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A Case Study of Four Female Electrician Technicians in a Male-Dominated Occupation

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A Case Study of Four Female Electrician Technicians
in a Male-Dominated Occupation

by

Maniphone S. Dickerson

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
in Curriculum and Instruction
Leadership Education, Adult, Career, and Higher Education Department
College of Education
University of South Florida

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Keywords: Feminist standpoint, apprenticeship, mentors, self-directedness, adult learners, gender stereotypes, workforce training.

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Dedication

This work is dedicated to my parents, Onsy and Khomphong, and to the O'Leary family. My parents made an incredible sacrifice to leave Laos, after the Vietnam War, to ensure a better life for their five children. I am the product of their hard work and sacrifice. I love you mom and dad.

My parents’ courage to leave a war torn country, brought us to a refugee camp in Thailand. My family was able to leave the refugee camp because Daniel and Carolyn O’Leary saw a need to help others and decided to sponsor refugee families impacted by the aftermath of the Vietnam War. The O'Leary family’s belief in humanity gave my family an opportunity to become United States citizens and achieve opportunities in America. Daniel and Carolyn O’Leary will always be remembered for their love and support of the Laotian community.
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Abstract

The purpose of this study was to understand the reasons the four female participants decided to pursue electrician technician training, their perspectives of the apprenticeship program, their perceptions of successful employment in a male-dominated occupation, and differences in treatment based on their gender. The exploratory questions that guided the study were: what led the females to make the decision for applying to the electrician technician apprenticeship; what was the nature of the education and training experiences of the participants in the electrician technician apprenticeship program, what were the participants’ perceptions of being successful in advancement within the workforce as a female electrician technician; and what gender differences did the participants experience as female electrician technicians? The theoretical framework for this study is based on feminist standpoint theory (Harding, 1991, 1993, 1987; Hartsock, 1997, 1998a 1998b; Smith 1987, 1997).

Data collection methods consisted of a demographics questionnaire, semi-structured interviews, participant journals, researcher’s reflexive journal notes, and electrician apprenticeship program data. The cross-case analysis generated five major themes: family support, independence, mentors, self-directedness, and gender stereotypes. These five themes included discussions of the micro, meso, and macro levels in a male-dominated occupation. Implications for practitioners and policy makers are described. This study contributes empirical research on feminist standpoint theory and females in male-dominated occupations. It also adds to the body of literature on
female electrician technicians’ decision processes, which are rarely studied, and success in a male-dominated occupation.
Chapter 1
Introduction

In 2012, the U.S. Department of Labor Women’s Bureau reported over half (58%) of the total workforce were females as participating in the workforce has increased in several industry sectors (Catalyst, 2013; Institute for Women’s Policy Research, 2011; U.S. Department of Labor Women’s Bureau, 2012b). However, this increase of females in the workforce is not reflected in high-demand industry trade occupations. Industry trade occupations require industry certification through apprenticeship training that combines classroom instruction with on-the-job skills development. The construction industry is a sector that includes high-demand trade occupations as part of its labor force. One of these high-demand construction industry trade occupations is electrician technician. In the construction industry, electrician technicians are predominately male, with a very low number of female electrician technicians (Graves, Chaudhry, Khouri, Frohlich, Lane, Rao, & Hogan, 2014; Helmer & Alstatdt, 2013).

The electrician career path consists of two types of electrician occupations. The professional types of electricians was electrical engineers who obtained a post-secondary degree. The other types was electrician technicians who received industry certification from an approved industry apprenticeship program. In 2010, the number of females employed as electrical technicians was 6%, electronics engineers was 3%, and electrical power-line technicians was 2% (U.S. Department of Labor Women’s Bureau, 2013). In 2013, the Department of Labor, Women’s Bureau reported there was a total of
9% of females employed in the construction industry, out of which 1.8% were electrician technicians. The low number of female electrician technicians in 2013 was due to only 0.5% of females who received industry certification (U.S. Bureau Department of Labor, Employment and Training Administration, 2013).

**Statement of Problem**

Despite those numbers, there has been scant research from the perspective of female electrician technicians related to their decision to pursue an electrician technician apprenticeship, their education and training in electrician technician apprenticeship, and their pathway to gain employment as an electrician technician in a male-dominated occupation. Thus this study may contribute to the understanding of what influenced females to be successful in a male-dominated occupation, and the implications for adult education, workforce development, and gender studies.

The number of females in male-dominated trade occupations has slightly increased over time. However, lack of access to male-dominated occupations has limited females to employment in low-wage and familial role occupations (Catalyst, 2013; Institute for Women’s Research Policy, 2013). The construction industry sector has employed females in different occupations over the past years. According to the U.S. Department of Labor, Women's Bureau (2013), at the professional level in the construction industry sector, 9% of managers were females, and so were 10% of executive officers, and 5% of corporate boards (Catalyst, 2013). At the technician level in the construction industry, less than 6% were females (U.S. Department of Labor, Women’s Bureau, 2013). Catalyst (2013), the Institute for Women’s Policy Research (2013), and the U.S. Department of Labor, Women’s Bureau (2013) reported in 2012 the
percentage of females who were electrician technicians was 6%, but only less than 1% of the female electrician technicians were able to obtain continuous employment as an electrician technician.

The electrician technician industry certification has utilized apprenticeship as an education and training process. Therefore, the skills and knowledge required by an electrician technician industry certification are acquired through a five-year commitment as a trade apprentice, in which apprenticeship programs combined on-the-job learning and classroom instruction to meet industry trade certification. The set of electrician technician skills and knowledge has consisted of electrical science (e.g., circuits, electrical currents), mathematical equations (e.g., dimensional measurements for wire or pipefitting), and technology (e.g., computer monitors of electrical energy, smart system wiring). The number of females applying to be an electrician technician has increased, but not enough to sustain the pipeline for more females in the construction trade occupations (Catalyst, 2013; Institute for Women’s Policy Research, 2013; U.S. Department of Labor, Women’s Bureau, 2013).

An explanation for the low number of females in the electrician technician occupation seems to be the lack of social acceptance of females in non-traditional occupations, hazardous work environment, and the lack of support at the worksites (Bowell, 2011; Denissen, 2010a, 2010b; Helmer & Alstatdt, 2013; Moccio, 2009). The lack of social acceptance of females in male-dominated trade occupations has also deterred construction businesses from hiring female electrician technicians (Bowell, 2011; Denissen, 2010a, 2010b; Moccio, 2009). The social belief that females and males are linked to certain occupations is structure as well as gender specific (Ali, 2007; Bowell,
In the history of the United States, the social view of females in a nurturing role is related to a patriarchal, capitalistic, and hierarchical social system (Einspahr, 2010; Lahiri-Dutt, 2012; Lent, Brown, & Hackett, 2000). According to Eisenberg (1998, 2011) and Moccio (2009), the slow progress of female electricians in the construction industry was further delayed by the fraternal-brotherhood culture that existed in trade occupations, which perpetuated the masculine culture in electrician technician occupations (Bennett, 2005; Brower, 2006; Bresser, 2006; Denissen, 2006, 2010a, 2010b; Moore & Gloeckner, 2007; Whittock, 2002). Even though those studies analyzed the lack of females in non-traditional trade occupations, there is still a gap in the research from the females’ standpoint regarding their reasons to enter electrician apprenticeship training, complete apprenticeship training, and achieve occupational advancement as part of the electrician technician workforce.

Purpose of the Study and Research Questions

The purpose of this study was to understand the reasons the four female participants decided to pursue electrician technician training, their perspectives of the apprenticeship program, their perceptions of successful employment in a male-dominated occupation, and differences in treatment based on their gender. The inquiry about their decision-making process included the reasons leading to enrollment to the electrician technician apprenticeship. It was relevant to look into the apprenticeship process since it is the process of education and training needed to achieve industry certification. Additionally, successful participation in the electrician technician workforce refers to the
active employment and advancement for the females who pursue the electrician technician occupation.

Accordingly, the following research questions were used to guide this study:

1. What led the females to make the decision to pursue the electrician technician apprenticeship?
2. What was the nature of the education and training experiences of the participants in the electrician technician apprenticeship program?
3. What were the participants' perceptions on successful advancement within the workforce as a female electrician technician?
4. What gender differences did the participants experience as female electrician technicians?

Conceptual Framework

The conceptual framework outlines the intersection of gender with occupational identity. These two socially constructed identities overlap in work and learning experiences in a male-dominated occupation (Billett, 2006a, 2006b; Billett & Somerville, 2004). The primary theory that grounds this conceptual framework is feminist standpoint theory. This conceptual framework assisted with understanding the participants’ experiences as a female electrician technician in a male-dominated occupation.

Theory. Feminist standpoint theory is the theoretical framework used to understand the elements of gender issues in a male-dominated occupation. This theory allows researchers to situate the female viewpoint at the center of the study without the intrusion of a male perspective in the research (Andersen & Witham, 2011; Collins, 1997; Davis, Evans, & Lorber, 2006; Dubeck & Borman, 1996; Harding, 1991, 2004;
Ramazanoglu & Holland, 2002). Therefore, a direct female perspective allows examination of power relationships and interactions of females in a male-dominated occupation.

**Feminist standpoint theory.** Bowell (2009) summarizes feminist standpoint theory as “achieved collective and consciousness” (p. 3), related to female’s struggles within a social order maintained by a dominant group. Harding (1991), a feminist standpoint theorist, indicated that the experiences of females in their struggles with the social order of a male-dominated culture “begin to see beneath the appearances created by an unjust social order to the reality of how this social order is in fact constructed and maintained” (p. 127). The perspectives of men are noted as a secondary level of understanding of the experiences of women and not at the core of the female’s experience. Research that focuses on female’s experiences gets to the epicenter of the subjection and oppression of being a woman in a male-dominated occupation. Feminist standpoint theory is relevant for this study, because it directly brings forward the female’s experiences with a clear set of their struggles and challenges in a male-dominated occupation.

The primary tenets of feminist standpoint theory are: (a) real-life situations (based on the Marxism position of two class groups) set limits on the full understanding of the reality of social interactions among groups; (b) when real life is structured in fundamentally opposing ways for two different groups and in systems of domination, the visions of reality available are male perspectives where partial and inverse truth exist; (c) the vision of the ruling class (or gender) structures the power relations in which all parties are forced to participate and, therefore, the oppressed group’s experiences cannot be
dismissed as simply false; (d) the version of reality available to the oppressed group must be struggled for, as it brings to the surface the social relations and education growing from those struggles in order to change the oppressed relations; and (e) the understanding of the oppressed and the adoption of a social location expose the real power relations among the groups, which points to reality (Bowell, 2011; Collins, 1997; Hartsock 1983, 1989; Ramazanoglu & Holland, 2002; Smith, 1997; Wood, 2009; Wylie, 2003).

In this study, the five characteristics of feminist standpoint theory were used as an interpretive tool to analyze the data. The intersection of gender and work identity provides an understanding of the social structure in work activities that construct individual interaction and perspectives about identity (Billett, 2006a, 2006b; Billett & Somerville, 2004; Somerville, 2005). According to Kirk and Okazawa-Ray (2010), micro, meso, and macro levels are needed to look at social interactions where intersections of gender identity and occupation identity converge. These levels provided an analysis of the emerged themes from the female electrician technicians’ social interactions with males and their knowledge of their occupational identity. The micro, meso, and macro structure was used for the second-level analysis of feminist standpoint theory.

Feminist standpoint theory assesses the different levels of marginalization of females to understand the oppression that may or may not be occurring in male-dominated occupations. It examines the different marginalization levels and the research data collection and analysis to include only the voices of females (Brooks & Hess-Biber, 2007; Collins, 1997; Crotty, 1998; Harding, 1986). At the micro, meso, and macro levels, there is a marginalization of females based on whether they are perceived to be capable
to be electrician technicians. Such marginalization makes it difficult to identify females as electrician technicians at the individual level (micro), the local group level (meso), and the larger institutional general social interactions level (macro) (Brush, Bruin, & Welter, 2009; Winker & Degele, 2011). In a male-dominated work culture, these social interactions indicate inequities and marginalization of the females in the workplace (Cunningham, Bergman, & Miner, 2014).

The issue of female identity versus male identity in the workplace underscores the unequal power noted in feminist standpoint theory. The power of the male dominant group subjugation constrained the four female electrician technicians to accept and conform to the dominated work culture. According to Denissen’s (2010b) research, females in male-dominate occupations encounter gender power conflicts, which may result in the acceptance of masculine traits.

Feminist standpoint theory is not without flaws or criticisms. One criticism is the diversity of approaches to structuring research. There is no one standard research criteria to translate into feminist standpoint research. The diversity of approaches to feminist standpoint theory does not structure one epistemological position over another, thus making the research less general to all females and more specific to the experiences of the female participants (Bowell, 2011; Haack 1996; Herkman, 1997; Ramazanoglu & Holland, 2002; Stoetzler & Yuval-Davis, 2002).

The feminist standpoint theory has been successfully used to examine the socio-political power of females and how a male-dominated work culture asserts power over female electrician technicians (Beddoes & Borrego, 2011; Powell, Bagilhole, & Dainty, 2009). Figure 1 below shows how the conceptual framework model situates the feminist
standpoint theory at the base of the framework. The first circle illustrates the participant’s motivation and reason for application to an electrician technician apprenticeship directly from a female’s point of view. The second circle illustrates the nature of education and training the female participants experienced throughout their five-year apprenticeship program. The third circle illustrates their success in advancement in the electrician technician occupation as females in a male-dominated occupation. These three circles overlapped as the participants discussed their individual experiences, interaction with others, overall perspective, and the apprenticeship program in a male-dominated occupation. The feminist standpoint theory was the base of these research processes in the data collection and data analysis.

The research literature on feminist standpoint theory is directed at examining the female experiences as the center of the study and allows the true nature of this reality to surface (Andersen & Witham, 2011; Collins, 1997; Davis at el., 2006; Dubeck & Borman, 1996; Harding, 1991, 2004; Ramazanoglu & Holland, 2002; Smith, 1997). In addition, feminist standpoint theory views the epistemology of the participants as their own individual and unique reality throughout the research, but does not generalize their experiences to every female (Bowell, 2011; Collins, 1997; Harding 1986, 1997; Ramazanoglu & Holland, 2002; Smith, 1997; Wylie, 2003). Feminist standpoint theory takes the epistemology of female experiences to be true, since they have direct and first-hand experience of their reality as part of a patriarchal society that maintains a sociopolitical power structure for the benefit of the dominant group (Bowell, 2011; Haack 1996; Herkman, 1997; Ramazanoglu & Holland, 2002). The theoretical framework, feminist standpoint theory, provided a lens to understanding the female electrician
Figure 1. Conceptual framework model. This model illustrates feminist standpoint theory as the base for this research. In the box where the individual, interactions with others, overall perspective, and apprenticeship program in a male-dominated occupation overlap with the three interlocked circles represent the purpose of the research, to understand female electrician technician’s experiences in the application process, education and training, and advancement in the workforce.
technicians’ experiences as they applied for training, were trained, and were employed

**Apprenticeship**

The apprenticeship model, which combines classroom learning with direct work experience through immediate employment, is still used by construction industry occupations as part of the industry certification requirements for carpenters, electricians, masons, plumbers, heating/ventilation/air conditioning (HVAC) technicians, elevator installers, and steelworkers (U.S. Department of Labor, Employment and Training, 2013). Each state is required to register approved apprenticeship training programs, which are part of the United States Department of Labor.

Apprenticeship pairs a novice learner or inexperienced worker with an experienced individual for a committed duration of time to gain knowledge and skills for gainful employment (Hamilton, 1990; Kursh, 1958; Smits & Stromback, 2001; U.S. Department of Employment and Training Administration, 2014). The apprentice agrees to stay in the program for up to five years to meet the industry requirement for classroom and worksite hours to obtain industry certification.

For example, industry certification is a requirement for electrician technicians. Electrician technicians complete apprenticeship training to achieve journey-level status, for which they must finish over 1800 hours of worksite experiences, attend classroom instructions, pass industry exams, and complete year-end comprehensive demonstration projects (Florida Department of Education, Career and Adult Education, 2013). The number of electrician technician apprentices selected each year is dependent on the number of employer contracts for electrical apprentices. The selection process for these apprentices includes an application, a math aptitude test, interviews, and a criminal
background check. Then, the selected electrician technician apprentices have a five-year paid contract and agree to take required classes and work at assigned worksites. After completion of the five-year apprenticeship and passing the industry certification requirements, the electrician technicians become journey-level and obtain direct employment at the company (U.S. of Labor, Employment and Training, 2014; Florida Department of Education, Career and Adult Education, 2013). Thus, apprenticeship training provides a pathway for electrician technicians to actively participate in the workforce.

**Significance of the Study**

In the 21st Century, females are still facing challenges to enter, access, and be accepted into occupations that are male-dominated (Catalyst, 2013). Because male-dominated occupations often they are in high demand and have higher wages (U.S. Department of Labor, Women’s Bureau, 2012a). The existence of occupations that are gender specific may contribute to the wage gap between men and women (Farrell & Glynn, 2013; Institute for Women’s Policy Research, 2011, 2013). Beyond the wage gap, there are also barriers associated with being female in a male-dominated work culture, such as unfair treatment due to their gender difference (Ericksen & Polladino-Schultheiss, 2009; Fogel & Campbell, 2011).

The barriers and challenges females experience in male-dominated occupations are not confined to just the occupation itself, but also to advancement in the occupation. The advancement of females in male-dominated occupations is connected to the type of work assignments they are given and the social network (or lack thereof) to help open opportunities for advancement (Denissen, 2010a, 2010b; Powell et al., 2009; Watts,
2007, 2009). According to Moccio (2009), male machismo behavior may hinder female advancement in the workforce. Such behavior emerges when worksite projects are viewed as too tough for females to handle. In contrast, social networking opportunities for female electrician technicians help build upon their prospects for advancement. In building a social network, females in male-dominated occupations may seek out role models to assist with getting the opportunities to demonstrate their skills and knowledge (Ericksen & Palladion-Schultheiss, 2009; Watts 2007, 2009).

Denissen (2010a) and Mocco (2009) indicated that social networking for females in male-dominated occupations may also be a challenge due to the isolation females may feel, which may result in their slow acceptance of advancement opportunities by engaging in social networking events and their fear of the perceptions of their male colleagues. Such fear may develop into overachiever behavior where females feel the need to over- or out-perform the males to break perceptions of being the weaker gender (Denissen, 2009; Fogel & Campbell, 2011; McBride, 2011; Moccio, 2009).

As the global labor market continues to push for gender diversification in the workforce, the need to understand the dynamics and experiences of females in male-dominated occupations becomes vital to the sustainability of the U.S. economy. The importance of understanding the experiences of female electrician technicians may shed some light to help understand the types of experiences that contribute to success in the application process, completion of apprenticeship training, and advancement in the occupation. Understanding the types of influences that females electrician technicians experienced to enter a male-dominated occupation may also provide different approaches to increase the number of females in male-dominated occupations. In
Summary, this research aims to focus on the experiences of female electrician technicians who are successful in a male-dominated occupation.

**Operational Definitions of Terms**

The following terms are operational definitions for this study.

*Apprenticeship Registered Programs*—Programs that are approved by the state and which must meet state guidelines for industry certifications.

*Electrician Technician*—Journey-level individuals with skills and knowledge to plan, test, and layout installation of electrical wires, circuit breakers, transformers, equipment, or fixtures and other electrical components, which are based on job specifications and local codes (ONET, 2013).

*Feminist standpoint theory*—Epistemology of marginalized groups are socially situated where their awareness of their oppression and subjugation of power by the dominate group (Bowell, 2011; Harding, 1986, 2004; Haraway, 1988; Smith, 1987).

*Journey-level*—A person who has completed sufficient skills and knowledge of a trade or occupation through either formal apprenticeship training or through practical on-the-job work experience and recognized by a state or federal registration agency (U.S. Department of Employment and Training Administration, 2012).

*Male-dominated occupations*—Jobs that consist of less than 25% of females working in that career or industry (U.S. Department of Labor, Women’s Bureau, 2013).

*Occupation*—A classification based on work performed and skills, education, and/or training required to perform the work at a competent level (Cosco & Emmel, 2010).
Organization of Study

Chapter 1 introduces the study, the statement of the problem, the purpose of the study and the research questions, the conceptual framework, apprenticeship, the significance of the study, and operational definitions of terms. Chapter 2 of this study includes a review of literature on feminist standpoint theory, females in male-dominated occupations, history of apprenticeships, policy initiatives, and a summary. In Chapter 3, the procedures of the study related to the research design, purposeful sampling and participant selection, data collection development, data collection process, data analysis, and a summary are presented. In Chapter 4, the findings are discussed. This chapter includes a profile of the participants, individual profiles, the four participant cases, themes, participant follow-up interviews, researcher’s reflexivity, and summary. Chapter 5 is the discussion of the findings and the themes connected to feminist standpoint theory. In addition, the micro, meso, and macro levels, apprenticeship, feminist standpoint theory, reflexivity, and summary. To conclude, Chapter 6 provides a summary of the study, conclusions, implications for practice and policy, and recommendations for further research.
Chapter 2

Review of Literature

The purpose of this study was to understand the reasons the four female participants decided to pursue electrician technician training, their perspectives of the apprenticeship program, their perceptions of successful employment in a male-dominated occupation, and differences in treatment based on their gender. This chapter starts with a discussion of feminist standpoint theory. Next, literature on females in male-dominated occupations is explained. The subsequent section highlights the history of apprenticeship. Then policy issues are discussed. The final section is the summary.

Feminist Theory

Feminist theory is a critical inquiry into the inequitable treatment of women. The core premises of feminist theory are: recognition of females’ oppression, examination of the factors that contribute to the sustainability of females’ oppression, solutions to eliminating the social injustice of females’ oppression, and goals of reaching equality for females (Andersen & Whitman, 2011; Ramazonglu & Holland, 2002; Wright, Gornick & Meyers, 2009). These central themes of feminist theory expand feminist research to stress females’ experiences, understand gender relationships, and reveal the effects of females’ oppression on other social institutions and the family unit (Andersen & Whitman, 2011; Ramazonglu & Holland, 2002).

**Feminist standpoint theory.** The theory of feminist standpoint positions females at the center of the research. The scholars who have generated a following in feminist

A research that highlighted females’ knowledge, power, and experience of their reality of oppression was Female’s Way of Knowing: The Development of Self, Voice, and Mind. Belenky, Clincy, Goldberger, and Tarule (1986) interviewed 135 rural and urban females (90 from educational institutions and 40 from social service agencies) to understand their cognitive processes. The females were from different ethnic backgrounds, socio-economic backgrounds, family structures, marital statuses, and employment experiences. However, the commonality of these females allowed the researchers to establish an epistemology of how females processed and developed knowledge through feminist research (Lather, 1992). The cognitive development process for females was dependent on their perception of self (Belenky, et al., 1986; Love & Guthrie, 1999).

The development of female identity plays a role in the interrelationship with others, female voices in their social situations, and their knowledge of self. Bekenky et al.
(1986) found female experiences showed a sense of self or identity acknowledgement, awareness of voice, and development of knowledge or mind. From the development of their self, voice, and mind, Belenky et al. constructed females’ five common epistemological characteristics: silence, received knowledge, subjective knowledge, procedural knowledge, and constructed knowledge. In developing their research with feminist standpoint, females were their only data source. One of the authors, Tarule (Belenky et al., 1986), did note the results of the study were gender related and could be viewed as gender specific.

A recent study conducted by Stein-McCormick (2011) utilized feminist standpoint theory as a foundation to understand the experiences of females in military careers. The research utilized a survey, sent via email, to females who had served in the military since 1979. The survey generated a total 44. Of the 44 females who responded to the survey, nine were selected to be interviewed. The results of the interviews, where females’ perspectives were the core focus of the research, provided data from the females, who reported unfairness in training and promotions and indicated the level of harassment that occurred during their military careers. The feminist standpoint lens allowed Stein-McCormick to include a deeper analysis of the experiences of females in the military.

In another study by Bush, Bruin, and Welter (2009), female entrepreneurs experienced challenges as they operated their own businesses. The meta-analysis study indicated a framework structure, which consisted of five facets for female entrepreneurship. The first set of the framework structure consisted of marketing, management, and money (3M), with motherhood as the core intersection of these three for the female entrepreneurs. The 3Ms were affected by the macro and meso
environment levels, which were beyond the female’s control. Gender differences presented challenges existed for them to be entrepreneurs. The intersection of gender at the micro, meso, and macro levels, in a social structural framework, indicated some level of barriers and challenges for females who aimed for social equity in the workforce, health, and economic wellbeing (Bowleg, 2012; Ferree & Hall, 1996; Hankivsky, Grace, Hunting, Ferlatte, Clark, Fridkin, & Laviolette, 2012; Hyde, 1989; Kirk & Okazawa-Ray, 2010; Li, 2012).

Feminist standpoint theory maximizes the understanding of the oppressed group and its relationship between sexism and institutional powers established by an androcentric society. Going to the sources where oppression occurs provides a unique insight to the full experiences females learned to cope with, deal with, navigate through, and allowed them to confront the challenges of oppression directed towards females. These research studies indicated that females face daily challenges and barriers that are specific to gender difference and are often marginalized based on gender difference.

**Roots of feminist standpoint theory.** Feminist standpoint theory is rooted in Marxist traditions and in the claim that females are prone to oppression and subjugation in society (Haraway, 1988; Harding, 1991, 2004; Hartsock, 1983, 1989). According to Hartsock’s (1983) Marxist claims, the capitalist society creates a class structure with a dominant group and an oppressed group. In this group structure, there is a division of labor based on gender, which places females at a “privileged vantage point on male supremacy” (p. 284). This provides a foundation to critique power relationships within patriarchal institutions.
Hartsock (1983, 1989) indicated that feminist standpoint theory epistemology consists of five central tenets:

- Real-life situations (based on the Marxist position of two class groups) set limits to the full understanding of the reality of social interactions among groups.

- When real life is structured in fundamentally opposing ways for two different groups in systems of domination, the vision of reality available is the male perspective, where partial and inverse truth exists.

- The vision of the ruling class (or gender) structures the power relations in which all parties are forced to participate and, therefore, it is not possible to dismiss the oppressed group's experiences as simply false.

- The version available to the oppressed group must be struggled for. It brings to the surface social relations, which can grow from these struggles, to change oppressive relations.

- In the version, the understanding of the oppressed and the adoption of a social location expose the real power relations among the groups, which points to reality.

These five central points of feminist standpoint theory are not without criticism. Herkman (1997) indicated that all levels of vision are *partial and perverse* and the visions are close to reality. Herkman's counter to Hartsock's feminist standpoint theory indicates that having the same hegemonic discourse is not necessarily representative of all repressed groups in a society.
There are criticisms regarding the stance of feminist theory. The three primary criticisms of feminist theory are the broad generalization of females’ experiences, ignoring the differences among females, and conflicting approaches to feminist knowledge. Feminist theory imposes a generalization of one woman’s experience to all females as a collective unit. Andersen and Witham (2011) define this as a faulty generalization of feminist theory that incorrectly implies knowledge from one’s experience as part of the whole experience of all females. The second criticism is that feminist theory ignores the “varied experiences of cultural differences, social divisions, and power relations” (Ramazanoglu & Holland, 2002, p. 3). For example, oppression of females might not be explained by the patriarchal system, so other factors such as racism, nationalism, and globalism should also be considered. The third criticism is the varied feminist theory approaches that oppose each other or only use selected components of feminist theory. According to Ramazanoglu and Holland (2002), there is a tension where postmodernists and poststructuralists question the foundations of knowledge between liberal and Marxist feminist theory. The array of branches that exist in feminist theory makes it difficult to define the term feminist theory specifically (Andersen & Witham, 2011).

**Females in Male-dominated Occupations**

In the United States over half the labor force is female (U.S. Department of Labor, Women’s Bureau, 2013). However, in industry sectors, there are a low number of females reaching executive leadership positions in male-dominated occupations in business, higher education, technology, sciences, the military, and construction. According to Lapovsky and Larkin (2009), the business sector had 18% of females in executive leadership positions, but less than 2% of females were on Fortune 100
corporate boards. In other sectors, for example, the military and higher education (over the past 10 years) 11% of females in the military held leadership positions and 23% of females held academic leadership positions (Lapovsyk & Larkin, 2009). In 2011, the number of females in the construction industry was 9% (Catalyst, 2013). The United States Department of Labor considers occupations with less than 25% of females as a male-dominated occupation.

An analysis conducted by the United States Congress Joint Economic Committee (2010) indicated that the number of females who participated in the workforce from 1984 to 2009 had increased from 44% to 59%. By 2010, females made up 54%, over half, of the labor force. This increase of females in the workforce was noted primarily in government, leisure and hospitality, education and health services, financial activities, and other service-related industries (U.S. Department of Labor, Women’s Bureau, 2013).

Recent studies have shown an increase in the lack of opportunities for females to access, enter, and be employed in male-dominated occupations, which often offer higher wages. This perpetuates a division of labor based on gender (Blau & Kahn, 2007; Catalyst, 2013; Institute of Women’s Policy Research, 2011, 2013). Researchers have noted these (un)intended practices in the labor market as gender-segregated occupations (Blau & Kahn, 2007; Dickerson, Schur, Kruse, & Blasi, 2010; Dunn, 1996; Menches & Abraham, 2007).

In other industries, however, the increase of females in the workforce was much lower. For instance, in 2009, females employed in construction, were approximately 13% as compared to 12% in 1984, a 1% increase of females working in that labor
sector. By 2011, the construction industry had declined to 9% female employees (Catalyst, 2013). In 1984, 32% of females were working in manufacturing occupations. By 2009, the number of females in manufacturing had decreased to 29%. Similarly, there was a decline of females represented in the communications industry. In 1984, 49% of females were working in communications occupations. By the year 2009, only 42% of females were employed in the communications industry.

**Construction industry occupations.** According to the U.S. Department of Labor, Bureau of Labor Statistics (2012b), the United States added more than $600 billion worth of new construction projects. That means an estimate of 240,000 jobs are created annually in the construction industry. According to the Bureau of Labor Statistics (2012b), electrical workers belong to the largest specialty building trade, with 874,000 members who represent 42% of all workers in this occupational sector (e.g., carpenters, plumbers, and roofers). Table 1 shows the percentage of females in construction trade occupations where females were less than 2% of the total population (Catalyst, 2013).

In Table 1, electrical power line installers and repairers included a total of 124,000 individuals in 2011. Of the 124,000 electrical power line employees, 4,600 (.04%) were females and 119,040 (96.6%) were males. The occupation in the construction industry with the highest percentage of females was roofers at 1% and the lowest percentage of females was in the brick mason occupation at 0.1%. The number of females in occupations within the construction industry remains small and stagnant.

The literature indicates that these low percentages of females may be connected to a negative stigma towards females working in a male-dominated occupation. In Chun, Arditi, and Balci’s (2009) research, they found that males held a negative perception of
Table 1

*Percentage of Females in Male-dominated Construction Trade Occupations.*

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Total number of people in occupation (in thousands)</th>
<th>% of females in the occupation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brickmasons, Blockmasons, and Stonemasons</td>
<td>162,000</td>
<td>0.1</td>
</tr>
<tr>
<td>Cement Masons, Concrete Finishers, and Terrazzo Workers</td>
<td>88,000</td>
<td>0.3</td>
</tr>
<tr>
<td>Electrical Power Line Installers and Repairers</td>
<td>124,000</td>
<td>0.4</td>
</tr>
<tr>
<td>Carpet, Floor, and Tile Installers and Finishers</td>
<td>209,000</td>
<td>0.5</td>
</tr>
<tr>
<td>Heating, Air Conditioning, Refrigeration Mechanics and Installers</td>
<td>392,000</td>
<td>0.6</td>
</tr>
<tr>
<td>Structure Iron and Rebar Workers</td>
<td>59,000</td>
<td>0.6</td>
</tr>
<tr>
<td>Bus and Truck Mechanics and Diesel Engine Specialists</td>
<td>339,000</td>
<td>0.7</td>
</tr>
<tr>
<td>Miscellaneous Vehicle and Mobile Equipment Mechanics, Installers, and Repairers</td>
<td>99,000</td>
<td>0.8</td>
</tr>
<tr>
<td>Tool and Die Makers</td>
<td>68,000</td>
<td>0.9</td>
</tr>
<tr>
<td>Roofers</td>
<td>214,000</td>
<td>1.0</td>
</tr>
</tbody>
</table>

Source: Catalyst, 2013.
females’ ability and effectiveness. Their study noted the existence of that negative perception was because the males had little or no experience with having a female co-worker on the construction sites.

In Chun, Arditi, and Balci (2009), the results of the survey also indicated negative stigmas exist towards female construction managers. The survey was sent to 208 construction managers from the Chicago area. There was a 32% response rate from 47 males and 20 female construction managers. The survey results indicated that (a) there was a perceived bias against females in forms of avoidance and indifference behaviors; (b) men who had worked with females viewed females as qualified, capable, and approachable; (c) female’s effectiveness was questioned by men who had never worked with females; and (d) an increase in acceptance of females as a “natural and equal part of the construction population” by a new group of male managers (p.11). They concluded that negative views of females would be likely to dissipate as more females entered construction occupations and men were more exposed to working with female colleagues.

In a different study by Heins, Hendricks, and Martindale (1982), family support was a reason for females to enter and stay in male-dominated occupation. Research of female physicians showed their decision to become physicians was related to their family support. The quantitative (207-item questionnaire) and qualitative (open-ended interviews) study indicated family influence (parents), spouse influence, and extra-family support were all high factors and reasons why participants had decided to become a physician. These different types of family support include encouragements that were measured by the productivity and achievements of the female physicians.
In Denissen’s (2006) qualitative study, 51 females in the construction trade were interviewed to ascertain their experiences in that occupation. Fourteen females were journey-level, 21 were apprentices, and 16 were pre-apprentices. Results from the study indicated that females in construction trade occupations experienced low social capital that hindered them from networking and affected their long-term career mobility. Additionally, Denissen states that the “most significant factor causing females to leave the trades” is sex discrimination in hiring practices (p. 85). The anti-discrimination laws were not strongly enforced in the construction industry and there “is little that females can do when contractors refuse to hire them” (Denissen, 2006, p. 85).

Schroedel (1985) examined females’ experiences in male-dominated occupations. Of the 25 females included in the qualitative study, 11 were employed in a construction occupation. Interview questions were related to participants’ backgrounds and motivations for entering the trade, on-the-job experiences, and how trade work was influenced by their family support and self-perceptions. Findings from the study resulted in three common themes: (a) the discomfort and disadvantage of late exposure to tools, whereas males were familiar with and comfortable with handling tools; (b) a sense of alienation; and (c) sex discrimination.

Female electrician technicians. Nontraditional occupations for females are occupations that have a high number of male employees. The U.S. Department of Labor defines these occupations as male-dominated when there are 25% or less female employees. More females are being drawn to these male-dominated occupations because, unlike some jobs traditionally held by females, the income is higher than female-dominated occupations.
Nontraditional occupations have paid training, wage increases, medical and retirement benefits, and career advancements. Females in nontraditional careers have been able to earn 20 to 30% more than they did in female-dominated occupations (Catalyst, 2013; U.S. Department of Labor, Women’s Bureau, 2012a; Institute for Women’s Policy Research, 2013). For example, a daycare worker earns an average of $7 - $12 an hour, but a journey-level electrician technician earns an average of $25 - 28 an hour (U.S. Department of Labor, Women’s Bureau, 2012a). In addition, females in nontraditional occupations often receive better benefits than female-dominated occupations (an exception is the registered nurse); these may include more sick leave, paid vacation days, and health insurance (Catalyst, 2013).

The number of female electricians employed in specific electrician occupation clusters are identified by the U.S. Department of Labor’s ONET database. ONET is a federal comprehensive database funded by the U.S. Department of Labor to centralize occupation standards, attributes, and characteristics.

Table 2 shows the total number of electrician technicians and the percentage of females employed. Females were low in all four types of electrician occupations. In 2010, the number of females with electrical power-line industry certification was .4% (n = 496) were employed. Out of the electrical and electronics engineers, 7.2% (n = 22,104) of females were employed. Out of 6% (n = 3,120) females were employed in home electronics installation and repairs. Of females who were electrician technicians in construction and energy facilities, 1.5% (n = 10,365) were actively employed. Of all the four types of electrician occupations, 15.1% (n = 177,274) of females were actively employed.
### Table 2

**Number of Females in Electrician Technician Occupations from 2010.**

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Total Employed (Both genders, in thousands)</th>
<th>% Females</th>
<th>Number of Employed Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical power-line installers and repairers</td>
<td>124</td>
<td>0.4</td>
<td>496</td>
</tr>
<tr>
<td>Electrical and electronic engineers</td>
<td>307</td>
<td>7.2</td>
<td>22,104</td>
</tr>
<tr>
<td>Electronic home entertainment equipment installers and repairers</td>
<td>52</td>
<td>6.0</td>
<td>3,120</td>
</tr>
<tr>
<td>Electrician technicians in construction and energy facilities</td>
<td>691</td>
<td>1.5</td>
<td>10,365</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1174</strong></td>
<td><strong>15.1</strong></td>
<td><strong>177,274</strong></td>
</tr>
</tbody>
</table>


In Moccio’s (2009) book *Live Wire: Females and Brotherhood in the Electrical Industry*, the challenges for female electrician technicians in male-dominated occupations stems from a brotherhood culture where “attachment to this male-dominated ideology” (p. 31) is difficult to escape at every level of the industry. The brotherhood ideology is maintained and passed on to men from generation to generation. The fraternal atmosphere makes female electrician technicians feel uncomfortable and experience unwelcoming machismo behaviors. These unwelcoming behaviors play out at the worksites when females are not provided proper safety tools and training because of the machismo perspectives of male electrician technicians. Even Eisenberg (1998, 2011), who is an author and tradeswoman, acknowledges that of the few females who do enter the electrician technician occupation and other construction trades, most will experience
inadequate training, biased evaluations, unsafe assignments, discrimination, and sexual assaults or harassment.

**History of Apprenticeship**

The practice of utilizing apprenticeships as a training approach was a way for the United States to develop a skilled and knowledgeable workforce. The American apprenticeship system of training for skills stemmed from the Roman and Greek civilizations where trading for the services of a young novice to work for a master craftsman was common practice.

