued technology because it helped her connect with the important people in her life. She also appreciated her laptop, which gave her the flexibility of working at home. Like Michelle, Violet often worked at home. However, Violet was keenly aware of how working at home often increased her workload and strained her body.

In Chapter Four, I introduced the participants and their accompanying musical metaphors. The five musical metaphors comprise the orchestra, which is symbolic of the individual and collective approaches to technology. Contemporary orchestras include four distinct sections: strings, woodwinds, brass, and percussion (Helsby, 2007). In my metaphorical orchestra, each woman comes from a different section and adds her unique voice, her perspective on technology, to the study. Lee, as the viola, is a member of the

string section. Michelle, the flute, is part of the woodwind family. Elizabeth, the trumpet,

represents the brass section. Priscilla, with her steady beat, is part of the percussion family.

Violet, as the soloist, is not part of a section but accompanies the orchestra with her voice.

Each instrument's individual tone and sound makes a unique contribution. Together, the

members of the orchestra produce a blended, beautiful sound that exceeds what one

instrument could play on its own. While there are only five players/participants in this study,

their unique voices combine to produce a unique sound, a distinctive perspective about

technology and sense of self.

Chapter Five: Findings and Recommendations

In Chapter Five, I analyze the findings described in Chapter Four by drawing connections among the participants' stories. My analysis of the significant stories link findings to the research questions as well as key concepts in the literature reviewed. The findings from this study are integrated with feminist critiques of technology, feminist endorsements of technology, and the postmodern concepts of subjectivity and agency. In addition, I discuss the implications of this study and offer suggestions for future research.

Introduction

This chapter focuses on my analysis of the findings and the significance of the findings, including implications and recommendations for changes in practice and future research studies. First, I review the purpose of the study and the research questions. In this qualitative case study, I used the methods of interviews, observations, document analyses, and object tours in order to understand how computer technology shapes the professional, personal, and socio-cultural experiences of five women faculty. My guiding questions were:

1. How do women faculty navigate and put to use different technology discourses?

2. How are their technology practices contextual and fluid?

3. How does technology shape their subjectivity and produce agency?

Merriam's (1998) definition of analysis guided my thinking. Merriam (1998) stated,

Data analysis is the process of making sense out of the data. And making sense out of

data involves consolidating, reducing, and interpreting what people have said and

what the researcher has seen and read—it is the process of making meaning. (p. 178)

I began the process of "making meaning" (Merriam, 1998, p. 178) by reading and

"immersing" (Marshall & Rossman, 2011, p. 209) myself in the data, reading all the

transcripts and notes multiple times. According to Glesne (2011) and Merriam (1998), the

analysis process begins with presenting the study's findings in a descriptive format, which I

did in Chapter Four. Next, I followed "the theoretical propositions that led to [the] study"

(Yin, 2006, p. 130). Yin (2006) explained,

The original objectives and design of the case study presumably were based on such

propositions, which in turn reflected a set of research questions, reviews of the

literature, and new hypotheses or propositions. The propositions would have shaped

your data collection plan and therefore would have given priorities to relevant

analytic strategies. (p. 130)

At this point, I began to see connections and patterns developing while I was reading

through the first draft of Chapter Four, so I began "creating categories of meanings"

(Marshall & Rossman, 2011, p. 159). According to Merriam (1998), the researcher must

construct categories or themes that "capture some recurring pattern that cuts across the data"

(p. 179). Merriam (1998) wrote, "Devising categories is a largely intuitive process, but it is

also systematic and informed by the study's purpose, the investigators' orientation and

knowledge, and the meanings made explicit by the participants themselves" (p. 179).

Throughout this analytic process, I connected the interview data to the theory, focusing on

the concepts of discourse, subjectivity, and agency. Rather than thinking of data and theory

as separate, I used theories in my literature review to "think with theory" (Jackson & Mazzei, 2012) and drew connections between the new data and existing theory. As I thought with theory, I focused on the following theoretically rich words: *tension*, *interruption*, *submission*, and *resistance*. These words were inspired by the participants' responses and the research literature. Most importantly, these rich words "reflected the purpose of the research; and, in effect, were the 'answers' to [my] research questions" (Yin, 2009, p. 183). Therefore, while writing up the answers to my research questions, I focused on tension, interruption, submission, and resistance. These theoretically rich words captured how the women unveiled the nuances of and their entanglement with discourse, subjectivity, and agency within their daily technology practices.

Each theoretically rich word corresponded with the study's research questions. The concept of negotiation also connected to the first question about navigating technology discourses. I selected this word because of how the participants described moving among technology discourses. Additionally, the participants displayed tension, interruption, resistance, and submission through acts of negotiation. In my analysis of the second question, I examined the concepts of fluidity and context. The third research question elicited more opportunities to write about tension, interruption, resistance, and submission. After I interpreted the data and revisited the scholarly literature, I concluded that subjectivity and agency are conceptually interwoven or "tethered" (Pascale, 2011, p. 33) and should be combined analytically. Therefore, I combined research questions three and four so that the revised research question three addressed both subjectivity and agency. I will discuss my answers to the three research questions in the next section.

How Do Women Faculty Navigate Different Technology Discourses?

In this study, I adopted a poststructural view of discourse as a "potential site of struggle" (Litosseliti, 2006, p. 49). In this sense, the words within discourses are not neutral but have additional meanings in historical, social, and political contexts (Fiske, 1994) and exist in "the social practices of everyday life" (Weedon, 1997, p. 108). Litosseliti (2006) explained,

> Discourses represent ways of seeing the world and they articulate, maintain, represent, reconstitute, negotiate, and even resist some of these ways. Discourse is a potential site of struggle, and participants are neither helplessly controlled by the dominant discourse, nor rational individuals that make free choices. (p. 49)

I focused on the word *negotiation* as I analyzed how the participants participated in and resisted technology discourses. I discovered several technology discourses at play during this analysis including technology-as-a-productive tool, technology-as-work-inducing, and technology-as-a-relational tool. During the interviews, the women talked about how they maintained dominant technology discourses by participating in them. For example, several women adopted the technology as a productive tool discourse when they talked about how technology helped them work more efficiently. Michelle said that the software on her computer made her a "more efficient, better writer;" Elizabeth explained that that her iPhone was "a tool to control her schedule."

At other times the women participated in the technology-as-work-inducing discourse. All women talked about how technology made more work for them. Lee said that having the ability to quickly fix errors in Microsoft Word makes more work because people feel pressured to continually make corrections. Michelle said that technology has changed

expectations for faculty workload and has contributed to the expectation to do more work. Michelle explained, "Now, the paperwork is just kind of endless. I don't know that those things are actually improvements." Throughout the study, the women talked about "endless email" and the "never-ending cycle of work" and questioned if technology really improved their work as professors. The women also maintained the technology-as-a-relational tool discourse. They spoke about using their phones to keep up with families and friends and using email and Facebook to stay in touch with students.

Additionally, the women talked about resisting some technology discourses. For example, Lee resisted using technology as a relational tool, preferring to keep in touch with her family in other ways. Priscilla resisted being taken for granted for her expertise when she said, "They don't mess with me." Throughout the study, the women talked about how they moved among technology discourses, at times maintaining the dominant discourse or the status quo, and, at other times, resisting the dominant discourse and presenting alternative discourses such Violet reinventing the iPad email tagline.

The women also talked about how they negotiated and navigated technology discourses. In alignment with the cyborgian perspective (Bell, 2007; Graham, 1999; Haraway, 1991), which points to the promises and perils of new technologies as well as the "negotiation and renegotiation of boundaries" (Haraway, 1991, p. 114), the participants saw the valuable and detrimental influences of technology in their lives. Additionally, the process of negotiation was similar to Braidotti's (2006) concept of nomadic subjectivity because the women moved and negotiated in purposeful ways among technology discourses. The participants talked about the ways they negotiated among different tasks, demands on their time, and physical limitations. The women were aware of technology's benefits such as

115

writing more efficiently and easily collaborating with colleagues in different countries.

However, the women spoke of technology's shortcomings such as "endless email" and

heightened expectations to produce more work in less time. Elizabeth summed it up when

she said, "Technology works both ways." In other words, the women liked the fact that

computers and smartphones allowed them to keep in touch with family and friends, but also

experienced guilt when they did not respond quickly to calls, text messages, and emails.

Technology helped and hindered the women in their daily lives as they negotiated

purposefully among these technology discourses. For example, Elizabeth and Michelle said

that they loved using their iPhones to connect with their children; yet, they admitted that the

iPhone encouraged them to work longer hours. For the women in this study, technology was

site of negotiation that revealed a blend of advantages such as staying in touch with family

and disadvantages such as the pressure to work more. Michelle summed up the benefits and

disadvantages of blended, cyborgian technology when she said, "Something will be gained

and something will be lost. That's kind of the whole deal." Michelle negotiated several

discourses in this scenario. She was aware of the environmental impacts of her decisions and

knew that technology could be used to reduce the carbon footprint. If she bought into the

technology-as-productive-tool discourse, she could save time by not driving to the

conference or waiting in line at the airport. Michelle's observation provided a crucial insight

into the role of technology in women's lives. The findings from this study indicate that there

are both gains and losses when navigating technology discourses; women must constantly

negotiate among different discourses, weighing both the benefits and disadvantages.