The first apprentice was Onnphris. Onnphris’ parents paid Abaros, a master weaver, to take in their son for two years and teach him the techniques of weaving (Smit & Stromback, 2001). The gilded age of the medieval era emphasized skills development through apprenticeship. In the industrial era of the 1900s, apprenticeships became geared towards adults and less for children. In the United States, the first contracted apprenticeship was in 1872 for the printing press manufacturing company named Hoe and Company. By 1888, other American companies like Westinghouse Machine Company, General Electric Company, and Baldwin Locomotive Works started offering apprenticeship training (Kursh, 1958; Hamilton, 1990; Smit & Stromback, 2001).

There are different approaches of apprenticeship training utilized in workforce skills and knowledge development. An apprentice is defined as a beginner or inexperienced person who is bounded by legal agreement to work for a prescribed amount of time in return for learning a trade or occupation by practical experience under a skilled or experienced individual (Hamilton, 1990; Kursh, 1958; Smits & Stromback, 2001). Construction industry occupations still use apprenticeships to train people to become
carpenters, electricians, brick and cement masons, plumbers, air conditioning/heat vent technicians, and millwright.

**Apprenticeship and industry certification.** The electrician technician training apprenticeships are registered with the federal government as active and operational programs, which have the following characteristics in common: (a) the time commitment of apprentices is normally a period of four years, (b) on-the-job work experiences under the guidance of a journey-level person, (c) apprentices are considered employees and receive pay during the training and achieve incremental increases during the apprenticeship, (d) an apprenticeship is a work contract agreement with a business sector sponsor to be able to obtain experience hours required by the program, and (e) a certificate of completion is issued to apprentices who have met all the training requirements and standards of the electrician technician occupation (ONET, 2013; Florida Education Department for Career and Adult Education, 2012; U.S. Department of Employment and Training Administration, 2013).

The primary pathway to entering construction trade occupations is through apprenticeship programs. The apprenticeship combines work-based learning with classroom instruction. Completion of the five-year apprenticeship training fulfills the need of the construction industry by preparing workers for skilled trades and achieving occupational certification. The apprenticeship is sponsored by employers, employer associations, or labor/management groups that have the ability to employ and further train the apprentices in the working environment. The primary benefit of apprenticeship is the opportunity for paid employment during the skills and knowledge training.
Electrician technician apprentices gain knowledge and skill sets required to meet industry certification. The electrician technician industry standards are kept on the ONET database for employers, training centers, and employees to access. According to ONET (2013), the knowledge that electrician technician apprentices learn during their five-year commitment are:

- **Building and Construction**—materials, methods, and the tools involved in the construction or repair of houses, buildings, or other structures such as highways and roads.

- **Mechanical**—machines and tools, including their designs, uses, repair, and maintenance.

- **Mathematics**—arithmetic, algebra, geometry, calculus, statistics, and their applications.

- **Design**—techniques and tools involved in production. Technical plans, blueprints, drawings, and models.

- **English Language**—the structure and content of the English language including the meaning and spelling of words, rules of composition, and grammar.

- **Public Safety and Security**—relevant equipment, policies, procedures, and strategies to promote effective local, state, or national security operations for the protection of people, data, property, and institutions.

- **Customer and Personal Service**—principles and processes for providing customer and personal services. This includes customer needs assessment, meeting quality standards for services, and evaluation of customer satisfaction.

- **Administration and Management**—business and management principles involved in strategic planning, resource allocation, human resources modeling, leadership technique, production methods, and coordination of people and resources.
Physics—prediction of physical principles, laws, their interrelationships, and applications to understanding fluid, material, and atmospheric dynamics, and mechanical, electrical, atomic and sub-atomic structures and processes.

Education and Training—principles and methods for curriculum and training design, teaching and instruction for individuals and groups, and the measurement of training effects.

**Industry certification standards.** The knowledge electrician technicians gain from on-the-job and classroom training incorporates classroom information to applicable worksite tasks. The skills that ONET requires electricians to have and that are required for electrician technician industry certifications are: troubleshooting operating errors, repairing machines and systems with the correct tools or equipment, active listening to understand and ask questions, critical thinking for logic and reasoning to identify alternative solutions, decision-making to ensure costs and benefits of projects, installation of equipment and other machinery, active learning to understand new information for problem-solving, complex problem solving to evaluate the optimal options, equipment maintenance for efficient performance, and instructing to teach and demonstrate to others how to do something. ONET recognizes nine specific types of occupations that fall into the cluster of electrician technician apprenticeship training. They are: protective-signal repairer, electrician in water transportation, electrician in construction, protective-signal installer, streetlight servicer, electrician maintenance, neon-sign servicer, electrician in ship-boat manufacturing, and residential electrical wiring.

The future of the electrician occupations has gained a technological advantage. The advancement in electrical technology, such as solar panels, makes the electrician occupations high-demand occupations. ONET and the U.S. Department of Employment
and Training Administration have designated the electrician occupation as a fast growth occupation. According to ONET (2013), the electrician technician occupation is projected to be an occupation that will have an average of 20% to 28% annual growth by 2020.

**Policy Initiatives**

Over the past decades, the United States has enacted several policies to enhance the practice of equitable treatment of females in recruiting, hiring, employment, training, and education of females in the labor market. Policies such as the 1938 Fair Labor Standards Act, the Equal Pay Act of 1963, the 1964 Title VII of the Civil Rights Act, the 1972 Title IX Education Act, and most recently the 2009 Ledbetter Fair Pay Act, indicate some progress towards equitable treatment of females in the workforce (Catalyst, 2013; U.S. Department of Labor, Women’s Bureau, 2012a). A specific policy that is aimed at recruiting more females into male-dominated trade occupations is the 1992 Women in Apprenticeship and Nontraditional Occupations Act (U.S. Department of Labor, Employment and Training Administration, 2013).

Thirty-five years after the executive order for affirmative action and almost 50 years after Title VII of the 1964 Civil Rights Act prohibited discrimination in employment based on gender; females remain pioneers in the construction occupations. According to Eisenberg (1998, 2011) and Moccio (2009), females in the construction industry experience some form of harassment that can deter them from entry or from remaining in the electrician occupation. There is also research where females experienced not getting job assignments or had longer working hours at the worksites than their male counterparts (Denissen, 2010b; Eisenberg, 1998). Not being hired or assigned to a
certain task does not allow females to fine tune, practice, or enhance the skills required for construction occupations (Denissen, 2010a, 2010b; Moccio, 2009; Ness, 2012).

Another policy enacted to enhance the practice of equitable treatment of females is the *Fair Work Act of 2009*. However, although the equal pay concept was introduced over 50 years ago “the gender pay gap is now wider than it has been in nearly two decades” (MacDonald & Charlesworth, 2013, p. 563). Females in male-dominated occupations not only face harassment, but their pay earnings are not equal to their male counterparts, even with this policy in place. Additionally, a challenge in pay differential arises for female electricians when opportunities to work are closed to females or are offered to the men first (Eisenburg, 1989; Martin, 1988; Moccio, 2009; Schroedel, 1985).

As discussed in the literature, policies have been established to support females in the workforce. These policies often require females to go to court to plead their case for fair treatment and to stop harassment. At the worksites, where unfair treatment of females in male-dominated occupations may often occur, minimal actions are present to enforce equitable pay and treatment (MacDonald & Charlesworth, 2013).

**Gender wage gap.** Historically, the wage gap has narrowed over the past decade, but not significantly enough to be equitable. According to the Institute for Women’s Policy Research (2011), there was an increase of 11.8% from 1980 to 1994 for the gender earnings ratio for annual earnings. The Institute for Women’s Policy Research forecasted that at the current pace of change in annual earnings, it would take another 45 years to close the gender wage gap. The slow progression of narrowing of the wage gap is a topic that is being actively investigated to understand the cause for the stagnation in the process of achieving wage equity between females and males.
Research on the gender wage gap shows a variety of contributing factors. Blau and Kahn (2007) identified seven characteristics that contribute to the wage differential between female and males: educational attainment, labor force experiences, race, occupational category, industry category, union status, and an unexplained category. The authors indicated the factors contributing to the wage gap are associated with the type of occupation and industry. Blau and Kahn state that occupational category factored in at 27% and industry category factored in at 22%. Their research supports the belief that the type of occupation and industry category contributes to females earning less than males. The Institute for Women’s Policy Research (2010a, 2010b) agrees with Blau and Kahn’s findings that occupational differentials are a contributing factor to the occupational segregation and gender wage gap.

Various types of female-dominated occupations are often low-wage, requiring low to medium skills, consist of nurturing or service-oriented tasks, have minimal opportunities for advancement, and are at risk of being non-sustainable jobs (Alksinis, Curtis, & Desmarais, 2008; Institute of Women’s Policy Research, 2011, 2013). Females’ wages in these occupations average $657 weekly (Institute for Women’s Policy Research, 2013). Whereas male-dominated occupations’ average weekly earnings are $819 for jobs in the military, business corporations, medicine, science, and construction (Catalyst, 2013; Lapovsky & Larkin, 2009; Institute for Women’s Policy Research, 2010a, 2010b). This means females earn 77 cents for every dollar males earn (Institute of Women’s Policy Research, 2011, 2013; Judy & Powers, 2012). According to Judy and Powers’ (2012) research, 27% of the factors attributed to the gender wage gap were associated with the type of occupation and the 22% of the factors were attributed to the industry.
According to the ACLU, once a woman completed an electrician technician apprenticeship program, her median weekly wage is estimated to be $857. This wage is higher than a secretary/administrative assistant, who earned an average weekly pay of $657 or a childcare provider with an average weekly wage of $398 (U.S. Department of Labor, Women’s Bureau, 2013). An electrician technician is one of the highest paid occupations in the construction industry. For example, a carpenter’s median weekly wage is $630, while the median weekly wage is $850 for a construction plumber (American Civil Liberties Union, 2012; U.S. Department of Labor, Women’s Bureau, 2013).

The practice of some industries to separate occupations based on gender to discourage females from attempting to access masculine types of occupations (for example, the construction industry), unconsciously developed gender-segregated occupations. Researchers view this practice as a society’s preoccupation with pairing or aligning occupations to gender identity because of the physicality of the tasks (Albrecht, Bahr, & Chadwick, 1977; Dickerson et al., 2010). This practice of attaching occupations to gender is noticeable in occupations that have females employed mostly in nurturing or caring roles, which often pay low wages. According to research data collected in 2010, of all the administrative assistants, 96% were females; of all the childcare service providers, 95% were females; of all the receptionists, 93% were females, and of all the instructor assistants, 92% were females (Catalyst, 2013; Institute of Women’s Policy Research, 2011, 2012; U.S. Department of Labor, Women’s Bureau, 2012).
Summary

This chapter discussed the literature related to this study. Overviews of feminist theory and feminist standpoint theory literature were discussed. Research literature provided data related to females in male-dominated occupations in construction and electrical sectors. The final section highlighted policy initiatives for inclusion of females in male-dominated occupations.
Chapter 3

Methods

The purpose of this study was to understand the reasons the four female participants decided to pursue electrician technician training, their perspectives of the apprenticeship program, their perceptions of successful employment in a male-dominated occupation, and differences in treatment based on their gender. This chapter begins with a discussion of the research design for this study. Next, purposeful sampling and participant selection are discussed. The subsequent section is an explanation of the instrumentation development and processes. The procedures for data collection are presented in the next section, followed by data analysis and summary.

Research Design

A case study design was utilized to explore the experiences of female electrician technicians who were trained and employed in a non-traditional occupation. According to Merriam (2009), the case study is “anchored in real-life situations . . . resulted in a rich and holistic account . . . that offers insights and illuminates meanings” (p. 51). The implementation of a case study design assisted in providing detailed accounts of the participants’ experiences. Overall, the case study design emphasized the participants’ experiences as their own epistemology and through their individualized perspectives (Denzin & Lincoln, 2008; Merriam, 2009; Yin, 2008).

The case study design utilized the following research questions:
1. What led the females to make the decision to pursue the electrician technician apprenticeships?

2. What was the nature of the education and training experiences of the participants in the electrician technician apprenticeship program?

3. What were the participants’ perceptions on successful advancement within the workforce as a female electrician technician?

4. What gender differences did the participants experience as female electrician technicians?

**Feminist standpoint research.** The research that guided this study was feminist standpoint theory. Feminist standpoint research aims to bring forward the oppression and subjugation of the female in the American social structure (Andersen & Whitman, 2011; Hartstock, 1983; Heckman, 1997; Ramazonglu & Holland, 2002; Wright et al., 2009). The primary perspective of the feminist standpoint research is the understanding that females are involved in their oppressive state and they experienced the actual realities of their subjugation in their lives. Feminist standpoint research states that the females’ personal and social experiences put them in a central social locale and they “are in a better position than men to face and understand the world of female subjugation” (Crotty, 1998, p.161). In addition, feminist standpoint research allows multiple data sources to understand female experiences and to “illuminate gender-based stereotypes and biases and unearthing female’s subjugated knowledge” that may occur in a male-dominated occupation (Brooks & Hess-Biber, 2007, p. 4). This theory was explicitly designed to inform the data collection and analysis through a critical feminist lens.
Purposeful Sampling and Participant Selection

**Purposeful sampling.** A purposeful sampling method was used for this study. The purposeful sampling was considered appropriate because of the low number of females in Florida’s electrician technician programs. According to the State of Florida apprenticeship database for the district regions for this research, there were six active female electrician technician apprentices and two more who had completed the apprenticeship program in 2010-2011 (S. Seville, Regional Director of Apprenticeship, personal communication, March 2012). In one of the state’s programs, there were 273 active electrician technician apprentices, but only two were female (Florida Department of Education, Career and Adult Education, 2013).

The overall low number of females in the electrician technician program in Florida's Region 3, made it necessary to use purposeful sampling for this study. In addition, not all electrician technician programs throughout the state had female electrician technicians. Research from other studies indicated that recruitment of females in male-dominated occupations would be difficult due to the fear of unwanted and unnecessary attention or retaliation (Ainsworth, Batty, & Burchielli, 2014; Denissen, 2010).

**Participant selection.** The selection criteria for this case study included female electrician technicians who were trained in an electrician technician apprenticeship program, were in electrician technician journey-level status, and were employed as an electrician technician. Contact was made with the program directors of four of the six state-approved electrician technician training programs. An inquiry about their training facility and general information about the program process was made. An email was sent to three program directors who had more than one female electrician technician
apprentice and had more than one female electrician technician who completed the apprenticeship training program. The three electrician technician facility training sites were within a 25-mile radius of each other and within Florida’s three major metropolitan cities located along the Gulf coast region and I-4 highway corridor. See Appendix A for a copy of the email sent to apprenticeship program directors for possible participants.

Two of the three directors responded by sending a roster of active enrolled female apprentices and females who had completed the electrician technician apprenticeship program. The roster included female electrician technicians’ email addresses and phone numbers as contact information. A total of two female electrician technician apprentices and one female journey-level electrician technician from training site A were identified as possible contacts to participate in this research. Then, electrician technician training site B provided two female electrician technician apprentices and two female journey-level electrician technicians as possible participants for this study.

There were seven possible female participants. All seven were contacted via email to recruit them as participants. See Appendix B for a copy of the email to the potential participants. Of the seven female electrician technicians contacted, four responded with willingness to be part of the research. The two who chose not to participate did so because of personal conflicts (one had recently had a baby and the other had family demands that led to cancelled meetings and non-responsiveness). The third possible participant did not respond to the three email requests and was dropped due to non-responsiveness to the initial email and phone messages for participation. The total number of participants targeted for this study was six, but only four completed the entire selection process.
Data Collection Development

The instruments used to examine the experiences of the female electrician technicians in a male-dominated occupation included (a) a demographic questionnaire, (b) four face-to-face interviews with the participants, (c) electrician technician enrollment and completion data, (d) participant journal entries, and (e) researchers’ journal. Figure 2 shows all the data sources including four the face-to-face interview sessions, participants’ journal entries, electrician technician apprenticeship program data, and researcher’s reflexivity journal.

Demographic questionnaire. The demographic questionnaire consisted of eight questions asked of the participants about their marital status, age, education level, income level, date of electrician technician training and completion, race, and ethnicity. See Appendix C for a copy of the demographic questionnaire used in the study. The questionnaire was given to the participants after the approved IRB consent form was signed and prior to the start of the first interview. Each participant took an average of 10 minutes to answer the questionnaire. After the questionnaire was completed, the first interview was conducted. The only question that was left blank by one participant was the income level. Not answering this question did not hinder her participation in the research.

Interview questions. There were three interview sets, each consisting of probing questions. The development of the interview questions utilized a panel review process and pilot study, according to which the set of interview questions were constructed in open-ended statements to allow for conversation. Specific probing questions were only used if deemed necessary to further understand the participant’s meaning.
Figure 2. Interview process model. This model includes the participants’ and researcher’s journals as data collection techniques across the multiple interviews.
In addition, the open-ended questions allowed me to “hear the details . . . internalize what participants say . . . find the participant’s ‘inner voice’ as opposed to an outer, more public voice, . . . stay alert . . . to move the interview forward as necessary” (Seidman, 2006, pp. 78-79).

According to Kvale (1996), open-ended questions provide the flexibility to adjust the flow of the interview questions based on the participants’ responses to the initial questions. The adjustments to the interview questions and probing questions were specific to each participant. Accordingly, the interview questions included between four to six open-ended questions and one or two additional probing questions.

In feminist standpoint research, interviews with open-ended probing questions are connected to aspects of feminist research approaches. According to Roulston (2010), feminist interviews can use open-ended questions to “promote an egalitarian relationship among female researchers and female participants with the aim of producing knowledge about previously unknown and unstudied facets of female’s lives” (p. 21). In this format, I was able to provide an equal or mutual benefit; an atmosphere to allow the participants to feel free to express their personal beliefs; but, at the same time, I facilitated the discussion to focus on the interview questions.

**Development of questions.** I created the questions for each interview session. The initial individual questions were reviewed by a panel of doctoral candidates, recent doctoral graduates, a faculty member, and directors of electrician technician training programs. See Appendix D for the list of names on the review panel. The review panel members were given the interview question sets for comments and feedback, which were
used to revise the interview questions, especially in relation to the sequence of the questions and wording changes to the probing questions.

*Research question one.* The interview questions and probing questions for the research question one for the first interview sessions were about participant entry and enrollment in the electrician technician apprenticeship program. These interview and probing questions were given to the panel to review for clarity and understanding. Minor revisions were made for the first interview session. The revisions consisted of word choice and the suggestions for additional probing questions. These minor revisions were made to the interview questions for interview session one. See Appendix E for a copy of the interview questions for the first session.

The following interview questions and probing questions were used for research question one to understand what led the participants to the decision-making process to apply to the electrician technician apprenticeship program.

1. How did you learn about the electrician occupation?
   Probing question: Were there other occupations or career interests?
2. What influenced you to become an electrician?
3. How did you learn about the electrician apprenticeship?
   Probing question: What were the steps to be in the electrician apprenticeship program?
4. What were your family’s thoughts about you becoming an electrician?
   Probing questions: Are other family members electricians? What are your family members’ education levels? What type of support does your family give you to be an electrician (financial support, advice, encouragement)?
5. Tell me about your prior education and any other certification training you may have.

Probing question: What was the process of you getting your certificate like?

*Research question two.* The second interview session asked participants about their experiences in the development of electrician technician skills and knowledge during their apprenticeship program. The review panel read the first draft of the second interview session questions for comprehension and appropriateness. The review panel made minor suggestions related to the probing questions. The suggestions were taken into consideration and edits were made to the probing questions for clarity. See Appendix F for a copy of the interview questions for the second session.

The interview questions for research question number two related to nature of education and training in electrician technician apprenticeship. They were:

1. Describe a typical day at your apprenticeship training.
   Probing question: What were some of the apprenticeship courses you took?

2. Describe a typical day at an apprenticeship worksite.
   Who are the people/crew at the worksite with you?

3. What knowledge and/or skill did you learn?
   What skills are you successful in and which still need development?

4. Describe an experience where you applied what you learned in the classroom to the worksite.
   Probing question: What was a problem/issue you were asked to solve and how did you accomplished the task?

5. What was the process to complete your apprenticeship like?
Probing question: How many hours did you need for school, worksite, and studying?

6. What is your overall apprenticeship experience?

What pushed you to continue and/or complete your apprenticeship program?

Research question three. The third interview session posed the questions related to the employment outlook for current female electrician technicians and for future female electrician technicians. The set of questions for session three was given to the review panel to read and provide feedback. The feedback from the panel was minimal and directed to the formatting of the questions. Accordingly, minor changes were made to the interview questions for session three. See Appendix G for a copy of the interview questions for the third session. The interview questions for research question three were:

1. Describe how you obtained your current electrician position.
   What did you have to do to find electrician work?

2. Tell me about your responsibilities and roles at your position.

3. Describe a project and/or task you completed as an electrician.

4. Is there someone you look towards for occupational advice?

5. How could more women be recruited into the electrician occupation?

6. Are you part of any community activities/roles?

7. How can female electricians expand their network for employment?

8. What do you think the future holds for female electricians?

Research question four. There were no pre-set interview questions for research question four for the fourth session with the participants. The fourth interview session was open and allowed me to contact the participants to clarify responses and maintain an
open discussion. The fourth session also allowed the participants to discuss the data I analyzed and the identified themes that emerged. I also inquired about their views and assessment about how they felt about participating in this study. Hattie, Anna, Martha, and Margaret all agreed with the themes that I identified from their experiences. They indicated that the research process was fine and suggested no changes or recommendations to improve the process for this study.

**Pilot study.** A pilot study was conducted as part of the instrument development. I met Tina (pseudonym) at the State Apprenticeship Advisory Council meeting and she agreed to participate in the pilot study. Tina had indicated that she had owned an electrical business that worked for a construction company, but she did not go through an apprenticeship program. At the time of the study, Tina was a program director for one of the state-approved regional electrician technician training sites. Both Tina’s prior work experience in the construction industry and her background as a female military veteran (another male-dominated occupation) made Tina a viable participant for the pilot study.

The pilot study consisted of the completion of the consent form, the demographic questionnaire, responses to the interview questions, and readability of the journal prompt questions. The pilot study with Tina was conducted face-to-face at her office in the morning. She completed the consent form and demographic questionnaire before the start of the interview. I conducted Tina’s three sets of interviews in one session due to her schedule constraints and her request to have the interviews completed in one session.

During the time of the pilot study, I realized the sensitivity of the discussion with Tina. Towards the end of the interview session, she cried because she had not realized
how much she endured as a female in the military, during her prior work in the
construction industry, and as female director of an electrician technician apprenticeship
program. Her emotions were caused by her recall of her experiences as a female in
male-dominated occupations (as owner of an electrician company and as program
director for the electrician technician program). Tina realized how much she had
overcome to become a successful female as an electrician technician and director of an
electrician technician program.

This experience prompted me to become more aware of the emotional impact the
questions might have on the participants. Tina was amazed and surprised by her
outpouring of the information she gave and her own unexpected emotions. Her
responses to the interview questions confirmed and supported the need to have three
separate interviews, so the process did not cause undue stress on the participants.

My researcher’s journal also provided reflexivity on the pilot study interview
session. I noted the emotions that connected me to Tina’s experiences and that I would
possibly need to have tissues available during my face-to-face interview sessions. In
addition, based on this pilot study, minor modifications were made to parts of the open-
ended interview questions and adjustments were made to the probing questions
(researcher’s journal). The journal prompts were also given to Tina for review. She read
the journal prompts for clarity, understanding, and appropriateness. Tina recommended
no changes to the journal prompts and felt the prompts were appropriate.

**Participant journals.** The purpose of the participant journals was for the
participants to write about any experiences that they may have forgotten to mention or
discuss during the face-to-face interview sessions. The journals were different colors for
each participant. The participant journals contained journal prompts to aid the participants in their writing process.

**Journal prompts.** The journal prompts were glued inside the first page of the journal books. The prompts were open-ended to allow the participants to write freely. The journal prompts consisted of five questions. In addition to the prompts, the participants could write about other topics that they felt were relevant to include in the journal. See Appendix H for a copy of the journal prompts.

The participants received the journals after the end of the first interview session. They were instructed to write about their day and/or topics that they may have forgotten to mention during the interview session. They were reminded that the prompts were optional and that other topics related to their experiences could be included in the journal.

The participants were not required to respond to the prompts; however, all four participants chose to answer only the prompt questions. One participant (Margaret Better) indicated that she had a work journal that she was required to write in and writing in a journal was not a new process. All four participants wrote five entries, approximately a page each, for the journal entries. The participants explained this was due to time constraints and, at an end of a busy work day, the journal entries were not as detailed as they would have liked.

**Role of researcher.** In a case study design, the role I played throughout the research process was integral to the validity of the study. As the researcher for this study, I was an instrument. I delivered and collected the data from the participants. I collected the information during my interviews with the participants and during my examination of the data (Creswell, 2013; Stake, 1995).
According to Janesick (1998), the role I played as the researcher, was to "address the researcher's self, which becomes critical in qualitative work, due to the fact that the researcher is the research instrument" (p. 3). I essentially became a part of the study and I was required to be reflexive on the approaches applied during this study. In addition, I critically analyzed myself as an instrument at every step of the process when I interacted with the participants and with the data.

My role as an instrument was to deliver the interview questions and to provide and collect the participants' journals. I was able to explain the process of the interview sessions and discussed the instructions for the journal. I collected the participants' journals at the end of the third interview session. I regularly logged my experiences in my researcher's journal about my thoughts during the implementation of the research data collection and data analysis process.

**Researcher's journal.** I maintained a reflexive journal throughout the data collection and analysis. The purpose of my journal was to allow reflexiveness on the data collection, data analysis, and other issues that arose during the research process. My researcher's journal provided another data source for analysis on this study.

Roulston (2010) stated that the journal can provide the researcher with "a series of written entries that records my reflexivity, ideas, commentaries, and memos" (p. 121). In feminist standpoint research, reflexiveness is key to exploring the issues of power dynamics between me and the participants. I am identified as an insider because of my gender affiliation, but as an outsider for not being an electrician technician. My insider-outsider position and being the instrument (Lincoln & Guba, 1985), played a role in how I shared knowledge and built trust with the participants.
Reflexivity. A component of feminist standpoint theory is my ability to be introspective about every interaction with the participants, data analysis, and day to day life interactions (Roulston, 2010). This reflexivity process was critical to understanding my overall mental state as I processed my thoughts, feelings, and actions. I played a role in the interaction with the participants and served as an instrument in data collection (Lincoln & Guba, 1985; Janesick, 1998). My reflexivity is defined as a process of self-awareness, social consciousness, and attention to ideologies and perspectives during the research (Hesse-Biber & Leavy, 2011; Denzin & Lincoln, 2008; Patton, 2002, Richardson, 1993; Richardson & St Pierre, 2008).

There are different types of reflexivity approaches in understanding the position of the researcher. The five common types of reflexivity are (a) introspection and self-discovery, (b) intersubjective or relationship interpretations, (c) collaboration or co-operative reflexive discussion, (d) social or power relationship, and (e) deconstruction of language or text (Richardson & St Pierre, 2008; Roulston, 2010). Reflexivity supported the knowledge claims by stating my role and assumptions made throughout the research process (Ramazanoglu & Holland, 2002).

Introspection and self-discovery. My introspection started with my insider and outsider identities during this research process. I am an insider because of I am a female in a male-dominated educational institution, but an outsider because I am not an electrician technician. My insider position provided me the initial connection with the female participants. My outsider position limited my understanding of the electrician technician occupation and the lack of knowledge of the terminology used in the occupation. My insider and outsider identities played out during my pilot study process.
and throughout data collection, analysis, and data presentation. I wrote in my journal how my first meeting with Martha was “stale and guarded information” (Researcher’s journal, p. 10). Martha’s reaction to me and my perception of her comments were due to my outsider status and did not propel a sense of trust in Martha.

**Relationship interpretation.** The relationship between me and the participants consisted of communications through email, text, and phone conversations. My relationship with each participant was different and each had unique parameters. For example, Hattie was as nervous as I was during our first initial meeting. In addition, my interview sessions with Hattie were not just about her work, but also about what was happening to her personally. Here is an example from my journal about her health.

I noticed Hattie was limping. I asked about why she was limping. She indicated she fell on the pavement on her driveway because she missed a step on the way out. . . . Tomorrow she is scheduled to get an MRI on her knee to see if she will need surgery. (Researcher’s journal, p. 20).

By the end of the data collection and analysis process, Hattie confided in me that she wanted to start a mentoring initiative, but was not sure how to start one. For her to share that with me showed that she had come to trust me and my reactions.

**Social and power relationships.** My reflexivity, in practice of feminist standpoint theory, was about me balancing the power relationship between me and the four female electrician technicians. I wanted to maintain an equal or mutual power relationship with the participants as much as possible, being aware that this research was about the four female electrician technicians. In my reflexivity, I was able to note my own individual need to share my background as a female in a doctoral program as a way to build mutual
relationship and understanding. I shared my experience in terms of being in a doctoral apprentice who was going into her fifth year of training.

_Deconstruction of language._ I often related my doctoral work to terminology related to their electrician technician education and training. For example, I related my doctoral proposal plan to the electrical blueprint the female electrician technicians had to construct, learn how to read it, and implementation of the electrical blueprint. I was intimidated by the electrician terminology that the participants discussed as much as they felt intimidated by my doctoral program.

Through my reflexivity, the experiences, as told by the four female participants, become part of the validity of the research (Lenzo, 1995). Richardson (1993) and Roulston (2010) indicated that reflexivity throughout the research process brings credibility to the data collected. My reflexivity captured my thoughts and began with my recruitment of the females to participate in my study. I was also reflexive about my face-to-face interview sessions with the participants. I was deep into my emotions during the data collection process and construction of the data analysis. For example, during my process of constructing the interview questions and pilot study, my reflexivity was to be aware of the sensitivity of the topic of being a female in a male-dominated occupation and what I would do if one of the participants started to cry. My reflexivity process reminded me to use the ethics of care approach. The ethics of care approach grounded me during the construction of the questions, delivery of the interview questions face-to-face, and the selection of their pseudonyms for this study.

_Quantitative data._ The purpose of the quantitative data was to provide a descriptive view of the number of females who applied, were accepted to apprenticeship
programs, dropped out, and completed the electrician technician training. Three electrician technician training sites were contacted based on the region they served and where the four female participants completed their electrician technician apprenticeship training. I met with the electrician technician training directors at the State Apprenticeship Advisory Council meeting on March 19, 2014, and exchanged contact information. The three directors of the program were contacted via email to request data regarding their programs. See Appendix I for a copy of the email to request program data.

The three electrician technician training directors were emailed in August of 2014 to request information for their programs. These three electrician technician training sites provided the data on the total number of electrician technician applications, total number enrolled, and completion numbers by year and gender. See Appendix J for a copy of the electrician technician program data sheet.

Table 3 shows the numbers of applications, apprentices, dropouts, and completions by gender from the three electrician training program sites for the 2010-2014 years. The table shows a grand total of 3,390 people applied to the electrician technician apprenticeship program in 2010-2014. Of the 3,390 people, 52 were females (1.5%) and 3,338 were male (98.5%). Those who applied to the electrician technician apprenticeship program, 31 females (1.1%) were accepted to enroll and 2,683 males (98.9%) were accepted to enroll. A total of 323 individuals who were accepted for enrollment dropped out of the electrician technician apprenticeship program. Of the 323, 10 females dropped the program and 313 males dropped out of the program. A total of 1,979 were still active and towards their completion requirements. Of the total active, 19 were females and 1,960 were males. The total number of electrician technician apprentices who completed
Table 3

Number of Female and Male Applicants, Apprentices, Dropouts, and Completed Electrician Technician Apprenticeship Programs From Three State Electrician Technician Training Programs.

<table>
<thead>
<tr>
<th></th>
<th>2010 n</th>
<th>2011 n</th>
<th>2012 n</th>
<th>2013 n</th>
<th>2014 n</th>
<th>Grand total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Applications</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Females</td>
<td>8</td>
<td>5</td>
<td>13</td>
<td>13</td>
<td>13</td>
<td>52</td>
<td>1.5</td>
</tr>
<tr>
<td>Males</td>
<td>602</td>
<td>644</td>
<td>617</td>
<td>766</td>
<td>709</td>
<td>3338</td>
<td>98.5</td>
</tr>
<tr>
<td>Total</td>
<td>610</td>
<td>649</td>
<td>630</td>
<td>779</td>
<td>722</td>
<td>3390</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Apprentices (Enrollees)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Females</td>
<td>6</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>7</td>
<td>31</td>
<td>1.1</td>
</tr>
<tr>
<td>Males</td>
<td>548</td>
<td>475</td>
<td>467</td>
<td>559</td>
<td>634</td>
<td>2683</td>
<td>98.9</td>
</tr>
<tr>
<td>Total</td>
<td>554</td>
<td>480</td>
<td>473</td>
<td>566</td>
<td>641</td>
<td>2714</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Dropout</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Females</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>10</td>
<td>2.9</td>
</tr>
<tr>
<td>Males</td>
<td>66</td>
<td>63</td>
<td>55</td>
<td>94</td>
<td>57</td>
<td>335</td>
<td>97.1</td>
</tr>
<tr>
<td>Total</td>
<td>67</td>
<td>66</td>
<td>58</td>
<td>96</td>
<td>58</td>
<td>345</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Active (Not met hours to complete; includes temporary layoffs)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Females</td>
<td>5</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>6</td>
<td>19</td>
<td>0.9</td>
</tr>
<tr>
<td>Males</td>
<td>377</td>
<td>317</td>
<td>328</td>
<td>366</td>
<td>572</td>
<td>1938</td>
<td>99.1</td>
</tr>
<tr>
<td>Total</td>
<td>382</td>
<td>319</td>
<td>330</td>
<td>370</td>
<td>578</td>
<td>1957</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Completion (Journeyman)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Females</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>0.5</td>
</tr>
<tr>
<td>Males</td>
<td>105</td>
<td>95</td>
<td>84</td>
<td>99</td>
<td>27</td>
<td>410</td>
<td>99.5</td>
</tr>
<tr>
<td>Total</td>
<td>105</td>
<td>95</td>
<td>85</td>
<td>100</td>
<td>27</td>
<td>412</td>
<td>100.0</td>
</tr>
</tbody>
</table>
the required hours and passed certification exams was 412. Of the 412, two were females (0.5%) and 410 were males (99.5%).

Data Collection Process

The data were collected within one year. The data collection process consisted of scheduled interview appointments with selected participants, audio-recorded interview sessions, participant journals, electrician technician apprenticeship enrollment and completion forms, and documented journal entries from me. The data collection process was consistent with the approved Institutional Review Board (IRB) protocols. See Appendix K for a copy of the IRB approval.

Interview data collection procedures. Over the span of the research, a total of four interviews were conducted with each participant. Each interview averaged between 40 minutes to an hour. The fourth interview was intended to be a clarification and/or make up for missed sessions for the participants. There were no missed interview sessions for the participants, and all four met with me for the fourth time to discuss the themes in this study. All interview sessions were audio recorded on my laptop computer through an application software that was ordered online. I tested the audio recorder on the laptop computer and on the back-up phone recorder the day before each scheduled interview session. I utilized the phone as a back-up recorder in case the audio recorder on the computer malfunctioned. The audio recorder on the computer only malfunctioned during the pilot study, but I was able to utilize the phone recorder. However, the phone recorder was limited to 30 minutes or less, so that was not a good alternative. Subsequently, for each interview, I brought an additional computer that had longer audio recording capabilities as an additional back-up.
The audio-recorded interview sessions for one, two, and three were transcribed by a transcriptionist. After I listened to the audio recording to ensure usable quality, the audio recordings were sent to the transcriptionist. The transcription company returned the transcribed interview before the next scheduled interview appointment with each participant. Interview four was also processed in the same manner. I transcribed the participant journals and my researcher’s journal.

**Storage of data.** The data were stored in a secure, locked, and password-protected location. The participants’ transcribed interviews and journal entries were stored in a locked file area where I am the only person able to access the files. The electronic versions of the participants’ audio recordings, interview transcripts, and the transcribed journal entries were stored in a password-protected cloud folder. I was the only individual able to access the electronic versions. The data that were electronically stored on the cloud were backed up to ensure data quality was maintained. The back-up hard drive was password protected to ensure the security of the data.

**Ethics of care.** The possible ethical implications of this research included the sensitive topics that may have arisen during the interview sessions. Kirsch and Mortensen (1999) cautioned interviewers that participants may “divulge information against their better judgment . . . participants can easily reveal intimate details about their lives” (p. 29). This would tend to occur when there was a familiarity with me as the researcher. I took an ethics of care approach to sensitive information that might have been divulged during the interview sessions. The ethics of care approach relies on me to use moral judgment, empathy, receptiveness to the experience of the participants, and a
keen awareness of the relationship between me and participants (Edwards & Mauthner, 2002).

The approach of ethics of care relies on me to maintain confidentiality of the participants’ identities while, at the same time, being mindful of the power dynamics that may or may not occur during the research process. The power relationship may increase the participants’ perceptions that I may or may not take the information to only benefit my self-interest, but there is a mutual respect and benefit. I took care to be reflexive about my presumed level of power dynamics that might have developed over the course of this research. In addition, I gave extra attention to sensitive information that constituted a possible moral or ethical dilemma.

Part of ethics of care includes the protection of the participants. This study did not present apparent or immediate risk to the participants, but care was still taken to protect the participants’ identities and confidentiality. The following steps were taken to minimize the occurrence of unintended negative consequences:

1. Autonomy, privacy, and confidentiality were closely protected and maintained and ethical usage of participant data was maintained.

2. Interview sessions were conducted in a comfortable conversational format with a friendly approach to generate a relaxed atmosphere that allowed participants to freely and openly express their thoughts.

3. Pseudonyms were used to identify the participants, companies, and training sites that were discussed. This process was also used to de-identify specific locations of work site areas.
4. Requests were made to the participants to use pseudonyms for family members and other relatives. If names of family members and other relatives were shared during the interview, these names were assigned pseudonyms to protect the participant’s and their family member’s identities.