Additionally, Elizabeth, Lee, and Violet talked about technology negotiations in their

classrooms. They said that technology enhanced their teaching; however, when students sent

text messages or played on Facebook rather than paying attention to lectures, technology disrupted the classroom. Thus, technology both helped and interfered with their teaching. As for Violet, her classroom and body were sites of negotiation. Violet said her laptop was a site of constant negotiation between the desire to work and the physical limitations of her eyes, neck, and hands. The women acknowledged the strain of negotiating different technology discourses at home, work, and other places, such as cars or restaurants. This was problematic because the participants said that negotiating within the technology discourses was hard, ongoing work. Additionally, negotiation was problematic because of the stress from competing discourses, such as the pressure to use technology to do more work as well as the pressure to adopt the technology-as-a-relational tool discourse, conforming to the cultural expectation to use technology to maintain relationships with family and friends. In this sense, technology was being used to maintain the "emotional labor" of the home (Hartel, Zerbe, & Ashkanasy, 2005, p. 216). How the women negotiated different technology discourses highlighted the multiple priorities that women must juggle as well as the many demands on their time. Therefore, while negotiation offered some benefits, negotiation also took a physical and emotional toll. For example, Lee talked about "constantly working to achieve a peaceful relationship with technology" and Violet said she experienced "continual negotiations throughout the day." Elizabeth said that she felt guilty when she did not respond to text messages. Negotiating discourses enabled the women to work in different places and allowed them to adjust their schedules in ways that were convenient for them. For example, Michelle often worked at home to be close to her elderly mother. Moreover, the women continually negotiated among the beneficial and undesirable aspects of their relationships

with computer technologies. These technology negotiations were often contextual, fluid, and contributed the women's subjectivity.

How Are Their Technology Practices Contextual and Fluid?

The concept of fluidity appeared in the research literature through the discussion of how technology blurs the lines between home and work (Leonard, 2003; Star, 2000). Following Haraway (1991), Bell (2007) pointed out that technology was "at the heart of this undoing, this blurring and breaking of boundaries" (p. 101). Similarly, Graham (1999) wrote,

> The boundary between 'natural' and the 'artefactual' may never have been secure, but now it is shifting and blurring more than ever. The ubiquity of computer technology and electronic media and the advent of genetic engineering are extending and displacing the physical body into new media, such as cyberspace, and reconfiguring taken-for-granted patterns of physical space, procreation, communication, and intimacy. (p. 421)

In this study, some participants used computer technology, phones, and social media to reconfigure "taken-for-granted patterns" (Graham, 1999, p. 421) in their homes, offices, and classrooms in fluid ways. When I asked about how their technology practices were fluid, Michelle, Violet, and Priscilla talked about the lack of boundaries. For these women, the firm lines that divided work and home had melted because of the technologies that allowed them to work at home. For Michelle, the boundary between work and home was beyond fluid—it did not exist. She said that her private and professional selves were "fused." Violet dismissed the concept of blurry boundaries and said that there were "no lines between home and work." Priscilla said that her technology use was "steady" in both places.

Zusman, Knox, and Garner (2009) wrote, "Individuals are born into, live in, and die in social contexts. We are not born into a vacuum, but into a family, which is part of a particular social class, community, and society" (p. 4). As I found in this study, technology use did not occur in a vacuum; technology use occurred within professional and social contexts as the women interacted with other people. Additionally, the participants talked about how they used technology in the context of their work as professors. Lee sharply divided her technology use between work and home. After witnessing high-tech equipment in her classroom, I was surprised to learn that she and her husband did not own cell phones and rarely used technology at home. Lee stated, "Technology has not become a part of the way our family lives." In other words, she tended to restrict her technology use to the work context. In contrast, Elizabeth used technology in similar ways, regardless of the context. For her, with one minor exception, technology was just a purposeful tool. Whether she was compiling a report or preparing for a class, she used technology only if it would do something *for* her. She used technology with family members but only for practical reasons, such as communicating with her husband about their child's schedule. For Elizabeth, her technology use was not contextual. She used technology in a similar ways in both social and work contexts.

Additionally, several participants gave examples of how computer technology changed "taken-for-granted patterns" (Graham, 1999, p. 421) of communication and intimacy, both interrupting and extending intimate moments. For example, Elizabeth said that technology changed the way she interacted with her friends. Haraway (1991) used the metaphor of the cyborg and the integrated circuit to call attention to the boundaries between human and machine, as well as traditional boundaries in society such as the one between

119

home and work. Haraway (1991) wrote that part of our responsibility is "embracing the skillful task of reconstructing the boundaries of daily life, in partial connection with others, in communication with all of our parts" (p. 39). Therefore, the majority of the participants used technology to reconstruct "the boundaries of daily life" (Haraway, 1991, p. 39). This is significant because these boundaries are constantly changing, and we must find ways to adapt and move forward, or risk getting left behind. Additionally, if the boundaries have moved for some and not for others, there is the chance that misunderstandings can occur such as push back from a chair or dean who expects professors to be on campus during certain times of the day. Reconstructing the boundaries of our daily life can help us be more flexible and responsive to our needs, as well as the needs of others around us, and attend to the multiple demands on our time.

How Does Technology Shape Their Subjectivity and Produce Agency?

By using the term subjectivity rather than identity, I adopt a postmodern view of subjectivity that is dynamic, non-linear, multiple, and always in process (Braidotti, 2006; Weedon, 1997). Sociologists Ellis and Flaherty (1992) urged scholars to embrace a broad understanding of subjectivity and adopt research methods that include attention to the inner self as well as their tensions with technology. Following the recommendation of Ellis and Flaherty (1992), I asked questions about the women's sense of self as well as their tensions with technology.

Violet said she was excited by the audio editing software that allowed her to express creativity and "create multiple versions" of herself. In this study, the women expressed various ways in which computer technology contributed to the "multiple versions" of themselves, which included the roles of professor, mother, daughter, spouse, friend,

colleague, and administrator. For example, Elizabeth talked about how her iPhone helped her keep on top of her child's schedule, and this was important to her as a working mother. So, while the iPhone was often used for work, she also used her iPhone to assure herself that she was an attentive mother and a successful professor. The iPhone allowed her to occupy the multiple positions of professor and mother. For Violet, her laptop helped her to be both an artist and a professor because she used the laptop to grade papers and write emails as well as to create online multimedia exhibits. For Michelle, technology allowed her to occupy the positions of professor, single mom, and daughter; she was able to live in a small town 20 miles away from the university because of Internet access. She could be the small-town girl who wanted to raise her son in a close-knit community, walk to the post office, visit often with her mother, and work as a professor. Technology helped her occupy the multiple positions of single mother, doting daughter, small-town girl, and professor. Elizabeth and Violet spoke of using technology for creative pursuits such as composing music, journaling, and creating art. Therefore, technology contributed to the creative side of their selves as they wrote poetry and created art and music.

This finding suggests that Braidotti (2005) was insightful when she wrote that today's humans have become "multiple, complex, multi-layered selves" and that technology is a challenge as well as "the chance we have given ourselves, as a culture, to reinvent ourselves and display some creativity" (p. 594). In other words, as Braidotti (2005) explained, technology can assist humans as we ask the question, "Who do we want to become?" (p. 594). Thus, technology contributes to the process of becoming.

The participants often spoke about how technology interrupted their lives. Elizabeth was disturbed when friends used their iPhones to look up the price of a bottle of wine during

121

a meal at a restaurant. She said that she was angry because the iPhone disrupted the dinner. At one point, she shouted, "Is nothing sacred? Put the phone away!" Elizabeth saw the iPhone as an interruption to her dinner with friends. Elizabeth, Violet, and Lee said that cell phones interrupted classes and meetings. Lee said that she regretted the "no rules, no manners" mentality that she witnessed when students texted during lectures and colleagues checked their phones during meetings. For her, cell phone use was an interruption and made her feel like she was competing with devices.

The women also displayed moments of tension, which were laced with emotion. Emotions are important consider because thoughts and emotions contribute to subjectivity (Weedon, 1997). Some outbursts were negative in nature, for example, when the women talked about technology interrupting something that was important to them, such as a class or meal. At other times, moments of tension were positive. Several of the women said that they "loved" software programs that enabled them to crunch numbers, create music, and edit documentaries.

Two significant concepts, submission and resistance, connect with Research Question Three. According to the postmodern perspective, agency fluctuates as a person interacts with others and experiences different positions (Weedon, 1997). Litosseliti (2006) elaborated by describing agency as a process by which "positions are created and social power relations are acted out, as well as challenged through discourses" (p. 49). Therefore, a person may be positioned as powerless in one discourse or powerful via an alternative discourse (Francis, 2007). All participants spoke about submission and resistance within various technology discourses. The findings from this study suggest that moments of submission and resistance provided insights into their subjectivity.

122

During the interviews, the women gave examples of when they accepted or yielded to the authority of another person or technological device. Elizabeth talked about "turning over control" when she depended on a male technology expert to help with a Web conference. Other participants talked about submitting themselves to specific technologies or devices such as "releasing control" of email or succumbing to "the lure of the laptop." For example, Violet spoke critically about the laptop she was issued by the university; yet, she did not resist the decision made by the university technology committee. In this example, I interpreted her behavior as compliant because she accepted the laptop that was selected for her by the university. In this technology discourse, I saw her adopt a passive position, which was contrary to her outspoken personality. The members of the technology committee acted in a patriarchal manner because they decided which laptop was best for the faculty. This situation reminded me of Wajcman (2004), who wrote about the early feminists who critiqued the patriarchal nature of technology, and who explained, "The view that Western technology itself embodies patriarchal values, and that its project is the domination and control of women and nature, is an important precept of radical feminism, cultural feminism, and eco-feminism" (p. 18). My study contributed to this argument by showing that patriarchal values and attempts to control how women use technology are steeped in the cultural expectations of the university environment. Additionally, my study showed that there is still work that needs to be done in order to dispel the preconceptions and negative stereotypes related to women and computing. One way to break away from these negative stereotypes is to show how women are using to technology to promote alternative and artistic discourses using technology. Additionally, this concept is connected to the social shaping of technology, where "technology is seen as socially shaped, but shaped by men to the

exclusion of women" (Wajcman, 2004, p. 30). Admittedly, I did not know the gender makeup of the university technology committee. However, I discovered that the participants were excluded from the decision-making process. Elizabeth and Priscilla accepted the decision. Lee and Michelle resisted and were able to get different laptops. Violet did not like the laptop but did not request a different one. This was an example of the dangerous legacy of technology patriarchy, when men or those in positions of power made decisions for women about which kind of technology they were allowed to use rather than involving them in the decision-making process.

These moments of submission were examples of the legacy of gender stereotypes surrounding women and technology, where men are positioned as experts and women are dependent on their expertise (AAUW Educational Foundation Commission on Technology, Gender, and Teacher Education, 2000; Cooper, 2006). I had optimistically hoped that gender stereotypes related to technology would not arise in this study, but they did. Three of the five women said that a man either taught them how to use a computer or they currently depended on a man to repair their computers. This is a potentially dangerous situation because the participants are role models for students. Additionally, my findings support earlier claims by feminists that women are still underrepresented in fields such as technical support as well as in informal roles of technical expert among family and friends (AAUW Educational Foundation Commission on Technology, Gender, and Teacher Education, 2000; Cooper, 2006; Selwyn, 2007). Gender stereotypes surrounding technology are limiting to women because they frame expectations about appropriate leisure activities, academic choices, and career paths (Anderson & Buzzanell, 2007; Cooper, 2006; Selwyn, 2007). This continues to be problematic because, as my study indicates, women are still underrepresented in

technology support positions, and women will continue to be less likely to obtain high-paying technical positions (Rosser, 2006). When women willingly submit to male technology experts, they reinforce the stereotype that women are not good with computers and must reply on men's expertise. My research confirms that these stereotypes still exist and more work needs to be done to draw attention to the stereotypes and overturn them by showing the alternative and multiple ways women interact with technology.

The most blatant example of the reinforcement of the sexual division of labor occurred during Priscilla's soap story. In this scenario, Priscilla's technology skills were taken for granted, and she was exploited by the department. Rather than being recognized for her tremendous technical skill and service to the university, her contribution to the accreditation project was diminished and downplayed when the male department chair presented her with a basket of soap in front of the whole department. She told me this made her feel like a "slave to their needs." What is striking about this situation is that it did not occur in a Third World country, where women are often seen as a cheap source of labor for computer manufacturers (Wajcman, 2004, p. 24) or 50 years ago, when women often expected to work for lower pay than their male counterparts (Leonard, 2003). Yet, despite Priscilla's whiteness, education, and well-paying job, she was treated poorly for her technology contribution. This situation is aligned with the sexist expectation in some work cultures where women work hard for little recognition and receive financial compensation less than their male counterparts (Scholz, 2010). Some feminist scholars (Cooper, 2006; Cowan, 1983; Foor & Walden, 2009) stressed that technology emphasizes the sexual division of labor. This view is consistent with the critiques of socialist feminists who assert that technology reinforces inequities such as the wage gap between men and women (Leonard,

2003; Scholz, 2010). My study indicates that those in leadership positions need to be more aware of how they treat people with technical expertise and ensure that gender does not influence the reward structure.

On the other hand, in their fluid use of technology, bound by discursive restraints, women did find sites of resistance, which emerged as another significant finding. Cyberfeminists wrote about the "subversive potential of digital technologies" (Braidotti, 2005; Daniels, 2010; Everett, 2004) to build supportive online communities, such as online discussion forums for breast cancer survivors, or to promote political agendas, such as Black feminists who used the Internet to promote the Million Women March. In my study, the women described ways they resisted technology or decisions about technology within their local context—the university. Two women challenged the technology committee's decisions about the standard laptop and requested and received different computers. Additionally, Priscilla positioned herself in a powerful stance with her overall approach to technology when she refused to let technology "beat" her. Similar to Priscilla, Elizabeth inhabits an authoritarian position in relation to her iPhone. She said, "It is like a hired assistant following me around." Violet exhibited multiple forms of resistance through her approach to teaching and scholarship. As a professor, Violet was aware of technology's impact on the students and assigned a transformative practice technology project to counteract the negative effects of technology. Additionally, she resisted Apple's branding by reinventing the iPad email tagline, which she planed to transform into an online art exhibit. Violet's idea of an online art exhibit was also aligned with cyberfeminists who put their art online to resist the limitations of traditional exhibits and reach a broader audience (Flanagan & Suyin, 2007). Moreover, Violet refused to let the laptop be the "hub" of her world. So, while she

acknowledged the usefulness of her laptop, she clearly positions herself as the one in control of the technology.

Throughout the study, the participants provided many examples of how they practiced both submission and resistance within technology discourses. I gleaned valuable insights about the participants' subjectivity when they talked about how technology interrupted their lives, troubled them, and evoked moments of tension. I caught a glimpse of the women's subjectivity, their sense of self, when I listened to their stories. These women were not just professors. They have many roles in their lives and should not be limited by one aspect of their self. Just as stereotypes limit the way one views a person, having a limited version of identity is narrow and restrictive. A narrow view of identify focuses on just one aspect of a person's sense of self rather than the multiple versions of themselves. Additionally, this is important because it is vital for people to stop putting female faculty into boxes or narrow versions of what they think a female professor should be. Also, this study could reassure women who do not fit into the mold of what others expect them to be. This study might also comfort women who are struggling because they are not who they want to be or where they want to be at this point in their lives by knowing that they are a work in progress and their sense of self is constantly evolving.

Conceptual Framework Revisited

The purpose of my study was to better understand the complex role of computer technology in the lives of women faculty. Throughout the study, the participants described how computer technology intertwined with their lives, affected their relationships, and connected to their self-concept. This qualitative case study was informed by several areas of research, including classic studies about gender and technology, feminist critiques of

127

technology, feminist endorsements of the possibilities of technology, and the postmodern concepts of subjectivity and agency. These theories provided the conceptual framework that guided my study.

Research conducted by Angelone (2010) and Noble and Lupton (1998) provided guidance for studying the ways in which technology connects to subjectivity. Studies conducted by Turkle (1986, 1995, 2011) and Downey (1998) served as exemplars and provided a framework for exploring the ways in which people interact and engage with computer technology. Additional inspiration was drawn from Haraway's (1991) cyborg and integrated circuit metaphors and Braidotti's (2006) concept of nomadic subjectivity. A tour of technological objects provided additional insight into the participants' sense of self. Object interview questions were informed by the work of Adams and Thompson (2011), Nordstrom (2013), and Turkle (2007). The scholarly literature and research studies reviewed provided a framework for the design of the study.

Some scholars have explored the connection between subjectivity and technology. Examples include Angelone's (2010) study about the blogs of women doctoral students, Rickman's (2012) presentation about how adolescents use social media sites to "create who they wanted to be" (p. 3). However, these investigations focused on the experiences of adolescents or graduate students. My research focused the experiences of women faculty in the context of higher education. Additionally, my research differed from other studies about subjectivity, computing, and higher education because it was focused on women faculty rather than faculty and staff of both genders. Also, my study builds upon and extends the classic work of gender and technology scholars, showing that new technologies are the modern-day equivalent of "more work for mother" (Cowan, 1983).

Given my study's purpose and feminist stance, qualitative methods were most suitable. In order to explore the complex, contextual, multifaceted relationships women faculty have with their computer technologies, I conducted interviews, observations, document analyses, and a tour of objects. Throughout the study, my goal was to listen with intent (Reinharz, 1992). I also practiced what Reimer (2003) calls "creative listening, characterized by an intense quest for understanding" (p. 117). In addition to creating musical metaphors to better understand each woman's relationship with technology, I reflected on the similarities between music and qualitative research. Bresler (2009) explained:

> The contents of interviews, like musical contents, are complex and nuanced in their expression, inseparable from affective moods. Equally important is the listening required in observations, listening for texture, for layers of meaning, for subtle dynamics, for dissonance and consonance. Analysis of data, too, requires listening to layered meanings and nuance. Listening and hearing, as Sorko Senyi and Reimer claim, go beyond the explicit text, the literal, factual content. It attends to tone and mood, to form and rhythm, to the tangible and the intangible. (p. 15)

Although I envisioned and carried out this qualitative case study, I was not the conductor of this metaphorical orchestra. Instead, I was an adoring fan, sitting on the edge of my seat, listening as the music unfolded, attending to tone, mood, form, and rhythm. My "creative listening" (Reimer, 2003, p. 119) and reflections led to the study's limitations, implications, and suggestions for future research and practice. Study limitations, implications, and suggestions for future research and practice will be discussed in the next section.

Emergent Research Design

When I conceptualized this study, I assumed that participants would talk about desktop computers and laptops. However, as the study progressed, the participants often spoke about mobile technology devices such as smartphones, iPhones, iPads, and Kindles. As a qualitative researcher, I acknowledge that a research design is emergent, and the data collection and analysis may evolve during the study in response to what unfolds during the study (Morgan, 2008). The concept of emergent design is significant for grounded theory (Creswell, 2007). Creswell (2007) explained, "A key idea is that this theory development does not come 'off the shelf,' but rather is generated or 'grounded' in the data from the participants who have experienced the process" (p. 63). Therefore, I justified the shift to mobile devices because of the participants' responses to interview questions. It was also significant that the mobile devices were held close to the body. The mobile devices were often used as a way for the participants to extend themselves, which is known as "technology embodiment relations" (Adams & Thompson, 2011, p. 740). The participants used computers and mobile devices to extend their physical bodies and their subjectivity.