5. The audio recordings, interview transcripts, original journals, and all other documents will be stored in password protected electronic files and secured in locked filing cabinets for up to three years.

**Data Analysis**

It was important for me, during an inductive and deductive data analysis, to become keenly familiar with the data. In the deductive techniques, coding categories were used from existing theory and research. During the inductive process, the text and data provided new coding categories. According to Miles and Huberman (1994), when the data directly spoke to me, the inductive process helped me to provide a deeper understanding to establish new codes and concepts.

I applied the following inductive techniques to generate a deeper understanding of the data: (a) scheduled specific days and hours to read the transcripts, (b) carefully and thoroughly read each transcript to be absorbed and immersed in the data, (c) generated preliminary and initial codes at each reading of the data, (d) reviewed the themes within and across the data sets, (e) documented iterations of theme classification and identification themes, (f) produced a mini-analysis report, and (g) recorded reactions to the data in a journal (Braun & Clarke, 2006; Stake, 1995, 2006). Kvale (1996) indicated that multiple and continuous readings, analysis, and saturation of the data supported an inductive process for coding and themes to emerge. The scope and quantity of data were
overwhelming to review and manage. However, by implementing these steps, the data were manageable and I was able to allocate specific time to read, code, and categorize themes.

The data analysis was verified through a process of member check and peer review, which included recent doctoral graduates who had conducted qualitative research, and a qualitative researcher practitioner to enhance the validity of the data. Data analysis of multiple data sources was conducted to enhance the understanding of the participants experiences collected from: (a) participants’ interview responses, (b) participants journal entries, (c) quantitative enrollment and completion data, and (d) the researcher’s journal (Lincoln & Guba, 1985; Merriam, 2009; Strauss & Corbin, 1998).

**Software.** I utilized the NVivo qualitative software to assist with the initial coding of the data. The assistance of a software program aided the research by managing the large number of codes and category identifications that arose from the transcripts. In a large data set where the information from the interviews covered several pages, it became beneficial to allocate a portion of time to spend in locating patterns, themes, and meanings in the text of the data (Yin, 2008). The NVivo software provided the first set of coding for possible categories. See Appendix L for a copy of the NVivo line segment color coding.

However, the NVivo software did become a challenge during the middle of the data analysis. The challenge was navigating the additional menus and the memory capacity that existed on my laptop computer. NVivo software required a large amount of memory that ended up not being suitable for theme analysis. In addition, the software required work around steps to convert word documents to meet the software’s
compatibility to code. I was frustrated that there were additional steps to get the information from a Word document to be compatible with NVivo software to allow it to code the transcribed interview lines. The amount of time I spent in converting documents and making space available to store the data took time away from the actual in-depth data analysis of the transcripts.

Consequently, the final data analysis was conducted using Windows Word 9 to generate the themes and each version of the theme coding was saved on a Microsoft Word document. Berg (2007) did warn that the amount of time researchers planned in learning “how to use and enter data into the computer program” (p. 333) can become a deterrent and counterproductive in an attempt to save time. The time spent in learning the new version of NVivo took me away from the actual data analysis.

Within-case analysis. The first step for the data analysis was to conduct within-case coding analysis. I utilized an open coding process (Creswell, 2013) for my initial review of the transcripts from the four cases. I began to code the interview transcripts and found the information overwhelming and seemingly unmanageable. To help organize the large amount of data, I analyzed each single case first. Each single case transcript was reviewed individually line by line to establish the preliminary codes and categories. Memos were also used to mark additional notes for possible coding. The initial open coding process generated the inductive process for each case. The second review of the transcripts allowed the data to be drilled down further to ensure there were no other possible codes to categorize. The excerpts were color coded into categories that possibly answered the research questions. See Appendix M for a copy of the NVivo screen for first open coding of categories.
Cross-case analysis. Cross-case analysis (Stake, 1996, 2006; Yin, 2008) was then utilized to identify common themes and patterns across the four cases. The cross-case analysis was based on the frequency of themes between the cases. The category coding process structured the research questions with the coded excerpts from the participants' interview sessions. By this means, I was able to generate themes. A chart was created to capture the category code into the common themes through a deductive analytical process. The excerpts were put into the appropriate columns that corresponded to the categories. See Appendix N for a copy of the major themes review forms for categories codes.

Figure 3 displays the inductive analysis for category coding within a single case and deductive analysis for themes across the cases. The initial process I used for data analysis started with an inductive process (first center block) where each line of the interview transcripts was read and reviewed for possible meeting. As part of the inductive process of the individual cases or within each case, I began to take notes and memo possible codes (first oval). I used the NVivo software to initially record the initial codes. During this coding process, my thought process consisted of exploration of the possible meanings of the data (first cloud). Then I moved to the next process of putting the excerpts into categories (middle block). During this step, I clustered and collapsed similar segments together (middle cloud). The excerpts were then given to a panel of experts, with adult education and qualitative research, to review the categorized peer review group (middle oval). After the inductive process of the single case, I moved to the deductive (cross-case) process to generate themes (bottom square). My thought process for the deductive process included common themes and long-term employment (bottom cloud).
Figure 3. Data analysis process using inductive and deductive model. The indicative process for within-case analysis and deductive process for cross-case analysis.
The possible themes were discussed with the participants as a member check process (bottom oval).

**Trustworthiness of data.** Trustworthiness of the data findings includes validity and reliability. This section discusses the validity and reliability of the data. The validity asserts a form of credibility of the data to match the lived reality (Janesick, 1998; Merriam, 1998). The reliability of the data indicates dependability of the data where the findings or “results are consistent with the data collected” (Merriam, 1998, p. 206).

**Catalytic validity.** This research had unintended outcomes that transformed the participants’ awareness and installed action towards social change. According to Kincheloe and McLaren (2000), catalytic validity in qualitative research is

> The degree to which research moves those it studies to understand the world and the way it is shaped in order for them to transform it . . . the reality impact of the inquiry process, it will direct this impact so that those under study will gain self-understanding and self-direction. (p. 297)

The act of being a participant in this study increased the participants’ level of consciousness and knowledge. The essence of being part of a study brings a sense of awareness and, in feminist standpoint theory, the experience brings an awareness of their social relations (Hartsock, 1983). The four participants gained self-awareness by participating in the study. In addition, the study may have influenced the participants’ understanding of their reality to either take internal and/or external action of some type to inform themselves or others around them (Guba & Lincoln, 2005; Lather, 1986).

The female electrician technician participants had different levels of awareness during this research. Their awareness ranged from the individual to the external level. These levels initiated some type of action towards change in the perceptions of females in
the electrician technician occupation. Specific examples of those perceptions are discussed for each participant.

**Hattie and Martha.** Hattie and Martha showed catalytic validity with their action towards implementation of change. Hattie talked about the action she took to learn more about mentoring women in the electrician technician occupation.

Since I’ve seen you last, I went to a union international women’s convention and one of the workshops I went in on was building mentorship for [our union] and the state . . . to have seen women electricians in California and stuff and other stronger areas of the country, but I started talking mentorship with them and they were powerful. I mean, powerful. I was so energized by that women’s conference, it was amazing. . . . If we could get it [mentor program] set up down here, they [international union] will actually come and teach us how to mentor. . . . Powerful to me for the women strength and how a lot of them have adopted these mentorships already and been through the union international training to know the tools that are useful to bring back at the local union level. (Hattie, 1603-1616)

Hattie indicated that since our last interview she had taken steps towards starting a mentor program for female electrician technicians. At the conference, Hattie indicated there were many workshops, but she focused on the mentoring program workshops. The purpose of her attending the mentoring workshop was to learn more on how to start a formal mentor program for female electrician technicians.

Martha discussed her action of mentoring females to become electrician technicians. She had hired a female to be an electrician technician and tried to guide her. The first female she hired moved and Martha continued to hire more females to work as electricians in her business.

I did hire a second girl, but she was doing another job and then she just, she kind of bailed on me, so I need to find someone that. . . . Well actually no, she had come in and she wasn’t my one of first choices, but she had come in a second time. She was having some issues with her personal life and she needed a fresh start, so I thought I would help her out but then she just like, she was going to be more loyal to her second, her other job than here. (Martha, 887-889)
Even though this second female did not work out as an electrician technician, Martha still planned to hire female electrician technicians. Martha was working with the local career technical high school to be able to hire females from that high school’s pre-electrician technician program. Martha had not thought about a formal partnership with the local career high school as a direct access for future female electrician technicians to work in her electrician business.

**Anna and Margaret.** Anna and Margaret showed self-awareness at an individual level. Anna discussed what she learned about being part of the study with her father, sister, and two nieces. Anna has not taken clear action steps towards improvement for female electrician technicians, but her discussion of this study with her immediate family indicated a passing on of information that her father, sister, and nieces did not know. Margaret was no longer timid about her leadership role. She indicated that she requested to be the lead project supervisor. Prior to this study, Margaret had discussed not wanting to be in a supervisor or leadership role.

Even though, Anna and Margaret did not take action towards change like Hattie and Martha, they had their own shift at an individual level. The act of sharing the knowledge with others, like Anna did with her family, about the challenges female electrician technicians faced to be accepted exposed others to Anna’s understanding of the occupation from her standpoint. Anna would not be aware of the number of female electrician technicians in the state and region, if not for this study. Margaret was able to change her internal perspective about herself as a leader and accept the challenge of being a supervisor. She no longer waits for the role of project supervisor to be assigned to her, Margaret now asks to be lead project supervisor. Anna’s and Margaret’s
movements towards change may seem subtle catalytic validity, but the changes in Anna and Margaret were enough to signify an increase in self-awareness at the individual level.

**Researcher.** I contributed to my own catalytic validity. The research provided opportunities for me to educate and inform others about this research. Because of this study, I went to the state capital to meet with the State Apprenticeship Advisory Board and discussed my research. In addition, I presented my study to the local chapter of Women in Construction Association. At both of these meetings, people asked and invited me to attend other state and local conferences to discuss my study.

I became a resource for Hattie, Martha, Margaret, and Anna. I did not expect this kind of relationship with them. I am in the process of assisting Hattie with her plans to start a formal mentoring program at her union electrician technician apprenticeship program. Hattie also plans to join me at the next Women in Construction Association meeting to network with other females and to use it as a possible resource to recruit mentors for the program.

I gained personal insight from Margaret and Anna. For example, Margaret increased my knowledge about the book she discussed. I purchased the book, *Shop Class as Soul Craft: An Inquiry into the Value of Work*, a resource for me to understand how this book has influenced Margaret's value of working with her hands. The concept of work brought me back to my first readings of Terkel's book *Working*. Terkel’s book also looked at the value of work directly from the people who did worked as masons, receptionists, airline stewards, actors, and many other occupations. The book was my first introduction to the world of work and the concept of value in work. Those two books capture the humanistic values of work beyond the production for capitalistic gains.
However, both books were written by men and lacked the feminist viewpoint about work. Crawford made a disclaimer that his experience was from a male perspective, but he was sure that females would appreciate the goal of the book. Terkel’s book included females in the chapters, but they were females as receptionists and other caregiver roles.

Anna had helped me realize the importance of conversation with families, even when you think they are not listening. For example, I worked on my dissertation around my two daughters. Several times, they heard me discuss my dissertation title and topic with relatives, friends, and other people, but I did not think they were paying attention to those conversations. However, they were listening. My two daughters attended a camp and went on a fieldtrip to a computer security company. At the end of the day, at dinner, my youngest daughter stated that I would have liked the fieldtrip because they had two females who talked to the group about computers and how they needed more girls to work there, because it is a male-dominated job. She continued to describe why it was important to have females be computer scientists and why it was male-dominated. I was surprised that my daughter understood my dissertation topic; to see her understand the concept of a male-dominated occupation was completely unexpected.

Overall, all four females inspired me to see that my struggles and challenges were not as insurmountable compared to what they struggle with on a daily basis. Thus, their inspiration pushed me to complete this study, not only for my own self-interest, but also to get their stories out and expose the challenges Hattie, Martha, Margaret, and Anna experienced as female electrician technicians. My personal gain from them sharing their experiences enhanced me personally and professionally to confirm that this is the correct path for my career.
Catalytic validity emerged in all four females and in myself as the researcher. The catalyst for change was seen in Hattie and Martha in their push to make changes to support more females in the electrician technician occupation. Hattie’s goal was to start a mentoring program was made possible by being part of this study that generated her willingness to push the union to send her to the National Women in Electrician Conference. Prior to the study, Martha had one female employee who had quit and she had not thought about sending a female to the electrician technician apprenticeship. Now, Martha’s aim was to hire more than one female employee and to send them to the electrician technician apprenticeship program. To increase her employee pipeline for more female applicants to work in her electrician business, Martha recently partnered with the local career technical high school to have her business as an approved site for on-the-job training for female students.

Anna and Margaret showed their increased awareness. Anna made it a point to directly talk to her nieces about her occupation, even if it was not what they wanted to hear. Margaret originally avoided being in the forefront of the projects, but she asked to be the lead in key electrician technician contracts and projects. She no longer waited to be assigned to the lead electrician technician for the project showcased her abilities and allowed other female electrician technicians see that they could also be the lead in a contract project. These changes to the four female electrician technicians were possible because of their increased awareness about themselves and the occupation through their participation in this study.

**Member check.** The interviews were conducted in three sessions with the fourth session for the participants to review the themes. The interviews were transcribed
verbatim by an external transcription company and reviewed by me. The transcribed interviews were member checked by the participants. The participants were sent an email attachment of their transcripts for review. See Appendix O for a copy of the email notification for member check.

Member checking allowed the participants to “review the material for accuracy and palatability” (Stake, 1995, p. 115). The participants provided their signatures as proof of approval of the transcripts. See Appendix P for a sample email from participants indicating approval of member check. In addition, the participant journal entries were reviewed with each participant at the end of the third interview session as part of the member-check process.

The experiences and perspectives of the participants were expressed through their own voices, as I made a conscious effort to preserve their voices by means of direct quotes from the transcripts. These direct quotes are indicated through quotation marks around short quotes and blocks of text for long quotes. Brackets are used to assist the reader in understanding the participants’ voices. For example, if “he” or “she” is used, brackets are used to indicate to whom the “he” or “she” is referring. To enhance the understanding and avoid distraction to the reader, I choose to delete repeated words or minimalist words. Examples of deleted words are: “like,” “uh,” “hmm,” and “umm.” Any deletions of words are noted with ellipsis characters (…). Other than these exceptions, I consciously aimed to maintain the authenticity of the participant voices as they conveyed their perspectives and experiences.

**Peer review.** I conducted a peer review of the analysis of the themed categories. The peer review panel members were given documents with excerpts from the transcript
that supported the category themes. Peer review examinations provide reliability to the data analysis process (Gall, Gall, & Borg, 2007). The peer review group consisted of seven members. See Appendix Q for list of names of reviewers for data analysis.

The expert panel credentials consisted of qualitative research and adult education backgrounds. The role of the expert panel group was to review the drafted themes and the data analysis. The expert panel either agreed or provided other possible themes for the excerpts and provided comments and feedback to the overall data analysis.

Each reviewer was emailed my final version of the possible codes and categories. The peer and expert examination members were given different sections of the themed excerpts due to the amount of data for each research question to review. For example, the two doctoral candidates were given research question one themes to review. See Appendix R for a copy of instructions for the peer examination process.

The review group was given instructions and key codes for the theme category review process. See Appendix S for the key code category forms. Feedback and comments from the peer group were reviewed for agreement or alternative category suggestions. See Appendix T for an example of feedback from expert reviewer.

Figure 4 depicts the multiple sources of data that included the interviews, enrollment and completion data, participant journals, and researcher’s journal as the data were analyzed as part of this research. The perforated lines link the data from a multiple data points that connect the multiple sources of data together.

**Researcher’s background.** As a part of reflexivity, my background played a role in how I constructed the research (Hesse-Biber & Leavy, 2011). My background includes my cultural identity and research experiences. My cultural and ethnic identity and my
Figure 4. Multiple sources of data collection process model. This model is related to data from the interview sessions, participants’ journals, researcher’s journal, and quantitative data on enrollment and completion.
research and professional experiences were essential to understanding my critical self.

**Cultural and ethnic identity.** I am a first generation refugee from Laos. My parents and four younger siblings arrived in the rural eastern part of Connecticut in 1980. My siblings and I are citizens of the United States through Naturalization Citizenship process. My ethnicity is classified in the U.S. Census as Southeast Asian American. The culture I was raised in was a mixture of Laotian traditions and American traditions. My parents celebrated the major American holidays, but at the same time practiced Theravada Buddhism.

I am the first in my family to graduate from college, to complete a Master’s Degree in Business Administration, and the only one to obtain a doctoral degree. My mother had no formal education from Laos or the United States. My father’s education was from the Laos military as he fought to protect the neutrality of the country during the Vietnam War.

**Research and professional experiences.** My research experiences included being a graduate research assistant for federally funded programs. As a doctoral student and graduate research assistant, I learned to be part of: research protocol development, interviewing participants, locating relevant literature, and coordinating the grant-submissions process. In addition, as part of my doctoral course work and preparation for this study, I took the following research courses: Statistics I and II, Research Method Design, and Qualitative Research I and II. My professional experiences consisted of conference presentations, membership in professional organizations, and assisting with publications. The research and professional experiences provided my preliminary knowledge and a level of understanding needed to conduct this research.
Summary

This chapter described the research methods that were utilized in conducting this study. The overview of the research design discussed the participant criteria and type of sampling approach. The data collection section described the interview process, participant journals, quantitative data, and researcher’s reflexivity. The discussion of data analysis consisted of coding within and across cases, member checks, and peer and expert review. The subsequent section describes the verification of the study and how the data were addressed through their multiple sources.
Chapter 4

Findings

The purpose of this study was to understand the reasons the four female participants decided to pursue electrician technician training, their perspectives of the apprenticeship program, their perceptions of successful employment in a male-dominated occupation, and differences in treatment based on their gender. This chapter presents group and individual narrative profiles of the participants. The group profile gives the general descriptive profile of the group. The individual narrative profile examines the participant’s individual responses related to the research questions. In addition, the themes identified from the interviews are discussed as well as the participant follow-up interviews, the researchers reflexivity, and a summary.

Profile of the Participants

The four female electrician technicians in this study were from Florida’s electrician technician apprenticeship program. Three completed their electrician technician apprenticeships sponsored by an electrician’s union and one completed her apprenticeship sponsored by an electrical company. The median age of these four females was 47 years. Two of the four females had a high school diploma, one dropped out of high school and returned as an adult to get her high school diploma and one of the female participants completed a four-year college degree in Education. Of the four females, one was in the fourth-year of her electrician technician apprenticeship training
and the others were journey-level electrician technicians. All four females were employed as electrician technicians within the same region.

Three of the participants were in a relationship and one was not. One participant was married, one had a boyfriend, and one was divorced. All four lived near or less than 15 miles from their primary place of employment. Three of the four participants had to take an entrance aptitude test and participate in a committee interview process. All four female electrician technicians self-identified with the White/Caucasian racial group.

The income of the participants ranged from $45-56 thousand annually, but their incomes were higher when overtime was included. One of the participants was an electrician service business owner and decided not to provide the revenue of her business or her salary from the business.

**Individual Profiles**

The individual profile of each of the participants described their experiences as an individual case. In this section, I first discussed the pseudonym selection process. Next, the introduction of the individual participants was expressed by a statement from one of the participant’s interview sessions. The introductory statement from the participant’s represented their perspectives that pinpointed to their overall experiences as a female electrician technician. After the introductory statement, descriptions of the participant’s general backgrounds followed the reported statement. Then, a summary of the interview sessions was provided and was followed by a description of the individual participants’ demeanors. The individual profiles concluded with a synopsis of the participants’ responses to their decisions to enter the electrician technician occupation. At the end of
each individual profile, a figure illustrates the participant’s responses and links to the research questions.

**Name selection.** To ensure anonymity of each of the female participants, the names of the participants were de-identified. Initially each participant selected their first name as their pseudonym, but later their pseudonyms were changed. I initiated the ethics of care approach and took the responsibility of selecting their pseudonyms to ensure full anonymity. My reason not to allow the participants to use their first names was because the participants were the only females in the class and at their worksites. The possibility that the participants were identifiable still existed because of this single factor; therefore, it was necessary that the participants’ names be changed.

The initial process the research took to select the participants’ pseudonyms was based on one of the participant’s statements, an analogy of a female electrician technician as a rare bird. The names of rare birds were searched and analyzed for significance and similarity to the participants. The rare bird names were abandoned because the female electrician technician participants’ were not heading towards extinction or dying off like the rare birds.

I finalized the participants’ pseudonym selection by searching through the National Women’s History Museum (NWHM) website. The website provided profiles of women pioneers for every type of industry. I reviewed each of the profiles of the women pioneers on NWHM’s website. The participants’ pseudonyms were selected based on the similarity to one of the women pioneers on NWHM’s website and to the participants’ backgrounds. The selection of the last names for the participants were based on a word
from their statements, used to introduce the participants. See Appendix U for the full profile from the NWHM.

In addition, selected statements used in their profiles were scrubbed and pseudonyms given to specific places, companies, and people mentioned. All selected statements in their profiles included the line number locations from the full interview transcripts. The process to ensure anonymity through a careful process of selecting the participants’ names was in accordance to my ethics of care approach for the four females.

**Case one: Hattie Alpha**

The quote that described Hattie was:

You’ve got alpha males. I'm kind of an alpha female. Sometimes you have to be strong on a job because they do take kindness for weakness. I’m never not kind but you do have to show a certain strength or men on the project will run over you. It’s just a testosterone thing. (Hattie, 583-586)

**General background description.** Hattie has long blond hair that went down to her torso. She had blue eyes. Hattie had considered herself average height and was content with her hair tied up for work, but her hair was down when she was at home. Hattie was walking with a slight limp at the time of the study and discussed her upcoming knee operation.

Hattie was 52 years old, married, and had no children. She has been married for over 20 years. She considered her three dogs her children. At all three interview sessions, Hattie would take care of her three dogs first. She volunteered for her local union during her spare time. Her husband also worked as an electrician technician, but for a different company.
Hattie started the electrician technician apprenticeship in 2000 and was a journey-level electrician technician for the past 10 years. She worked for the same company for the past 10 years. Hattie worked in a local facility plant with several larger buildings. It was her responsibility to maintain and update electrical instruments. Her role as journey-level foreman was to supervise a team of two to three other journey-level electrician technicians and one to two electrician technician apprentices.

**Interview sessions.** All three interview sessions were conducted at Hattie’s place of residence and after work at 5:30pm. Hattie’s house was situated across from a patch of farmland that generates a dusty mist around her property. Her house was on the land owned by her father-in-law, who lived next door.

The interview started with the setup of the audio recording devices and followed by the IRB consent process. Hattie asked general questions about the purpose of the research. She was content with the explanation of the process of the research and the goal of the study.

Hattie indicated that she was nervous during the first interview session. She indicated that, “I’m kind of a little nervous now, kind of rambling around the place” (Hattie, 132). Towards the end of the first interview session, Hattie was less nervous and open to the interview discussion.

During first interview, she showed her house and the recently completed furnished screened-in porch. Hattie indicated that her screened-in porch was her relaxation area. By the second and third interview, Hattie felt comfortable and was less nervous about what she had to say and do. For example, on our second interview session, Hattie did not wear the standard company designated gray shirt and dark tan trousers. She
changed from her work clothes to a floral printed house dress. This showed that Hattie was comfortable with me. The interviews at Hattie’s house also made it possible for her to talk to me openly about her experiences.

**Hattie’s response to research question one.** Hattie reported that the reason she was an electrician technician was because of her husband. Her husband was an electrician technician and had a family history of other electrician technicians, with her brother-in-law in the trade and her father-in-law was a retired electrician technician. Hattie’s husband encouraged her to enter the electrician technician occupation even though she had never thought about the possibility.

My husband went through the apprenticeship program. He had a brother go in before him. He had an uncle that went through the apprenticeship program. So it’s like some of the family members had already been through that same apprenticeship. (Hattie, 88-91)

The topic of being an electrician technician was introduced by her husband. Hattie was exposed to the electrician technician occupation through her husband and his family. The electrician technician occupation was familiar, but what was not familiar to Hattie was hearing about females in an electrician technician occupation.

He brought it up, would you be interested in starting or becoming an apprentice in our program, and that’s how the idea, after being with him for 12 years, even came to light because, I never thought of it before, ever. I couldn’t even listen to him tell about the trade. I told him it scared me too much. Because being an electrician can be dangerous work. So when he brought it up to me, I was real nervous about making that decision. (Hattie, 18-24)

Hattie stated, over the 12 years of their marriage, he never considered talking to her about becoming an electrician technician until he saw other females go through the electrician technician apprenticeship program. Even when her husband discussed the
option with Hattie, she was hesitant to be an electrician technician because of the scary stories her husband told her about the dangers of being an electrician technician.

The other reason why Hattie decided to give the electrician technician occupation a chance was because her job was not sufficient for her retirement needs. Hattie had worked for a pizza chain for over eight years and gave that up for an occupation that would provide her retirement benefits.

We travelled at first, so I got jobs at restaurants. I started working at a Pizza Depot [pseudonym] . . . we travelled to other states and there’s Pizza Depots everywhere. I worked at a Pizza Depot for eight and a half years, was going to start my own store, and I got to the age where I needed something that was going to give me a retirement. (Hattie, 10-13)

Hattie’s age was a reason she decided to apply to the electrician technician apprenticeship program. The electrician technician occupation seemed to be a better option than staying in the restaurant service industry.

At first I took a pay cut to start, but knowing after so many [years], a certain amount of time and then once you became that journeyman status, it was the pay. With being a union, we have a negotiated wage package as well. That $4,400 I make a month is just what I make dollar amount. I actually get free family coverage put in on my benefit and I get vacation pay and I get pensions. I get a local pension with my dues payment. I get a national pension or an international pension. I actually get three pensions for working through my local union. (Hattie, 26-33)

Hattie indicated that the retirement pensions was a reason for her to take an initial pay cut. The thought of retirement pensions seem to provide Hattie a sense of security.

The process of the decision, he [husband] brought it up, “have you ever thought about joining the apprenticeship program?” I knew how tough it would be because it is a male-dominated career, it’s a trade. But I’ve always worked physical work and I’ve always been good with tools. I used to work in a warehouse pulling orders. I’ve always done a, quote-unquote, man’s job anyway so that part, the physical aspect of it, didn’t scare me. It was the actual scholastic part, the academic part that I was concerned on whether I would do well in or not. (Hattie, 65-71)
Hattie was comfortable in working the electrician technician environment, but the educational aspect was a concern. She seemed familiar with the physical aspect of the electrician technician occupation. Hattie seemed less comfortable about the academic aspect of the electrician technician apprenticeship program.

To even start the apprenticeship program you’ve got to take what they call an aptitude test and I failed the initial aptitude test, and the only way that they actually waved that test that year is because they didn’t have enough apprentices to start the program. I had to consider dedicating my time to go to school, start doing homework. I hadn’t been to school in 20 years when I made this decision to go through the apprenticeship program because I was already in my mind . . . I was already like 37 years old. So it was a life changing decision, but I felt at the time I didn’t have nothing to lose and everything to gain. I went through a pre-math course before I even got accepted into the program at the apprenticeship hall. When they threw that workbook at me and told me to add and subtract fractions, I’m really freaked, hadn’t had any dealings with math, [and] was not really my strong suit in school, I didn’t think. You don’t know how much math would [be needed], but when I went through that course and I started learning, it was like a sponge. I enjoyed it. (Hattie, 34-47)

Hattie made the life-changing decision to go ahead to become an electrician technician and persevere to overcome her fear of the academic requirements. Even though Hattie failed the entrance aptitude test for the electrician technician apprenticeship program, she pushed through the math requirements and discovered her enjoyment for learning.

**Hattie’s response to research question two.** Hattie had several notable learning experiences during her electrician technician apprenticeship training. Her experiences inside the classroom and at the worksite were ways that helped her develop her electrician technician skills and knowledge.

I started actually working what they call indentured--that’s when they just put you on the job. I worked on the job for probably two months before I went through my interview and then from the interview I think school started not long after that . . . I probably went to work in June because I actually started school in August, so that sounds more like it. I went to work in June and it was August before the first class actually started. (Hattie, 58-64)
Hattie worked as an indentured electrician technician before she was accepted as an electrician technician apprentice. As an indentured electrician technician, Hattie’s job was to shadow a journey-level electrician technician and learn through observations. Hattie was accepted as an electrician technician apprentice after her interview with the electrician technician apprenticeship committee members.

Hattie described her initial worksite education and training experiences in terms of a helper. Hattie stated the following:

I’ll just tell you when I first started--I went on the job site and I told the foreman in charge that this is my very first day, “I know absolutely nothing,” and he said, “that’s fine, we’ll teach you.” One thing good about our apprenticeship program is we get on-the-job training, so I got a chance to be on the job and they put you in, a young apprentice like me, in the tool room and that way you get an opportunity to learn the tools. You’re more of a helper. You clean the coolers. It takes you a while to earn your way up to even start doing any electrical work because you’re just a helper. . . . I was the only one in the tool room. The only one in the tool room, but they would let me go out into the field too, carrying their tools and every now and then I’d have to help them. (Hattie, 88-101)

Hattie’s first encounter with her assigned journey-level electrician technician, was to let him know that she knew nothing about being an electrician technician and he was there to teach her. Her training started with being a helper with the tools and sometimes helping the journey-level electrician technician.

Hattie’s experiences with her journey-level electrician technician was also part of her education and skills development.

You would get just one journeyman that you would work with so you could learn their behaviors and be able to be more productive with them, or you get popped around with different ones and it’s hard to foresee what they need, especially when you’re just in the industry. You don’t know the names of the material or the tools and you’re just being aware to be safe while you’re out there on the job. (Hattie, 128-132)
Going through the apprenticeship program, you work with journeymen who went through the same program. They encourage you. You can throw questions at them, ask them, I don’t understand this, and they’ll actually even talk to you about it, try to help you understand it. (Hattie, 170-174)

Well when you’re working around a lot of journeymen on the job most of them have come up through the apprenticeship program anyway so they’ll start throwing questions at you to see what you’re learning in school and then they’ll actually go out there and show you this is what this is, this is what an electrical box looks like when you’re finished with it and you learned that in school you’re able to bring it back to the jobsite. Your journeyman is going to quiz you on them all the time just to see how well you’re doing, just to make sure you’re doing your school work so the hands on practical application and the workbook they do coincide with each other. (Hattie, 258-267)

I went to him [journeyman] a lot and you know there were some times he told that was part of the lessons I never could get and I’d laugh at him, “What do you mean, how can you be any help?” but everybody has their strengths and weaknesses and sometimes I would come to him with some things that he couldn’t grasp. (Hattie, 324-328)

When Hattie’s journey-level supervisor was not able to explain a process to her, she would ask her husband, “I would come to him [journey-level supervisor] with some things that he couldn’t grasp, but being I did have an electrician [husband] live in the household with me it was very helpful in my studies.” (Hattie, 328-329)

In addition to learning and developing her skills with journey-level electrician technicians, Hattie’s education was also from her peers. One peer was a female electrician technician apprentice who was a year ahead of Hattie.

A lot of times being she was ahead of me in the class and we weren’t on the same job site I could call her for advice on certain things, but, yes, she was always available. All I had to do was call her and say I’m having a problem with this particular problem; help me to see it so that I can understand it because of again a lot of this is if you can’t see it in your head it was hard to put in application. (Hattie, 387-392)

Well one thing too is, again, an apprenticeship program, based on the way we have it formatted, is a lot of it is self-learned . . . and people helping you, I’d say
50%, maybe even more of our learning is talking to the men on the job. (Hattie, 545-549).

The other worksite experiences Hattie had that helped with her skills development were with the direct tasks that were assigned to her.

That’s why I stayed in and I got fortunate I got with a contractor who did a lot of what we call panel building and that’s where I learned control. It’s kind of like putting a puzzle together off the print with all of these electrical devices and you put them in a box but then when you get that box in the field and you’re actually making the wiring from what that little control thing in the box actually works out in the field that’s when the light bulbs start going off and that’s where you’re on the job. (Hattie, 503-509)

I got fortunate to where I was on the job to do a lot of controls. It goes from plain wiring, to receptacles, to DC theory, to AC theory, [and] then you calculate up to what they call inductive reactors capacities. Then you have motor controls. You had instrumentation. They teach you about fire alarms. They have a lot of books that they teach motors. How a motor hooks up and what is involved in that motor to make it work electrically. And for a woman, I never knew the internals of a motor, so sometimes it was hard for me to understand that motor makeup. . . well I’m learning it in school, but then you get right out there into the field and a motor goes bad you’ve got to find out what’s wrong with the motor. (Hattie, 282-292)

In the classroom, Hattie expressed the electrician technician apprenticeship education was helpful because of the instructor.

So my teachers worked with me and I’d tell them, I don’t understand this part, and they would turn around and actually teach it to me and sometimes they would even stay longer than their time to make sure that I understood it. (Hattie, 179-181)

Some apprentices brainstorm, you know get together and have a study group, or like I did I went to the teacher an awful lot as well. (Hattie, 315-316)

Hattie’s experiences with the education and training in the electrician technician apprenticeship program consisted of classroom and worksite. In the classroom, the instructors and peers provided support, but she indicated that some of her education was self-directed.
It is a self-taught program, but we do have instructors that help us learn the program. I say self-taught because you do have to do the homework and everything like that. It’s not like they [instructors] stand up there and teach it to you and go over the curriculum and help you understand it. (Hattie, 878-882)

In the classroom instruction, the textbook and hands-on assignments were another process where Hattie developed her electrician technician knowledge.

You had to read the material, write down the answers in the workbooks because some of them sections had 50 to 75 questions per lesson and you would get a homework assignment just like you do in any other course and sometimes it was very hard to stay focused to learn the actual academic part of it. (Hattie, 304-308)

You can learn what they call a stop/start station and in the school they have it like a peg style that you put the little probes in pegs to simulate what you would be doing if you were actually wiring it in the field and then you get your little lights to come and then in the field you have to go and actually put one together in actual application and you’re like “oh,” and you might not understand it on the pegboard but when you’ve got it in your hand you’re like “oh, well it’s easier than I thought.” It was because this wire goes here and goes out the other side . . . oh, I got it. (Hattie, 270-277)

Hattie stated her education and training in the electrician technician apprenticeship consisted of a variety of ways to learn her skills and knowledge. Overall, Hattie emphasized that the training and education was important.

I went through [the apprenticeship program [and] I did the state competency test. So, I’m registered as a journeyman electrician in the state of Florida and to get to that goal, they always said they could never take that away from you even if you’re struggling with it [apprenticeship]. (Hattie, 409-412)

Hattie described her apprenticeship education and training as the “dedication, required in my studies was intense. It was hard juggling a job, home life and school work. But, the satisfaction of completion is the best.” (Hattie, Journal Entry #4)

**Hattie’s response to research question three.** Hattie discussed her success as a female electrician technician and her role as a journey-level electrician technician supervisor.
Because, obviously sometimes when you’re on a job, now when you become [an] apprentice and all of the sudden you're a journeyman, you're competing—not necessarily competing, but you're on the jobsites with people who could have up to 40 years of experience. And boom, all of the sudden you've got to be just as smart and just as productive as they are on the construction site of this industry to stay successful. And obviously in construction when the job is over, sometimes they have layoffs. I just happen to be with a contractor who when our job was slow, they would find other places within the company to put me because they know, no matter where they put me, I'm going to give them a good day for eight hours pay. (Hattie, 1195 -1104)

I'm just fortunate to be with a contractor that has jobs in multiple locations, and again, at the plant that I'm working with, that they’re able to continue to get little jobs. I don't have to prove my worth with every job I'm on. Which means you would have to always start at the lowest and work your way up. (Hattie, 1224-1228)

Contracted electrician technician jobs are with companies who have projects that require several electrician technicians. The companies will go to the union to hire electrician technicians. The type of contract will vary in duration and location. Hattie expressed that having a contractor who has multiple jobs and locations allowed her to stay employed and not be part of any layoffs when the economy was slow. Hattie felt having the same contractor allowed her to maintain her status and not have to start over at a lower level and prove her value.

Hattie valued the electrician technician occupation because of its need in society to function.

When that computer company goes out of business, somebody is still going to need their lights on, they're still going to need plumbing in their houses, they're still going to need the high power lines, they're still going to need tradesmen. (Hattie, 1277-1278)

Hattie indicated that lights and electrical power are important to business operations and her electrician technician skills are needed.
Hattie discussed her advancement in the electrician technician workforce and her role as a journey-level electrician technician.

I have been, with each contractor that I've ever been to, going in as a journeyman electrician or journeyman wireman . . . completion in what they call a journeyman like manner, has always led me into having foreman positions, which is what I'm in right now. I run a crew of 10 people, at the moment, at one of Most-New Water's [facilities] [pseudonym], which is a phosphate facility. I have all the responsibilities of ordering the material, doing the timesheets, knowing what the job dollar amount is, making sure I bring in jobs, with the man hours, and material being purchased on that job or being spent on that job under the job dollar amount. So, not only can I make my contractor profitable, which makes him [the contractor] obviously be able to go and bid more jobs. So just from working too much with my tools, to actually get into the actual management part of the industry . . . I'm actually doing a general foreman's position. (Hattie, 656-671)

The foreman position advanced Hattie's role and gave her responsibilities to manage the completion of the project. Once Hattie completed her apprenticeship training and achieved journey-level electrician technician status, she was able to become a foreman at the worksites.

It was not just the advancement at work, but also the advancement to go beyond the electrician technician occupation.

If you wanted to go to college, for an electrical engineer, you can acquire credits from your apprenticeship program to get you there. But it’s an on-going process. They have so many individualized parts of electricity in the electrical program to advance your technology training that I have gone through and learned. I got my competency card from the Lake Pond County (pseudonym) which is recognized state-wide as a journeyman electrician . . . I didn’t have to have it to graduate, but I went and got it. I’ve actually taken further education in what they call instrumentation and I’m on the national register for being an instrument tech. I’ve learned what they call motor controls, which is what keeps me working. (Hattie, 184-194)

Hattie took additional courses to get certified in other specialties as an electrician technician. Her additional certification in instrumentation and motor controls allowed Hattie to advance in her knowledge and skills development as an electrician technician.
Hattie also stated, “A person like me, who is holding office, who gets to bring home a company truck every night . . . earned through the confidence of the contractor, being out there working in a foreman capacity” (Hattie, 996-998). For Hattie, the advancement in her occupation was shown through the usage of the company truck. Hattie indicated that it was not just confidence from her contractor, but a level of trust that was built over time.