Study Limitations

My study was limited in several ways. I accurately reflected the perspectives of the five women who participated in my study; however, these perspectives may not represent how technology shapes the social-cultural experiences of all women faculty in higher education. I would have liked to have observed each woman in additional settings, such as their homes, to gain more insight into how their technology use fluctuated within different contexts. Although the women talked about using technology in different contexts, I could have gained further understanding by observing them directly. I had limited access to the

participants because of their busy schedules. Additionally, although the women came from diverse academic fields and represented a wide range of technology adoption levels, I had hoped for additional diversity in terms of race, cultural background, and physical ability.

Geographic location was an additional issue. Although I was able to visit the site frequently, I did not visit the research site as often as I liked because of the distance from my home and the demands of my full-time job. If I were to conduct another study, I would seek grant funds so I could take a leave of absence from my position and spend additional time in the field, or I would select a site closer to my home. I often felt rushed and pressured to do as much as possible in a two-day visit so I could return to my full-time job. Spending more time in the field would have allowed me to conduct fewer interviews per day and spend more time reflecting and writing. Another limitation was the lack of participation with the technology journals. Three of the five participants returned technology journals to me. However, I do not think this was a serious limitation because all participants provided rich data during the observations, interviews, and object tours. If I were to conduct the study again, I would not ask the participants for journal entries. Instead, I would schedule additional observations or interviews based on the participants' responses during interviews.

Study Implications

The stories generated from this qualitative study could inspire women working in academia by shedding light on their lived experiences and could lead to alternative technology initiatives related to technology discourses, fluidity, subjectivity, and agency. As I discovered, some women are not aware of the powerful influence of technology in their lives and how it connects to their sense of self. The findings from this study indicate that we need to be critical of the way technology shapes us and we are shaped by technology. We

must pay more attention to technology discourses, especially the discourses related to workload and heightened expectations. For example, if a department chair person distributes iPads to all professors, does the chair person think about or communicate the expectations that accompany the technology? Does the chair person expect the professor to work in a doctor's office waiting room, at the local coffee shop, or while sitting on the couch in the evenings? This study provides examples of why it is necessary to challenge some of the dangerous technology discourses and avoid being trapped and seduced into doing more work because of a shiny new device, unlimited Internet access, or text messaging. As Violet reminded me, it is very easy to succumb to the lure of the device. This study also challenges outdated notions of what it means to work at home or hold office hours as well as how students expect to communicate with faculty. For instance, this study points to the need to re-examine what it means to work from home. Furthermore, this study indicates that some women are willing to challenge taken-for-granted patterns and traditional technology discourses, and even invent alternative discourses. This study could inspire other women to do the same at their universities.

As the women explained, technologies can lead to interruptions in classrooms and meetings. How will these interruptions be managed? What toll do they take? Women need to be aware of what kinds of technology discourses they are contributing to and which ones are undermining them. Additionally, women in positions of leadership need to critically consider what expectations they are placing on both the men and women that they supervise when speaking about or distributing laptops, iPads, or other technological devices.

While there are some named advantages to using technology in a fluid way, there are also stresses and strains from being continually connected as well as the pressure to respond

quickly to students and colleagues. Sometimes, a fluid approach leads to the false

assumption one must be constantly available. Now is the time to critique the cultural

expectation that permeates higher education. It is time to stop buying into the intoxicating

myth of rewarding people for working long hours, which is enabled by always-on computer

technology. It is time to remind people that technology is far from a neutral tool. As my

study has shown, when the boundaries between home and work melt, there is tendency to

work more. It is time to reclaim some of our sacred spaces such as dinner with family,

exercising outdoors, or engaging in a favorite hobby; because although technology can be

used to connect with family, friends, students and students, technology can also separate us

from the physical world, the physical body, and people important to us.

We must be critically aware of both the connections and disconnections offered by

technology. Technology is far from a neutral tool sitting quietly on a shelf. Technology is

more like Elizabeth's iPhone with its broken plastic case and screen smudged with bits of

foundation, powder, and blush. This iPhone is imperfect yet essential to her life as a woman.

Technology is messy. Rather than talking about technology as a neutral tool, we should

think of technology as multipurpose Swiss army knife with its different blades and other

tools such as scissors, screwdrivers, and nail files. Technology is both a productive tool, a

work-inducing tool, a relational tool, and a seductive tool. While technology offers

marvelous possibilities, technology also has a sharp side and should be used with caution.

We must be critical of the productive promises, perils, and potentials lurking within our

devices.

Moreover, as a result of this study, I question the university culture that rewards those

who spend extended time on their computers and other devices. I am highly critical of a

133

leadership structure that uses technology to increase expectations to produce more work and respond more quickly. As Elizabeth reminded me, technology is an enabler. It is time to redirect the conversation from what is technology doing for us to what technology is doing to us and what is it saying about us and our values. As Turkle eloquently (1984) wrote,

> Mirrors, literal and metaphorical, play an important role in human development. In literature, music, visual art, or computer programming, they allow us to see ourselves from the outside and to objectify aspects of ourselves we had perceived only from within. (p. 155)

Our devices serve as a mirror, reflecting back to ourselves and to the world what we value. Yet, we must be willing to pick up that mirror and look deeply and critically at the devices in our palms, purses, and other places, and critically question what technology says about us.

Recommendations for Future Practice

As a result of this study, I present several recommendations to faculty development personnel, IT staff, and faculty. The findings from this study should be shared those who work in faculty development centers and those who lead workshops and other types of professional development. I recommend that faculty development personnel examine their technology workshop offerings and critically look for the technology discourses that they are supporting as well as undermining. For example, are the workshops sending the message that technology will increase productivity? Faculty development staff should supplement technology-as-a-productive tool and technology-as-a-teaching tool workshops with other initiatives that address the downsides of technology such as the stress of negotiating different technology discourses and the downsides of being constantly available to students. Faculty development staff could offer workshops or other programs to address issues such as

technology interruptions during classes and meetings. Additionally, faculty development

staff ought to critically examine what their Web sites and email communications say about

technology and how it should be used by faculty. Faculty development initiatives, including

workshops, book groups, and mentoring programs, should reflect many technology

discourses, including technology-as-a-productive tool, technology-as-work-inducing,

technology-as-a-relational tool, and technology-as-a-seductive tool. For example, rather than

blaming the students or the devices for technology interruptions, we have a duty to explore

ways to educate and inform students, faculty, and staff about the best practices for

technology use in classrooms, meeting, and social settings.

Additionally, the findings from this study have implications for IT staff. The findings

from this study indicate that faculty use technology in fluid and contextual ways. This ought

to serve as a lesson to IT staff as well. Grajek (2013) wrote that IT staff must adopt support

models "that are more fluid and can respond better to the ebb and flow of both physical and

virtual environments and the technologies they employ" (p. 40). Rather than cling to rigid

support models, IT staff need to honor flexibility and fluidity over rigidity. This could

include supporting faculty when they are working at home and providing assistance with how

smartphones, iPads, and other devices interact with campus resources.

Finally, this study has many implications for faculty women. My first

recommendation is for woman to take steps to protect the sacred spaces in their lives,

including time for family, exercise, and hobbies. Women ought to recognize the seductive

power of technology and be attentive to the need to step away and make time for themselves.

Secondly, women should communicate expectations and alternative schedules to students,

colleagues, and administrators. Additionally, women need to resist dominant technology

discourses and use technology in alternative ways that suggested by university. Women must

be willing to challenge expectations and taken-for-granted patterns for how technology is

used in their lives and be open to possibilities for creativity and resistance.

Recommendations for Future Research

This qualitative case study, which addresses a gap in the existing gender and

technology literature, does not present a comprehensive exploration of the complex

relationship between faculty women and technology. For example, after conducting this

study I wanted to explore the perspectives of university administrators and faculty

development directors. After conducting this study, I wondered whether administrators were

aware of the messages they were sending faculty about technology, workload, and

productivity. While I explored five participants' views about their relationships with

technology, I did not delve into the perspectives of students or university leadership,

prompting the need for additional studies. Throughout the study, the women talked about

interacting with students in classroom settings and through email and social media sites such

as Facebook. A comparative study between the perceptions and experiences of students and

faculty could provide valuable insights into how technology affects faculty-student

relationships and communication patterns. A focus group comprised of faculty and students

could generate interesting insights about technology, interaction, and expectations.

Future researchers might explore how IT leadership can best meet faculty's needs.

For example, someone could explore this research question: How can IT leaders address

faculty's need for flexible technology solutions that complement their teaching, scholarship,

and personal needs? Future researchers could interview the students and university

administrators to see if the results contrasted or complimented this study's findings. This

would be an ideal follow-up study because it has many implications for university administrators and technology leadership.

Additionally, a follow-up study might be conducted with male participants. Future researchers could explore how men negotiate the home-work boundary and how their responses compare to the findings from this study. Other studies could explore the perspectives of administrative support staff, who are predominantly female. A comparative study about administrative support staff and their supervisors would draw attention to issues related gender, race, class, and technology in the workplace.

This study indicates the need for a new ways to critique technology discourses. Rather than employing the language of capitalism, such as consumer, producer, profit, or labor, future researchers might explore how people use religious terms and the language of addiction to talk about their relationship with technology. Alternative language could be used to bring attention to issues related to gender, class, sexual orientation, ability, religion, or other differences and how they intersect with technology.

The women did not discuss their technology privileges such as Internet access, up-to-date computers, mobile devices, printers, software, and social media. Additionally, as professors, the participants enjoyed technology privileges such as technology workshops, academic databases, technical support, and other resources. As a researcher and university guest, I had limited technology privilege; however, the participants seemed unaware of their technology privilege. This suggests that technology privilege, like the invisible backpack of white privilege described by McIntosh (1990), is hidden and needs to be unpacked and critiqued. The concept of technology privilege could be explored in future studies.