And that's where that trust level runs too. The main supervisor I've ever had, he's actually an electrical engineer, [and] he knows my skills. So he was the one, he is really high up into the actual company, so he was the one that directed, "Okay, you need to use her for these jobs". . . . The direct project manager, I work for right now, picked me personally to do his jobs. You know what, he [project manager] never really actually seen me work. He just knew of my skills. (Hattie, 792-798)

Hattie also explained her satisfaction and enjoyment about her growth as an electrician technician and her opportunities for advancement.

So it’s the challenge for me because I don’t get stagnant in my mental thinking . . . I learn something new every day, even today. I’ve only been in the trade, this year will be 14 years, but I already run a crew and in the economic downturn I was one of the ones that never lost a job. It’s a whole attitude of putting in the time into doing what we call a journeyman’s job and it’s a non-ending, growing experience and that’s what I love about it because I learn and by learning . . . the [electrician] industry can grow from being just a regular working with your tools. You can be an estimator. You can go into so many facets of the business that the possibilities are endless and that’s what I love about the industry. (Hattie, 220-229)

It is a self-learn program and a woman’s got to decide, I can speak for myself, have to decide is it easier to do a lesser job, probably, but is it as fulfilling, and I find fulfillment in what I do every day and especially when the men on the job respect you as an electrician, not that they don’t respect me as a woman, but when you’ve grown in the industry and they actually respect you as an electrician it fills you with such gratitude and in confidence in knowing that you made the right choice for your life. You stuck with it, it was hard most definitely. You take more tests and you want to take toward the end of it you’re like if I got to take one more test I’m going to scream, but they always said it would be worth it in the end and it is and it is a self-applied. You obviously got to keep applying yourself. (Hattie, 552-566)
Hattie indicated that she feels fulfillment in being an electrician technician because of the occupation and indicated it was hard work with all the tests, but it was worth it at the end. Hattie enjoyed her learning and to be able to advance several times over the 14 years as an electrician technician.

In terms of the outlook for current and future female electrician technicians, Hattie had the following advice for current and future female electrician technicians.

It wasn’t that I would discourage them, but what I do is I sit them down and I give them the real skinny [and say] “Listen, this is hard. It can be backbreaking work. The school is very intensive. You have to be dedicated the school. The work is very intensive and it's physical labor." Now, we do train them to work smart, not hard, asking them to pay attention. But once you get that, if they're still interested, then you let them know all the benefits. But for a woman, you have to let them know first that the benefits are totally just self-gratifying because once you make that commitment . . . because the education you get through that apprenticeship program you cannot beat. I mean, the union apprenticeship program is one of the most top notch apprenticeship programs in the country. And with that being said, after that fact, you can take this industry anywhere you want to go. (Hattie, 842-854)

A lot of them [jobs are] very physical jobs, and I had a couple of them [jobs]. If you’re willing to work though, and you go in there as a woman, show them your desire that you don’t have to be “toted” by a man. We know that nobody can pick up 150 pounds by their selves but don’t go “well I can’t do that it'll break my nails.” You have to take the girl factor out of it. If you prove that you’re a good worker, these guys will work well with you. (Hattie, 358-362)

Hattie indicated here that current and future female electrician technicians need to gain their respect of their male peers to show that females are able to do their own work.

**Hattie’s response to research question four.** Hattie provided several examples to show how she was treated as a female electrician technician.

I did have to work with one contractor who was keeping me working which I was thankful for but I was already a fourth-year apprentice. They [journey-level supervisors] had me cleaning out their shop and moving furniture and doing nothing but a material person . . . that one frustrated me. Because I was getting no electrical experience, so I did have to make a stand and ask them, “what is your
plans for my future with your company?” And this particular contractor flat told me, “I see you as my warehouse supervisor.” Well, I didn’t go through the apprenticeship program to be a warehouse supervisor. I think he didn’t want to train a woman. So I told him I said, “Okay well that’s not what my desire is,” and fortunately with our program we can go back to our apprenticeship hall and he [supervisor] will find us another job, but I didn’t have to go that far. I had a talk with him and I told him I said, “You all are stunting my education, my on-the-job-training, so I would like to be put on a job to where I could learn something and if you can’t do that for me, I want you to give me a layoff and lay me off this job so I can get with somebody who will teach me.” (Hattie, 340-352)

Hattie had to respond to her supervisor’s beliefs of having her be a warehouse supervisor instead of an electrician technician. She was willing to be put on the layoff list to be able to learn from another journey-level electrician technician. Hattie was vocal about her needs and expectations about what she wanted to learn, even though her supervisor stereotyped her as a female and assigned her to work in the warehouse.

You know what, they turned around and respected me differently that way. Because I just let it roll over for so long, they thought I was fine with it. But when I told them I was not happy with the lack of experience that I was getting, electrical experience, they turned around and got a new respect for me and did start putting me on jobs so a woman does have to stand her ground like that. You can’t get involved with somebody who doesn’t see the same future as you do and that’s when you just have to be bold and stern and step up for yourself, this is not what I came into this program for; I want to be an electrician, not a warehouse supervisor. (Hattie, 364-372)

Hattie description of how males treated female electrician technicians in terms of being the weaker gender.

I’ve always worked in a male-dominated jobs anyway. I’ve worked in a warehouse pulling orders and stuff like that, so I’ve always had that experience on how a man thinks on the job site. They [males] see a woman, especially if she’s a pretty woman, and if you show them that any sign of weakness some of them like to expand on that but, that’s when you have to be tough. You’ve got to put on that tough skin and tell them I’m here for my job, I’m not here for your amusement and step up, and I think that’s harder. For a man, [he] just goes through it. I’m not saying it’s not hard for him but, not only does a woman have to go through it [different treatment] but, she also has to let him know that she can do the job and
she’s not going to take all of it [treatment] and it can fall right in the line of almost harassment sometimes, if somebody allows that. (Hattie, 588-598)

I did have some incidences where I was on a job . . . I had just got with a contractor and I said, “Listen, I don’t know this task. You need to tell me what my next step is until I learn what we’re doing and then I’ll be one of the best workers you have.” So after a few days, I guess he got comfortable thinking that I was just okay. So I said, “Well what’s my next task going to be? What do I do next?” He looked at me and he said, “What I really want you to do is be in the kitchen cooking me lunch.” And I said, “Excuse me? But I don’t let my husband talk to me like that. You’re not going to.” So in the construction industry, you still have that construction mentality sometimes, and a woman has to be strong enough to let them know I’m not going to accept that type of behavior. (Hattie, 600-610)

Hattie had to be vocal and confront behaviors that stereotyped her as being weak and not be in the kitchen, instead of being an electrician technician. She indicated that dealing with the stereotypes from males requires internal strength to deal with the unpleasant male behaviors.

Hattie attempts to understand and explain why the males treat her differently.

I work with these men, [who] spend so much time away from home. They’re [males] trying to make a living for themselves and so human nature takes over sometimes. You have to be real careful. A woman has to be real careful sometimes on how friendly she is with people because, they [males] can get the wrong opinion. So a woman always, in my opinion, I always have to keep myself on that professional level while I’m on my job. That way they [males] look at me as a professional and they don’t let any weirdness come into play on it. (Hattie, 613-619)

Last year, a learning curve between each other [supervisor]. And the learning curves failed sometimes . . . [because] men not being used to a woman, even though he wanted me to do his jobs. Every now and then he would treat me like a woman instead of another man or instead of another worker or another journeyman. It would be kind of like if he was talking to his wife. And I would have to remind him that I’m an electrician. I’m not just another woman he gets to boss around. You know, and he would step back and he would go, “You know, I did come across that way. I’m sorry.” So that working relationship is no different than any relationship. Whether it’s two men working together or a man and a woman working together. (Hattie, 800-810)
Hattie experienced the different treatment by the male co-worker and supervisor, but she focused on the professional so that the gender difference was not the main focus.

Hattie’s discussion of the outlook of recruitment of more females to the electrician technician occupation is described in the following interview transcript excerpts.

That’s a struggle because we’re raised as girls to somehow follow a certain career path line. Okay, you go into nursing, you go into childcare, in a restaurant. Of course, I went to school a long time ago and I don’t have children. So I don’t know how they do it in the schools these days. But, it is hard and society wants girls to play with dolls and guys to play with cars. So that being said, it’s hard for a girl to know the mechanics. And to be an electrician you have to have a very mechanical mind as well. Okay, so sometimes it’s a tomboy that and the girls sometimes have to have that kind of tomboy attitude. That they [females] don’t want to do the typical female job or female career. Because you do have to get your hands dirty and it is hard work and you sweat. (Hattie, 823-833)

It’s hard to recruit a girl or another woman. When they get on the jobsite they’re overwhelmed because they see how vast it is . . . if they [males] happen to have the regular mentality of, “I’m going to push her to the limit, she’ll either make it or she won’t.” And that happens, unfortunately it does. It happens a lot. I just talked to a girl at this last banquet. They did that to her on her last job. They told her she would never amount to anything, and they gave her a layoff. And I told her flat out, “Let the naysayers be naysayers.” (Hattie, 857-864)

Hattie’s experience of different treatment because of being a female electrician technician was reflected in her statements. She had heard about other female electrician technicians experiencing gender stereotyping from male electrician technicians.

Hattie also experienced gender stereotyping from not only her male co-workers and supervisors, but from others. She reported the following experiences regarding her interaction with a contracted vendor.

I was on a jobsite and we were about to commission this particular technical piece of equipment and I had done all of the prior electrical application and we were just ready for the vendor to come and commission the piece of equipment. And obviously he was a man and my boss told me, "Okay, he’s at the gate, you have to escort him on the property, and then he’s going to be the one that’s commissioning the piece of equipment." So I says, "Okay." So I go and get him. I says, "Are you
so and so?" He says, "Yes." I said, "Well, I'm going to take you to the area where
the piece of equipment is at and we're ready to commission." I get him into the
area and he gets all set up and then he stands there. Well, I just stand there. I
don't know what he's waiting on. About 10 minutes later, he looked at me and he
said, "Well, when's my electrician going to show up?" And I said, "Well, sir, I am
your electrician." And he turned all kinds of shades of red. He said, "Well, I
apologize." He said, "But I've never been introduced to a woman electrician
before." So it still happens and it's amazing when they say, 'Oh, okay.'" (Hattie,
1043-1057)

That's how mainstream society starts learning that a woman can. You see it still
on a more regular basis than you really think you do. That men will come up and
say, "I hear you're an electrician." "Yes, I am." "I've never met one, what is your
name?" You know, they want to know about it because that's not in the normal
mainstream. And it is gratifying when you can be that steppingstone for another
mentality in knowing that, yes, a woman can do this industry. They can use it for
support. (Hattie, 1063-1069)

It's very important for a woman to have within the apprenticeship program--the
foundation starts in the apprenticeship program. That a woman can come on that
job and no matter what task they were given that she worked at it, she did it in a
professional manner, even though she was learning she always asked the right
questions, she was always enthusiastic, she never sat around, she was always up,
what can I do, what else can I learn. (Hattie, 1106-1111)

First of all though, you've got to install that confidence in them. It's like anything. If
you walk in the door and show a sign of weakness; not talking about knowledge,
but a sign of weakness. If you walk in and you look scared to be there, that's
gonna come across. That's gonna come across. I would even see it. If a man
walked on my jobsite right now and he just kind of drags his feet when he walks
and he kind of looks around, don't want to look you in the eye, well then, I'm not
going to have the same confidence level in him as I'm going to have in the next
man who comes up to me, shakes my hand, "What have you got today, I'm ready
to go to work." So the woman has to have that same type of attitude. (Hattie,
1117-1126)

A woman has to go out there and prove herself on a daily basis that she's worth
giving that job and she's worth--even though she's got that journeyman title, a
woman still has a harder time going out there and proving that she can do the job.
But once she goes out there and does it, and the management says, "You know
what, that girl comes out here on this job--most women are detail oriented too. So
when we do something, we do it thoroughly. And when that relationship is
established with the contractors, then women hold a job. (Hattie, 1147-1153)
I have in my career men on the job and supervisors that still hold on to the mentally that a woman does not need to be in this industry. Old mind sets like this are very hard to break. So they would put you on a job that would be difficult to see if you’d fail. It made me more determined to prove that I had the knowledge and skill to do the same job as the other electrician. I have had to find someone else in management and let them know that if they did not want to help me advance that I would be willing to be given a lay-off of work so I could go to another contractor. That seems to show them how dedicated I was and help me propel forward. (Hattie, Journal Entry #3)

There were many experiences that Hattie provided during our interview sessions. Hattie’s responses to the interview questions afforded an understanding of her experiences as a female electrician technician. The inductive analysis process was used to segment statements that responded to each of the research questions. Figure 5 provided an outline of Hattie’s experiences and these experiences linked to the research questions.

**Case two: Anna Tightrope**

A statement that explained Anna’s experiences were:

> You don’t want to outshine them [the men] but you also don’t want to short yourself. If it’s in your ability to do better, do better. I’m sorry that they don’t do as well as you do . . . [It’s] like walking a tightrope. (Anna, 385-387)

**General background description.** Anna had medium length brown hair, but it was always tied-up in a ponytail. Anna was 37, single, had no children, had never been married, and was the youngest of four children. She lived with her older sister and niece in a home owned by their father. Anna likes to cook and read in her spare time. She went to a technical college to become a chef, but burned-out from working to support her full-time education. She often cooked for her classmates and enjoyed the cooking process. Reading was Anna’s other passion and she reported reading as much and often as she could. These two things are her primary outlets.
Figure 5. Single case data analysis of Hattie’s responses linked to the research questions.
**Interview sessions.** The initial meeting was at a conference room at one of the other participant’s office. The second and third meetings were at the electrician technician training facility building. One was in an empty classroom of the electrician technician training facility and the other was in the director’s conference room.

During the interview sessions, Anna was very open about her experience of being an electrician technician. She knew that she wanted to continue after her first year. She received the highest grade in her group and was one of the top students to pass the year-end exams. Anna has taken every opportunity to improve her skills. She received permission to sign up for a course that was normally reserved for a fifth-year apprentice. During the time of the interview, Anna was taking an extra class in addition to her normal electrician technician classes for her designated year. Anna also achieved all the required certificates (instrumentation, safety, mining, and industrial) before her completion of the program.

**Anna’s response to research question one.** For Anna, the electrician technician occupation was never what she wanted to do. Her father was an electrician technician for over 35 years and he had always wanted one of his children to follow him and become an electrician technician.

My dad was a union electrician for 35 years, and he tried to get me to go into the program right out of high school, and it just wasn’t something that interested me, and so I did a little bit of college, went out in the work field, and I just had to work enough not-so-good jobs to realize how great of an opportunity it would be. (Anna, 1-4)

I knew my brother had gone to like a summer apprenticeship where they go out and work for the summer to see if they like it. And I never wanted to do that. I always wanted to go to the Girl Scout camp instead of working for the summer. (Anna, 1004-1007)
Depending on what he [my dad] worked on. I know he worked at water reclamation plants. Basically where they take sewer water and they clean it up before they can release it. And he’d come home pretty dirty and pretty stinky. And I was like, "I don’t want to do that. I don’t want to come home smelling like that. I don’t want to work in that environment all day." (Anna, 949-953)

Anna indicated she did not consider the electrician technician occupation even when her father discussed it with her. She was not initially interested in the electrician technician occupation at all. In addition, seeing her father coming home dirty and stinky discouraged Anna from immediately applying to the electrician technician apprenticeship program.

You don’t hear little kids, when they’re growing up, “I want to be an electrician when I grow up.” [It’s] either, “I want to be fireman, I want to be a policeman.” They’re more well-known. A lot of people don’t think about how much electricity affects them until the lights go out. . . . If my dad hadn’t been an electrician and he did some other type of work, I probably wouldn’t have thought about it at all . . . I probably wouldn’t have thought about it back then, except he brought it up. I mean, you take a lot of stuff for granted when you’re younger. And I think this is one of the things I took for granted. (Anna, 1164-1171)

The point when Anna decided to enter the electrician technician apprenticeship program was when she recalled her father pushing her to become an electrician technician.

He [her father] said he knew women that had children, that were single parents and working in this trade. Women who were married, and their husbands didn’t work in a trade. That they did office work or retail work, or something totally different. And I thought that was kind of cool because it kind of gave me the idea that women can come from all different backgrounds and still work in the trade. (Anna, 860-867)

Being out in the workforce for a while had put the electrician technician occupation in a different light and she thought that the electrician technician occupation was the best option for her. Anna had enrolled in some courses at a technical college in Indianapolis to appease her parents who pushed her to continue her education immediately after high school. During her one year at the technical college, she worked two full-time jobs and three supplemental part-time jobs to support her college education.
I’d been working in retail for 10 years on the night shift, and I just . . . I got tired of it, and I tried to think of what some of my options would be to get out of that, and I remembered that he had tried to push me for that, and I was like, that doesn’t sound like such a bad idea now. (Anna, 10-13)

Anna ended up working in the retail industry in the night shift for over 10 years. Anna got tired of working in the retail industry and living pay check to pay check. She started looking for better options for a new career.

When I got out of high school, Mom and Dad pushed me to go for college, further my education, and I just didn’t want to. I had just completed high school, I didn’t want to sit through any more schooling, and I ended up working two full-time jobs, going to school full time, and three part-time jobs, and I burnt out after a year of trying to get through a TC State College [pseudonym], and I just went out into the workforce and starting doing menial jobs, and finally I’d had enough, and I was like, what can I do that’s not going to have me living paycheck to paycheck? (Anna, 77-83)

Anna indicated that it was a short conversation with her father when she finally decided to apply to the electrician technician apprenticeship program. She said that “it was never like a full-length conversation. It was, ‘You know, you can always do this! It’s not a bad job. You make good money” (Anna, 1001-1002). Anna started seeing the difference in her pay, “I made $2 more an hour. That’s, probably, about a $100 a paycheck difference” (Anna, 1025-1026).

Anna’s reasons that led her to apply for the electrician technician apprenticeship were encouragement from her father and her dissatisfaction with her ability to earn a living wage. These two primary reasons made Anna consider the electrician technician occupation.

Anna’s reasons that led her to apply for the electrician technician apprenticeship were encouragement from her father and her dissatisfaction with her ability to earn a living wage. These two primary reasons made Anna consider the electrician technician occupation.

Anna’s response to research question two. Anna’s experiences in her education and training development to be an electrician technician included worksite tasks, classroom instruction, textbook materials, and learning from others.
In the classroom instruction, Anna’s education and training depended on the instructor and her interactions with her classmates.

Once we started our regular classes in first year, I actually brought . . . several of us thought that starting a study group would help us, and so I said, I’m available on this day. If you have any trouble, come see me. I’ll help you. It’s not a problem. And I think now they depend on that, for some of the explanations outside class, to be able to complete their homework. (Anna, 112-116)

Our instructor has time outside in the field (area). We’ll ask him questions. We’ll tell him stuff that we’ve seen, stuff that we don’t understand, and he’ll explain it all out in ways that we understand and we learn that way. (Anna, 184-186)

The teachers help by telling us, “We haven’t covered semi-conductors, that was taken out of the core curriculum for the school but it’s still on the craft certification test.” So they told us, hey, “This is going to be in there. . . . We’ll help you out with the ones that we haven’t covered.” Because teachers know what they’ve taught us and what they haven’t. But, they pretty much say, “What are the things that we’ve gone over this year? What areas of study have we covered?” That’s what you need to go back and look at and make sure you know it. (Anna, 298-304)

In addition to the instructor, Anna relied on the textbook and workbook materials as part of her understanding of the knowledge needed for the electrician technician certification.

They [instructors] have a really good set of textbooks and workbooks and they give us the lessons that they want us to study. We do the workbook questions and we go over them in class the next week. If there’s anything during the class, because obviously it’s a six-hour class, you go over three or four workbook chapters. (Anna, 180-183)

Anna’s textbook materials were part of the classroom curriculum for the electrician technician program. The curriculum was designed to provide as much information needed to prepare for end-of-year exams as well as the industry certification test.

They [instructors] set out tests, that they have core curriculum that you have to pass, and through the year, say if it’s on blueprint reading, we’ll have a test over that core curriculum for blueprints, and then we’ll go to the next chapter of study, which might be AC theory, and then we would have a test on AC theory. At the end of the year, they used to have finals and they’ve cut that out. They go to craft
certification now. So that at the end of our apprenticeship we will receive a card that says we are craft certified as electricians, and the craft certification, again, you have to get 70% of the entire test, and all the questions are based on what you should know as a third-year apprentice, so that’s the one I just took. First-year apprentices, what should a first-year apprentice know, and they put together a test of 100 questions and you have to get at least 70% to pass it. (Anna, 286-297)

Anna explained the process and the different types of exams for each year that the apprentices had to complete to be able to move on to the next year. In addition, to the written portion, there were also hands-on projects that Anna had to complete as part of her classroom assignments.

The boot camp was mostly hands on, they were actually giving us hand-benders, having us bend the conduit, doing some of the math equations to get the right bends; what we would be seeing out in the field, and then when we actually started class, that was more on electrical theory and electrical background, history, things like that. (Anna, 118-121)

To complete the apprenticeship, we’ll have hands-on tests. They’ll [instructors] tell you this is what it should look like. They already have the boxes pre-set, so you have to go and take your measurements, bend it correctly, and have it in there just right so that it’s plumb and level and looks good and is functional, in a certain amount of time. (Anna, 347-351)

Some of the conduit bending, when you take your measurements and you’re positive it’s going to turn out right and you go and bend the pipe, and it’s two inches short, and I’m like, “What did I forget? There was a step I must have missed.” (Anna, 360-363)

When Anna was at the worksite, her education and training was through the direction of journey-level male electrician technicians.

If I don’t know, I ask the journeyman. He’s always there to double-check our work because we are apprentices so we can make mistakes and he will just double-check everything before he okay’s it and then we move on to the next step of the project. (Anna, 194-196)

It’s been very good. I think I’ve been very fortunate in the jobs that I’ve been sent to. I have been paired pretty much one-to-one with a journeyman which is great because you can learn from that one journeyman. If you’re handed to several journeymen, then you’re pretty much just running to help them get all their projects
done. If you have several apprentices put with one journeyman, you don’t quite get the same amount of time, personal time I guess to learn from them. And to develop your skills. (Anna, 228-233)

If you feel overwhelmed or you feel like you can’t do something, you just need to tell them [journeyman], “I’m not sure I can do this”, and they tell you, “yes, you can, this is how I want you to do it.” They’ll break it down into steps for you, a little easier to chew. (Anna, 243-246)

Anna had good experiences with her assigned journey-level electrician technicians. She goes to them to understand how to complete a task. Anna indicated that she was fortunate to have had journeymen who were willing to teach her one-on-one. She expressed that the one-on-one is not always the norm since there may be situations of many apprentices and one journeyman.

The other process that Anna was educated and trained in the electrician technician field, was specifically in the type of assigned work tasks.

Right now, we’re working on building a stacker reclamer. What that does is, when they bring the ships in full of coal, they run in on conveyor belts, it goes up onto the stacker and then actually spews it out and makes big piles of it. Then when the plant is ready for more coal, it’s got a big bucket wheel on one end and it goes and it scoops the coal up, runs it down on conveyers and into the plant to be burned. (Anna, 142-146)

Running one of the man lifts. A man lift is basically four wheels, it’s got a turning radius body, it’s got a boom arm and a basket that you can put people in, a maximum of two people or you can take that by yourself. I’ve been trained on it to use it now and like all day yesterday I was in it by myself. (Anna, 256-259)

Some of the pipe runs, some of the layouts, it was . . . again, depending on how they want it, from this breaker over here to this box, I knew that I had to put little offsets in them and turns here, and they had to be attached so many feet, and that knowledge just came up. It’s like, okay, I’ve got to remember to put a strap in here and a strap in here, and I need these parts so I can go get all of my equipment right now and have it over here and I don’t have to make trips to the supply trailer. It’s some days it goes really quick and it’s like, wow, I did a great job today, and there are other days it’s like, man, I feel like nothing went right, I couldn’t find half the stuff I needed. (Anna, 423-430)
But the first job I worked on was at a hospital. It was a commercial job site, so they had a cafeteria. You’re working in air conditioning. You’ve got to get up into the ceiling where there’s insulation, but overall it was a pretty nice place to work. And then, they ran out of hours to give me, so I got rotated to another company, and that was on an industrial site at a coal-fired power plant, and right now I’m working out in the middle of a coal field. It’s dirty, it’s gritty, in the winter it’s cold, in the summer you get the sun blazing down, the heat reflecting back off the coal; it’s not nice. But, I like being outside so it balances out. Both of them had good points. Both of them had bad points. (Anna, 516-524)

I prefer to do that [tasks] because I feel like I’ve accomplished something. I don’t feel like I’m just standing around watching, watching, watching, watching. Wow, do we have five more hours till the end of the day? Still watching. To actually get your hands on it and do the work, you feel good, you feel like you’ve accomplished something, you’ve gotten it done, and you can go back later and be like, that panel right there—I did that. (Anna, 452-457)

Understanding the types of tasks at the worksite allowed Anna to see how things worked and operated. Knowledge of these different tasks helped Anna connect the concepts from the classroom and apply them at the worksite. She also pointed out that the conditions that she has worked in can be physically demanding on the body and that for her to like being outside was a positive attribute to being an electrician technician.

The different types of worksite tasks that Anna received depended on the journey-level electrician technician to trust her and willing to give her the task for the first time.

I was working at a hospital, and we were putting together an electrical room that had seven transformers and 12 panels on the wall, and he’s [journeyman] like, “You know how to terminate a panel, right?” I’m like, “Yes, you follow the path of the wire. They’re all labeled on the end so you know where they’re supposed to go, strip the wire head off, put them in there, tighten it down, wiggle a little, tighten it down some more so it’s really torqued on there.” And he goes, “Okay, why don’t you do this panel while I do this one.” He goes, “I’ll check you when you’re done.” I’m like, “Okay, cool.” This was something I hadn’t really done before. I’d seen it done, I understood the concept of it, but I hadn’t actually gotten the hands on part of it, and I took off, I completed the panel. I think I got done before he did. And he looked it back over and he was like, “Looks good to me, you’ve got them all in the right spots.” (Anna, 447-457)
The task that Anna described provided an avenue to connect the foundational classroom information and see how the actual concepts were actually used in real-time work situations.

I’d ran a bead with the welder. My pimp stepped up, a pimp is the person that helps the welder, gets everything prepared for him at the ground down, ready to go. So that way the welder can just step up and weld, and he had been the welder and he’s like, “Hey, you’re taking the welding class. Why don’t you try a few?” I’m like, “Okay.” So we traded job positions and he stepped up to chip the slag away from it, and whoever’s not working is supposed to be watching, and we were working on a handrail and the handrail’s got this industrial paint on it, that when it burns smells hideous, and I kept smelling something burning. I’m like, “Joe [pseudonym], is it still on fire? Is the paint burning? Because I smell something burning. I don’t see any flames.” He’s like, “No, I don’t see anything.” I’m like, “I smell something burning.” And by the time I looked down—it had been a really cold day so I had four or five layers on. I’m like, “Oh, I’m on fire!” And he turned around and he goes, “Put it out! Oh, my gosh!” So I patted it out. And he started laughing. He goes, “Man, if I’d thought about it, I would have grabbed the fire extinguisher and dumped it on you.” I’m like, “I’m glad you didn’t.” I was in second year. Or, no, I was in third year.” (Anna, 594-604)

In this task, Anna experienced the concept of welding and being safe. Her learning at the worksite has some safety risk and the welding task brought that to Anna’s attention.

From that fire welding task, for a few weeks, her classmates had nicked named her “girl on fire.”

Overall, Anna felt that her education and training in the apprenticeship was worth it. She did wish that she had started when her father told her to. But, at that time Anna did not think she was good enough for the electrician technician occupation.

But, I think that going through the apprenticeship is an excellent way to learn the trade, because it combines classwork with on-the-job training. You can sit in a classroom and they can explain something to you. Until you get your hands on it, you won’t understand it. I know there are some journeymen out there that say, “Oh, that classwork stuff! You’ll never use that in the field.” But, you still need it for the journeyman test to top out [complete the program]. But yeah, I think this has been an excellent experience. I’m really glad I finally did it. And like I said, I know my dad tried to get me to go through this right out of high school, and I didn’t want
to have anything to do with it. I wish I had known a little better back then and started this earlier, but I don’t think I was a good candidate for doing trade work. (Anna, 927-944)

I also get to work with my hands, complete jobs and have the satisfaction of accomplishing them, meet new people, see new places, and no one can ever take away the skills I’ve learned. I look forward to the rest of the journey. (Anna, Journal Entry #4)

**Anna’s response to research question three.** Anna viewed her success as an electrician technician from her father’s accomplishments and her own perspective compared to prior job experiences.

I know my dad when he retired, fiber optics had just started. And now everybody has wireless in their homes, and it’s a big deal. He knows absolutely nothing about that part of electrical work. I think I mentioned it in the journal. I know I’ll know more than he does when I leave this, than he knew when he retired. It kind of, it makes you kind of wonder what new technology’s going to come out that you’re going to learn. You don’t know what you’re going to run into. And you just have to take every opportunity, again, to learn. That’s one of the reasons that I attend the union meetings, is to find out when new classes are starting. Even if you’re done with the apprenticeship and you’ve topped out, they still offer journeyman level classes that you can go in and learn about the new technology. (Anna, 902-913)

Having seen what her father was able to do as an electrician technician made Anna feel that her opportunities would increase over time because of the technology advancements in electrician technician occupations. It is no longer an occupation limited to electricity for lights, but for other electrical wiring, such as cable wires for internet capabilities.

Anna also viewed her advancement as positive compared to other options for occupational growth.

It’d be the same as going to college, but you’re earning money while you learn. I mean, you’re still going out and you’re working the jobs and learning as you work. You get those pay increases as you go. And when you top out [complete], you’re there! I mean, it’s not like, “Here’s your diploma, good luck finding a job.” It’s, “Here’s your top, here’s your card, and you passed the final test. Go put your
name on the books [hire list]. You'll have a job soon." You know, what other career automatically gets you in line to get a job? Not many. (Anna, 1177-1183)

For Anna the prospect of getting employment immediately after she completed her apprenticeship was a plus. She did not have to go out searching for work, the program had her name on a list to work and companies request the apprenticeship union program to send them electrician technicians for projects.

In the discussion of the outlook for current and future female electrician technicians, Anna indicated that, “All in all I think it’s been a very good experience. It’s not for everybody, I understand that” (Anna, 241). Anna talked about her work to her niece and sister.

My other niece. I don’t get to see her as often because she lives further away. But she’s not a physically strong person at all. She’s had a lot of health issues, and so I wouldn’t even recommend something like going into a trade for her. . . . When I tell her all the different things. . . . I’ve always had physical jobs. I have never had a sit-behind-a-desk and work-on-a-computer kind of job. And when she hears about those, I think it encourages her more to get her education and degrees now. She doesn’t want to have to work physical jobs for her life. (Anna, 739-745).

She’s [sister] a computer programmer. So she does the, sit-behind-a-desk and work-on-a-computer all-day jobs, which I know are mentally fatiguing. So I know she’s tired when she comes home. I might not have as much thought into my work. Obviously, you always have to be very safety conscious on a construction site, but mine is more physically demanding, so when I come home I’m like physically tired. (Anna, 776-780)

Well, you just have an idea in your mind. “I don’t want to be a construction worker. I don’t want to go out and get dirty and work with all these disgusting guys,” you know? It’s not like that. It’s really not. You go out there, you make friends with people. Yeah, it can be a dirty environment that you work in, and it can smell bad; you get coal dust flying through the air at the power plant. But all in all, it’s really not that bad. (Anna, 946-951)

As for how to get more females to electrician technician occupation, Anna viewed it as not for everyone because of the physical nature of the occupation.
I know being right out of high school, I wouldn’t have just been like, “Oh yeah, there’s a female electrician. I want to do that.” If I had known the person, then like, “Okay, I know this person. I know what they can do. I know we can both do this.” I would try it then. But just to see some random female working as an electrician, that wouldn’t have inspired me to go and work. (Anna, 1141-1145)

It’s not everybody’s cup of tea. Not everybody wants to go stand out in the blazing sun, you know, jeans, at least four-inch sleeve T-shirts, and a hard hat. Not everybody wants to do that. Not everybody can do that. So, if there was a way to let them experience the work—that would help. (Anna, 1202-1206)

Anna indicated that an ideal female candidate for the electrician technician occupation would be:

Somebody that can take the heat and the cold, working outside, working in and sometimes you work in an enclosed space. Sometimes you work in chemical plants, where there are chemicals in the air and you have to wear respirators. You want people that can follow the safety rules and not do dangerous things on the job site. That’ll get you thrown off a job site. You've obviously got to be able to do math, because you do kinds of measurements and pipe bending, wire pulling. (Anna, 1208-1212)

**Anna’s response to research question four.** Anna indicated that her experiences as a female electrician technician was due to lack of males working with females on the worksite and in the classroom. Anna had the following experiences of that indicated different treatment based on her gender.

I’m nervous about change, so I know when the day comes that they say, hey, we don’t have any work for you here, we’re going to send you out to this site, it’s anxiety. Who am I going to work with? Am I going to get along with them? Am I going to have that tension of, “Oh, I don’t want a female on my job”. . . . Some guys expect to give you special privileges, like, “You just stand there and look pretty. You don’t have to do any work.” It was another apprentice [who said that]. He was being silly . . . I told him. I said, “that’s not in my skill set to just stand here and look pretty.” He started laughing. (Anna, 493-500)

I bring baked goods in all the time for them [male peers] because they like it. Some of them will call me Mama Bear. They’re like, you look after us. I’m like, don’t call me Mama Bear. I’m an older apprentice and so some of the younger guys, they’re like . . . you’re almost at the age . . . it’s like, I could be your mom. Don’t call me Mama Bear. (Anna, 643-646)
There has maybe been a few that had reservations about having a women on the jobsite, but you have to kind of expect that. And by working hard and trying your best it’s easy to win those few over. I do, on occasion, work with guys that think I have to be treated differently, for example, have doors held open or need heavier materials picked up or moved for me . . . I just have to show them that that behavior isn’t needed or wanted. I can open my own door and prep my own work. If I do need help, I don’t hesitate to ask, but mostly, I can keep up with the guys. (Anna, Journal Entry #2)

For Anna, the different treatment was subtle and was laughed off as the guys being silly in calling her, “Mama Bear” and feeling the need to carry her materials for her. However, Anna felt that there really should be no division based on gender, but admitted that it exists. She states:

You know, you’ve just got to be part of the crowd. It’s not guys and girls. When you think about it, you’re all workers, you’re all apprentices, and you’re all journeymen. It shouldn’t be divided men and women, even though it is. (Anna, 1192-1193).

To provide Anna’s experiences, Figure 6 illustrates Anna’s responses to the interview questions and linked to the research questions for this study.

Case three: Margaret Better

The excerpt that described Margaret’s experiences were:

You’re better than they are, you do it better, [and] you make it look better. They [the men] want to hate you, but they can’t. That’s very difficult to do. You’ve got to kind of get around that—you’ve got to be better than them [men], but you still have to work with them so you have to be careful as far as the male ego thing. But you can do it. (Margaret, 1415-1421)

General background description. Margaret has very blond, pixie-style short haircut that emphasized her stark cheek bones and other physical features. Margaret was 52 years old during the time of this study and was a recent graduate of the union electrician technician apprenticeship program. She had a boyfriend of two years and had
Figure 6. Single case data analysis of Anna’s responses linked to the research questions.
no children. Margaret was the top student in her apprenticeship cohort. She was nominated for top apprentice by her classmates and was given an electrician technician tool set. She considered that recognition an honor and enjoyed that her other fellow colleagues were recognized as well.

Margaret worked as a general electrician technician for a commercial electrical company that received contracts from other commercial companies such as banks, supermarkets, and hospitals. Margaret had worked for the same commercial electrical company since she entered the electrician technician apprenticeship program six years ago.

**Interview session.** It was a challenge to connect with Margaret to schedule our first initial meeting. The initial interview meetings took two weeks for a confirmed time and location. The reason why Margaret had taken a long to set up a meeting was due to her worksite being located outside the city where the company was based. The commercial electrical company she worked for has electrical contracts over three major counties in the state.

At any point in time, Margaret could be required to travel over an hour or more to work on an electrical job. She was also recently assigned as a supervisor by her supervisor. She was in charge of the projects and had to be at the worksites early in the morning. Margaret was concerned about not having to travel to meet her at her worksite, but at a reasonable location, which was close to her home.

The interviews with Margaret were initially stale in the sense that her responses contained a tone of caution, but during the third interview the discussions were more
conversational and she gave less guarded responses. The first interviews were in a quiet area further from the main entrance of the hotel lobby. The second and third interviews were conducted at a quiet section of the hotel’s restaurant.

Margaret chose the hotel lobby area to meet for our interviews, because it was next to the building where she was installing electrical wiring. The electrical company she was working for had to install the new electrical components for the remodeled floor plans for a large financial building. Margaret was intrigued by the purpose of the research study and excited to provide her experience as an electrician technician.

**Margaret’s response to research question one.** Margaret’s reasons that led to her decision to enter the electrician technician apprenticeship was the need to work with her hands in a tangible occupation. She wanted to work in an occupation that would bring her gratification in her work.

Margaret had worked in the family pool service business for a long time. She completed her Bachelor’s degree in Education while working for her family’s business. Margaret made an occupational change when her father died and her mother decided to sell the family swimming pool business.