Conclusion

I agree with José Bowen (2012), dean, music professor, and technology advocate at Southern Methodist University, who wrote that universities should rethink the way technology is viewed on college campuses. Bowen (2012) urged faculty and administrators to re-think the connection between technology and relationships. Bowen (2012) wrote, "There are times when we want a better Web site and times when we want to talk to a real person. Getting the balance of humanity and technology is everyone's new mission" (p. 49). Whether reading the bottom line of the budget, teaching a technology workshop, or creating guidelines about mobile devices, those who work at universities must seek a careful balance between "humanity and technology" (Bowen, 2012, p. 49). Now more than ever, qualitative studies like mine are necessary because of the growing role of technology in daily life, especially university life. Additionally, qualitative studies can help people better understand the complex relationship between technology and self. Qualitative studies are needed because they can help people see beyond the technology-is-just-a-tool mindset and explore what technology teaches us about ourselves.

As a qualitative researcher, I agree with Van Maanen (1988) who wrote that learning to conduct research is more "akin to learning to play a musical instrument than solving a puzzle" (p. 118). Van Maanen (1988) explained:

> What the fieldworker learns is how to appreciate the world in a different key. Early experiences and understandings of the world studied (and their representations in fieldnotes) are not data per se but rather primitive approximations of the writer's later knowledge and perspectives of those studied—a little like the beginning pianist's two-finger playing of "Twinkle, Twinkle, Little Star." (p. 118)

The melody known as "Twinkle, Twinkle, Little Star" appeared in piece by Wolfgang Amadeus Mozart in the 18th century ("Variations," 2013). The lyrics of this well-known lullaby were based on a poem written by Jane Taylor (Watson, 2001). The final verse goes like this:

> As your bright and tiny spark,
>
> Lights the traveler in the dark,
>
> Though I know not what you are,
>
> Twinkle, twinkle, little star.
>
> Twinkle, twinkle, little star,
>
> How I wonder what you are!

Like the little star mentioned in this song, I hope my work will be a "bright and tiny spark" that inspires other researchers to explore the wonderful, relational world of technology and self. As this study concludes, I acknowledge that my life as a qualitative researcher is just beginning. Although my time in the field was limited, what I learned from the five women at Piedmont University resulted in a study that can help faculty, technology experts, and university leaders better understand technology from a feminist, postmodern, personal, and relational perspective. I hope that the findings from this study will help university leaders think about technology "in a different key" (Van Maanen, 1988, p. 118) and reconsider "taken-for-granted patterns" (Graham, 1999, p. 421) and policies related to university computing. Like the novice piano player described by Van Maanen (1988), I admit that my work is simple; yet, like a piano, which is capable of producing children's lullabies as well as complex symphonies, my work can make a difference by illuminating a different perspective

about technology. I hope that the findings from this study will make a difference and

demonstrate to university leaders why a blend of "technology and humanity" (Bowen, 2012,

p. 49) is sorely needed.

Bibliography

AAUW Educational Foundation Commission on Technology, Gender, and Teacher Education. (2000). *Tech-savvy: Educating girls in the new computer age.* Washington, D.C.: American Association of University Women Educational Foundation.

Adams, C. A., & Thompson, T. L. (2011). Interviewing objects: Including educational technologies as qualitative research participants. *International Journal of Qualitative Studies in Education, 24*(6), 733-750.

Agar, M. (1980). *The professional stranger.* New York, NY: Academic Press.

Allen, I. E., & Seaman, J. (2011). *Going the distance: Online education in the United States.* Wellesley, MA: Babson Survey Research Group.

Anderson, W. Z., & Buzzanell, P. M. (2007). Outcast among outcasts: Identity, gender, and leadership in a mac users group. *Women & Language, 30*(1), 32-45.

Angelone, L. (2010). A critical discourse analysis of representations of female doctoral student bloggers. In R. Gaijala, & Y. J. Oh (Eds.), *Cyberfeminism 2.0* (pp. 61-81). New York, NY: Peter Lang.

Barad, K. (1998). Getting real: Technoscientific practices and the materialization of reality. *Differences: A Journal of Feminist Cultural Studies, 10*(2), 87-128.

Beal, G. M., Bohlen, J. M., & Rogers, E. M. (1957). Validity of the concept of stages in the adoption process. *Rural Sociology, 22*(2), 166-168.

Bell, D. (2007). *Cyberculture theorists: Manuel Castells and Donna Haraway.* London, UK: Routledge.

Bennett, J. (2010). *Vibrant matter: A political ecology of things.* Durham, NC: Duke University Press.

Bernard, H. R. (2000). *Social research methods: Qualitative and quantitative approaches.* Thousand Oaks, CA: Sage Publications.

Bettie, S. (2003). *Women without class: Girls, race, and identity.* Berkeley, CA: University of California Press.

Boris, E. (1994). *Home to work: Motherhood and the politics of industrial homework in the United States.* New York, NY: Cambridge University Press.

Bourriaud, N. (2009). *The radicant.* New York, NY: Lukas and Sternberg.

Bowen, J. (2012). *Teaching naked: How moving technology out of your college classroom will improve student learning.* San Francisco, CA: Jossey-Bass.

Boxer, M. J. (1998). *When Women Ask the Questions: Creating women's studies in America.* Baltimore, MD: Johns Hopkins University Press.

Braidotti, R. (1994). *Nomadic subjects: Embodiment and sexual difference in contemporary feminist theory.* New York, NY: Columbia University Press.

Braidotti, R. (2005). Meta(l)morphoses: The becoming machine. In W. K. Kolmar (Ed.), *Feminist theory: A reader* (pp. 586-597). Boston, MA: McGraw-Hill Higher Education.

Braidotti, R. (2006). *Transpositions: On nomadic ethics.* Cambridge, UK: Polity Press.

Bresler, L. (2009). Research education shaped by musical sensibilities. *British Journal of Music Education, 26*(1), 7-25.

Bryman, A. (2004). *Social research methods*. Oxford, UK: Oxford University Press.

Christensen, K. (1989). Home-based clerical work: No simple truth, no single reality. In
Homework: Historical and contemporary perspectives on paid labor in the home.
Chicago, IL: University of Illinois Press.

Clark/Keefe, K., & Miller, V. (2012). Transpositions toward becoming leading subjects. In
C. I. Gerstl-Pepin, & J. A. Aiken (Eds.), *Social justice leadership for a global world*
(pp. 189-208). Charlotte, NC: Information Age Publishing.

Cockburn, C. (1983). Caught in the wheels: The high cost of being a female cog in the male
machinery of engineering. *Marxism Today*, 16-20.

Cockburn, C. (1992). The circuit of technology: Gender, identity and power. In R.
Silverstone, & E. Hirsch (Eds.), *Consuming technology: Media and information in
domestic spaces* (pp. 32-47). London, UK: Routledge.

Cockburn, C., & Ormrod, S. (1993). *Gender and technology in the making.* London, UK:
Sage.

Cohn, C. (1987). Sex and death in the rational world of defense intellectuals. *Signs, 12*(4),
687-718.

Cole, A., & Conlon, T. (1994). Information technology and gender: Problems and proposals.
Gender & Education, 6(1).

Comeau, T. D., & Kemp, C. L. (2007). Intersections of age and masculinities in the
information technology industry. *Ageing & Society, 27*(2), 215-232.

Connelly, M. (2010, June 6). Your brain on computers: More Americans sense a downside to
an always plugged-in existence. *The New York Times*.

Cooper, J. (2006). The digital divide: The special case of gender. *Journal of Computer Assisted Learning*, 320-334.

Cowan, R. S. (1983). *More work for mother: The ironies of household technology from the open hearth to the microwave.* New York, NY: Basic Books.

Creswell, J. W. (2007). *Qualitative inquiry and research design: Choosing among five approaches* (2nd ed.). Thousand Oaks, CA: Sage Publications.

Creswell, J. W. (2009). *Research Design: Qualitative, quantitative, and mixed methods approaches* (3rd ed.). Thousand Oaks, CA: Sage Publications.

Daniels, J. (2010). BlogHer and blogalicious: Gender, race, and the political economy of women's blogging conferences. In R. Gaijala, & Y. J. Oh (Eds.), *Cyberfeminism 2.0* (pp. 29-60). New York, NY: Peter Lang.

Denzin, N., & Lincoln, Y. (2003). *Strategies of qualitative inquiry.* Thousand Oaks, CA: Sage Publications.

Downey, G. L. (1998). *The machine in me: An anthropologist sits among computer engineers.* New York, NY: Routledge.

Drury, M. (2011). Women technology leaders: Gender issues in higher education information technology. *NJAWHE, 1*(1). doi:10.2202/1940-7890.1054.

Eagly, A. H., & Carli, L. L. (2007). *Through the labyrinth: The truth about how women become leaders.* Boston, MA: Harvard Business School Press.

Ellis, C., & Flaherty, M. G. (1992). *Investigating subjectivity: Research on lived experience.* Newbury Park, CA: Sage Publications.

Everett, A. (2004). On cyberfeminism and cyberwomanism: High-tech mediations of feminism's discontents. *Signs, 30*(1), 1278-1286.

Faulkner, W. (2001). The technology question in feminism: A view from feminist technology

    studies. *Women's Studies International Forum*, 79–95.

Fiske, J. (1994). *Media matters: Everyday culture and political change.* Minneapolis, MN:

    University of Minnesota Press.

Flanagan, M., & Suyin, L. (2007). Rethinking the f word: A review of activist art on the

    internet. *NWSA Journal, 19*(1), 181-200.