Before that I graduated with a Bachelor of Science in Education and I never used that because I went to work with my parents in their business, which was a swimming pool business. They had a store, they did retail, so I’ve always been around like swimming pools, pumps, and motors. So when we sold our business, then I thought I was going to retire at age 48. I got bored after about like a month. So I started just looking around for what I might want to do. So I was hired on with PM Yachts [pseudonym]. I didn’t know an 18 gauge wire from a 30 cable, but they trained me and I learned. (Margaret, 18-27)

Due to the sale of the family business, Margaret could have stopped working and retired at the age of 48. Margaret tried retiring for a month and a half before she decided
to seek employment. She did not want to go back to the pool business or build on her 
Bachelors of Education degree. Instead, Margaret wanted a career that would be 
personally satisfying for her and something constructive that involved her building 
something that would utilize her current knowledge and allow her to work with her hands. 

I like building things, I like yachts. What can I do that will be more suitable? . . . 
I've always worked my whole life. I didn't want to stop working. I wanted to learn 
something that I could make a living. . . . I had everything, I had my house, 
everything. I was pretty much going to retire and then that just wasn't for me. I got 
bored so I wanted something more interesting. That was the challenging part, to 
find what I could do with my hands because it's just that I like doing that. At the 
end of the day, at the end of business, my work is there, it speaks for itself, and I 
like that. (Margaret, 24-41) 

I had a knack for wiring, so I wanted to get something that was going to be that, if I 
wanted to really consider it as a career. . . . I was going to have to get something 
more common . . . that you could make a living at it instead of building yachts . . . 
when the economy shifted in 2009, that was time, I was already in my second 
career but, I was like “hmm, I like this [electrician].” So I wanted to learn more 
about it.” (Margaret, 11-16) 

Margaret started searching for occupations online for similar work to yacht 
building. She found the electrician technician apprenticeship information during her 
internet search. 

I got online, just started checking out some different stuff and I was curious. And 
I'd never done that [electrical] before. So I was just kind of seeing whether I even 
wanted to go back to school. I mean, that's another thing I was thinking about, you 
know, so I just started looking at possibilities for like a career to be tangible. . . . I 
was looking for something specifically in the area and that's just when it hit, when I 
met Jim [pseudonym] at the electrician office. . . . It's local . . . it was like wow. So 
that was it. I was really just curious about what was out there. I mean, I was still 
working as a yacht builder, but I wanted to see what other possibilities, did I want 
to go back to school, did I want to totally do something different, and then that's 
when I realized why go rebuild the ark, just go with what I have, my skill set, and it 
just seemed like a natural timing. (Margaret, 377-389) 

I was kind of weighing whether I wanted to go that direction or not. I just thought 
being an electrician or learning more about electricity was more specific and could 
be more like the lighting. I saw a future for it, regardless of the downturn with the
I could see that with energy efficiency, already the changing in the light bulbs. I saw, what I thought, was going to be a pretty good thing, to get into for practicality, for employment, and for the interest because I like it. (Margaret, 55-61)

Margaret had explored her options of the different occupations that were similar to her interests that she had developed from working in the yacht industry. She concluded that the electrician technician apprenticeship was the best choice for her. The electrician technician occupation gave her a sense work stability and she added:

It seemed to be a more attractive field as far as right now. If you look in the paper there are ads for electricians so when people are not working, you know, a skill set like electrical or electrician, you’re going to be working because there’s a demand for it, especially whether construction’s up and down with renovations or like build outs, you know you still have to have the power thing and it seemed like, when I started doing the research, that seemed to be more of a less exotic field, more mainstream, electrician versus a marine electrician. (Margaret, 371-377)

Margaret subsequently discovered that she would be employed in a yacht building company. She worked in the yacht building industry for about six years and loved the process seeing the final result of the projects. In addition, Margaret had exposure to different types of electrical wiring and cable building work that were components of yacht construction. Margaret indicated that, “I really enjoy working with my hands and the task at hand like building a yacht or you’re wiring a building or you’re hooking up computers, you know, it’s just I like the process of that” (Margaret, 75-77).

Margaret’s decision to become an electrician technician was during the economic downturn and the yacht business was slowing down. She saw this as a sign to look for a more stable occupation that would provide work regardless of the swing in the economy.

It seemed like the electrical part to me . . . , but the future for power, like with the grid in the entire United States, that was something, when I started to do research, that seemed to be a little bit more interesting because it had the possibilities for some growth and new stuff like cleaning up the electrical stuff, improving electrical systems, and all that kind of stuff tied into it. (Margaret, 363-369)
After researching several job occupations, Margaret decided on an electrician technician apprenticeship program. Overall, Margaret reported the appeal of the electrician technician apprenticeship program was the combination of cognitive learning in the classroom, hands-on learning approach, and paid employment.

This allowed me a hands-on approach, still get the textbook, which I liked, you know I think that keeps your brain in a habit when you get to be old so, I enjoyed that but I wanted something practical and I could do that, I could still work. (Margaret, 50-53)

I just found it way too appealing. You can go to school, we pay for your books, we get you a job, you work as an apprentice, and it was like to me, it was totally beneficial. I was like wait, I can learn a new trade. I can learn something new, I don’t have to quit a job to go back to school to do it; I can do it all. I can go to school and work and learn something new. It was like okay, sign me up. (Margaret, 1122-1127)

Margaret’s reasons that led her to decide to enter the electrician technician apprenticeship stemmed from her prior work experience and an occupation that was stable regardless of the shift in the economy. She summarized her motivation to be an electrician technician:

My motivation wasn’t like “oh yeah, I’m going to join the union and make a lot of money or drive a company truck.” Those weren’t my motivations. It was learning the trade and knowing what goes into that. That’s what’s most important to me. To know that I have learned something and it can benefit the company and I can be of benefit to them. Then I can just keep learning and growing. (Margaret, 1323-1335)

**Margaret’s response to research question two.** Margaret’s experiences as an electrician technician apprenticeship included classroom and worksite projects. The nature of Margaret’s training and development of her electrician technician apprenticeship included classroom education, practical experience at the worksite, and interactions with peers and journey-level electrician technicians.
The textbooks. Sometimes they didn’t get it or they didn’t understand it so I just did it. Sometimes some of the other guys would. It worked out. So it wasn’t always 100%, but I usually had 90% of it so it was a collective effort. Probably for the textbook aspect of it, but then again, when we were in the lab, maybe they would help me with something like how to do a certain bend or whatever so I think it was a mutually beneficial thing. (Margaret, 517-522)

I did it mostly myself. When we got to motor controls, I got a little bit of input from a couple of the journeymen just out of curiosity and a couple of the other guys in the class, but yeah, everything. I mean, there was plenty of resources there if you wanted to learn. (Margaret, 633-636)

Margaret’s education and training consisted of learning from her tasks at the worksites with the journey-level electrician technicians and her peers.

The foreman basically took me on a ladder and just told me I had to drill a hole up high. Then they have this box drill that’s like 45 pounds, get up high on the ladder, drill a straight hole. They’re just seeing if I could do it, how I was going to react to it, whatever. And, of course, I did it and then he said, “Cool. If you did that, great.” Then he took me outside. We had a trench, just nothing but mud coming in and digging it out. We had to have access holes coming into the building, so I had that same box, drill down in the mud to drill holes in the side of the building, to allow us to come in and put a trough down near the side. (Margaret, 392-400).

[Journeyman said] “You had a hard hat on and safety glasses, just drill the hallway down, put all the MCs in,” and then they let me tie it into the main electrical room. Then after that we went up on the third floor and they taught us how to do conduit bending in a production sense because you want to get it done in a certain timeframe. So it wasn’t just like take your time and do it. It was like knock it out. So, just all different parts of that building, putting it together, points of entry into the building, how you’re going to access it, your runs for your circuits and then actual roughing in, putting in the boxes, doing the setups and all that stuff. So that was typical then, but we did all kinds of stuff, wire pulls, terminations, just anything . . . it was very broad and there really wasn’t a set day—every day was like this [different]. Fortunately for me, it was fast paced and moving and doing a lot of different things. (Margaret, 409-420)

Another example was the windiest day I can ever recall on a Monday. One of the more difficult foremen. . . . We had to go up and change out a light pole. I’d never done that before and I’d never been in this type of a lift before. But, it was him and me and I was like well, “I’m either going to do this or I’m not,” and he just flat out said, “I’m going to show you how to do the first one and you’re going to do the rest.” So that was it. By lunchtime, I was very comfortable with doing it. But initially, first of all I had to get comfortable with the lift. The ballast was heavy. It
was a very heavy metal halide light and just getting myself positioned so that I could do it. I mean, obviously he had confidence that I could, but the issue was, was I going to do it and how would I feel about doing it. Well, once I got comfortable with it, then I did them all just like he said. (Margaret, 429-439)

Margaret’s training had her working and experiencing different types of electrician technician skills. Through the guidance of her journey-level supervisor, she was able to directly be part of the electrical construction process.

Margaret had the following to say about her education experiences in the classroom with the instructors, peers, and assignments.

I mean, they break it down in sections and the most difficult part was that you have your workbooks. You have your textbooks and you would have to do the homework. They [instructors] didn’t go over the material first. Like when I was in college, you had your lecture, you did your book reading, and then you took your test. So you combined both lecture and that. So this was totally different. It’s like here’s your book, here’s your workbook, and then you test. It started out with a lot of math initially, but then you get into everything from, you start out with D/C theory and go to A/C theory and then what I think they attempt to do is expose you to as many different things as they can in that timeframe. (Margaret, 447-455)

Sometimes they didn’t get it or they didn’t understand it so I just did it. Sometimes some of the other guys worked [it] out . . . , but then again, when we were in the lab, maybe they [male peers] would help me with something like how to do a certain bend or whatever. So, I think it was a mutually beneficial thing. (Margaret, 518-522)

Margaret shared her understanding of the concepts from the textbook with her classmates. In return, her classmates helped her understand the hands-on components of the course. The classroom component of her education was not new to her, since she had attended a four-year university and was used to the traditional lecture-style format of learning information.

As for the hands-on classroom assignments, Margaret stated the following:

I loved pipe running. That was just really cool to be able to learn how to do the different bends and be able to take a stick of pipe and make it go around
something and connect it. I mean, I enjoyed pipe bending or conduit bending they call it. That probably was the most unique thing and then welding. I loved welding. That was cool. (Margaret, 588-592)

Once you finish fifth year and you complete all your projects—your fifth year you have projects you have to do. They give you a certain amount of projects you have to complete, be able to wire a transformer, you have to be able to wire a panel of fuses, you have to do conduit bending and training records, you have to do motor controls, and you have to complete like a little computerized dial. So you have to do that plus finish your test [and] your final exam. And then the 8000 hours, then you’re done. (Margaret, 682-688)

Well, the motor controls were a little bit challenging, but we kind of all worked together on it a little bit in class. Probably the funny one was conduit bending because I had completed, unlike the guys in my class . . . I wanted to get my projects done and go into the last couple weeks not having to worry about anything. So I was very aggressive getting my projects completed and I had everything signed off on by Ben [instructor, pseudonym]. The last thing I had to do was conduit bending. (Margaret, 698-703)

These hands-on in class projects helped Margaret learn and develop her electrician technician skills and knowledge. Margaret indicated that she was aggressive in getting her projects finished and was able to complete the workbook assignments.

But, from my original class of like 40, two of us made it through the program. What happens is once the attrition, once a class goes down to a certain size, they’ll [program directors] mix in another class. But from the original start date until the finish date, two people in my class, myself and Tylor [pseudonym]. (Margaret, 660-664)

At the end of the fifth year of the electrician technician program, Margaret had only one peer who originally started the program with her. Both, Margaret and Tylor were nominated for the Apprenticeship of the Year Award.

The very last class, for fifth year, I was interviewed for Apprentice of the Year—with the only other guy in my class who made it, Tylor, who won by the way, which he totally deserved it. (Margaret, 658-660)

[The award was] for the one who has like the highest scores. . . . They give you a plaque and all this, but your attendance is excellent, your work in the classroom, your reports that they [instructors] give you for work, your work evaluation sheets
and all that, so all that combined and then you interview with the committee. But, Tylor was terrific. He hands down should have won. I was just delighted to be considered. (Margaret, 667-672)

Margaret’s achievements during her electrician technician apprenticeship were noticed and recognized as one of the top apprentices.

They keep track because they’ve got like apprentices. . . . “Oh yeah, she’s running work now, she’s got a truck, that’s all I need to hear.” Then it’s funny because Ben [program coordinator] told a group of guys, I forget whether it was second year or third year, he met some guys and said, “Well, take a good look at her, you’re going to be working for her one day.” It was just nice that he said. Ben is one of the good guys. (Margaret, 1399-1404)

Margaret was given accolades by the program coordinator. He saw her achievement and made others recognize her skills by making other apprentices aware of Margaret.

Throughout her education and training, Margaret enjoyed the hands-on classroom assignments and was able to demonstrate her skills at the worksite.

*Margaret’s response to research question three.* Margaret believed that the advancement of female electrician technicians is possible since she has been able to advance as a female electrician technician. She indicated that advancement was possible because of the need for electrician technicians.

Actually I’ve been running a couple different jobs, but it’s no big deal. That doesn’t matter to me. They put me in charge of stuff, but I like doing the work myself. I mean, I do all the [electrical] terminations myself and that sort of thing. (Margaret, 965-967)

Margaret was promoted and advanced within a year and was “running jobs, lead some jobs, and making sure that everything’s 100% perfect” (Margaret, 1007). Her advancement as an electrician technician came with company perks. Margaret described them as:
You don’t get awards, but they give you shirts, hats, all the tools, [and] different things . . . they let you know that “hey, we value you.” They give you a van, here’s a truck for you, here’s a gas card, here’s a company credit card. But, I was perfectly fine. You’ve got the responsibility, the company likes you, and you don’t have to buy your own fuel now for work, and wear and tear on your vehicle. The company said “hey, we want you to do work for us, here’s a van, go do it. But, I’d be just as happy if they took it away from me and said okay, we just need you to [do this]. The van’s not a status thing for me. I really don’t even like vans, a big old box, but it’s convenient for work. (Margaret, 1191-1201)

When I topped out [completed of apprenticeship program] . . . like two months after topping out I was already in a company vehicle. But, it wasn’t something I really aspired to do, it just happened. (Margaret, 1203-1205)

Margaret’s process to her advancement in the electrician technician workforce included advice from her supervisor journey-level electrician technician. She had this to say about the advice she received from her supervisor:

Actually, when I was getting to be fifth year, I asked him [journeyman supervisor], I said, “I know you think I’m terrific and everything, but as I’m getting ready to get out, specifically what do I need to work on?” And he just said, “You just need to be a little bit more aggressive. You’re a fifth year now, you know the stuff, and it’s time for you to step up and be aggressive with it.” Which was something—I always kind of stayed in the back. I wanted to learn and I was watching and I didn’t want to be a boss, I didn’t want to be in charge so I just kind of stayed back. And he was just saying, “Now it’s time for you to step up.” So like my last semester and it was just a natural thing, I mean, I’ve always had that ability. I just needed the confidence level . . . I don’t like being the boss so that was kind of a hard thing. But, I definitely took his advice and stepped up a little bit and became a little bit more, you know [aggressive]. (Margaret, 622-633)

Margaret was advised to be aggressive and not to fade so much in the general background. She did not originally want to be the boss, but advanced into that position by being more in the forefront (aggressive) and a lead in the projects.

In further discussion about advancements for female electrician technicians, Margaret pointed to the versatility of the occupation. She reported other opportunities to
advance herself by going to other companies and other areas where electrician technicians were needed.

When the economy was bad when I was in the program, they basically said if you have a job, hold on to it. But, now because there's so much work they're saying okay. They could have said to me, “Margaret, you've done a good job with Seller Electric [pseudonym], but we want to rotate you over to KB Electric or EV Electric [pseudonyms] because we want you to get this experience.” So it was kind of a good thing for me that things were the way they were because it worked out for me . . . now that there's plenty of work and they [electrician apprenticeship programs] have an abundance of applicants into the program . . . and they have a lot of work. (Margaret, 796-800)

I'm comfortable with Seller Electric, but there's plenty of work out there. Electricians are working now. . . . Whether it's new construction or rebuilds, whatever, there's work for electricians. What I'm doing a lot of now with the integrated systems with the level tension data and all that. So it looks good and if it changed, then it would give me a chance to look at the other areas where it is busy like the mines. I didn't get to work in the mines. A lot of people did at XTest [pseudonym]. XTest is huge and they're doing like millions of dollars worth of work in the area and everyone at the [union] hall is working, so it's a good thing. Even the guys who don't have a really good reputation, everybody's working because there's a lot of work. (Margaret, 858-857)

Margaret was content with being with the same electrical company that she had throughout her electrician technician apprenticeship program. But, if she ever decides to develop her electrician technician skills in a mining industry or other chemical facilities, Margaret had opportunities to do that.

I had no intention of not working for Seller Electric. But if that happens, you go to the [union] hall, you sign the [employment] books. When jobs come available, then these guys are the first ones out to go to the job and that's what's happening now. There's so much work that companies are calling in to get the skilled labor to come out to fill whatever job it is, two-week call or six-month job or whatever it is. (Margaret, 870-875)

Electricians are working. Check the paper on Sundays. Electricians are still—this past Sunday there was an ad again. Electricians are in demand right now. There's a lot of work. So I'm not concerned at all. Because I have other careers. I also do swimming pools and I build yachts so to me any one of the three careers I'd be happy to. I can do anything of that stuff so I'm happy with the skill set I have
now, but it’s nice to know that I can go back to that. The worst case scenario, even maybe with the college degree do something like that, but I doubt that’ll happen. (Margaret, 883-890)

If Margaret decides to leave Seller Electric, she can either have the union locate another company for her to work for or look through the general employment advertisements. In addition, she reported that she had her prior skills in the yacht and pool business to fall back on, but she believed that would not be necessary because of the need for electricity and technology advancements in electricity.

A reporter from the campus tribune came to interview our class about the economy and how bad it was. He [apprenticeship program director] had them talk to me because my thought was, by the time I finish this program, things are all going to change around. The thing is, you have to have power. You have to have electricity whatever you’re doing. Whether you’re doing innovative lighting or solar or whatever it is, there has to be some transition for power. AC, DC, whatever it is, you’ve got to have power. If the lights are out, you get a candle. Your computer goes down, your phone doesn’t work, and you’re out of luck. You’ve got to have power and that’s the bottom line so that somehow, some way in the infrastructure you find a place for it. (Margaret, 898-902)

I think it’s excellent. I think that because there’s going to be so many changes. For example, the power grid, the antiquated system that we have throughout the country, they’re doing upgrades, transformers, generators, the preventative maintenance that goes into—there’s huge companies and corporations that have these backup generators, should the power go down, those have to be properly maintained. There’s all kinds of work going on now. Like the roads. They’re building a bridge over by where I live on the beach and there’s a light . . . you have to have that so I’ve been able to watch that. I think for a young guy getting into it, the possibilities are endless. Motor controls, transformers, solar, instrumentation, just a lot of opportunity for someone. A young person in the electrician field, I think it’d make a great career. (Margaret, 1027-1037)

Margaret has a positive outlook regarding the employment opportunities for electrician technicians. She pointed to the variety of industries and companies that need electrician technicians.

I probably won’t do the master [electrician] thing because you have to, I think they want you to actually be running work a lot and I don’t really—I’m kind of just happy
not running that much work, but we'll see how that happens. . . . At this point, I'll never say never to anything. You never know what might happen. . . . I don't have any aspirations to go any higher. I'm happy doing what I'm doing now because at the end of the day, it's the end of the day. (Margaret, 1161-1175)

Margaret can also continue her occupational advancement by completing the requirements to obtain the master-level electrician technician certification. At the time of the interview, she did not aspire to be a master-level electrician technician.

Margaret’s overall experiences as a journey-level electrician technician were satisfying. She related it to one of her favorite books.

In the journal I mentioned an article, a book that was written about—it’s called *Shop Class as Soul Craft* and it’s written by a guy who’s very intelligent. He has the significance of the work element, working with your hands and what’s involved in that so there’s a lot of detail. I feel the way he feels about working with your hands and completing a project yourself. Especially with all the changes in the world with electronics . . . the satisfaction that you get from working with your hands. Knowing at the end of the day a task was complete because of what you did and not what somebody else thought. (Margaret, 826-833)

Margaret’s success in the electrician technician workforce was demonstrated by her advancement to a supervisor role within a few months after completing the electrician technician apprenticeship program.

**Margaret’s response to research question four.** Margaret had reported different treatment due to being a female electrician technician. She stated her experiences were related to being able to avoid the male ego.

I mean and the electrician stuff you know you’ve got to pay attention, there’s a lot of stuff. Not so much from what you’re going to do, but some of the people you’re working with. Some of the guys you’re working with, you know you have to kind of watch and be careful . . . there’s a lot of safety issues in some of the settings. We worked in some industrial settings and commercial settings that were you know you’ve got to keep your eyes open and pay attention. (Margaret, 104-109)

A lot of guys don’t have the patience to do that . . . I learned this on one of the jobs. One of the supervisors said it’s not that they won’t tell you, they say, “oh, I’m
not good at that.” Well, that means “I don’t want to do it.” So then I learned that and find out what you can do that no one else wants to do and be good at it. (Margaret, 1267-1276)

No one wants to do this and suddenly you want to do it then they are, “oh great, we’ll get her to do it”. . . . Like we had to shrink wrap rigid pipes for CC Bottle [pseudonym], because they [males] wouldn’t let it [pipes] into the building if possibly debris could get in. It was a horrible job. No one wanted to do it, I was happy to do it. I did it, did it well, and they see you doing that then suddenly you’re doing more things. (Margaret, 1257-1261)

It’s like my best friend, he said, “They want to hate you, but they can’t.” Like when I was building yachts. “You’re better than they are, you do it better, and you make it look better. They want to hate you, but they can’t.” That’s very difficult too. You’ve got to kind of get around that—you’ve got to be better than them [males], but you still have to work with them so you have to be careful as far as the male ego thing. But you can do it. (Margaret, 1418-1421)

Margaret’s difference in treatment was confronting the male ego. The males wanted to only do certain tasks and let her do the work that they did not want to do. Margaret felt that the male behavior was something to pay attention to at the worksite.

I was in class, [a male peer] said, “You know, we’re going to make somebody an awful lot of money,” and I was just like, “Yeah, you’re right and I like being able to make a lot of money for Seller Electric.” (Margaret, 1328-1330)

Margaret believed that females who wanted to be electrician technicians needed to be physically ready.

Not in my group, no, there weren’t. There were girls ahead of me and girls behind me, but none in my class. Well I think it was great for me because I mean I love working with guys and the age group was such that we had young guys and we had older guys so it was a great mix, there was a nice chemistry, they realized that you’re just one of the guys. You’re not offended or you’re not intimidated then you are just one of the guys and then it’s very comfortable and it was actually very enjoyable. The guys were a source of comic relief usually and it was not an issue. (Margaret, 284-293)

The main thing is you’ve got to stay in shape. It’s a very physically demanding trade and that’s number one. Number two, just your attitude and be flexible, whatever no one wants to do, I would be the first to do it because then you become a value to the crew. As a first-year apprentice or new apprentice,
whatever I would realize that nobody wanted to do, I would volunteer for it because then you’re going to have a spot. No one wants to do this and suddenly you want to do it then they’re “oh great, we’ll get her to do it,” then you get your foot in that way. (Margaret, 1249-1256)

Be active. I did a lot of like weight training and stuff. I’ve done a lot of like races. I did a couple marathons. You keep yourself physically fit working out and just being able to—you’re carrying a lot of the equipment sometimes. Ladders, you have to be able to navigate a ladder around some tight situations. You’ve got to have good balance. You’ve got to have a good sense of skill so if you’re an athlete, then it’s perfect. If you’re not, you’re just not going to make it through the day. Sometimes it’s not, but most of the time, especially in the commercial electrical side of it or industrial side, it’s very physical. (Margaret, 1278-1285)

Margaret pointed out the heavy lifting that is needed. Having a good physical condition allowed her to carry her own weight and not depend on her male peers.

In terms of equity issues for females in the electrician technician occupation, Margaret did not see this as an issue as a female electrician technician.

It’s nice to know that when you go to another part of the country to work on a big job like a nuclear plant or something like that, you’re going to be at their pay grade, whatever it is, and that’s one thing that would, for a lot of women, I think, is very cool. With all this talk about inequity for women and inequality in the pay structure, well, guess what? A journeyman wireman woman makes the same thing as a journeyman wireman man so that’s kind of the cool thing there, so there’s no inequity there. I don’t think we have a glass ceiling at all, but that’s one thing—I hate that expression, but men and women make the same. (Margaret, 1339-1347)

Women who were looking for something, where I’m going to make the same as the guys, regardless—it’s kind of in a way there’s inequity here. I mean, there’s journeymen who’ve been working in the trade for 15 years and here I come in with [and] I’m going to make the same money. So that’s kind of weird. So it seems like they should make more because of their experience. . . . I just mean that it seems to me, talking about inequity, that a newly topped out journeyman makes the same as a journeymen who’s been doing it for 15 years. It seems to me like that guy should be making more, but that’s just because—they [union] set the [pay] scale. They set the scale, so regardless of how many years you’ve been doing it, that’s what you’re making. (Margaret, 1353-1371)

Margaret did not think there is a glass ceiling for female electrician technicians, but where possible inequity exists, it was related to the experiences of the electrician technician.
She does not agree with the term glass ceiling and indicated that there was equitable pay regardless of gender.

Figure 7 illustrates Margaret’s experiences as a female electrician technician and the corresponding relevance to the research questions for this study. This summary illustration showed her experiences as she went through the electrician technician apprenticeship program and later as a journey-level electrician technician.

**Case four: Martha Rare**

A statement that expressed Martha’s experiences was:

I think part of it’s because I’m female. Because it’s rare. I mean, if you saw a bird and it was like the rarest bird you ever saw, wouldn’t you want it to survive? (Martha, 676-677).

**General background description.** Martha was 52 years of age during the time of the interviews. Martha was an entrepreneur and started her own electrician company that primarily focused on solar energy as an electrical source. She went through a non-union electrician technician apprenticeship program and had to initiate several processes by herself. Martha was a high school dropout and went back at the age of 41 to get her high school diploma. She went back to a technical high school in Michigan. It took her two years to complete her high school diploma. Two months after she obtained her high school degree, she moved to Florida to become an electrician technician. Once she was in Florida, Martha searched for an electrical company that would sponsor her to enter the electrician technician apprenticeship program.
Figure 7. Single case data analysis of Margaret’s responses linked to the research questions.
**Interview sessions.** The first interview with Martha was stale and lacked in-depth responses. Martha often responded with one or two statements to the questions. During this first interview, Martha answered in short sentences and more than one probing question was needed to have her go beyond her general statements. Martha gave some sense of hesitation and a lukewarm tone in her response to the interview questions.

By the second interview, Martha provided detailed accounts of her experiences and her responses were less cautious and she had a more vibrant tone. At our third interview, Martha was not as guarded and approached the third interview as a conversation with a friend.

This change in attitude was due to an exchange of knowledge from me about resources for her business and as a business owner. The information I shared was website links to small business seminars and workshops aimed at assisting small businesses owned by females. This one beneficial piece of information made Martha open up to the questions and she discussed her experiences without hesitation at the second and third interview sessions.

**Martha’s response to research question one.** Martha indicated that it was her instructor in a technical class who she credited partly for helping her decide to get her high school diploma. Her high school instructor told her about the electrician technician apprenticeship program.

When I was in Michigan, I went back to high school. I was 41, and most of my classes were electives that I need to make-up, so I took some auto mechanic repair and some electrical wiring courses for my electives . . . in that course, they [instructors] told me that you could get a job and they would put you through school. So, I decided that that was going to be my goal that I was going to change my career and start doing electrical work. (Martha, 1-5)
Her other reason to pursue this occupation was her brother. He was an electrician technician for over 30 years and encouraged her to become an electrician technician. Martha stated that, "My brother was very excited. He’s been in the electrical field for 35 years. So, when he found out that I was doing electrical work, he was very excited" (Martha, 38-39).

Martha’s reasons to enter the electrician technician apprenticeship program included what her instructor told her and what her brother told her from his experiences. In addition, she was entering a new occupation at the age of 41 and wanted a sustainable occupation.

Martha reported the business opportunity was her main reason to become an electrician technician. She wanted to be her own boss and get to choose the type of electrical contract work she would do.

I've always been really hands-on and I have always liked to fix things. And it just seemed like something that was interesting and fascinating because when you start wiring stuff up and it works, it's really amazing. (Martha, 7-9)

**Martha’s response to research question two.** Martha did not go through a union electrician technician apprenticeship. She had to locate an electrical company that would pay for her apprenticeship program and have her work for them as part of her required hours to receive industry certification.

Martha’s following excerpts from the interview showed her experiences in the electrician technician apprenticeship program.

The steps for me were a little more difficult I think than most people. You have to have somebody sponsor you. So you have to have an employer sponsor you to get into the school. I found the employer, but a lot of people didn't want to sponsor me because they didn't take me seriously so it took me a lot longer to get into the school and convince them that I was serious. I finally did get into the school and
once I did get into the school I jumped all kinds of hurdles and it has not been easy. I'm a squeaky wheel. I want to go to school. (Martha, 9-13).

Once Martha was sponsored by her employer, she started her electrician technician education and training through a state-approved apprenticeship program. Her education and training included learning in the classroom and at the worksite. She was educated and trained by instructors and journey-level electrician technicians. Martha’s classroom education and training consisted of direct learning from the instructor and the workbooks.

Calculations, motor controls, motor troubleshooting. I usually used the Internet or I would buy books, some of my books from school or you could buy hands-on books that would help you with like the math. Calculations, sometimes the algebra can be really tricky so I would buy books strictly on algebra and self-teach. (Martha, 266-269)

Some of the times I went to the classroom I didn’t understand a lot of the things. Then when I went to the job and they had me do it, it made things click. It really gave you a greater understanding. Then there were times when I would be at work and I would be doing something and not understand and then later on, it might not have been the same day, same month or even the same year, but later on I would go to classes and they would explain it and then I got a greater understanding. (Martha, 256-261)

Martha also indicated that her classroom instructors were also helpful in her education.

She provided the following examples of how the instructors aided in her knowledge development.

Their teaching helped me when I was applying it on the job. Now that I’m doing this part of the electrical, where I’m the contractor, I find that people that don’t go to school are missing something. People that go to school and don’t do the work, they’re missing something. (Martha, 274-276)

A lot of times while I was in school the things that I was learning applied when I was in the field so I think it made me understand and there was a lot of things that I was learning in the school that I didn't understand but when I got into the field and started doing them they kind of made sense. So it was really helpful for me to go. (Martha, 33-35).

The apprenticeship was pretty good at teaching me what I needed to know. Being that I was so late graduating high school, I think that I struggled with some of the
math and that was a personal thing, it wasn’t a schooling thing. And the school was good because if you had anything like that they offered to help you. In addition to the schooling, you could get additional teaching to help you overcome that. (Martha, 139-143)

However, Martha explained that she used external resources as well to help her understand concepts and how to troubleshoot problems.

I go online to Electricianstalk.com and sometimes if I have an issue that I don’t quite understand, I’ll go to that one. . . . You can ask a question and then you can get answers for that question from other people that do electrical work and sometimes inspectors are involved with that too. . . . There is the Sam Polt [pseudonym] online that gives you, like, tests that you can take, mock exams and ask a lot of questions. I ask so many questions, people just want me to shut up. But I wanted the answers, I wanted the knowledge. (Martha, 657-665)

So if you work in the right company, in the right area, some of my companies would put me in areas where I was learning that. XPI Electric [pseudonym] was really good for that because when I was in certain parts, they would put me in things that I was learning and doing the work at the same time. (Martha, 261-263)

Well, we had supervisors, so the supervisors would come in and say do this and they’d give you somebody that had done it before and they would show me that this is how you do this and you want to make sure it’s here. The one time we had a pipe that was off, we heard about it. (Martha, 106-109)

The one I can say I value the most is the first company I worked for. His name is Ted [pseudonym] and he taught me how to troubleshoot. And he was a funny character because we worked together for about eight months and he hardly spoke to me and we’d been working together for six months and he made the first joke and once he made the first joke I could tell he was accepting me. Then after that he just started teaching me and teaching me and he was a great troubleshooter and he taught me how to troubleshoot really, really well. (Martha, 128-133)

One of Martha’s memorable tasks that she was trained in at the worksite was threading the pipes for the wiring.

I think some of the fondest memories I have was when I worked at XPI Electric and I learned so much because I learned how to use the threader which is a machine that threads rigid pipe which I really like doing even though it's really greasy and dirty. It was really fun to do. I liked doing that. And putting the pipe in the ground and stuff, it was very interesting and you have to make sure everything
lines up, like the first floor has to line up exactly where the second floor stuff is going because if you don't your pipes won't be in the wall. (Martha, 95-101)

Overall, Martha reported that the nature of her education and training included classroom instructions, worksite projects, and other external resources.

**Martha's response to research question three.** Martha reported that the advancement and opportunities for female electrician technicians do exist. She made her own path and started her own company. Martha's advancement in her electrician technician development started during her apprenticeship training.

When I first started doing it [apprenticeship], they put me in charge of an apartment complex that had smoke detectors that were laid out incorrectly. So, what I had to do was, I had to go to the management company and let them know I was there. Then I had to go through a set of apartments and if the people weren't there sometimes I would get the keys and then go in, make sure the smoke detectors were in the right place. If not I would have to put them in the correct place. Then when that process was complete then I would meet with the inspectors and go through my work with the inspector. (Martha, 157-163)

There was another company I worked with, they had me do a complete remodel with 192 units. They were apartments and we changed them into condominiums. Everything was ripped out, every device, every light fixture, the water heater, the air handlers, air conditioners, everything was ripped out. We put in all new [electrical wiring]. I had a crew with that job and I had the guys come in. Sometimes I did the work, sometimes I just set them up for them to do the work. Once a unit was completed, I would have my inspector come in, I would walk with him through the unit, they'd pass the inspection, and then move on to the next one. I worked on that for about 14 months . . . I started leading within my first year. They put me on lead jobs within a year. (Martha, 164-172)

By the second year, I had a crew. Not always apprentices. Sometimes they gave me electricians that had many, many more years than I did and that was my crew. Anywhere from two to six [electricians] depending on the needs. (Martha, 183-185)

When I finished it, I was working at XPI Electric and I maintained my job there. And then the economy kind of took a tank and I got laid off. That was in '09. And then after that, I sought employment and I worked at a couple of different contractors at the same time I was working to get my masters license. (Martha, 277-279)
Martha talked about her personal advancement of owning her a small business and her aspirations for her company.

I would hope the future for me is to have less responsibility and be able to have a bigger group of employees where they can handle some of my responsibility. I also see my company as doing really well. Especially as solar takes off. I'm hearing that in the next five years it's just supposed to be really, really growing. I have a feeling with what we see with solar and the people demanding the solar panels, in the [my] new shop, I think the business is fully going to take off. I think I'm probably going to grow and grow and grow. (Martha, 355-360)

I hope that my company can grow a bit larger. I don't want it to get too big, and I hope that it's successful. I hope the store's successful. I'd like to see more people do solar and I'd like to see more people learn solar [in apprenticeship programs], because I have the feeling that when solar really takes off, there's going to be such a high demand for it, that there's not going to be enough people to accommodate the demand. Like when the building industry got here, and houses and businesses were going up all over the place, there was just such a high demand. I think solar is going to be like that. I'd like to see my company be very profitable. (Martha, 680-687)

For females interested in advancing in the electrician technician workforce, Martha said “there’s some aspects that you need the strength for. Like some of the wire is very heavy, the pipe can be very heavy, some of the machines, the tools, the chipping hammer” (Martha, 406-407). Martha indicated that the heavy equipment was a physical activity of the occupation that females need to be aware of and prepare for to be successful as an electrician technician.

**Martha's response to research question four.** Martha’s different treatment because of her gender started at the beginning and continued throughout her development of her own electrical service business.

I finally did get into the [apprenticeship] school and once I did get into the school, I jumped all kinds of hurdles and it has not been easy. I'm a squeaky wheel. I just kept saying, "I want to go to school, I want to go to school, you let him go to school and he’s only been here for a few weeks, I've been here for three months, I want to
go to school.” I think it’s because I’m a woman. The first company that hired me, they wanted me to go out in the field, and this is the impression I got, they wanted me to go out in the field. Get a little bit of an education so they could put me in the office. So they’d have somebody that had some education talking to the customers, and that’s not what I wanted to do. (Martha, 10-21)

The first company that I started with did that and I told them that I wanted to go to school. They said, “Well, you haven't been employed here long enough to go to school, you have to be employed here for like three months before we let you go to school.” Then they had somebody else come in and they started him in school when he’d been there for a few weeks. I got really upset with them. I said “look it here, you let him go to school. You’ve been putting me off.” So then they put me in when I started pushing them like that. I did have another employer that promised me that I could go to school. Then when it came time he just kind of like pulled back, but I was very insistent . . . I'd been there for three or four months and it was obvious they didn't want to put me in the school. They tried to get me to work in the office and they kind of told me that they wanted me to work in the office because I knew a little bit about electrical. I told them, I don't want to work in the office. (Martha, 49-60).

Martha had to be vocal and asserted her desire to go to an apprenticeship program. She was treated differently at the beginning from her employers. The employer was letting other male workers attend the apprenticeship program and was denying her the opportunity to attend the electrician technician apprenticeship program. The employer was interested in keeping her in the front of the business as a customer service employee.

During her apprenticeship training, Martha experienced different treatment from her male peers.

I had a few that kind of like treated me like I didn't belong there. But most of them were respectful to me. Most of the people that I had through the course of my electrical field had been really good, because most of the guys I worked with had wanted to teach me. I've only run into a few that don't want me in the field. You can tell when they don't want you there. They'll talk to you disrespectfully. They'll say derogatory things. You ask them for help and they won't help you. (Martha, 75-80)
I have had many of the men in the field teach and educate me. I had one tell me not to bring my tools that I was to use his tools; in fact, he would not even let me put my tool in the vehicle. Then a few months later, I was brought into the office for not bringing my tools. . . . I had a dispatcher that would send me a text between 7:15AM and 7:25AM for a job in Salt Point [pseudonym], which is a full hour and more drive in good traffic. Then he would call me and ask me if I would be on time and then harass me about why I couldn't be in Salt Point by 8AM. . . . I was working with someone who always said “You can't do that,” and it would make me want to prove him wrong. (Martha, 31-26 and Journal Entry #3)

I mean, I noticed it but it just didn't faze me. Although I've always been the one who hung around the boys. Some treated me like they didn't want me there, some treated me like they needed to take care of me, and some treated me like I like to be treated like an equal. . . . Well, like I said, the actions of those that didn't want me to be there was obvious. They would just like talk kind of down to you and kind of disrespectful. They [male electricians] wouldn't teach you anything. The ones that would treat me like equals would show me how to do it, so that I knew how to do it. Then the ones that wanted to take care of me would want to do it for me instead of teaching me how to do it, so I could do it for myself. Most of the people treated me like an equal. A very small percentage treated me like they didn't want me to be there. Those that treated me like they wanted to take care of me, I didn't do it for long because I don't let people do that. I basically stopped that right away. (Martha, 115-125)

One does stick in my head but I'm just not going to go there. It was a supervisor. I could just tell that he—I don't know if he didn't like me in the field, but I could just tell he didn't like women. He'd gone through a bad divorce and you could just tell the way he spoke about women he just didn't like women, so I don't think it was me. (Martha, 133-135)

The treatment Martha experienced from the male electrician technicians ranged from machismo to total avoidance and a disdain for females. One supervisor had gone through a bad divorce and transferred his resentment for his ex-wife to Martha.

I think he was thinking there's a lot of people, employers, a lot of coworkers, friends, relatives that thought it was a phase I was going through. You know how kids go through phases? A lot of people that I knew and a lot of people that I associated [with] so pretty much the group of people that thought that way is kind of what I was saying. Because there was a large group of people that treated me like that, like I just mentioned, employers, people I worked with, coworkers, family, friends “Yeah, she’s going through a phase. You know, it's not something she'll do.” (Martha, 233-239)
The treatment Martha received from some of male electrician technicians was obvious. Martha indicated that the treatment was disrespectful and that he was not seeing her as an electrician technician.

There’s a lot of stress. There’s a lot of pressure. You always have it in the back of your mind, it’s like you’ve got to be at least as good as the guys. Because I always felt that I had to be equal to the person that I’m working with. If I’m not equal to the guys, if they have more strength than me, then I need to have more knowledge, something to equal it out. (Martha, 406-409)

Martha stated that it is stressful not knowing the type of behavior she would experience from the male electrician technicians and apprentices. She felt the best way to combat the different treatment was to be better than the male electrician technicians.

The different treatment that Martha experienced also included the perspective that she was not an electrician technician.

I get a lot of that from the [career tech high school] students. They’re like, “do you work in the [electrician] field?” . . . I know it’s unusual, for girls to be in the field. So most people don’t think I work in the field. (Martha, 548-550)

Martha reported that even her son did not view females as electrician technicians. She explained that her son felt that way because:

It’s a man’s field. I don’t think he [son] feels that his mother should be working at a man’s job. Okay, let’s change the rest of the group and say that he was—I hate to say this because it sounds so much like I’m categorizing him, but he’s like a lot of the men that think it’s a phase. (Martha, 230-233)

Martha experienced different treatment as a female electrician technician. The different treatment included passing her over to attend the apprenticeship training program. In addition, male electrician technicians who treated Martha different based on their experiences with females who were not electrician technicians.
Figure 8 illustrates Martha’s interview question responses and their link to the research questions for this study.

**Themes**

The themes in this section discussed the factors for these four female electrician technicians’ reasons to enter, complete the apprenticeship, and stay in the electrician technician occupation. The four primary themes discussed in this section are family support, personal independence, self-directedness, mentors, and gender stereotypes.

**Theme one: Family support.** All four of the participants had family support in their decisions to become electrician technician. According to Heins, Hendricks, and Martindale (1982), for females who choose to work in nontraditional occupations, it is important that their family support them in their endeavor to achieve in their career path. The success of Hattie, Martha, Margaret, and Anna in becoming electrician technicians was linked to their family support systems. Heins, Hendricks, and Martindale’s (1982) assertion was that the support of the family assisted in ways that made it possible for females in nontraditional careers to be successful.

Three of the females had family members who were electrician technicians. Hattie’s husband was an electrician technician, Martha’s brother was an electrician technician, and Anna’s father was a retired electrician technician. Margaret did not have family members who were electrician technicians, but her boyfriend supported her occupational choice. The family support came in a variety of ways. Family members provided encouragement and a primary support base that was central to the participant’s shared purpose to become electrician technicians.
Figure 8. Single case data analysis of Martha’s responses linked to the research questions.
Hattie’s husband came from a family of electrician technicians. Her husband’s father was a retired electrical lineman, who worked for one of the major utility companies in the county. Hattie explained that her husband’s family were primarily all electrician technicians. All of the family members, who were electrician technicians, went through the union-sponsored apprenticeship program.

He [her husband] with his support and with my father-in-law’s support, I was very blessed that I have them. . . . Ken [pseudonym, her husband] comes from electricians. Ken’s brother went through the same apprenticeship [electrician] program. He had a brother go in before him. He had an uncle that went through the apprenticeship program. So it’s like some of the family members had already been through that same apprenticeship [electrician] program, so it wasn’t hard for them to support me on the backside of it because they knew the industry. (Hattie, 77-85)

Hattie’s family support system allowed her to ask her husband and others in the family specific questions about being an electrician technician. She had direct access to family members who could demonstrate how to connect wires and troubleshoot electrical problems. Her husband and other family members shared their knowledge of electrician technician skill needs, in addition to their moral support. When Hattie had difficulty understanding electrical concepts, she discussed the topic with her husband or father-in-law. Her father-in-law, Mike (pseudonym) who lived next door, inquired about what she learned at work and class. Mike became her confidant and allowed her to reflect on her experience at work and class.

Anna received support from her father and her sister. Her father was a recently retired electrician technician, who called her weekly to discuss her day at work and class. Anna indicated that her dad was a union electrician technician for 35 years, who often
encouraged her to become an electrician technician when she was in high school. Anna and her father talked on a regular basis.

He has a really good knack of calling me in the middle of a class. I'm like, "Dad! You know I'm at class right now." "I'm sorry; I'll call you back later." He asks, "What's going on? How the job's going? Are there any problems?" I tell him stuff I've seen, that I haven't seen before. He's like, "Oh yeah! That's a such-and-such. You see those all the time in a power house." Face-to-face conversations are a little easier because I can be like, "Well I don't know what it's called, but I've seen this," and I'll draw a picture, and he's like, "Oh, I know what that is! Here, let me tell you about it." (Anna, 1385-1394)

Anna's father encouraged her and listened to her experiences at worksites and at class. She indicated her father asked about the specific types of electrician technician's tools and materials she used to fix a problem. Anna's father played an active role in her skills development as an electrician technician and shared some of his electrician technician knowledge with Anna.

In addition to her father, Anna also had the support of her sister. Anna lived with her older sister and her niece. Her sister provided her emotional support as a listener and supported her goal to become an electrician technician.

I think they're [her family] happy that I chose this. They can tell that I'm much happier than where I was working before. My brothers were supportive. They said that it seemed like a good idea for me to go and do something that was hands on . . . I have an older sister, she's been supportive. . . . [her sister said] "Good for you" [and] "We're glad you decided to go and do something that's suited for you." (Anna, 68-79)

Anna and her sister saw each other at the end of a long day and talked about their day. Anna's sister listened to her, provided advice, and they shared their experiences about working in a male-dominated occupation. This allowed Anna to have someone to debrief about her electrician work at the end of day.
It’s a discussion on how your day was. My sister and I live in the same house right now. . . . It’s a, “How was work today? . . . Oh, this happened. Oh, I had to deal with this. Oh, it was great”. . . . She’s a computer programmer, so she does an inside job, office setting. . . . She listens to my complaints if I’ve just had a bad day, whether it’s perceived or an actual bad day. She listens, she gives helpful ideas, or at least just listens, and I do the same for her. (Anna, 698-712)

Anna and her sister also shared a common bond, both working in male-dominated occupations. Anna recognized this “actually as a computer programmer, she’s [her sister] being a female computer programmer, she is in the minority for that field” (Anna, 1470-1472). Having this similarity in working in a male-dominated occupation has provided an additional connection between her and her sister.

In Martha’s case, her brother was an electrician technician for 35 years and “he was very excited” to learn that she was going to be an electrician technician (Martha, 38-39). She had learned about the opportunity to be an electrician technician from her brother and had seen him do well for himself as an electrician technician. Martha’s brother was supportive of her decision to become an electrician technician. If she did not know something, she would just contact him.

Well he [her brother] has been doing it [electrician] for 35 years so if there’s something that I don’t understand, I’ll just call him up and ask him a question, and he usually explains it to me quite well. . . . Anytime that I was lacking, all I had to do was make a phone call . . . to my brother and say I don’t know how to do this or I need help with this . . . if my brother was there, he would show me how, so he was teaching me at the same time. (Martha, 388-394, 1298-1300)

Martha’s brother also encouraged her to continue even when she felt like quitting. He gave her encouragement not to give up and to continue the electrician technician apprenticeship. The support from her brother helped her achieve journey-level and master-level electrician technician status. “There were quite a few times I was going to give up. He [her brother] says, ‘Don’t give up, you’re doing really well,’ and my brother
was very good about that,” (Martha, 700-703). Martha’s brother provided her continuous words of encouragement she needed to hear when she felt like giving up. He believed in her when she did not believe in herself.

Margaret’s family support was not from her immediate family members and none of her immediate family had backgrounds as electrician technicians. Her mother and father were small business owners who serviced commercial and residential pools. Her mother retired after the death of her father and sold the business.

Margaret’s mother was not directly involved with Margaret’s occupational choices. Margaret reported, because the loss of her father and sale of the family business, she did not want her mother to worry. It was not that her mother did not support her occupational choice to be an electrician technician, Margaret felt that it was not something her mother needed to be concerned with at the time.

Margaret’s primary support in her decision to be an electrician technician was from her boyfriend. Her boyfriend was an extension of her family since she lived with him and discussed becoming an electrician technician. He was not initially excited about her choice to be an electrician technician. However, he realized and saw that electrician technician skills and knowledge made her happy.

He [her boyfriend] was initially not real thrilled with it, but then came on board and was very supportive and now is just very happy because he knows I’m happy and that worked out well. . . . Once I made the commitment, then he was supportive. . . He knows I’m happy (Margaret, 1141-1146)

Margaret’s level of support may seem minimal compared to the other participants, but it was still a key support for her to complete the electrician technician apprenticeship and remain employed as an electrician technician. Her boyfriend supported her career.
choice once he noticed that the work made her happy and saw her commitment to be the best.

**Marginalization of female electrician technicians.** Even though there were direct family supports to become an electrician technician, for the four female electrician technicians, there were also hints of marginalization from their family members. For example, Hattie’s husband did not initially consider the possibility of female electricians until he saw other female electrician technicians already working.

He was one of the old men mentalities, at first that a woman didn’t belong in the trade, until he watched a couple of other female go through it. When he’d seen them succeeding in it he said, “Well, if they can do it, I know you can.” He brought it up, “Would you be interested in starting or becoming an [electrician] apprentice in our program?” and that’s how even the idea [came up]. After being with him for 12 years [and] now it [electrician] came to light, because I never thought of it before, ever. I couldn’t even listen to him tell about the trade. I told him it scared me too much. . . . Because being an electrician can be dangerous work. So when he brought it up to me, I was real nervous about making that decision. (Hattie, 15-22)

Hattie’s husband waited until he noticed other females able to complete the electrician technician program before he mentioned the possibility to Hattie. During Hattie’s 12 years of marriage, her husband discussed the electrician technician occupation, and shared stories of a dangerous and risky occupation. These stories made Hattie hesitant and nervous of being an electrician technician.

In addition, her father-in-law, who was supportive after she started and completed the electrician technician training, was not initially concerned about her electrician technician skills, but how other male electrician technicians reacted to her being his son’s wife.

He [her father-in-law] didn’t want me to go through the program. He thought that with me being the wife of an already member [union electrician] it would create
kind of like a protective environment, somebody say something, he’d [her husband] want to be my, quote-unquote, protector. (Hattie, 72-75)

In her father-in-law’s eyes, he saw that Hattie would need protection because she was a wife of an electrician technician and this made her a target for other electrician technicians who opposed or disliked her husband. Hattie’s father-in-law was worried for Hattie’s safety because of her husband’s enemies. She reported this did not happen and towards the end, this was no longer a concern for her father-in-law.

In Anna’s case, she recalled that her father wanted her to be in the electrician technician apprenticeship right after high school, but the images in her mind from her father’s stories made her not want to become an electrician technician.

I know he [father] worked at water reclamation plants, basically, where they take sewer water and they clean it up before they can release it. And he’d come home pretty dirty and pretty stinky. And I was like; I don’t want to do that. I don’t want to come home smelling like that. I don’t want to work in that environment all day. (Anna, 1258-1262)

In addition to the type of work her father did, Anna’s father shared stories of female electrician technicians that he worked with. These stories made her initially not to want to become an electrician technician right after high school.

He’s [her father] told me that he had female apprentices working for him when he was a journeyman. He gave his opinion on their work ethics and it wasn’t always good, so it just makes me want to do better. They [female apprentice] wanting somebody to do all the work for them, not being strong enough to bend some of the bigger conduits by themselves, that kind of stuff. It was a little more on the derogatory side. (Anna, 57-62)

Anna’s father shared negative stories about female electrician technicians and the type of behaviors they displayed. He portrayed them as being weaker by explaining that they had the men do their work for them. These stories from her father had fostered Anna’s initial undesirable and avoidance response to the electrician technician
occupation. The stories Anna heard from her father prompted her to be a different type of female electrician technician and do better than the females her father described.

Hattie’s conversation with her father-in-law and Anna’s discussion with her father made the females seem incapable of becoming an electrician technician and marginalized the role of females. The notion of females as the weaker sex and as ineffective electrician technicians maintained the power structure in favor of electrician technicians who are men (Haraway, 1988; Harding, 1997; Hartsock, 1997; Smith, 1997).

Margaret did not have family members who were electrician technicians. This lack of family members who were electrician technicians distanced Margaret from any preconceived ideas about the behaviors of female electrician technicians. However, Margaret did not receive initial support from her boyfriend. His initial reaction was to question her reasons for becoming an electrician technician as opposed to other occupations.

Probably like most guys wouldn’t be. . . . He [her boyfriend] “like really, you really want to do that at your age and do you really want to work like that?” . . . He has a totally different idea and again, [he is in] information technology . . . because he would rather that I just be staying around and taking care of him and not worrying about. . . . He [her boyfriend] was ‘you know, you don’t really need to work and I’ll take of this.” But, I was younger and independent that way. (Margaret, 1145-1153)

Her boyfriend’s initial reaction to her occupational choice made her feel that it was not necessary for her to work since he could be the main financial supporter. His offer to take care of Margaret asserted a male-dominated role and marginalized her ability to be her own income earner.

**Theme two: Personal independence.** The female electrician technicians in this study indicated the need to be personally independent. Margaret alluded to her personal
independence spirit and need to work in an occupation that made her happy. Hattie, Anna, and Martha’s desires for personal independence were in forms of higher wages, health benefits, retirement plans, and owning a business. Each of the female electrician technicians expressed that their personal independence was important to them. Martha’s personal independence was her electrical business. Her business provided the personal independence to be her own boss and to be able to work on projects that she wanted.

Hattie explained that the benefits and retirement plans gave her personal independence and would give her peace of mind with respect to her finances as she got older.

I have a retirement package that has put in above and beyond what I've got on my check. And, I also have health insurance. . . . I make a living wage enough to where I have got that . . . that's why I got into it. I wanted to be able to, first of all, work toward a retirement that I can live a good life in retirement and I'm building on that as we speak. And that's the selling point for a woman these days, is to be self-sufficient. Not have to depend on her parents, a man, or anybody else that she can be self-sufficient in this trade because you can take it anywhere you want to . . . working for a retirement so that she doesn’t have to work until she's 90 years old . . . would never have to rely on anybody else but herself to be able to make a good living. That's a selling point that you can be self-sufficient with good health insurance and be able to provide for your family without anybody else being in the equation. Then if you ever get into a dual income family, well, then that's just an added bonus. (Hattie, 1144-1168)

Hattie equates this level of personal independence as part of the American dream. The retirement plans and a higher living wage made the financial benefits as part of her personal independence and gave her a strong reason to be an electrician technician. Being an electrician technician would afford her a future with financial stability when Hattie retires.

Anna’s personal independence was related to income and not to work more than one job to earn a living wage. She was living paycheck to paycheck and was working two
full-time jobs before the electrician technician apprenticeship. She wanted the higher wage as an electrician technician, to be independent and not worry about her income.

I had just completed high school. . . . I ended up working two full-time jobs, going to school full-time, and [later] three part-time jobs, and I burnt out after a year of trying to get through Tech State College. . . finally I’d had enough, and I was like, what can I do that’s not going to have me living paycheck to paycheck? (Anna, 96-102)

Anna had worked in the retail and restaurant industries for over 15 years before she started the electrician technician apprenticeship program. Both of these jobs did not provide her the personal independence she needed. Anna stated that “just starting out in the apprenticeship program, I made $2 an hour more [and] probably, about a $100 a paycheck difference” (Anna, 1009-1010). The paycheck difference was a level of personal independence that Anna did not have when she worked several jobs to cover her living expenses.

Anna reported that an electrician technician’s salary was the step she needed towards long-term personal independence. She saw her father raise four children with only his income and her mother did not have to work. She noted that the retirement plans also gave her a sense of personal independence about income-earning potential. Anna indicated that the retirement plans were good. She stated that her father “actually makes more money now being retired . . . just because the pension programs are so good” (Anna, 1383-1384).

Martha’s personal independence came in a form of owning her own electrical business. After getting her journey-level electrician technician status in less than a year, Martha obtained her master-level electrician technician status (an additional 4,000 hours).
Once that occurred, she opened her own electrician technician contracting service with her brother. She started her business in 2010.

Once I got the [electrician] licensing, we already knew what we were going to do so we had all the things in order that we needed to start the company. I know a lot of other people that start their company and once they get their license then they have to go get their name. . . . The last thing that we needed to do was file the paperwork with the state. Once they gave it to us, all we had to do was get a business license and soon we were up and going. . . . We had our own hand tools. We had ladders. We had our vehicles so it was just a matter of getting people to know about us. (Martha, 624-640)

Martha had dreamed of owning her business and seeing it come true amazing to her. Her personal independence to seek out her own work as an electrician technician was what she wanted to do. Martha talked about solar electricity as a way of making her business grow. She said, “I’m hearing that in the next five years it’s [solar electricity] just supposed to be really growing. . . . the people demanding the solar panels . . . I think the business is fully going to take off” (Martha, 711-715).

The need for personal independence kept these four female electrician technicians in the occupation for a long duration of their work life. This personal independence was in the form of higher wages, retirement and pension, and entrepreneurship.

**Theme three: Mentors.** The female electrician technicians in this research discussed the role of informal mentors who played a part in their development process to become an electrician technician. Their informal mentors were either journeyman supervisors, instructors, and/or peers.

The apprentice training model pairs an entry-level electrician technician apprentice with an experienced journey-level electrician technician at the jobsite. They
were paired to a journey-level electrician technician supervisor or to a general journey-level electrician technician. At the journey-level, the supervisor directed the completion of the projects. The role of supervisor or journey-level electrician technicians was to mentor, provide advisement, and guide the electrician technician apprentices in their skills and knowledge development. However, this mentoring by the supervisors or journey-level electrician technicians was not always the case for the female electrician technicians.

The four female electrician technicians had to seek out supervisors or journey-level peers or co-workers who were willing to guide them through the electrician technician skills and knowledge development. The participants reported that when the mentor was the supervisor, the female electrician technicians worked on projects that enhanced their comprehension and applicability of the knowledge taught in the classroom.

Mentoring was important for the female’s career advancement within the company. Position advancement was possible for the female electrician technicians when their informal mentors publicly supported them and spoke about their achievements as skillful electrician technicians.

Margaret received advice from one of her mentors to be more outspoken and confident in her electrician technician skills and be less timid and soft-spoken around her peers and team. This advice from her mentor, who was also a journey-level supervisor, was a process to guide her to advance in the electrician technician field.

He [supervisor] just said, “You just need to be a little bit more aggressive. . . . You know the stuff [electrician skills/knowledge], and it’s time for you to step up and be aggressive with it . . . he was just saying, “Now it’s time for you to step up”. . . . I’ve always had that ability. I just needed the confidence level. . . . But, I definitely took
his advice and stepped up a little bit and became a little bit more, you know [aggressive]. (Margaret, 620-628)

Since Margaret took that advice from her mentor, she was promoted to a project supervisor. The promotion included the use of a work truck and company credit card. Margaret felt pride and a level of achievement to be promoted so quickly, just after a short two months since obtaining her journey-level electrician technician status. Margaret discussed the significance of the company truck and credit card.

They gave you a van, here’s a truck for you, here’s a gas card, here’s a company credit card . . . to a lot of people who are in the union, that’s it, you’ve made it . . . You’ve got the responsibility, the company likes you. You don’t have to buy your own fuel now for work, wear and tear on a vehicle. The company said hey, we want you to do work for us, here’s a van, go do it. (Margaret, 1193-1201)

For Anna, her journeyman mentored her through the process and did not let her think she did not know how to do something. He spent time and broke-down details of the processes into understandable steps.

The journeyman came over and looked it over and said, “You’re good.” If you feel overwhelmed or you feel like you can’t do something, you just need to tell them, “I’m not sure I can do this”, and they tell you, “yes, you can, this is how I want you to do it.” . . . [It was] a little easier to chew. (Anna, 309-313)

For Martha, a male peer, mentored her and provided guidance on how to troubleshoot problems.

His name is Dan [pseudonym]. He taught me how to troubleshoot. . . we’d been working together for six months and he made the first joke and once he made the first joke, I could tell he was accepting me. Then after that he just started teaching me and teaching me and he was a great troubleshooter and he taught me how to troubleshoot really, really well. (Martha, 240-253)

Her mentor helped her learn a skill like troubleshooting to guide Martha in her development of electrician technician skills and knowledge. Troubleshooting skills are not part of class instruction or part of the required electrician workbook. Martha’s mentor
went beyond his normal role as supervisor to guide her through a critical thinking process of how to identify and solve problems and/or issues that occur during electrical wiring installation. The guidance from her supervisor made it possible for Martha to persevere to complete her electrician technician training and stay in the electrician technician occupation.

Hattie had a female peer mentor who was a year ahead of her. She knew her peer mentor from seeing her around and they saw each other at the apprentice training center.

She [peer mentor] was ahead of me in the class and we weren’t on the same job site. I could call her for advice on certain things, but she was always available. All I had to do was call her and say “I’m having a problem with this particular problem. Help me to see it so that I can understand it”. . . . Because a lot of this is, if you can’t see it in your head, it was hard to put in application . . . she [peer mentor] is still in the trade and she is very resourceful. (Hattie, 350-365)

Hattie was able to reach out to a peer who was able to mentor her and provided guidance when she had issues with understanding the concepts. Also, her mentor was someone Hattie reached out to, who was beyond her immediate family members, and who is an electrician technician.

In addition to a peer mentor, Hattie’s other mentor was her supervisor. He started out as her supervisor, but was a mentor in developing her electrician technician skills.

The main supervisor I’ve ever had, he’s actually an electrical engineer. He knows my skills. So he was the one, he is really high up into the actual company, so he was the one that directed, "Okay, you need to use her for these jobs.” (Hattie, 792-794)

Hattie’s mentor vouched for her skills and expertise. Her mentor put her in the forefront and made it a point to let others know she needed to be included in other projects. Hattie was able to build on her skills because her mentor cheered her on and was a champion
for her. She was able to be included in different types of electrical projects and could expand her knowledge and expertise as an electrician technician. Hattie may not have had these opportunities if she did not have a mentor at work.

I work with my mentor I told you about the man that mentors me a lot. He was a regular electrician. I mean they even didn’t even let him go into the program back when he was in his early 20s because he was too small. They didn’t think he could do the job and he’s the one that had such a high grade point average and he applied for a scholarship and went to the University for an electrical engineer, and he tells me every now and then he says “I don’t look at you as a woman on my job.” He says, “I look at you as an equal.” So that’s where a woman wants to be is when the men don’t look at her as a woman coming on their job, they look at her as an equal. (Hattie, 523-531)

Hattie’s mentor also showed her respect and gave her a sense of belonging. Her mentor was also an inspiration to her. Her mentor faced discrimination, but he worked through the challenges and was able to be an electrical engineer.

**Instructors as mentors.** In addition to supervisors and journey-level electrician technicians as mentors, the instructors were reported by the participants as mentors. Hattie, Margaret, Anna, and Martha, all expressed that their instructors were very helpful in mentoring them through their apprenticeship years.

Hattie’s instructor went beyond the classroom time and was available before and after classroom hours. This was beyond the general class tutoring sessions and classroom time. This instructor provided individual guidance to Hattie.

If I was confused at home and I wrote it down on paper though, that’s what I would remember. So my instructors worked with me and I’d tell them, I don’t understand this part, and they would turn around and actually teach it to me and sometimes they would even stay longer than their time to make sure that I understood it. (Hattie, 177-179)
In another situation, Margaret’s instructor mentored her beyond the normal classroom hours and encouraged her to achieve her highest potential as an electrician technician.

We had Abe [instructor] who’s like Mr. Laidback. He’s like really a cool guy. . . . The last thing I had to do was conduit bending. Well, Abe knew that I had all these other things completed and the other guys in my class didn’t so we had like a trainer, it’s like a metal training box and you had like certain pipelines you had to do coming into this box, and when I finished mine . . . Abe comes up, looks at it. And he’s like, “I think you can do better,” and of course I took that as a challenge like, “You know what, Abe? You’re right.” (Margaret, 1400-1415) (See Appendix V for photos related to final completion projects.)

Margaret viewed Abe’s feedback as a way to challenge herself to be the best. Abe mentored her not to hold back and pushed her skills and knowledge further to be the best electrician technician. Abe was laidback and calm compared to the other males, but did not guide the others. Margaret expressed how Abe made additional opportunities in class for her to further her knowledge and work on skills as an electrician technician. Her mentor believed in Margaret, respected her abilities, and taught her to trust her abilities.

The mentors were available for the female electrician technicians when they had additional questions and/or needed guidance. For Hattie, Anna, Martha, and Margaret, the mentoring role of their supervisors and instructors played a key part in their learning and development of their electrician technician skills. All the participants expressed the mentorship from supervisors and instructors helped them learn the skills they needed to be an electrician technician and taught them specific steps and processes to troubleshoot various electrical tasks.

Theme four: Self-directedness. All of the participants discussed their self-directedness. A level of self-directedness was needed to gain their electrician technician
skills and knowledge. In occupational studies, self-directedness was defined as “a characteristic adaptation to influence career process in order to cope for oneself on the labor market,” and the individual taking personal responsibility or disposition for their learning with minimal or no guidance (Brockett & Hiemstra, 1991; De Bruin, & De Bruin, 2011; Guglielmino, 2008; Raemdonck, Tillema, Valcke, & Sergers, 2012; Raemdonck, 2006). The four female electrician technicians had to be self-directed to navigate through the male culture at the training facility and at the worksite. Hattie, Anna, Martha, and Margaret indicated that their self-directedness was necessary to balance out the long days at the job site and the evening class hours. The self-directedness required the female electrician technicians to learn on their own to understand the materials.

Hattie’s self-directedness included following instructions through a computerized software learning program. The self-directedness was a result of a need not to display weakness or inability in front of their male peers, co-workers, supervisors, and journey-level electrician technicians. Hattie indicated that she was, “self-taught because you do have to do the homework and everything like that . . . it's not like they [instructors] stand up there and teach it [workbook] to you and go over the curriculum and help you understand it” (Hattie, 882-883). There were topics that Hattie had to master on her own that were on the workbook exams, but not taught by the instructor.

The navigation process for applying to be an electrician technician apprentice required the participants to have self-directedness. The application process was not easy and clear. Individuals have to locate a training center, confirm a sponsor (electrician company or electrician union) who will pay for the training, and submit an application. All
this required self-directedness to learn the process and locate a sponsor to pay for the
apprenticeship program.

In Anna’s case, she went beyond her traditional track of a third-year apprenticeship
and self-directed her learning plan.

Right now, I’m actually taking two classes. I actually signed up to take the
instrumentation class which is actually a journeyman-level class. I didn’t realize
that at the time, but when it was announced I asked our school coordinator, “Did I
have to be a certain year in school to take the class?” He said, “Just don’t
overload yourself.” So I signed up for the class, so on Monday is that class. My
regular apprenticeship class is on Wednesdays right now. . . . On Mondays, I work
from seven in the morning till five in the evening and I have to be at the school
from six until we get done, which is usually about nine. (Anna, 127-134)

The navigation that Anna did related to her getting to the classes she wanted. She
wanted to learn more and take more classes and be able to take on as much as she
could to gain more knowledge.

They set out tests, that they have core curriculum that you have to pass, and
through the year, say if it’s on blueprint reading, we’ll have a test over that core
curriculum for blueprints [see Appendix V for photos related to final completion
projects], and then we’ll go to the next chapter of study, which might be AC theory,
and then we would have a test on AC theory. At the end of the year they used to
have finals, and they’ve cut that out and they go to craft certification now, so that at
the end of our apprenticeship we will receive a card that says we are craft certified
as electricians, and the craft certification, again, you have to get 70% of the entire
test, and all the questions are based on what you should know as a third-year
apprentice, so that’s the one I just took.” (Anna, 286-295)

Anna expressed the small amount of time to learn subjects before each exam.
The very short window required self-directedness from Anna. Passing the exams and
test was necessary to move on to the next year of apprenticeship courses and
certification.

Martha learned to self-direct herself to obtain the knowledge she needed that was
lacking in the classroom instruction. She indicated that she “just got home and got some
books out and started doing it myself. I tried to get study groups but I think I had a hard
time” (Martha, 146-148).

In addition to her self-directedness with the textbook and workbook assignments, Martha utilized computers to assist with her learning. When she wanted to learn more about an electrician technician skill, she would go to the internet and search for additional information and purchase additional books to read, “I usually used the Internet or I would buy books, some of my books from school or you could buy hands-on books that would help you with like the math” (Martha, 264-265).

The self-directed learning was necessary for these participants to get a better understanding in what they needed to learn. The self-directed learning compensated for any lack of knowledge from their mentors, instructors, and peers.

Hattie learned to navigate through the process in learning not to show her weakness and seem confident at all times. The navigation process required self-directed approaches in Hattie’s behavior towards male electrician technicians. She wanted to practice trouble-shooting skills and seek out an instructor to provide her the software for training.

They even have trouble-shooting, even right now Mike, which is Lynn’s assistant, to be able to used it [software program] you’d have to be in the apprenticeship shop to take an online trouble-shooting practice course . . . I was able to get in and they actually let me bring it home, I’ve got it on my home computer, and what it does is it gives you examples and you have to trouble-shoot it and you’re able to do it in the comfort of your own home . . . [helpful for] who have never done troubleshooting so it gives you examples and you’re the one that’s got to figure it out. It won’t let you go to the next one until you figure out what the problem is.” (Hattie, 468-475)
Margaret had used her self-directedness to observe and figure out from whom she needed to learn the electrician technician skills because there were variety of approaches to the work.

By continuing to learn, you can see who’s doing what and what you want to learn from them. So that was an elevated, an additional thing that I hadn’t counted on, but it made it more interesting. . . . It wasn’t like alright, this is the way to do it [and] there’s only one way to do it. That’s not the case. There were other ideas behind it like “Here’s what I do, here’s how you do it,” and so there wasn’t one set electrical way to do this. Sometimes some of it [electrical approach] is only one certain way but there’s different ways to do it. . . . But no, it’s not like that; there’s different ways and you’re continuing what you’re learning, not just what they’re teaching you in school, but you’re learning how to get it done on the job.

(Margaret, 323-334)

Margaret’s self-directed process showed how her navigation was part of learning by watching who to learn from and what to learn. She was able to navigate the culture of electrician technicians and male culture in a way that required her to learn the nuances of her peers, co-workers, and journeymen.

Margaret used her self-directedness to complete projects ahead of schedule so she did not waste time when she would be learning other skills.

Well, the motor controls was a little bit challenging . . . probably the funny one was conduit bending because Abe, I had completed, unlike the guys in my class, I wanted to get my projects done and go into the last couple weeks not having to worry about anything so I was very aggressive getting my projects completed and I had everything signed off on by Abe. The last thing I had to do was conduit bending. (Margaret, 698-703) (See Appendix V1-V4 for photos related to final completion project.)

**Theme five: Barriers and challenges.** The barriers and challenges the female electrician technicians faced are counter to their positive experiences of being female electrician technicians. The females experienced the following barriers and challenges to
being electrician technicians. These barriers and challenges were gender stereotypes, hazing and harassment, and the entry process.

**Gender stereotypes.** All four of the participants experienced gender stereotypes. The degree of stereotyping varied based on the situations of the female electrician technicians. These stereotypes were recognized by the female electrician technicians and they confronted those who used the stereotypes. The females also resisted the male’s remarks that were based on gender stereotypes.

Hattie had this to say about her supervisor who wanted her to work in the warehouse of the electrician company and not on actual electrician projects:

I was already a fourth-year apprentice and they had me cleaning out their shop and moving furniture. Being nothing but a material person and job-to-job [task] and that one frustrated me because I was getting no electrical experience. So, I did have to make a stand and ask them what is your plans for my future with your company and this particular contractor flat told me, “I see you as my warehouse supervisor.” Well I didn’t go through the apprenticeship program to be a warehouse supervisor. I think he didn’t want to train a woman. (Hattie, 341-348)

Hattie experienced gender stereotyping that as female, she was expected to work in the warehouse and not out on the worksite.

Hattie, who had the most experience and had been in the electrician technician occupation the longest, still faced gender stereotyping. She discussed an experience when someone did not think she was an electrician technician:

I was on a jobsite and we were about to commission this particular technical piece of equipment and I had done all of the prior electrical application and we were just ready for the vendor to come and commission the piece of equipment. And obviously he was a man and my boss told me, “Okay, he's at the gate, you have to escort him on the property, and then he's going to be the one that's commissioning the piece of equipment.” So I says, “Okay.” So I go and get him. I said, “Are you so and so?” He said, “Yes.” I said, “Well, I'm going to take you to the area where the piece of equipment is at and we're ready to commission.” I get him into the area and he gets all set up and then he stands there. Well, I just stand there. I
don’t know what he’s waiting on. About 10 minutes later, he looked at me and he said, “Well, when’s my electrician going to show up?” And I said, “Well, sir, I am your electrician.” And he turned all kinds of shades of red. He said, “Well, I apologize.” He said, “But I’ve never been introduced to a woman electrician before.” So it still happens and it’s amazing when they say, “Oh, okay.” (Hattie, 1043-1057)

Hattie found it amazing, when men did not expect a female to be an electrician technician and their surprise when they actually saw one, as if the concept of a female electrician technician was a new and rare sight.

In Anna’s case, the stereotype that females are weaker and needed assistance from men promoted the characteristic of a female nurturing role.

I don’t know if any of the guys really knew how to deal with having a woman in class. I think they knew that it was a male-dominated field, and having a woman there just threw them off. A lot of guys will want to treat you like their sister or their mother or their girlfriend or their wife. They have a different approach to dealing with female than they would dealing with one of the guys, and you just have to show that you’re willing to be one of the guys. Some of the guys will use some foul language, as guys will, and I think they made it a personal goal to see how much I would blush by some of the things they would say. I knew that was their goal, but you still blush anyway. (Anna, 100-109)

For Anna, when they set out to make her blush from the jokes they made, it was harassment, but also mocking the role of females as not being able to handle the crude jokes. Anna made an excuse that the men do not know how to treat female electrician technicians, because their experiences are based only their immediate family members (sisters, mothers, or wives). The notion of a female as a co-worker or peer is not what they have experienced. They even gave Anna the nickname of, “Mama Bear” because she liked to cook and brought extra for the group.

Some of them will call me Mama Bear. They’re like, you look after us. I’m like, don’t call me Mama Bear. I’m an older apprentice and so some of the younger guys, they’re like you’re almost at the age... it’s like, I could be your mom, [but] don’t call me Mama Bear. (Anna, 653-655)
Her peers stereotyped the behavior of bringing food to the group as a motherly trait. Anna indicated that the food brought by the male peers who brought food were not given the “Mama Bear” nickname because their wives or their girlfriends made the food.

Martha describes how she was not taken seriously because of her gender.

You have to have somebody sponsor [pay for the apprenticeship] you so you have to have an employer sponsor you to get into the school. And I found the employer but a lot of people didn't want to sponsor me because they didn't take me seriously so it took me a lot longer to get into the school and convince them that I was serious. And I finally did get into the school and once I did get into the school I jumped all kinds of hurdles and it has not been easy. . . . I'm a squeaky wheel. I just kept saying, I want to go to school, I want to go to school, you let him go to school and he's only been here for a few weeks, I've been here for three months, I want to go to school. . . think it's because I'm a woman. The first company that hired me, they wanted me to go out in the field and this is the impression I got, they wanted me to go out in the field and get a little bit of an education so they could put me in the office so they'd have somebody that had some education talking to the customers, and that's not what I wanted to do. (Martha, 10-21)

Martha experienced resistance from her employer to send her to electrician technician apprenticeship training. The employer gender-stereotyped her by not taking her seriously, sending a male co-worker who had been there less than a month, and training her to be at the front office to talk to customers.

Margaret explained how she did unpleasant tasks because the males did not want to do them.