Foor, C. E., & Walden, S. E. (2009). Imaginary engineering or re-imagined engineering:

    Negotiating gendered identities in the borderland of a college of engineering. *NWSA*

    Journal, 21(2), 41-64.

Foucault, M. (1980). *Power knowledge: Selected interviews and other writings, 1972-1977.*

    New York, NY: Pantheon Books.

Fox-Keller, E. (1985). *Reflections on gender and science.* New Haven, CT: Yale University

    Press.

Francis, B. (2007). Postmodern and poststructural theories. In B. J. Bank, S. Delamont, & C.

    Marshall (Eds.), *Gender and education: An encyclopedia* (pp. 78-84). Westport, CT:

    Praeger Publishers.

Glesne, C. (2011). *Becoming qualitative researchers: An introduction* (4th ed.). Boston, MA:

    Pearson.

Gough, B. (2009). A psycho-discursive approach to analysing qualitative interview data, with

    reference to a father-son relationship. *Qualitative Research, 9*(5), pp. 527-545.

    doi:10.1177/1468794109343624

Graham, E. (1999). Cyborgs or goddesses? Becoming divine in a cyberfeminist age.

    Information, Communication & Society, 419-438. doi:10.1080/136911899359484

Grajek, S. (2013, May). Welcome to the connected age: Top ten IT issues, 2013. *Educause Review*, 31-57.

Haraway, D. (1991). A cyborg manifesto: Science, technology, and socialist-feminism in the late twentieth century. In *Simians, cyborgs, and women: The reinvention of nature.* New York, NY: Routledge.

Hartel, C. E., Zerbe, W. J., & Ashkanasy, N. M. (2005). *Emotions in organizational behavior.* Mahwah, NJ: Lawrence Erlbaum Associates.

Hausherr, R. (1992). *What instrument is this?* New York, NY: Scholastic.

Hekman, S. (2010). *The material of knowledge: Feminist disclosures.* Bloomingham, IN: University of Indiana Press.

Helsby, G. (2007). *Those amazing musical instruments.* Naperville, IL: Sourcebooks Jabberwocky.

Hesse-Biber, S. N., & Leavy, P. L. (2007). *Feminist research practice: A primer.* Thousand Oaks, CA: Sage Publications.

History of the Sonata. (2003). *Encyclopedia of the romantic era, 1760-1850.* Retrieved from http://0-www.credoreference.com.wncln.wncln.org/entry/routromanticera/sonata

hooks, b. (2000). *Feminism is for everybody: Passionate politics.* Cambridge, MA: South End Press.

Jackson, A. Y., & Mazzei, L. A. (2012). *Thinking with theory in qualitative research: Viewing data across multiple perspectives.* Abingdon, Oxon: Routledge.

Jaggar, A. M. (1996). Love and knowledge: Emotion in feminist epistemology. In A. Garry, & M. Pearsall (Eds.), *Women, knowledge, and reality: Explorations in feminist philosophy* (2nd ed., pp. 166-190). New York, NY: Routledge.

Kerman, J. (2012, November 10). *Beethoven, Ludwig van*. (O. U. Press, Producer) Retrieved

from Oxford Music Online:

http://www.oxfordmusiconline.com/subscriber/article/grove/music/40026pg14

Kimmel, M. S. (2011). *The gendered society.* New York, NY: Oxford.

Knight, P. T. (2002). *Small-scale research: Pragmatic inquiry in social science and the

caring professions.* Thousand Oaks, CA: Sage Publications.

Lather, P. (1991). *Getting smart: Feminist research and pedagogy with/in the postmodern.*

New York, NY: Routledge.

Lather, P. (1993). Fertile obsession: Validity after poststructuralism. *Sociological Quarterly,

4*, 673-693.

Lather, P., & Smithies, C. (1997). *Troubling the angels: Women living with HIV/AIDS.*

Boulder, CO: Westview Press.

Latour, B. (1996). On actor-network theory: A few clarifications. *Soziale Welt*, 369-381.

Lawrence-Lightfoot, S., & Davis, J. H. (1997). *The art and science of portraiture.* San

Francisco, CA: Jossey-Bass.

Leonard, E. B. (2003). *Women, technology, and the myth of progress.* Upper Saddle River,

NJ: Prentice Hall.

Lerman, N. E., Oldenziel, R., & Mohun, A. (2003). *Gender and technology: A reader.*

Baltimore, MD: Johns Hopkins University Press.

Lincoln, Y., & Guba, E. G. (1985). *Naturalistic inquiry.* Newbury Park, CA: Sage

Publications.

Linn, E. (1999). Gender equity and computer technology. *Equity Coalition, 5*(4), 14-19.

Litosseliti, L. (2006). *Gender and language: Theory and practice.* New York, NY: Oxford University Press.

Lucey, H., Melody, J., & Walkerdine, V. (2003). Uneasy hybrids: Psychosocial aspects of becoming educationally successful for working-class young women. *Gender & Education, 15*(3), 285-299.

Lupton, D. (1995). The embodied computer/user. *Body & Society, 1*(3-4), 97-112. doi:10.1177/1357034X95001003006

MacLure, M. (2013). Classification or wonder? Coding as an analytic practice in qualitative research. In R. Coleman, & J. Ringrose, *Deleuze and research methodologies* (pp. 164-183). Edinburgh: Edinburgh University Press.

Marshall, C., & Rossman, G. B. (2011). *Designing qualitative research.* Los Angeles, CA: Sage Publications.

Matters, P. (1983). Hi tech cottage industry: Home computer sweat shops. *The Nation*, 390-392.

Maxwell, J. A. (2005). *Qualitative research design: An interactive approach* (2nd ed.). Thousand Oaks, CA: Sage Publications.

May, C. (2009). Innovation and implementation in health technology: Normalizing telemedicine. In C. May, J. Gabe, & M. Calnan (Eds.), *The New Sociology of the Health Service* (pp. 143-160). London, UK: Routledge.

McIntosh, P. (1990). White privilege: Unpacking the invisible knapsack. *Independent School, 49*(2).

Merriam, S. B. (1998). *Qualitative research and case study applications in education.* San Francisco, CA: Jossey-Bass.

Merriam-Webster, I. (2002). *Webster's third new international dictionary of the English language, unabridged.* Springfiled, MA: Merriam-Webster.

Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook.* Thousand Oaks, CA: Sage Publications.

Montuori, A. (2005). Literature review. *Journal of Transformative Education, 3*(4), 374-393. doi:10.1177/1541344605279381

Moore, G. A. (2002). *Crossing the chasm: Marketing and selling disruptive products to mainstream customers.* New York, NY: Harper Business Essentials.

Morgan, D. (2008). Emergent design. In L. Given (Ed.), *The SAGE encyclopedia of qualitative research methods* (pp. 246-249). Thousand Oaks, CA: Sage Publications.

Myers, D. G. (2008). *Psychology.* New York, NY: Worth Publishers.

Njambi, W. N., & Sprenkle, M. P. (2004). Rethinking masculinized tools: Machetes, women's work, and suburban yard maintenance. *NWSA Journal*, 121-137.

Noble, G., & Lupton, D. (1998). Consuming work: Computers, subjectivity, and appropriation in the university workplace. *The Sociological Review*, 803-826.

Nordstrom, S. N. (2013). Object-interviews: Folding, unfolding, and refolding perceptions of objects. *International Journal of Qualitative Methods, 12*(1), 237-257.

Palloff, R. M., Pratt, K., & Palloff, R. M. (2007). *Building online learning communities: Effective strategies for the virtual classroom.* San Francisco, CA: Jossey-Bass.

Pascale, C. (2011). *Cartographies of knowledge: Exploring qualitative epistemologies.* Thousand Oaks, CA: Sage Publications.

Patton, M. Q. (2002). *Qualitative research and evaluation methods.* Thousand Oaks, CA: Sage Publications.

Pefanis, J. (1991). *Heterology and the postmodern: Bataille, Baudrillard, and Lyotard.* Durham, NC: Duke University Press.

Phillips, J., & Phillips, M. (Composers). (1965). California Dreamin'. On *If You Can Believe Your Eyes and Ears* [Album]. Los Angeles, CA: Dunhill Records.

Piedmont University. (2013, September 20). *Committee on Information Technology.* Retrieved from Committee on Information Technology: http://groups.wfu.edu/CIT/

Plant, S. (1998). *Zeroes + ones: Digital women + the new technoculture.* New York, NY: Doubleday.

Randel, D. M. (Ed.). (2003). *The Harvard dictionary of music.* Cambridge, MA: Belknap Press of Harvard University Press.

Reimer, B. (2003). *A philosophy of music education: Advancing the vision.* Upper Saddle River, NJ: Prentice Hall.

Reinharz, S. (1992). *Feminist methods in social research.* New York, NY: Oxford University Press.

Rickman, A. N. (2012). Girls online: Adolescence, social media, and the gendered body. *Paper presented at the International Congress of Qualitative Inquiry.* Urbana-Champaign, IL.

Rogers, E. M. (1995). *Diffusion of innovations.* New York, NY: Free Press.

Ross, D. B. (2011). *Digital storytelling: Ordinary voices, extraordinary stories.* Retrieved from NC Docks.

Rosser, S. V. (2006). Using the lenses of feminist theories to focus on women and technology. In M. F. Fox, D. G. Johnson, & S. V. Rosser (Eds.), *Women, gender, and technology* (pp. 13-46). Urbana, IL: The University of Illinois.

Rossman, G., & Rallis, S. (2012). *Learning in the field: An introduction to qualitative research.* Thousand Oaks, CA: Sage Publications.

Saldaña, J. (2009). *The coding manual for qualitative researchers.* London, UK: Sage Publications.

Sappleton, N., & Takruri-Rizk, H. (2008). The gender subtext of science, engineering, and technology (SET) organizations: A review and critique. *Women's Studies, 37*(3), 284-316.

Scholz, S. J. (2010). *Feminism: A beginner's guide.* Oxford, UK: Oneworld.

Sconiers, Z., & Rosiek, J. (2000). Historical perspective as an important element of teachers' knowledge: A sonata-form case study of equity issues in a chemistry classroom. *Harvard Educational Review, 70*(3), 370-404.

Searby, L., & Collins, L. (2010). Mentor and mother hen: Just what I needed as a first year professor. *Advancing Women in Leadership, 30*(20), 1-16.

Seidman, I. (2006). *Interviewing as qualitative research: A guide for researchers in education and the social sciences* (3rd ed.). New York, NY: Teachers College Press.

Selwyn, N. (2007). Hi-tech = guy-tech? An exploration of undergraduate students' perceptions of Information and communication technologies. *Sex Roles*, 525-536.

Senft, T. M. (2001). *Reading notes on Donna Haraway's cyborg manifesto.* Retrieved August 1, 2012, from http://www.terrisenft.net/students/readings/manifesto.html

Singing and Song. (2013). Retrieved from The Hutchinson Encyclopedia: http://0-www.credoreference.com.wncln.wncln.org/entry/heliconhe/singing_and_song

Skynyrd, L. (Composer). (1974). Sweet home Alabama. On *Second Helping* [Album]. Doraville, GA: Studio One.

Smith, T. W. (1999). *Toward a prototype of expertise in teaching: A descriptive case study.* Retrieved from WorldCat.

Spavold, J. (1990). Observations of attitudes to IT in database use in schools. *Women in Computing* (pp. 109-118). London, UK: Springer-Verlag.

Spertus, E. (2006). Professor in a circuit-board corset. In A. &. Newitz (Ed.), *She's such a geek!: Women write about science, technology & other nerdy stuff.* Emeryville, CA: Seal Press.

Stake, R. E. (1995). *The art of case study research.* Thousand Oaks, CA: Sage Publications.

Star, S. L. (2000). From hestia to home page: Feminism and the concept of home in cyberspace. In D. Bell, & B. M. Kennedy (Eds.), *The cybercultures reader* (pp. 632-643). New York, NY: Routledge.

Tracy, K. (2007). *Elvis Presley: A biography.* Westport, CT: Greenwood Press.

Turkle, S. (1984). *The second self.* New York, NY: Simon and Schuster.

Turkle, S. (1986). Computational reticence: Why women fear the intimate machine. In *Technology and women's voices* (pp. 41-61). New York, NY: Pergamon Press.

Turkle, S. (1995). *Life on the screen: Identity in the age of the Internet.* New York, NY: Simon & Schuster.

Turkle, S. (2007). *Evocative objects.* Cambridge, MA: Massachusetts Institute of Technology.

Turkle, S. (2011). *Alone together: Why we expect more from technology and less from each other.* New York, NY: Basic Books.

Van Maanen, J. (1988). *Tales from the field: On writing ethnography.* Chicago, IL: The University of Chicago Press.

Variations. (2013). *The Hutchinson unabridged encyclopedia with atlas and weather guide.*

    Retrieved from http://0-

    www.credoreference.com.wncln.wncln.org/entry/heliconhe/variations

Wajcman, J. (2000). Reflections on gender and technology studies: In what state is the art?

    Social Studies of Science, 30(3), 447-464.

Wajcman, J. (2004). *TechnoFeminism.* Cambridge, UK: Polity Press.

Wajcman, J. (2006). Feminization of work in the information age. In M. F. Fox, D. G.

    Johnson, & S. V. Rosser (Eds.), *Women, gender, and technology* (pp. 80-95). Urbana,

    IL: University of Illinois Press.

Wajcman, J. (2010). Feminist theories of technology. *Cambridge Journal of Economics,*

    34(1), 143-152. doi:doi:10.1093/cje/ben057

Watson, V. (2001). *The Cambridge guide to children's books in English.* Cambridge, UK:

    Cambridge University Press.

Webster, J. (2012, October 27). *Sonata form.* Retrieved from Oxford Music Online:

    http://www.oxfordmusiconline.com/subscriber/article/grove/music/26197

Weedon, C. (1997). *Feminist practice and poststructuralist theory* (2nd ed.). New York, NY:

    Routledge.

Whittemore, R., Chase, S. K., & Mandle, C. L. (2001). Validity in qualitative research.

    Qualitative Health Research, 11(1), 522-537.

Winner, L. (1986). Do artifacts have politics? In L. Winner, *The whale and the reactor: a*

    search for limits in an age of high technology (pp. 19-39). Chicago, IL: University of

    Chicago Press.

Wolf, D. L. (1996). *Feminist dilemmas in fieldwork.* Boulder, CO: Westview Press.

Yarborough, R. H. (2012). *Finding our voices: The bittersweet journey of a dream first-generation female doctoral graduates.* Retrieved from NC Docks.

Yin, R. K. (2009). *Case study research: Design and methods.* Thousand Oaks, CA: Sage Publications.

Zusman, M. E., Knox, D., & Gardner, T. (2009). *The social context view of sociology.* Durham, NC: Carolina Academic Press.

Appendix A. Key Terms

Agency. Postmodern feminists, influenced by theories of Foucault and Derrida, define
agency as something that is "discursively produced in social interactions between
culturally produced, contradictory subjects" (Weedon, 1997, p. 176).

Cyborg. Haraway's (1991) cyborg is a powerful metaphor that represents the boundary
between organisms and machines. Within this lived reality of new technology,
Haraway called attention to struggle between wholesale adoption and rejection of
technoculture (Senft, 2001). She pointed out the importance of understanding both
perspectives at once. She wrote, "[E]ach reveals both dominations and possibilities
unimaginable from the other vantage point" (Haraway, 1991, p. 122). The cyborg is a
potent myth for "resistance and recoupling," (Haraway, 1991, p. 122) especially for
women in technology-heavy societies.

Gender. In this study, like Kimmel (2011), I conceive of gender as cultural or social construct
rather than a biological determination.

Integrated circuit. An integrated circuit is "a tiny complex of electronic components and their
connections that is produced in or on a small slice of material" (Webster's online
dictionary). Integrated circuits or microchips are used in computers, mobile phones,
and other devices. Today's integrated circuits function as amplifiers, timers,
counters, memory, and microprocessors. Haraway (1991) argued that like the
integrated circuit, women have multiple functionality. She suggested that the
integrated circuit works as a network that "suggests the profusion of spaces and
identities and the permeability of boundaries in the personal body and in the body
politic" (p. 136). She employed the integrated circuit metaphor to critique
private/public distinctions (home, market, paid work, state, school, hospital, and
church).

Nomad. The nomad is Braidotti's (2006) expression of a figuration of a situated, culturally
differentiated understanding of the subject. She wrote, "Differentiations like class,
race, ethnicity, gender, age, and others interact with each other in the constitution of
subjectivity. The notion of nomadism refers to the simultaneous occurrence of many
of these at once. Nomadic subjectivity is about the simultaneity of complex and
multi-layered identities" (p. 10).

Positionality. "Positionality refers to the race, class, and gendered identities that people
occupy in society and the ways in which the culture situates those identities, as well
as the power that they are able to accrue as a result of those positionalities" (Francis,
2007, p. 244). All people are raced, classed, and gendered; these identities are
relational, complex, and fluid.

155

Postmodernism. According to (Francis, 2007), postmodernism is best understood as an "umbrella term incorporating those theorists who critique modernism and the enlightenment philosophical positions and assumptions" (p. 78). Postmodern theorists critique reason, scientific truths, and the view of self as a rational, agentic subject. Scholz (2010) wrote, "Postmodernism rejects 'grand narratives,' or more or less comprehensive explanatory theories. So, in discussion of postmodern feminism, we should not think of it as a theory but rather a collection of ideas" (p. 31).

Poststructuralism. Poststructuralism, as a theory, emerged in response to the structuralist movement's literary criticism and its analysis of signs. Leading poststructural theorists include Jacques Derrida and Michel Foucault. Key concepts include viewing text and language as discourses as well as concepts of power and resistance (Weedon, 1997). Other basic principles include the plurality of language and the impossibility of fixing meaning (Weedon, 1997).

Subjectivity. According to Weedon (1997), subjectivity is "the conscious and unconscious thoughts and emotions of the individual, her sense of herself and her ways of understanding her relation to the world" (p. 32). In this sense, identity is not fixed but "precarious, contradictory and in process" (Weedon, 1997, p. 32).

Technology. Technology is defined as artifacts and hardware as well as the cultures and practices associated with them (Wajcman, 2010).

Appendix B. Demographic Survey

        The purpose of this survey is to gather information to ensure diversity among the participants in the study. The survey results will be downloaded, printed, and kept in a locked filing cabinet in the researcher's office. Please complete the following questions.

1. Name:

2. Age:

3. Race/Ethnicity:

4. Current position/title:

5. Number of years in academia:

6. Select your college/school.
    a. Undergraduate College
    b. Graduate School of Arts and Sciences
    c. School of Business
    d. School of Divinity
    e. School of Law
    f. School of Medicine

7. Select the statement that best describes your attitude toward technology adoption.
    a. I am first of my peers to use a new technology.
    b. I adopt a new technology before most of my peers.
    c. I adopt a new technology at the same time as the majority of my peers.
    d. I am among the last of my peers to adopt a new technology.