No one wanted to do it, I was happy to do it. I did it, did it well, and they see you doing that then suddenly you’re doing more things. You’ve got find something that you can do that the guys hate doing. . . things I had to do required some patience. . . . For example, like you’re putting your wires or your cables or your conductors or whatever, they’ve got to look perfect. You’ve got to take the time to get them so it looks like they’re supposed to be there. A lot of guys don’t have the patience to do that. They would just rather get the cable, shove them in there. They don’t want to take the time to make it look the appearance that you want to see like wow, who did this, and I do so I’ll take the time to do that. And they don’t want to do it. . .
One of the supervisors said it’s not that they won’t tell you, they say “oh, I’m not good at that.” Well, that means “I don’t want to do it.” (Margaret, 1260-1275)

Margaret took the jobs that the males did not want to do and left it for her. She was able to learn when the men did not want to complete the task and the task was given to her as secondary option. The tasks men avoided were associated with appearance and things that required patience to complete.

All these female electrician technicians had internal and external support reflected in their experiences, but it was not enough to counteract the gender stereotype that women were the weaker gender. What the participants encountered was related to the perception that females were weaker physically and mentally.

**Hazing and harassment.** Workplace hazing is a practice of bulling an individual (or group) which could cause intended or unintentional physical and mental risk and/or harm to the person (Capitano, Mawritz, & Cunningham, 2014; Josefowitz & Gadon, 1989). The process of work hazing and harassment is a culture of practices towards females who are in male-dominated occupations. It is considered a rite of passage by the males for females to be able to deal with the teasing, jokes, harassment, and mocking their weakness. Hattie indicated the test of weakness, by the men, was at the point of harassment.

If you show them that any sign of weakness, some of them like to expand on that, but that’s when you have to be tough. You’ve got to put on that tough skin and tell them I’m here for my job, I’m not here for your amusement and step up . . . that’s harder for a female [who] just going through it [teasing]. . . not only does a woman have to go through it [teasing] but she also has to let him know that she can do the job and she’s not going to take all of it [teasing] and it can fall right in the line of almost harassment sometimes. (Hattie, 591-598)
Another experience of hazing was when Margaret realized her foreman was testing her ability to complete the physical task.

The foreman basically took me on a ladder and just told me I had to drill a hole up high and then they have this box drill that's like 45 pounds, get up high on the ladder, drill a straight hole, and they're just seeing if I could do it, how I was going to react to it, whatever. And of course, I did it... then he took me outside. We had a trench, just nothing but mud coming in and digging it out and we had to have access holes coming into the building so, I had that same box drill down in the mud to drill holes in the side of the building to allow us to come in and put a trough down near the side. (Margaret, 392-400)

The participants experienced a double hazing that their male colleagues did not experience. The hazing the female electrician technicians experienced consisted of being required to demonstrate that their gender would not hinder them from doing what was required of as an electrician technician. It was not just hazing as a newcomer to the occupation, but hazing that put the female electrician technicians on display to show their gender weakness.

**Entry process.** The entry process to be selected to the electrician technician apprenticeship was a challenge to the participants. Both Hattie and Martha were re-entering academics after being out of school for extensive years. They were entering the classroom as adult learners who had life experiences but limited academic experiences. Both, Hattie and Martha, experienced difficulty in taking the math aptitude entrance exam. Hattie had to get extra help prior to being fully accepted into the electrician technician apprenticeship program.

I had to consider dedicating my time to go to school, start doing homework. I hadn't been to school in 20 years when I made this decision to go through the apprenticeship program because... I was already like 37 years old. So it was a life-changing decision, but I felt at the time I didn’t have nothing to lose and everything to gain. I went through a pre-math course before I even got accepted into the program at the apprenticeship hall. When they threw that workbook at me...
and told me to add and subtract fractions, I’m really freaked, hadn’t had any dealings with math, [it] was not really my strong suit in school . . . but when I went through that course and I started learning, it was like a sponge. I enjoyed it. (Hattie, 37-47)

As adult learners, who have been out of school for a long period of time, additional academic assistance becomes important to the level of success of female electrician technicians. Hattie and Martha were out of school for over 10 years and needed additional time and assistance to pass the aptitude test.

Anna and Margaret had experienced post-secondary education and had taken algebra courses previously. Margaret actually qualified not to take the aptitude entry test since she had a Bachelor’s Degree in Education, but she took it any way. Having taken an algebra entrance exam, which they did not need to take, would have not prolonged their acceptance to the electrician technician apprenticeship program.

Participant Follow-up Interview

The participants enjoyed talking about their experiences. Hattie expressed that she did not think she had much to say until she read the interview transcripts. She liked the process so much that she printed the transcripts out to keep them for herself. Anna, Martha, and Margaret all indicated that they learned a great amount of information about their voice from being part of the study.

Hattie agreed with the themes of the study. She indicated she recently had attended the National Women Electrician’s conference. At the conference, she had attended all the workshops on starting a mentoring program. Hattie was very excited to be able to start the mentoring program for female electricians, but she was not able to fully implement the process due to lack of time. Hattie has not given up on the concept of
the mentoring program for the female electrician technicians. Hattie was told that the union electrician technician apprenticeship interview committee will include a female on the panel. She has been recommended to be the first female on that interview panel.

Martha was surprised to learn that three other people were interviewed for the research, because she did not realize that there were that many females in the program. Even Margaret was surprised to learn that 6% of electrician technicians in Florida were females. Margaret was surprised that it was that high and was happy to hear that there were more female electrician technicians.

Anna indicated that she agreed with the themes. She believed there was nothing to add to the process of the research. Anna was near the end of her five-year apprenticeship and due to complete her program in the summer. She could not believe that it had already been a year since the interviews. Anna overall was interested in what would happen to the findings from the study.

Margaret found the themes agreeable. There were no additional comments or clarifications from Margaret. She was working outside her region as part of an electrical project. Margaret was enrolled in another certificate electrician technician course related to data instrumentation which was required for her continuing education credits for journey-level status.

**Researcher’s Reflexivity**

I was the conduit between these female electrician technicians who were excited to learn that there were other female electrician technicians like themselves. The female electrician technicians had no interaction or knowledge about other female electrician
technicians. I was able to bridge this knowledge gap through their participation in the study.

The female electrician technicians in this study had an impact on my perspective on the challenges they experienced. I became aware and understood the participants’ abilities to overcome the gender stereotypes and still be successful. I was connected to the four female electrician technicians because they made me see how I could be better and continue to be successful in my own profession. At a deeper level, I felt honored to be the one to tell their story through this research and the experience made me realize the larger benefits of this research.

The participants had also regarded me as a friend and checked on my well-being. Martha would email to just see how I was doing. I was humbled by the outreach of the participants and the support they provided me throughout this study. Additionally, I was surprised by the outpouring of support from the participants to encourage the completion of the study.

Summary

This chapter first discussed the participant profiles. Then, the individual cases of the participants were examined. Next, the themes from the participants’ interviews were presented. The participant profiles discussed the descriptive backgrounds of the participants as they related to their age, ethnicity, marital status, income level, and educational level. The individual profiles discussed the participants’ experiences and the connections to the research questions for this study. The themes that emerged from this study were identified and discussed as factors about why the females decided to become electrician technicians and stay in the electrician technician occupation.
Chapter 5
Discussion of Findings

The purpose of this study was to understand the reasons the four female participants decided to pursue electrician technician training, their perspectives of the apprenticeship program, their perceptions of successful employment in a male-dominated occupation, and differences in treatment based on their gender. The first section of this chapter begins with the discussion of the themes as they relate to the research questions for the study. Next, feminist standpoint theory and the connections to the themes are discussed. The last section is the summary.

Themes

Themes from this study were based on the information gathered to address the four research questions. The research questions that guided this study were:

1. What led the females to make the decision to pursue the electrician technician apprenticeship?
2. What was the nature of the education and training experiences of the participants in the electrician technician apprenticeship program?
3. What were the participants’ perceptions on successful advancement within the workforce as a female electrician technician?
4. What gender differences did the participants experience as female electrician technicians?
The four female participants in this study had distinctive personal backgrounds, each was a unique individual in a different situation and each had different life ambitions. Even though there were differences among the four female electrician technicians, there were also common themes that bound them together. The themes that connected the four female electrician technicians included family support, personal independence, mentors, self-directedness, and gender stereotyping. These themes assisted in understanding the participants’ experiences as female electrician technicians in a male-dominated occupation.

**Participants’ reasons for applying to an electrician technician apprenticeship.** The themes generated from the four female’s experiences answered research question one for this study. The females indicated family support and personal independence were two motivators for applying to be an electrician technician apprentice.

**Family support.** The participants reported that family support was one of the major reasons they applied to the electrician technician apprenticeship program. Part of the family support that Hattie, Anna, Martha, and Margaret received included words of encouragement to be an electrician technician. Hattie, Anna, and Martha had family members who were electrician technicians and who supported them by sharing their electrician technician experiences. Margaret did not have any family members who were electrician technicians, but her boyfriend was supportive of her commitment to be an electrician technician.

Females in other male-dominated occupations reported their decision was influenced by their family support (Hein et al., 1982; Schroedel, 1985). For example, research of females in other male-dominated occupations in science, technology, math,
and engineering indicated that strong family support contributed to their decision-making process to be in a male-dominated occupation (Dabney, Chakraverty, & Tai, 2013; Heins et al., 1982; Maltese, Melki, & Wiebke, 2014).

The contribution that family members made to encourage the females to enter male-dominated occupations highlights the need for family to be attentive to the occupational or career decisions of their children. Females in this study, who had an interest in being an electrician technician, had the support of their family members. The support came in the form of approval to become an electrician technician. This approval from the family members was a major reason that supported the females in making their decisions to apply to work in a male-dominated occupation. The family support, in the form of approval, for Hattie, Anna, and Martha was easily given since they had immediate family members who were electrician technicians. Margaret did not have an immediate family member who had firsthand knowledge of the electrician technician occupation and relied on the Internet to learn about the occupation. Her boyfriend and her mother supported her decision to be an electrician technician, because it was what she wanted and she enjoyed the work. Margaret indicated that she enjoyed the work when she is creating and working with her hands.

Personal independence. The other reason the four female participants applied to the electrician technician apprenticeship was the need for independence. Personal independence to them was the ability to be self-reliant and not dependent on others for financial resources. The income and benefits as an electrician technician were greater than their prior occupations (retail, pizza maker, and yacht builder). The female electrician technicians reported that personal independence was a reason for leaving their
prior occupations that lacked decent wages, health benefits, and retirement options. The need for personal independence is supported by Blau and Kahn (2007), Catalyst (2013), and the Institute of Women’s Policy Research (2011 & 2013). The female electrician technicians perceived the employment outlook for female electrician technicians as positive. The participants believed opportunities existed for female electrician technicians through several means. One such opportunity was to be employed by a company for a longer duration and therefore, have work longevity. Another was that they could be self-employed and own a businesses. They all believed that occupational advancement was possible for females who seek personal independence.

*Participants’ experiences in apprenticeship education and training.* The experiences of Hattie, Anna, Martha, and Margaret as electrician technician apprentices varied, but they had similar requirements to complete their electrician technician apprenticeship program. The requirements they all had in common were the specific hours worked on site, the in-class course requirements, the exams, the final hands-on demonstration classroom projects, and the final electrician technician certification exams. In addition, all were evaluated by their journey-level supervisors and their course instructors.

Overall, the electrician technician apprenticeship program required a five-year commitment for Hattie, Anna, Martha, and Margaret. They received journey-level electrician technician status after completion of the final projects and the state electrician technician industry certification exam. The four female participants perceived the nature of their education and training experiences was positive due to mentors and their own self-directedness.
Mentors. The participants believed that mentors were essential to gain optimal skills and knowledge in the electrician technician apprenticeship. These mentors made it possible for the female electrician technicians to advance in their skill and leadership development. The female electrician technicians explained that mentors went beyond assigning them to entry-level work and gave them more challenging projects to enhance their skills (Denissen, 2010a, 2010b; Moccio, 2009; Ness, 2012). These mentors also ensured that other male electrician technicians noticed their credible work and respected the skills and abilities of the females.

Having mentors throughout their education and training as apprentices made it possible for the four females to continue their apprenticeship process. The mentors not only provided additional academic support, but their mentors also provided a buffer against other males who perceived females not capable of becoming electrician technicians. Hattie, Anna, Martha, and Margaret’s mentors also challenged them to overcome these barriers by putting them in the forefront of the group and to allow them to demonstrate their skills in front of their male peers and other supervisors.

Self-directedness. The female electrician technicians viewed their own self-directedness as another part of their electrician technician apprenticeship experience. All the participants expressed the need to be self-directed because the male environment was often hostile to their success and/or their skill and knowledge development. The four female electrician technicians took responsibility for their education and learning processes during and after their apprenticeship program.

The self-directness that emerged from Hattie, Anna, Martha, and Margaret was created out of necessity. It was necessary for the four female electrician technicians to
be self-directed because they felt they could not display any form of inadequacy in front of their male peers, colleagues, or supervisors. They had to learn additional information on their own and to use the class textbook on their own.

In addition, the nature of their education and training experiences provided little time to work in groups or continuously relay on mentors. For example, Hattie reported that some of her journey-level supervisors did not know to instruct her to actually do something and were not able to answer her questions. Thus, to compensate for the lack of knowledge from her journey-level supervisors, she would look up the information and teach herself. Martha would search the internet for ways to trouble shoot electrical problems.

The mentors and their own self-directedness were key components of the four female electrician technicians’ experiences during their education and training. First, the reliance on mentors to guide them and pave the way to allow them to take on meaningful electrician technician projects to build their skills and, at the same time, display their capabilities to males who viewed females as incompetent. Hattie, Anna, Martha, and Margaret’s self-directedness compensated for when the mentors were not accessible and helped ensure that males did not perceive them as incapable to be electrician technicians.

**Participant perceptions of being successful in advancing in the workforce.**

The perception of being successful in advancing as a female electrician technician was to be “one of the guys.” Being one of the guys meant having physical strength, not being “catty,” being assertive, and being competitive. The competitiveness required Hattie, Anna, Martha, and Margaret to state what they wanted and to resist any deterrent that
could undermine their learning and development. Overall, the four female electrician technicians indicated that being one of the guys and being recognized as one of the guys was a process to advance within the electrician technician workforce. The four female participants perceived being one of the guys was necessary for acceptance within the electrician technician occupation.

**Participant gender group work preference.** The female electrician technicians indicated that the gender stereotypes of females as weak impacted them enough that they expressed their preference for working with men and not with women. The notion of being one of the guys was critical to the female electrician technicians, because it symbolized that they were not typical females who did not carry their own weight and who were not catty (hurtful or spiteful, in this case). All of the participants indicated they would prefer to work with men and presumed that most women were catty and would not be able to do the work required as electrician technicians. Below were statements from Martha, Anna, and Margaret where they indicated they would prefer to work with men and not with women.

I think it was great for me because I love working with guys and the age group was such that we had young guys and we had older guys so it was a great mix. There was a nice chemistry . . . they [guys] realized that you’re just one of the guys and you’re not offended or you’re not intimidated, then you are just one of the guys and then it’s very comfortable and it was actually very enjoyable. The guys were a source of comic relief usually and it was no issue. (Margaret, 284-293)

I work well with guys. I love working with men. And you get a lot of women, there’s a lot of personalities and you don’t focus on the task at hand whereas men, it’s work and I like the fact that it’s work. You gotta produce or you’re not going to be around. (Margaret, 924-926)

In different gender groups, guys are a lot more straightforward, women are a little more . . . I don’t want to say manipulative or catty, but they’re more strategic, I guess, would be the proper [way] to say that, and I base my reactions to people on
what they present to me. . . . I’m one of the guys. I’ve had a lot of them say, you’re one of the boys. . . . Again, I’m at the point now that I’m one of the guys. . . . If you present yourself as a little princess, then that’s how they’re going to end up treating you. (Anna, 93-96, 210-211)

It is hard and society wants girls to play with dolls and guys to play with cars. So that being said, it’s hard for a girl to know the mechanics, and to be an electrician, you have to have a very mechanical mind as well . . . sometimes to have that kind of tomboy attitude [and] that they don’t want to do the typical female job or female career . . . because you do have to get your hands dirty and it is hard work and you sweat. (Hattie, 826-833)

Part of being one of the guys is to be physically fit and to show competence by being able to carry the equipment and tools.

I’m pretty strong for a girl. Most women aren’t as strong as men. (Martha, 357-358)

Be active. I did a lot of weight training and stuff. I’ve done a lot of races. I did a couple of marathons. You keep yourself physically fit working out and . . . you’re carrying a lot of the equipment sometimes. Ladders, you have to be able to navigate a ladder around some tight situations. You’ve got to have good balance. You’ve got to have a good sense of skill so if you’re an athlete, then it’s perfect. If you’re not, you’re just not going to make it through the day. Sometimes it’s not, but most of the time, especially in the commercial electrical side of it or industrial side, it’s very physical. (Margaret, 1278-1285)

There was also an expressed feeling of being aware of the level of competition with the males, which included proving their competencies as electrician technicians. Denissen (2009), Fogel and Campbell (2011), McBride (2011), and Mocciio (2009) found similar results in their research, all four participants expressed this during the research process.

A woman has to go out there and prove herself on a daily basis. . . . Even though she’s got that journeyman title, a woman still has a harder time going out there and proving that she can do the job. But, once she goes out there and does it, and the management says, "You know what, that girl comes out here on this job to work. Most women are detail oriented too. So when we do something, we do it thoroughly. And when that relationship is established with the contractors, then women hold a job. (Hattie, 1147-1153)
There’s a lot of stress. There’s a lot of pressure. And you always have it in the back of your mind, it’s like you’ve got to be at least as good as the guy. Because I always felt that I had to be equal to the person that I’m working with. If I’m not equal to the guys, if they have more strength than me, then I need to have more knowledge, something to equal it out. (Martha, 406-409)

You just have to show them that they’re going to need you there. They’re going to want to have you there because you’re just that good. It makes you want to do better and attain a higher level. Just you saying, “You’re sure you don’t want me here, because I do a darn good job.” (Anna, 502-505)

It is a male-dominated trade. Know that going in and always remember it. Your success will be determined by your ability to perform and excel with the guys. (Margaret, Journal Entry response to prompt question #4)

The statements from all the four participants indicated a preference for working with males and their perception that the electrician technician occupation was masculine. Feminine traits were not mentioned as being favorable. Part of the competitiveness was to show the males they were just as capable as the men. Anna stated that the male group would want the females working with them, because their skills exceeded the males and that would make advancement possible.

The perception of the four female electrician technicians was to accept and accommodate the masculine culture to advance in the electrician technician occupation. In terms of advancing in the electrician technician occupation, the females felt they had to be competitive and show aggressiveness in verbalizing what they wanted in their occupational development. This required the female electrician technicians to be accepted as one of the guys to be acknowledged as a capable and skilled individual. In turn, this meant supporting the masculinity of the occupation and de-feminizing the role of females as electrician technicians.
Gender differences the participants experienced. The participants did experience different treatment because of their gender. The difference in treatment was based on the gender stereotypes that females are inferior to males in physical labor. The stereotype that Hattie, Anna, Martha, and Margaret experienced was a barrier, but it did not stop them from being successful electrician technicians.

Gender stereotypes. Although each of the females had different experiences, they had some commonality in the barriers and challenges that were related to each of them being the only female in the electrician technician classroom and worksite. These barriers that were identified by the participants as gender stereotypes were linked to mother, daughter, sister, or girlfriend roles, who needed help and who was not meant to be working outside the home as an electrician technician. The female electrician technicians reported that the gender stereotypes existed both during training and at the worksite in ways similar to what had been reported by others. Chun et al. (2009), Denissen (2010a, 2010b), Moccio (2009), and Scholder (1989) found gender stereotypes as a barrier for females in trade occupations. All four females resisted and reacted to the unwanted harassment or hazing treatment.

The existence of gender stereotypes in a male-dominated occupation were described as harassment treatment behavior. According to Moccio (2009), male-dominated occupations are difficult environments for females because of the “hostility towards women” where sexual harassment and machismo behaviors are tolerated (p. 162). The harassment the female electrician technicians experienced is part of the male culture, especially in male-dominated occupations. Moccio stated that:
Women’s presence sharply reminds male workers that the value placed on physical aspects of electrical work are continuously undermined by new groups of less-valued workers, namely, women. Male workers often try to rid the work site of women workers by vulgar displays of pornography or inappropriate jokes or language. . . . Gender discrimination and sexual harassment continue to be endemic to the construction trades. (pp.162-163)

Hattie resisted the harassment, and when it became intolerable, she reacted and reported the harassment to her supervisor.

All four females resisted the gender stereotype treatment and indicated the need to be tough and stand up against the harassment. The participants in this study overcame the harassment that emerged from the stereotyping by not accepting the differential treatment because of their gender. Hattie, Anna, Martha, and Margaret’s resistance against the negative stereotypes (e.g., speaking up for themselves, asserting their discontent with unwanted behaviors) made them successful and able to continue to become journey-level electrician technicians.

The findings of this study showed that gender differences hindered female participants, but mentors helped them through the process to assist them becoming successful as electrician technicians. The male-dominated electrician technician occupation culture oppressed the female participants. The participants felt they were challenged by machismo behavior. Even though the participants did not use this specific word (machismo), they were describing similar behavior reported in Moccio’s (2010) research. The participants in this study affirmed that the electrician technician occupation was male-dominated. The female electrician technicians had to acclimatize to the masculine environment to become successful.
Feminist Standpoint Theory

The theoretical framework, feminist standpoint, was the lens used for this research. The discussion of the findings of this study related to feminist standpoint theory. Harding (1986) and Hartsock (1998a, 1998b) assumed five primary tenets of feminist standpoint theory. The five tenets are discussed in relation to the experiences of the four female electrician technicians.

The first tenet of feminist standpoint theory states that real life situations (based on the Marxism position of two class groups) sets limits on the full understanding of the reality of social interactions among groups. The experiences of the four female electrician technicians were influenced by their social interactions with males (peers, instructors, journeyman, supervisors, contractors, and clients) in the classroom and worksite as the gender minority of the group. Feminist standpoint theory states that a power relationship may be imbalanced due to the social structure (Collins, 1997; Harding, 1997; Haraway, 1988; Hartsock, 1983; 1987, 1989, 1997; Lather, 1992; Smith, 1997).

To get an understanding of the female electrician technicians’ reality of oppression, I included the research question to directly address the gender differences. There were no specific interview questions that asked about being treated differently, but there were probing questions to elicit their experiences about being treated differently by male peers, journeyman, supervisors, and contractors. Research question four examined whether the female participants experienced differential treatment because of their gender. Feminist standpoint theory indicated that females are closest to their oppression. Acknowledgment of being the only female showed their awareness of different treatment.
Hattie, Anna, Martha, and Margaret acknowledged being the only female at the worksite and in the classroom.

I was the only woman and most job sites would be the only woman . . . In my particular [first year] class there were four other women. One of them had to drop out because of medical problems . . . I graduated before the four women. (Hattie, 130-134)

I’m the only female in that class. There was a woman in the fourth or fifth year class when I started, and she has since topped out [graduated], and then there’s a young lady in the class behind me also. (Anna, 40-42)

No [girls] in my group, no there weren’t. There were girls ahead of me and girls behind me, but none in my class. (Margaret, 339-340)

I was pretty much the only female. I did have one class that there was another female in my third year, but she didn’t make it all the way through. (Martha, 66-67)

Their acknowledgment of being the only female showed how the four participants viewed their social position among the males and realization of being in a structure that classified them as having no power within the electrician technician occupation, because of their gender. The experiences of these four females provided a direct perspective of their oppression being the subordinate group in a male-dominated environment. The females’ social position follows the feminist standpoint theory that females are in the front lines in understanding and awareness of the oppression they faced during their process of becoming an electrician technician.

The second tenet of feminist standpoint theory is when real life is structured in fundamentally opposing ways for two different groups, and in a system of domination, the vision of reality available are from a male perspective where existence of truth is partial and inverse. The reality of the imbalance of power among the females and males exposed the truth of the actual experiences the four female electrician technicians
encountered in a male-dominated structure. Hattie, Anna, Martha, and Margaret recognized the power males had over their process to be an electrician technician. One example, reported by Martha, was the male supervisor who utilized his power not to send Martha to the electrician technician apprenticeship because of her gender.

Martha stated that she “kept saying, I want to go to [apprenticeship] school, I want to go to school, you let him go to school and he's only been here for a few weeks, I've been here for three months, I want to go to [apprenticeship] school” (Martha, 15-16). The power the male supervisor had was to continue to send males and not females to the electrician technician apprenticeship program. Martha recognized the reason for her supervisor’s behavior was because “I'm a woman . . . they wanted me to go out in the field and get a little bit of an education so they could put me in the office so they'd have somebody that had some education talking to the customers, and that's not what I wanted to do” (Martha, 17-19).

Margaret, like Martha, had experienced the imbalance of power during her process to enter the apprenticeship program. She described her interview with the group of males.

I was a little apprehensive about the interview because I wasn't sure and there's a roomful of a bunch of guys, old school guys, and I went in my pretty white blouse and jeans. . . . I wasn’t sure how this was all going to be]. . . . I remember walking out thinking well, I gave it my best shot. . . . It's up to them to decide so there’s that uncertainty. . . . They're looking at all your stuff [application materials and exams] and then they’re looking at you and then they’re going to decide . . . a bunch of guys. (Margaret, 202-214)

Hattie experienced a male contractor exercise his power by limiting her worksite duties to the warehouse area. She reported how her supervisor restricted her tasks to carrying, cleaning, and fetching tools.
I have worked with one contractor who was keeping me working. . . . I was already a fourth-year apprentice and they had me cleaning out their shop, moving furniture, and being nothing but a material person. . . . That one frustrated me because I was getting no electrical experience, so I did have to make a stand and ask them what is your plans for my future with your company and this particular contractor flat told me, “I see you as my warehouse supervisor.” (Hattie, 416-424)

The contractor regulated Hattie’s duties to a domestic role of cleaning and organizing the furniture and materials.

In Anna’s case, the power that was exerted was from her male peers. The male peers exerted their power by giving her familial and unwanted nicknames. They would call Anna by the nicknames of Mama Bear and Girl on Fire instead of her actual name. The nickname of Mama Bear shows the male power of dominance by pigeonholing Anna in a familial role. The Girl on Fire nickname was a reminder of when Anna made a mistake and caught on fire. Even though Anna had told them not to call her by these names, the male peers still continued calling her by these nicknames.

All four female electrician technicians in this study reported this imbalance of power existing in the electrician technician occupation structure. The power domination of the males impacted the female electrician technicians through the control of the application process for apprenticeship, the type of task assigned at the worksite, and the classroom. The power relationships were part of the females’ reality as electrician technicians.

The third tenet of feminist standpoint theory states the vision of the ruling class (or gender) structures the power relations in which all parties are forced to participate. Therefore the dominate group cannot dismiss the oppressed group’s experiences as false. Female knowledge is the basis for understanding true oppression and
marginalization of the females in this study. All four female electrician technicians reported their knowledge and skills were viewed as not credible by male electrician technicians, but they were still able to affirm their knowledge and skills by advancing though their competency tests, worksite tasks, and final projects.

Anna was told her knowledge was deemed nonexistent by her male peers. The males diminished and downplayed her knowledge in the classroom. Anna stated her male peers would say “of course they’re [instructors] going to give an ‘A’ to the girl because there’s only one in here” (Anna, 378). The comment meant that Anna was doing well in the classes solely due to the fact she was the token female and was not based on her knowledge and understanding of the class instructions and materials.

Hattie had males who viewed her knowledge and skills as nonexistent, as though not truly hers, and that she was there because her husband was an electrician technician. Hattie talked about how male apprentices and other males believed that she had no electrician technician knowledge.

My husband was in the [electrician] trade and that didn’t always work in my favor because, and even to this day, young apprentices who don’t know me, [say] “well she gets her jobs because of who her husband [is]”. . . . they [males] would automatically make that assumption without even knowing me or even seeing my skills. But I let them say what they had to say and when the day [ends] . . . and after a while they’ll come up to me and apologize. I’ve had many men come up to me and apologize for having a preconceived idea of who I was. (Hattie, 682-690)

Male peers and supervisors marginalized Anna and Hattie’s knowledge. Moccio (2009) and Denissen (2010) indicated that males often feel threatened by females and would assert their power by devaluing female’s skills and knowledge.

The fourth tenet of feminist standpoint theory states that the vision available to the oppressed group must strive to uncover the existing oppressed social relations. The
experiences reported by Hattie, Anna, Martha, and Margaret were from their unique social position as being the only female in their male cohorts. In their acknowledgment and awareness of their lower social position, being the only female in their class and worksite, their knowledge included how their subjugation and marginalization (as indicated by gender stereotyping) challenged their education, training, and advancement as electrician technicians. In addition, the four female electrician technicians’ experiences identified specific behaviors, personalities, and self-directedness that a female must have to succeed in a male-dominated occupation. For example, the females identified being physically fit as a necessity to handle electrician technician tools and equipment, as well as prevent being seen as weak or not knowledgeable females.

The fifth tenet of feminist standpoint theory states, in the understanding of the oppressed within their social interaction location, will expose the reality of the existing power relations among the groups. The females’ distinct knowledge, developed through their experiences of oppression, was relevant and closer to accurate about the subjugation within the male-dominated occupation. The experiences reported by Hattie, Anna, Martha, and Margaret show the level of oppression in the electrician technician occupation. The four females were the direct targets of oppression and were conscious of different treatment because of their gender. Their knowledge of the experiences are deemed accurate because the information was from the ground level of the oppression. For example, all four females discussed the need to resist the male-dominated power that oppressed their skills and knowledge development. They had to speak up, to be a “squeaky wheel”, and to assert clear responses against the oppressive behavior directed
at them. Their description of what occurred is the distinct knowledge formulated and affirmed from their experiences as females in a male-dominated culture occupation.

Overall, the epistemology of feminist standpoint theory was part of this study. According to Ramazanoglu and Holland (2002), it is a feminist standpoint theory research when certain epistemology tenets claims are satisfied. These epistemologically claims are used to maintain the voice of the female participants by showing how they think about gender, how they know what they know of gender, and how statements made reflect gender power relations (Ramazanoglu & Holland, 2002). Throughout this research, the voices of the female participants were maintained through direct communication with the four females at every phase of the study. I made a conscious effort to balance the power between researcher and participant that were documented and noted during the data collection and data analysis process. In these research processes, feminist standpoint theory provided a method to isolate the female electrician technicians’ power relations in a male-dominated occupation.

**Identity**

The issue of gender identity is an aspect of the feminist standpoint framework to understand the power relationship of one dominant gender group over another gender group. According to Denissen (2010), females in male-dominated occupations encounter gender conflict and demonstrate *masculine* traits to assimilate into the male culture at work. The feminist standpoint theory includes examining the social interactions and situations to analyze how a male-dominated work culture asserts power over females to become part of the existing social structure (Powell, Bagilhole, & Dainty, 2009).
In the social position of females in male-dominated occupations, the emergence of identity in feminist standpoint theory is the social intersection. Since social position and social interactions overlap, a social structure of the interactions, related to the four female’s occupational identity, are examined through the micro, meso, and macro levels. The misidentification of females as electrician technicians were experienced at the individual (micro), the local group (meso), and the larger institutional general social interactions (macro) levels (Brush, Bruin, & Welter, 2009; Winker & Degele, 2011). At the micro, meso, and macro levels, the females were often not identified as electrician technicians, due to the social and political perceptions that the electrician technician occupation was not for females. At the individual (micro), the local group (meso), and the larger institutional (macro) level, the four females worked towards being successfully identified as electrician technicians. The social structure levels show the inequities and marginalization the females reported both in the classroom and at the worksite.

**Micro, meso, and macro levels.** An illustration of the occupational identity as electrician technicians for the female participants is described at the micro, meso, and macro levels. The themes that emerged were structured in the micro, meso, and macro spheres that captured the participants’ experiences as they worked through being accepted as electrician technicians in a male-dominant occupation. Figure 9 illustrates the themes from a feminist standpoint lens as the dominant group challenges female to be identify as an electrician technicians in terms of their social spheres.

At the micro level (individual), the females were most comfortable being identified as electrician technicians with the support of their families and their individual needs to be personally independent (financially and career sustainability). Hattie, Anna, Martha, and
Figure 9. Analysis of the themes model. A feminist standpoint structural illustration of the themes that emerged from the study in terms of the individual (micro), the local group (meso), and the larger institutional (macro) levels; and as the females were identified as electrician technicians throughout their social interactions in a male-dominated occupation.
Margaret’s personal independence and need to be self-reliant were emphasized by attainment of the higher wages and other benefits. This personal independence generated a level of internal ease and comfort to be identified as an electrician technician and associated with the occupation.

At the meso level (local group), the females had some level of acceptance and were identified as electrician technicians among their peers and co-workers with the support from mentors and their own self-directedness to be competitive and to be better than their male peers. Even though the mentors and self-directedness seem to be opposite [learning from others compared to learning by oneself] for the four female electrician technicians both were needed. For example, when the mentors were not available, it was their self-directness that made it possible for the females to succeed.

Hattie, Anna, Martha, and Margaret’s identification as electrician technicians was challenged in both the classroom and at the worksite. The four females had mentors who assisted them in affirming their occupational identity and supported them as electrician technicians. But they also had to rely on themselves to gain the knowledge and skills to be identified as capable electrician technicians. Hattie, Anna, Martha, and Margaret were often not identified as electrician technicians as they encountered and interacted with males.

At the macro level (larger institutional), the females often were not identified as electrician technicians by the general public because of gender stereotypes that assumed females could not be electrician technicians (Kirk & Okazawa-Ray, 2010). These three structural levels indicated marginalization of the four female electrician technicians in the classroom and worksites (Cunningham, Bergman, & Miner, 2014). At the micro and
meso level, the female’s occupational identity as electrician technician was minimally challenged by their family members and by some of their peers. When Hattie, Anna, Martha, and Margaret interacted with those outside of their micro and meso spheres, their occupational identity was not obvious and assumptions were made that they were not, or could not be, electrician technicians because they were females. However, the female’s occupational identity as electrician technician was a larger problem at the micro level.

In feminist standpoint theory, the social structure of the electrician technician occupation oppressed the female electrician technicians at some level that challenged their perspective of masculine and feminine traits, as mentioned by Powell et al. (2009). The nature of a male-dominated occupation reinforces the idea that these occupations are defined by masculine behavior. Harding (1986) and Hartsock (1989a, 1989b) indicated, from a feminist standpoint theory, the four female electrician technicians’ experiences challenged their prior knowledge about acceptance and led them to formulate the knowledge that being one of the guys was an indicator of acceptance to being identified as an electrician technician. The need for occupational identity was a priority for the female than gender identity to be accepted.

In the process of affirmation of their identities as one of the guys, the participants suppressed their feminine traits (considered as weak characteristics) to gain acceptance and be recognized as electrician technicians. The suppression of the feminine traits showed the male-dominated group’s power to subjugate the females to seek approval from them. At the same time, the female’s acceptance of the male ideology and value of the masculine traits maintained the dominant group’s power structure to keep female’s out of the electrician technician occupation.
Apprenticeship

Electrician technician training is based on an apprenticeship model where a new electrician technician is paired with an experienced journey-level electrician technician. The apprenticeship program combines work experience and classroom instruction time to meet electrician technician industry standards for certification as a journey-level electrician technician. The apprenticeship program primarily emphasizes applicable learning through work-site experiences. The classroom time is reserved for foundational learning through instructor and textbook materials.

The females in this study primarily discussed their experiences from the workplace and less reports of their experiences in the classroom. These experiences were focused on the workplace because the apprenticeship program requires more hours at the worksite than in the classroom. For example, the female electrician technicians indicated that they would attend class for half days, plus two days of the week from 1:00 P.M.-7:00 P.M. For the remaining days, they were working at their designated sites Monday through Friday from 8:00AM-5:00PM. For the days they were required to be in class, they would be at their workplace until 12 noon. Thus, the themes generated were primarily related to the workplace. The female electrician technicians reported more gender basis at the workplace, but the gender stereotyping was not just limit to the workplace.

The apprenticeship program provided an avenue for the female electrician technicians to learn and craft their skills and knowledge. The process to enter the apprenticeship program was complicated and long for the participants in this study. The apprenticeship program remains male-dominated partially due to the lack of female
representation in the entrance process. For example, Margaret discussed being interviewed by a panel of males and how that experience made her the prospect of becoming an electrician technician. Despite the challenge to the entrance process, the female electrician technicians believed that the apprenticeship program was a good experience to develop their skills and knowledge.

**Researcher’s Reflexivity**

During the research process, I encountered conflict between my role as a researcher and the critical feminist standpoint lens. As the researcher role, I had the responsibility of preserving and upholding the ethics of care for my participants and ensuring that their voices were the primary focus. I felt that in upholding the ethics of care I would maintain a level of consciousness to ensure that no unnecessary risk was bestowed upon the female participants during and after this research. However, from a feminist standpoint lens, I had to analyze their reported experiences with a critical perspective about a patriarchal system. This dilemma was apparent during my analysis of the data.

**Their voices verses my voice.** Maintaining the participants’ voices was important to me. I did not want to impose my beliefs and values on the participants. Kirsch (1999) indicated that a researcher’s desire to empower participants to act or impose a different perspective may actually silence their voices. In maintaining the female electrician technicians’ voices, I minimized my voice so I did not intentionally or unintentionally press my views or opinions upon their experiences. I wanted “to present the data with these women in mind . . . [because] these extraordinary women took on a male-dominated occupation” (Research’s journal, p. 87). By respecting and honoring the
participants, I indirectly and directly emphasized the female electrician technicians’ voices and not my own voice.

I honored these female electrician technicians throughout my research. Maintaining their trust and a commitment to tell their stories was essential to me as a researcher.

A commitment to participants urges researchers to listen to women’s voices, to honor their trust, and to cooperate with women in the telling of their stories, while a commitment to the research community asks researchers to be as accurate, exhaustive, and frank as possible in the process of gathering and presenting information about other people and cultures. (Kirsch, 1999, p. 52)

My voice as a researcher was defined by the data and information I collected. However, my responsibility was to the female technician electricians rather than assert my opinion about their behaviors and experiences.

**Critical dilemma of feminist standpoint research.** Ethics of care dictates a researcher ensure anonymity, maintain confidentiality, and minimize any potential unforeseen risks. The dilemma in conducting research from a feminist standpoint is the balance of power in the interpretation of the data. In using a feminist standpoint lens, being critical of the data is one of the essential elements of data analysis; however, being critical does not necessary mean to create unnecessary or undo risk to the participants.