Appendix C. Lay Summary

I invite you to participate in a research study about the connection between computer use and identity (subjectivity). I am conducting this research as a requirement for my doctorate in Educational Leadership at Appalachian State University. This university was selected as a site for this study because of the size of its faculty as well as its proximity to my home. My research requires a university with a sufficient number of full-time faculty to allow me to recruit enough research participants who meet my criteria: tenure track, faculty representing each of the four phases of technology adoption (e.g., innovator, early adopter, majority, and laggard).

I am inviting you to participate because you are a woman professor who meets these criteria. I believe that your ideas about your connection to technology will help me better understand how women faculty describe their relationship with technology. The benefits to you in participating in this study are that it may help you better understand the impact technology is having on you personally, professionally, and culturally. Additionally, you might enjoy having the opportunity to share your story and participating in a qualitative research study. Your participation in this study may one day help me and others better understand the complex role of technology in everyday life. There is a slight risk associated with this study in that, as a participant, you may feel self-conscious about how you use technology.

Your participation in this study will be confidential. During the study, I will use a pseudonym, which you can choose. I would like your permission to record our interviews with a digital recorder and take notes on my laptop. The digital audio files and notes will be kept on my computer, which is password protected.

The purpose of this study is to better understand the contextual, shifting use of technology by women faculty. During this study, I will interview you three times over a two-month period. The interviews will be conducted at your office or another location of your choice. Each interview will last one hour and a half and will be scheduled at your convenience. As part of this study, I would like to observe you teaching a class. I will also ask you to keep a technology journal during the semester. Collecting multiple sources of data will enable me to better understand and convey your story.

You have the freedom to decide whether or not to participate in this study. You may withdraw from the study at any time. If you decide to stop participating in this study, it will have no impact on your relationship with me or Appalachian State University.

Appendix D. Participant Consent Form

I agree to participate as an interviewee in this research project on computer technology and self concept. This study to be conducted by Lisa McNeal, a doctoral student in the Educational Leadership at Appalachian State University, is scheduled for Spring 2013. I understand that my comments will be recorded, transcribed, and used for a dissertation with the possibility of future publication. The interviews are planned to take place two different times for one hour and a half each over the course of eight weeks. I understand that there is a slight risk that being a participant may make me feel self-conscious about how I use technology. I also know that this study may give me greater insight into my experiences with technology. Additionally, I will keep a technology journal during this period, to which Lisa McNeal will have access. I will also allow Lisa McNeal to observe me for three hours.

I give Lisa McNeal ownership of the audio files and transcripts from the interview(s) she conducts with me and understand that these audio files and transcripts will be kept in a secure location. I understand that quotations from the audio files and/or transcripts may be published with identifying details altered to protect my privacy. It is possible that this study may lead Lisa McNeal to conduct future studies in which she will refer back to the findings from this project. I understand that I will receive no compensation for participating in interviews or keeping a technology journal. I realize that participating in this study is voluntary and I can end it at any time without consequence. I also understand that if I have questions about this research project, I can contact Lisa McNeal at (828) 262-6735 or mcnealla@appstate.edu or get in touch with Appalachian State University's Office of Research Protections at (828) 262-7981 or irb@appstate.edu.

_____   _____
Name of Interviewer (printed)   Name of Interviewee (printed)

_____   _____
Signature of Interviewer   Signature of Interviewee

_____Date(s) of Interview(s)

Appendix E. Interview Questions

1. Tell me about the different ways you use computer technology.

2. How do you describe your computer?

3. What tensions do you experience when using technology?

4. How do you describe the role of technology in your life?

5. What emotions do you associate with technology?

6. What are some of the most difficult experiences you have with technology?

7. What are some of the most rewarding experiences you have with technology?

8. How do you describe your relationship with technology?

9. What does technology do for you?

10. What does technology do to you?

11. What have you learned about yourself as a result of using technology?

12. In what ways is technology use connected to your identity?

13. In what ways does your technology use change throughout the day?

14. How does your technology use fluctuate as you interact with other people?

15. How does technology blur the lines between your personal and professional life?

16. Is there anything I should have asked but did not?

Appendix F. Object Interview Questions

1. How is this technological object part of your daily life?

2. Why did you select it?

3. Where does it take you?

4. What do you feel?

5. What are you better able to understand about yourself by using it?

6. If your object could talk, what it would it say about you?

7. In what ways is this object part of who you are?
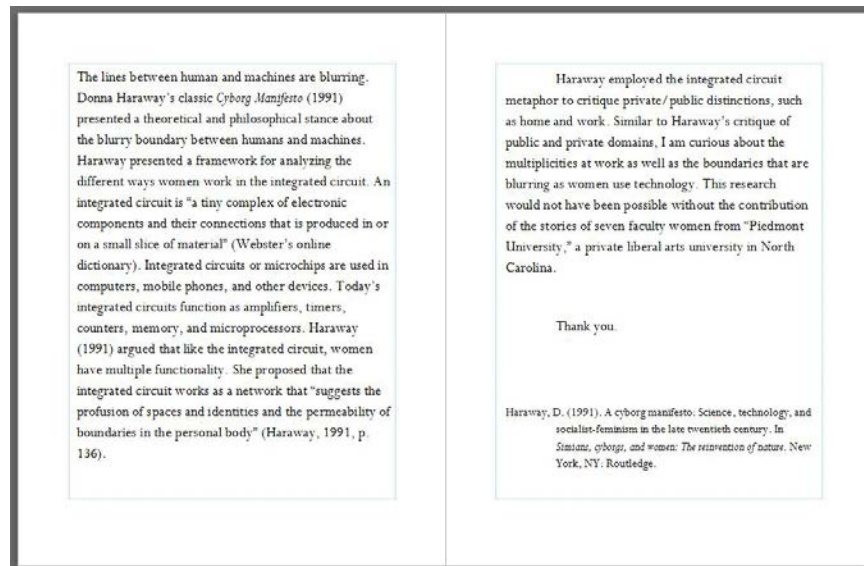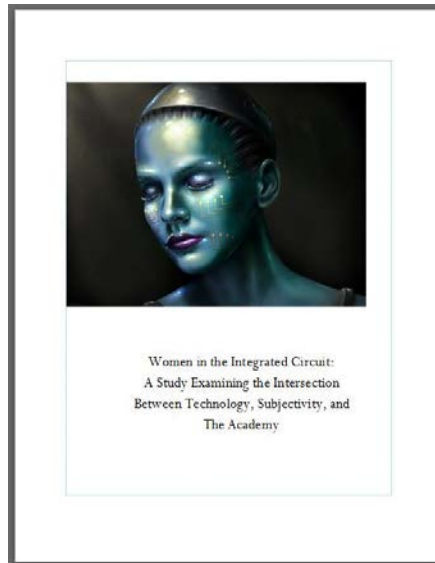
Appendix G. Journal Prompts

1. How does technology frustrate you?

2. How does technology help you?

3. How does technology blur the boundaries between home and work?

Appendix H. Thank-you Gift

Appendix I. Thank-you Card

Women in the Integrated Circuit:
A Study Examining the Intersection
Between Technology, Subjectivity, and
The Academy

The lines between human and machines are blurring. Donna Haraway's classic *Cyborg Manifesto* (1991) presented a theoretical and philosophical stance about the blurry boundary between humans and machines. Haraway presented a framework for analyzing the different ways women work in the integrated circuit. An integrated circuit is "a tiny complex of electronic components and their connections that is produced in or on a small slice of material" (Webster's online dictionary). Integrated circuits or microchips are used in computers, mobile phones, and other devices. Today's integrated circuits function as amplifiers, timers, counters, memory, and microprocessors. Haraway (1991) argued that like the integrated circuit, women have multiple functionality. She proposed that the integrated circuit works as a network that "suggests the profusion of spaces and identities and the permeability of boundaries in the personal body" (Haraway, 1991, p. 136).

Haraway employed the integrated circuit metaphor to critique private/public distinctions, such as home and work. Similar to Haraway's critique of public and private domains, I am curious about the multiplicities at work as well as the boundaries that are blurring as women use technology. This research would not have been possible without the contribution of the stories of seven faculty women from "Piedmont University," a private liberal arts university in North Carolina.

Thank you.

Haraway, D. (1991). A cyborg manifesto: Science, technology, and socialist-feminism in the late twentieth century. In *Simians, cyborgs, and women: The reinvention of nature*. New York, NY: Routledge.

Made especially for you by:

Lisa McNeal

164

Vita

Lisa Ann McNeal was born in Atlanta, Georgia, on September 6, 1971. She graduated from Wheeler High School in Marietta, Georgia, in June 1989. Ms. McNeal was awarded the Presidential Scholarship to Samford University in Birmingham, Alabama. She graduated magna cum laude with a Bachelor of Arts degree in Journalism in 1993. Ms. McNeal worked in publishing and public relations from 1993 to 1999. In the spring of 1999, she accepted an entry-level position in Technology Services at Samford University. While working at Samford University, she began study toward a Master of Science degree through an online program at Florida State University. She was awarded the M.S. from Florida State University in August 2007. In July 2008, Ms. McNeal left her position as the Director of the Learning Applications Group at Samford University to work as an Instructional Developer at Appalachian State University. She began the Ed.D. in Educational Leadership in June 2009. In December 2012, she received a graduate certificate in Women's Studies from Appalachian State University. She completed the Ed.D. from Appalachian State University in December 2013. As a doctoral candidate, she was awarded a research grant from the Curtis D. Williams Graduate School that partially funded her travel and transcription expenses. Preliminary findings from her dissertation research were presented at the International Congress of Qualitative Research in May 2013. Ms. McNeal is a member of First Presbyterian Church and an occasional athlete and musician. She resides in Boone, North Carolina, but longs to return to "Sweet Home Alabama" (Skynyrd, 1974, track 1).