According to Kirsch (1999), I am already complacent in introducing potential risks to female electrician technicians through their participation in this study. The number of females in the electrician technician occupation is already in an unbalanced situation with an average of one female for every six years of the electrician apprenticeship program. This information was important to me and was constantly at the forefront of my thoughts. Even though I took great care to maintain the anonymity of their identities, the participants
may be identifiable through the personal situations they provided because they were the only females who encountered those situations.

In conducting feminist standpoint research, I encountered an interpretive dilemma. My values were at odds with some of the participants’ values and ideology. Kirsch (1999) indicated that interpretative dilemma often emerges and advised:

Researchers need to ask how representations might play out in public discourse, the media, and policymaking bodies, all of which influence educational agendas . . . directly affect lives. . . . Whose words, and whose reality was to prevail in the research report? (pp. 50-51)

Even though my values were different from the four female electrician technicians’ perspectives, I had to address the issue beyond myself and thought about how this research would be viewed at a wider scope of possible impact. This research may or may not affect policy that may increase the number of females to pursue an electrician technician occupation. At the policy level, I had discussed my research at Florida’s Apprenticeship Office. This study may affect how recruitment and apprenticeship training are conducted to ensure more females become electrician technicians at the Florida Apprenticeship Office. Overall, this research was designed to provide a space for the female electrician technicians’ voices to be heard and acknowledged, but the potential to impact social policies were taken into consideration during the analysis of this research.

I had to choose between my role as critical researcher or my responsibility to the participants. I took the latter approach to ensure the highest level of minimal risk to the female electrician technicians in this study. Being recognized or identified as a critical researcher was not as important to me as ensuring the safety and physical and psychosocial well-being of my participants. Their lives continue after this study. They live
in the environment they reported, which is not necessarily a good or bad issue. Their lives are the reality they live in and experience.

**Summary**

The discussion of the themes from the data analysis was related to the participants’ experiences. In addition, further elaboration of the themes was included as part of the participants’ responses to the research questions. The next section analyzed the participants’ experiences linked to feminist standpoint theory as it relates to a male-dominated occupation. The final section synthesized the researcher’s reflexivity and where the researcher’s role is in conflict.
Chapter 6

Summary, Conclusions, Implications, and Recommendations

The purpose of this study was to understand the reasons the four female participants decided to pursue electrician technician training, their perspectives of the apprenticeship program, their perceptions of successful employment in a male-dominated occupation, and differences in treatment based on their gender. The first section of this chapter begins with the summary of the study. Next, the conclusions are discussed. Then, the implications of the study are presented. The final section of this chapter provides some recommendations for further research.

Summary of Study

As indicated in prior chapters, the body of research about the experiences of female electrician technicians in a male-dominated occupation has been limited. Research has been conducted about females in the construction industry, but none specifically related to female electrician technicians (Bowell, 2011; Denissen, 2010a, 2010b; Ditomaso et al., 2007; Helmer & Alstatdt, 2013; Moccio, 2009; Sallop & Kirby, 2007). There has been no research to understand the reasons that led females to apply to an electrician technician apprenticeship program, complete apprenticeship training, advance in the electrician technician workforce, and/or to illustrate differences in their treatment in a male-dominated occupation.

The following guiding research questions were addressed in this study to facilitate an understanding of the experiences of the female electrician technicians:
1. What led the females to make the decision to pursue the electrician technician apprenticeship?

2. What was the nature of the education and training experiences of the participants in the electrician technician apprenticeship program?

3. What were the participants’ perceptions on successful advancement within the workforce as a female electrician technician?

4. What gender differences did the participants experience as female electrician technicians?

The female electrician technicians were a purposeful sample from three state-approved electrician technician training facilities located in Florida’s I-4 corridor region in the state of Florida. Of a total of seven possible participants, six responded to participate in the study, but only four female electrician technicians were able to fully complete the study. The four female electrician technicians completed four interview sessions, completed journal entries, and confirmed transcripts from the interview sessions.

The interview questions were constructed through a panel of peers and a pilot study of one female. Three sets of interview questions were established based on the research questions. There were no pre-set interview questions for the fourth session. The fourth session was a follow-up and discussion of the emerging themes from the study. The participant journal question prompts were also reviewed by the panel of peers and the pilot study participant.

The interview sessions were conducted during four separate occasions based on the participants’ schedules. The participants chose the location of the interview sessions. The times for each of the four interview sessions ranged between 30-60 minutes. The
interview sessions were audio recorded and transcribed by an external transcription company. The four female electrician technicians reviewed their transcripts and confirmed the information on the documents was correct and accurate.

The feminist standpoint theory (Harding, 1986, 1987, 1991, 1993, 1997; Hartsock, 1983, 1997, 1998a, 1998b; Smith, 1987, 1997) was used to structure the data analysis process. The four female electrician technicians were uniquely different in their experiences during their decision processes, apprenticeship education and training, advancement within the electrician technician workforce, and different treatment based on their gender. Even though the four females had different experiences, there were some commonalities in their experiences. Through the feminist standpoint lens, the common themes that emerged were family support, independence, mentors, self-directedness, and gender stereotypes. The analyses of the themes were structured around the male-dominated occupation social structure at the micro, meso, and macro levels. In the feminist standpoint theory, this structure of micro, meso, and macro levels views the experiences of being a female electrician technician from the closest, middle, and furthest points of their experiences.

Conclusions

As the researcher, I drew the following conclusions related to the research study.

The majority of the females were introduced to the electrician technician by their family members. All four female electrician technicians reported personal independence, that included financial and job security was another reason that led them to pursue the electrician technicians.
In terms of the nature of their education and training, the participants believed that they had to perform at a higher level than their male counterpart at both in classes and at worksite.

In relation to successful advancement, all of them reported that they benefited from active individuals that they considered to be their mentors. All the females stressed the need for intensive self-direction to learn what was needed to be successful. In addition, all of the females reported unemployment was not an issue because they knew that the jobs in this field will always be there.

In relation to gender difference, all of the females experienced some level of harassment and hazing. They believed that gender stereotyping existed both during training and at the workplace. To combat this, each female believed it was necessary to fit in (e.g., to be one of the guys), rather than be perceived as a female who did not seem competent.

**Implications for Practice and Policy**

Implications for both practitioners and policy makers are presented below.

**Practitioners.** The implications of this research indicate the need for informal or formal mentoring processes to connect to female electrician technicians across the state. An established mentoring initiative could pair journey-level female electrician technicians to first-year female electrician technician apprentices. One implication for practice is the need to recruit females to become electrician technicians. This can be accomplished through an annual conference of state journey-level electrician technicians with specific events for females.
Program directors. Program directors, during recruitment, should consider female electrician technicians as part of the recruitment strategy and enrollment process. For example, all the participants indicated that there were no females on their interview panels. Adding diversity to the recruitment and enrollment process, provide materials that included female images, would increase the visibility of women in the occupation. In addition, program directors should have female electrician technicians attend career and job-fair events to promote more female exposure to the electrician technician occupation. Program directors need to be more conscious and deliberate on their outreach efforts to include females.

Supervisors and journey-level electrician technicians. Supervisors and journey-level electrician technicians who have female apprentices could take more of a mentor approach. Consideration could also be taken to ensure that the female apprentices are given work projects that enhance their skills and knowledge development.

Training directors. Training directors should be aware of how the females are being treated at their training sites. The training directors could have regular discussions with the female apprentices to assess if they are being trained appropriately at the worksite. Regular meetings would allow the training director to ensure that supervisors or journey-level electrician technicians are providing meaningful tasks to apply their classroom learning.

Instructors. Include a second instructor that will provide tutoring and other academic support. In addition, instructors should include females as guest instructors for
specific topics that are applicable to the field. This would expose the male students to female electrician technicians who are already employed.

**Policy makers.** State-level policy makers and educators can use this study to develop funded programs to increase the number of women in male-dominated occupations. The impact of the programs can be beneficial to women who are seeking occupations with a higher wage and long-term employment.

**Other similar occupations.** Other male-dominated occupations can also make an effort to include female apprentices and journey-level women at every stage of the process. There should be a female as part of the entrance process, training development, and employment process. The female participants indicated that they were not seeing other women in the program, but had heard that there were other women in the program. Opportunities to interact with females is an activity that would enhance networking among the women for all male-dominated occupations.

**Recommendations for Further Research**

The recommendations for further research for this study include:

1. Find apprenticeship programs that have women of color to participant in the study. The participants in this study self-identified themselves as Caucasian/white females. Female electrician technicians who are women of color might provide further insight about their experiences as an electrician technician in a male-dominated, white-dominated work environment. Electrician technicians who are women of color may experience different challenges and barriers that Caucasian/White women
do not experience when seeking entry and employment in male-dominated occupations.

2. Additional research could include females who have young children as part of the study. The female electrician technicians in this study had no children. Participants who have young children and are working as electrician technicians can report on their experiences of being a mother while employed in a male-dominated occupation. In addition, the women might be able to provide recommendation to training directors for childcare and other options conducive to support female electrician technicians with young children.

3. Another study could add other regions of the state. This study was specific to the southwest region of the state. Other regions may practice different processes for application, apprenticeship pairing, and worksite options. This could help determine whether other regions of the state are similar or different to the situations in this research since all regions would be under the same state guidelines.

4. Additional research could include other states since this study was specific to the state of Florida. If other states may have more female electrician technicians who have been successful, their information would help make it possible to increase the number of females who would want to become electrician technicians. Including other states could provide a broader understanding of how women across the states experience working in a male-dominated occupation.
5. Identify other male-dominated occupations to study whether some of the challenges and barriers emerged for females. Examining other male-dominated occupations might show how females succeed in those occupations. This might also provide further understanding within the structure of a male-dominated occupation.

6. Another recommendation is to add other apprenticeship programs that are male-dominated. Research on other apprenticeship programs, that are male-dominated, may assist with a better understand of the learning process. Also, this study could either affirm or not affirm that the mentoring process exists in other apprenticeship programs.

7. Further research needs to be conducted on the applicability of the journal writing process for feminist research. Including journal writing in other male-dominated occupations may or may not support the usage of participant journals. It was not effectively used by the participants in this study and it may be more useful for other participants in other male-dominated occupations.

8. Another recommendation is to have a focus group and interviews with apprenticeship program directors. The program directors have a direct line to the recruitment, enrollment, application, and apprenticeship selection process. This research could assist with understanding the program directors’ perspectives of the number of females in their programs.
9. An additional study could include interviews with state regional directors of apprenticeship programs. Inclusion of the state regional directors can provide some understanding about the state's activities as they relate to outreach programs, goals, and perceptions of female apprenticeship programs.

10. To further expand the research, a focus group for female electrician technicians from across the regions in Florida and in other states is could be used. The focus group of female electrician technicians could help identify if the challenges and barriers from this study are the same. A focus group would also provide an opportunity for female electrician technicians to interact with other females in the field.

11. Another recommendation is to locate a male-dominated occupation that has a formal mentoring program. Research conducted on a formal mentoring program in a male-dominated occupation may assist with the impact it has on females who are being mentored. In addition, the research could attempt to determine if formal mentors were more successful than informal mentors compared to the females in this study.

12. Since the number of females who receive electrician technician certification is much higher than the numbers of females who are not employed if the field, research to identify additional reasons/causes behind this discrepancy is recommended.
References


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Appendices
Appendix A

Email to Apprenticeship Program Directors for Possible Participants

From: Maniphone Dickerson
Sent: Wednesday, April 02, 2014 11:44 AM
To:
Subject: Re: Moni Dickerson-USF Electrician Research

Hello

Thank you so much for talking with me this morning about my research. Per our discussion, below is an email to send to the potential participants for you research. I have also attached the email document.

Please also let me know your earliest availability for us to meet face-to-face.

Best regards,
Moni Dickerson

To: (Potential Participant Name Here)
Subject: Female electricians in male-dominated occupation IRB#15516

Dear (Potential Participant Name):

I am in the process of conducting a study on the experience of female electricians. I identified your name on the State, Region, or program database/record as an active electrician apprentice or a graduate of an electrician apprenticeship training.

I am sending you this email request to see if you would be interested in participating in this study. If you choose to participate, the commitment would be to:

1. Complete a consent form
2. Answer the demographic questionnaire
3. Meet for 3 interview sessions (possible 4th for reschedule time and/or review of interview write-up). Each interview session would be between 45 minutes to an hour.
4. Possible journal writing entries

If you are interested in participating in this study, please email me back with a reply with a “YES”. I will send a second email back to schedule an initial meeting to go discuss the IRB consent form.

Sincerely,
Maniphone S. Dickerson, MBA
Doctoral Candidate in Curriculum and Instruction
Adult, Career, and Higher Education Department
College of Education, EDU 105
University of South Florida
Tampa, FL 33612
Appendix B

Email to the Potential Participants and Response from Participant

Female Electrician IRB#15516

Maniphone Dickerson

Thu, Apr 3, 2014 at 3:58 PM

Dear [Name],

I am doctoral graduate student at USF. I am currently in the process of conducting a study on the experiences of female electricians. I identified your name on the state, region, or program database and as an active electrician apprentice or a graduate of an electrician apprenticeship program.

I am sending you this email to see if you would be interested in participating in this study. If you choose to participate, the commitment would be to:

1. Complete a consent form
2. Answer a demographic questionnaire
3. Meet for 3 (45 min) interview sessions (possible 4th for re-schedule time and/or review of interview write-up). The interview location is determined by you and your name will not be identified.
4. Possible journal writing entries

If you might be possibly interested in participating in this study, please email me back with a reply with a "YES" to learn more about the study. I will send a second email back to schedule an initial meeting to discuss the IRB consent form and schedule an interview appointment.

... 

Best regards,
Maniphone (Mon) S. Dickerson, M.B.A.
Instructor for EVT 4551
Adult, Career, and Higher Education Dept.
Doctoral Candidate
College of Education
University of South Florida

Fri, Apr 4, 2014 at 9:38 AM

To: Maniphone Dickerson

Yes

Fri, Apr 4, 2014 at 10:00 AM

To: [email]>

Hi

Great, thank you so much. What day and time can you meet with me next week. You can choose the location of our meeting.

Best regards,
Moni Dickerson

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Appendix C

Demographic Questionnaire Used in the Study

DEMOGRAPHIC QUESTIONNAIRE

Please choose a pseudonym (fake name): __________________________

The following questions will help collect general information about the participants in this study. Answers given to the following questions will be kept strictly confidential. Please answer the questions as I read them aloud. If you have any questions as I am reading through this, feel free to ask me.

1. What year did you enroll in apprenticeship? __________
2. What is the length of time you have been the apprenticeship program? _____
3. What is your age? _____
4. What ethnicity do you identify as?
   ____ Asian American
   ____ African American
   ____ Mexican American or Latina
   ____ Native Hawaiian or Pacific Islander
   ____ American Indian or Alaska Native
   ____ Caucasian or White
   ____ Bi- or multi-ethnic (please specify) _________________________________
   ____ Other (please specify) _________________________________
5. What is your highest level of education and/or training?
   ____ Less than High School (please indicate highest grade completed: _____)
   ____ GED
   ____ High School Diploma
   ____ Some College/Technical Training
   ____ Associate’s Degree
   ____ Bachelor’s Degree
   ____ Graduate Degree
6. What is your relationship status?
   ____ Single
   ____ Single, Never Married
   ____ Married
   ____ Separated
   ____ Divorced
   ____ Widowed
   ____ Partnered
   ____ Other (please specify): __________________________
7. What is your employment status?
   ____ Full-time
   ____ Part-time
   ____ Disability leave or permanent disability
   ____ Unemployed
   ____ Student
   ____ Other (please specify): _________________________________
Appendix C continued

10. If you checked full- or part-time employment, what type of work or job(s) do you do?

11. Please check the following sources of income that apply to you.
   _____ Full-time employment
   _____ Part-time employment
   _____ Governmental Assistance
   _____ Child support from child’s father
   _____ Other (please specify): ________________________________

12. What is your total monthly income? __________
Appendix D

Names of the Review Panel

Christy Rhodes, Ph.D., Assistant Professor, Eastern Carolina University
Helena Wallenberg-Lerner, Ph.D., Adjunct Professor, University of South Florida
Melanie Wicinski, Ph.D., Director of Assessment, University of South Florida

Ezzard Bryant Jr., Doctoral Candidate
Anthony Hill, Doctoral Candidate
Tonya Scotece, Doctoral Candidate
Appendix E

Interview Questions for the First Session

FEMALE ELECTRICIAN TECHNICIANS
INTERVIEW 1: ENTRY

Date: 
Time Start: 
Time Ended: 

Participant Pseudonym: ____________________

Research read this statement to participant: 
The following questions will help collect general information about your experience for this study. Answers given to these questions will be kept strictly confidential. If you have any questions as I am reading through this, feel free to ask me.

<table>
<thead>
<tr>
<th>Main Question</th>
<th>Probing Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. How did you learn about electrician occupation?</td>
<td>Where there other occupation or career interests?</td>
</tr>
<tr>
<td>2. What influence you to become an electrician?</td>
<td></td>
</tr>
<tr>
<td>3. How did you learn about the apprenticeship?</td>
<td>What were the steps needed to be in the electrician apprenticeship program?</td>
</tr>
<tr>
<td>4. What were your family’s thoughts about you becoming an electrician?</td>
<td>Were other family members an electrician? What are your family members’ education? What type of support does your family give you to be an electrician (financially, advice, encouragement)?</td>
</tr>
<tr>
<td>5. Tell me about your prior education and any other certification training you may have.</td>
<td>What was the process of you getting your prior education and certificate?</td>
</tr>
</tbody>
</table>
Appendix F

Interview Questions for the Second Session

FEMALE ELECTRICIAN TECHNICIANS
INTERVIEW 2: SKILLS & KNOWLEDGE TRAINING

Date:
Time Start:
Time Ended:

Participant Pseudonym: ________________

Research read this statement to participant:
The following questions will help collect general information about your experience for this study. Answers given to these questions will be kept strictly confidential. If you have any questions as I am reading through this, feel free to ask me.

<table>
<thead>
<tr>
<th>Main Question</th>
<th>Probing Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Describe a typical day at your apprenticeship training.</td>
<td>What were some of the apprenticeship courses you took?</td>
</tr>
<tr>
<td>2. Describe a typical day at apprenticeship worksite.</td>
<td>Who are the people/crew at the worksite with you?</td>
</tr>
<tr>
<td>3. What knowledge and/or skill did you learn?</td>
<td>Which skill are you successful in and which still need development?</td>
</tr>
<tr>
<td>4. Describe an experience where you applied what you learned in the classroom to the worksite?</td>
<td>What was a problem/issue you were tasked to solve and how did you accomplished the task?</td>
</tr>
<tr>
<td>5. What is process in completing apprenticeship?</td>
<td>How many hours for school, worksite, and studying?</td>
</tr>
<tr>
<td>6. What is the overall apprenticeship experience?</td>
<td>What still push you to continue and/or complete your apprenticeship program?</td>
</tr>
</tbody>
</table>
Appendix G

Interview Questions for the Third Session

FEMALE ELECTRICIAN TECHNICIANS
INTERVIEW 3: OCCUPATIONAL OUTLOOK

Date:
Time Start:
Time Ended:

Participant Pseudonym: ________________

Research read this statement to participant:
The following questions will help collect general information about your experience for this study. Answers given to these questions will be kept strictly confidential. If you have any questions as I am reading through this, feel free to ask me.

<table>
<thead>
<tr>
<th>Main Question</th>
<th>Probing Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Describe how you obtain your current electrician position.</td>
<td>What did you have to do to find an electrician work?</td>
</tr>
<tr>
<td>2. Tell me about your responsibilities and roles at your position.</td>
<td></td>
</tr>
<tr>
<td>3. Describe a project and/or task you completed as an electrician.</td>
<td></td>
</tr>
<tr>
<td>4. Is there someone you look towards for occupational advice?</td>
<td></td>
</tr>
<tr>
<td>5. How could more women be recruited into the electrician occupation?</td>
<td></td>
</tr>
<tr>
<td>6. Are you part of any community activities/roles?</td>
<td></td>
</tr>
<tr>
<td>7. How can female electrician expand their network for employment?</td>
<td></td>
</tr>
<tr>
<td>8. What do you think the future holds for women electricians?</td>
<td></td>
</tr>
</tbody>
</table>
Appendix H

Participants Journal Prompts

Please note that these are only suggestions and not required to be in or part of your journal entries.

1. Describe a time when you work as part of an electrician team/group.

2. Describe a time when you work independently as an electrician.

3. Describe your experience with an electrician supervisor or male electrician that supports or did not support your learning and skills development.

4. Describe your experience in preparing for the electrician completion exam/certification.

5. What advice would you give to women who want to be an electrician?
Appendix I

Email to Request Program Data

Maniphone Dickerson

Electrician data question

From: Maniphone Dickerson
To: Maniphone Dickerson

Mon, Aug 4, 2014 18:18 PM

Hi,

We meet at the State Apprenticeship meeting and day in Tallahassee back in late March.

I am reaching out to you today to request your assistance. As you know I am working on my final research for my doctoral degree. I am collecting general application and enrollment data from electrician programs.

This data sheet will not identify which program the information is from. I am collecting the data to make a cumulative set of information. The data sheet would need to be completed and return to me by Monday, August 18th.

Please let me know if you have any questions regarding this form and/or if you need additional time to complete the data sheet.

Best regards,
Maniphone (Moni) Dickerson, M.B.A.
Instructor for EVT 4451
Doctoral Candidate
College of Education
University of South Florida

[Email attachment: Electrician Program Data Sheet.docx] 14K
### Appendix J

**Electrician Program Enrollment Data Form**

<table>
<thead>
<tr>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Applications</strong></td>
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<td># of Male:</td>
<td># of Male:</td>
<td># of Male:</td>
</tr>
<tr>
<td></td>
<td># of Female:</td>
<td># of Female:</td>
<td># of Female:</td>
<td># of Female:</td>
</tr>
<tr>
<td></td>
<td>Total:</td>
<td></td>
<td>Total:</td>
<td></td>
</tr>
<tr>
<td><strong>Apprentices</strong></td>
<td># of Male:</td>
<td># of Male:</td>
<td># of Male:</td>
<td># of Male:</td>
</tr>
<tr>
<td>(Enrollees)</td>
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<tr>
<td></td>
<td>Total:</td>
<td></td>
<td>Total:</td>
<td></td>
</tr>
<tr>
<td><strong>Dropout</strong></td>
<td># of Male:</td>
<td># of Male:</td>
<td># of Male:</td>
<td># of Male:</td>
</tr>
<tr>
<td>(includes unqualified)</td>
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<td># of Female:</td>
<td># of Female:</td>
<td># of Female:</td>
</tr>
<tr>
<td></td>
<td>Total:</td>
<td></td>
<td>Total:</td>
<td></td>
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<td><strong>Active</strong></td>
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<td># of Male:</td>
<td># of Male:</td>
<td># of Male:</td>
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<tr>
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<td># of Female:</td>
<td># of Female:</td>
<td># of Female:</td>
<td># of Female:</td>
</tr>
<tr>
<td></td>
<td>Total:</td>
<td></td>
<td>Total:</td>
<td></td>
</tr>
<tr>
<td><strong>Completion</strong></td>
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<td># of Male:</td>
<td># of Male:</td>
<td># of Male:</td>
</tr>
<tr>
<td>(Journeyman)</td>
<td># of Female:</td>
<td># of Female:</td>
<td># of Female:</td>
<td># of Female:</td>
</tr>
<tr>
<td></td>
<td>Total:</td>
<td></td>
<td>Total:</td>
<td></td>
</tr>
</tbody>
</table>
Female electricians in a male-dominated occupation.

Study: Female electricians in a male-dominated occupation. (Pro00015516)

Description: The purpose of this study is to explore the factors that influence entrance, completion, induction, and longevity of women within the electrician occupation. The study aims to understand women’s perception of training enrollment, apprenticeship participation, occupation induction, and longevity experiences in electrician occupation. The research aims to understand the perceptions of women in entering the electrician occupation, apprenticeship experiences, and their outlook on job attainment and advancement in the electrician profession.

Principal Investigator: Maniphone Dickerson
Study Coordinator: Maniphone Dickerson

Funding Sources: Non-Sponsored
IRB Letter:
IRB Letter for Study Pro00015516 (0.01)

Expiration Date: 3/28/2015
Enrollment Status: Active

Approved Stamped Consent Forms:
Please use only the most current official IRB stamped consent forms.

<table>
<thead>
<tr>
<th>Name</th>
<th>Approval Date</th>
<th>Expiration Date</th>
<th>Version</th>
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<td>3/28/2014</td>
<td>3/28/2015</td>
<td>0.01</td>
</tr>
</tbody>
</table>

Expired Stamped Consent Forms:
Name
There are no items to display

Smartform Section 1 - Study Personnel & Funding
Appendix L

List of Names of the Panel of Review Members for Data Analysis

Peer reviewers:

Yvonne Hunter-Johnson, Ph.D., Assistant Professor, Bahama University
Helena Wallenberg-Lerner, Ph.D., Adjunct
Ezzard Bryant Jr., Doctoral Candidate

Expert Reviewers:

Stephen Charles, Ph.D., Director of Medical Education, University of Kansas
Kiona Lewis, Ph.D., Research Manager, Georgia Tech Institute Diversity
Christy Rhodes, Ph.D., Assistant Professor, Eastern Carolina University
Carmeda Stocks, Ph.D., Diversity Initiative Program, University of Michigan
Appendix M

Sample of NVivo Line Segment Color Coding

1. Right now I am a foreman.
2.
3. No, No, don't be political correct for me.
4.
5. Yes, I'm a foreman on my current job. Yes.
6.
7. Actually, my husband.
8.
9. My husband is in the trade, yes.
10.
11. I was with him for 12 years. I worked at a job. We travelled at first, so I got jobs at restaurants. I started working at a Pizza Hut and because there's Pizza Hut's, we travelled to other states and there's Pizza Hut's everywhere. I worked at a Pizza Hut for eight and a half years was going to start my own store, and I got to the age where I needed something that was going to give me a retirement.
12.
13. Well, he was one of the old men mentality at first that a woman didn't belong in the trade, until he watched a couple of other women go through it. When he'd seen them succeeding in it, he said, well, if they can do it, I know you can. He brought it up, would you be interested in starting or becoming an apprentices in our programme, and that's how even this idea, after being with him for 12 years, even came to light because, no, I never thought of it before, ever. I couldn't even listen to him talk about the trade. I told him it scared me too much.
14.
15. Because being an electrician can be dangerous work. So when he brought it up to me, I was real nervous about making that decision.
16.
17. The influencing factor was, at first I took a pay cut to start, but knowing after so many, a certain amount of time and then once you became that journeyman status, it was the pay, okay. With being union, we have a negotiated wage package as well. That $4,400 I make a month is just what I make dollar amount. I actually get free family coverage put in on my benefit and I get vacation pay and I get personal, I get a
# Appendix N

## Sample of NVivo Screen for First Open Coding

### Nodes

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<th>Name</th>
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<th>References</th>
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<th>Created By</th>
<th>Modified On</th>
<th>Modified By</th>
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<td>7/17/2014 7:23 PM</td>
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### Major Themes Review Form

**Version 4-Final**

**Research Question #1**

1. What led the females to make the decision to apply for the electrician technician apprenticeship?

<table>
<thead>
<tr>
<th>Theme</th>
<th>Location &amp; Line number</th>
<th>Statements/Quotes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family Member Electrician</td>
<td>Hattie: 7,80, 88-91, 93-94</td>
<td>&quot;Actually, my husband. My husband is in the trade.&quot; Hattie, 7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&quot;His dad is a retired lineman, worked for [redacted] Electric.&quot; Hattie 80</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&quot;... my husband went through the apprenticeship program. He had a brother go in before him. He had an uncle that went through the apprenticeship program. So it's like some of the family members had already been through that same apprenticeship.&quot; Lynn, 88-91</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&quot;One of them, my father-in-law being a lineman and the rest of them being the electricians.&quot; Hattie, 93-94</td>
</tr>
<tr>
<td></td>
<td>Martha: 38-39</td>
<td>&quot;Well, my brother was very excited. He's been in the electrical field for 35 years. So when he found out that I was doing electrical work, he was very excited.&quot; Martha, 38-39</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&quot;My dad was a union electrician for 35 years, and he tried to get me to go into the program right out of high school, and it just wasn't something that interested me, and so I did a little bit of college, went out in the work field, and I just had to work enough not-so-good jobs to realize how great of an opportunity it would be.&quot; Anna, 1-4</td>
</tr>
</tbody>
</table>
|                  |                        | "Well, because my dad was an electrician, and he's told me some stories about – and again, very few women that he's worked with in the trade – I knew
Appendix P

Email Notification for Member Check

Maniphone Dickerson

Need Confirmation-Interview transcripts

Maniphone Dickerson  Tue, Jun 3, 2014 at 8:13 PM
Hi,

I hope you are doing well and that you have hired some electricians for your business.

Per our last meeting, I said I would send you the complete transcripts for you to read.

To make clarifications changes, please do the following:
1. Bold the area that requires clarification changes
2. Use a different font size for the changed statement
3. An example of clarification change would look like:

   The changes make it difficult and easier.

   The changes are not good and some are good.

   IV. The changes are not good and some are good.

If you have no changes, please do the following:
1. Signed the first page indicating no changes
2. Email me a PDF copy of the signed page by Monday, June 16, 2014. I can also come by and pick up the
document from you if you are unable to PDF the signed page back to me.

Please review note that the IV is me (Mom) and the IE is you. If I have not received any changes or signed
confirmation by June 16, I will follow-up with an phone call reminder.

Feel free to contact me anytime if you have any questions about the interview transcripts.

Best regards,
Maniphone S. Dickerson, M.B.A.
Instructor for EVT 4651
Doctoral Candidate
College of Education
University of South Florida

---

All transcripts data.doc

139K
Appendix Q

Email from Participant Indicating Approving of Member Check

Moni Dickerson

signed first page
4 messages

Moni Dickerson
Sun, Jun 16, 2014 at 11:31 AM

Hi ___

Thank you for the signed page confirming no changes/edits made to your interview transcripts. In a few weeks I will have my preliminary research/analysis report for you to read.

Thank you again for taking time to read over the interview transcripts.

Best regards,

Moni

Moni Dickerson
Mon, Jun 16, 2014 at 6:46 PM

2014-06-15 11:31 GMT-04:00

----- Forwarded message -----

From: ___
Date: Mon, Jun 16, 2014 11:33 AM
Subject: signed first page

----- Forwarded message -----

From: ___
Date: Mon, Jun 16, 2014 11:33 AM
Subject: signed first page

----- End forwarded message -----
Appendix R

Instructions for the Peer Examination Process

Peer Reviewer Instructions

Thank you for your participation as a peer reviewer for my dissertation titled "A Case Study of Four Female Electricians in a Male-Dominated Occupation.”

I have conducted 3 sets of interviews with 4 participants (total of 12 interviews for an hour each) total of 4 transcripts during the course of this study. As part of the analysis process, I have identified quotes (or statements) from the interview transcripts that I would like you to review. I have coded the quotes using the list of codes that I created. In order to ensure that I have coded the quotes properly, I am asking you to review each quote/statement and indicate if you agree or disagree with the coding (if you disagree with the coding, please indicate how you would code the quote differently) so that I can compare your choices to my own.

In order to assist you with the review process, I have provided you with the following documents:

- a list of codes and code definitions
- a list of the quotes/statements that I have extracted from each of the transcripts (separate attachments for each research questions)
- Peer Reviewer Form (2nd page of this document)

After you complete your review, please scan e-mail your responses and your signed Peer Reviewer Form by Sunday, August 10, 2014. If you have any questions, please let me know.

Thank you in advance,

Moni

Maniphone S. Dickerson, MBA
Doctoral Candidate for Curriculum & Instruction
## Appendix S

### Sample Key Code Category Form

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Codes/Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What are the factors underlying the decision of female electricians to enroll in an electrician apprenticeship program?</td>
<td>Exposure</td>
</tr>
<tr>
<td></td>
<td>Family Member</td>
</tr>
<tr>
<td></td>
<td>High School Course</td>
</tr>
<tr>
<td></td>
<td>Prior Work Experience</td>
</tr>
<tr>
<td></td>
<td>Benefits</td>
</tr>
<tr>
<td></td>
<td>Retirement/Pension</td>
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<tr>
<td></td>
<td>Health</td>
</tr>
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<td></td>
<td>Pay/Wages</td>
</tr>
<tr>
<td></td>
<td>Occupation</td>
</tr>
<tr>
<td></td>
<td>Available Jobs</td>
</tr>
<tr>
<td></td>
<td>Interest</td>
</tr>
<tr>
<td></td>
<td>Career Change</td>
</tr>
<tr>
<td>2. What are the participants’ experiences in an electrician apprenticeship program?</td>
<td>On Job/Worksite</td>
</tr>
<tr>
<td></td>
<td>Journeyman/Supervisor/Forman</td>
</tr>
<tr>
<td></td>
<td>Actual Task</td>
</tr>
<tr>
<td></td>
<td>Peer Group</td>
</tr>
<tr>
<td></td>
<td>Classroom</td>
</tr>
<tr>
<td></td>
<td>Instructor</td>
</tr>
<tr>
<td></td>
<td>Books/workbooks</td>
</tr>
<tr>
<td></td>
<td>Hands-on assignments</td>
</tr>
<tr>
<td></td>
<td>Other Resources</td>
</tr>
<tr>
<td></td>
<td>Family Member Electricians</td>
</tr>
<tr>
<td></td>
<td>Internet/Software</td>
</tr>
<tr>
<td></td>
<td>Self-Directed [relay on self to learn]</td>
</tr>
</tbody>
</table>
Appendix T

A Feedback from Peer/Expert Review Group

Hi Moni,

I have completed the reviews. I have attached my files below.

Overall, it was clear and very professional as to what my instructions were. I would advise if you do qualitative analysis coding again to have the comments be in excel not word. I could not write my comments in the comment sections. Also there is quite the possibility that I might have stopped some comments unintentionally. everytime I went from the bottom of one page to another it skipped to the next code which involved skipping at least 10 pages or more. It is important that each comment have it's own row and cell to make it easy for the reader to code it.

Question #2: I had some concerns about the coding in regards to peers vs forman vs company. You may want to see if you can separate that out. Also, I see one company name mentioned quite a bit. I did not have any companies mentioned in my dissertation and you may need to check with IRB about that and/or your committee. Also it is ok to split comments as well because a few of yours actually could be coded under multiple codes.

Question #3 we were right on everything. Good stuff.

Thanks,
S.Taw

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3 attachments

   62K
   69K
Appendix U

Profiles of the Females the Participant Names Were Selected from the National Women History Museum

Hattie Wyatt Caraway was the first woman elected to serve in the United States Senate. Born in Tennessee, she graduated from college in 1896, where she met her husband. They moved to Arkansas, and her husband was elected to Congress in 1912 and the U.S. Senate in 1920. When he died suddenly in 1931, Hattie was appointed to serve in his place and a special election confirmed the appointment. She began to gain a reputation for supporting President Franklin D. Roosevelt's New Deal, particularly on matters affecting veterans and unions. She was re-elected once, and during her second term she co-sponsored the Equal Rights Amendment. She left the Senate in 1945 and continued her career in public service through appointments by Roosevelt to the U.S. Employees' Compensation Commission and later to the Employees' Compensation Appeals Board. 

Works Cited: Article is excerpted from the NWHM Winter 2007 Newsletter

PHOTO: Library of Congress Biographical Directory of the U.S. Congress

Martha Matida Harper. Inventor of the business concept franchising, Martha Matilda Harper was born in Oakville, Ontario, Canada, in 1857. When she was a young woman, Harper's father bound her out into service as a domestic servant in the home of a minister in Rochester, New York. During her free time, she experimented with formulas and created one for organic hair shampoo; she felt that the chemicals in other shampoos were more harmful than good. By 1888, Harper had saved enough money to rent an office in Rochester and she opened a combined beauty parlor and factory for producing shampoo. She called it the Harper Method Shop. Harper's own hair was so long it nearly reached the ground and she used it as a marketing tool for her product. Her beauty method not only included organic shampoo, but she also advocated for good hygiene, nutrition, and exercise. Harper invented the first reclining shampoo chair. She is the one who also initiated the concept of a professional salon. Prior to her salons, hairdressers visited customers at their homes. As the demand for her products and services quickly rose, Harper decided to open a franchise parlor in Buffalo, New York, in 1891. The following year, she opened another one in Chicago. Harper's franchise was the first of its kind; she trained women to open their own businesses under the name Harper Method. At the height of its success, there were over 500 Harper salons in the United States, Canada, South America, and Europe. As Harper's business grew, she added new products to her line, such as creams, cosmetics, and other hair products. She also developed hair coloring products and permanent wave formulas. All of her products were organic and marketed with the Harper Method trademark. Harper also established beauty training school in cities like Rochester, NY; Atlanta, GA; Madison, WI; and Calgary, Alberta, Canada. Harper's business was not only the first of its kind in the nation, complete with a trademark and franchises, but also she provided numerous women with business opportunities at a time when most of the jobs women could obtain were as domestic servants, factory workers, and teachers. 

Margaret E. Knight. Ask about the role of American women in the 19th century Industrial Revolution, and you may be told of women who worked in the New England textile mills. But the story does not end there. Fascinated by tools and machinery, Margaret E. Knight applied her natural creative genius while working at various factories to invent devices that improved productivity and saved lives. Knight was fortunate that her family allowed her to pursue these unconventional interests during her childhood in Maine. Knight received little schooling and never traveled out of northern New England, instead joining her brothers in factory work. Before electricity, manufacturers built their facilities along rapidly flowing water, preferably waterfalls, which provided the energy to turn the waterwheels that powered the belts that turned the wheels inside the factory. In Knight's time, mills expanded from producing lumber and processing grains to manufacturing many types of goods, such as fabric and shoes which families formerly made completely and tediously by hand. Knight's New England was soon dotted with textile mills and shoe manufacturers. While it was water that powered factory machinery, it was women who ran those machines—almost all of them young. Scratching out a living from rocky soil in a cold climate always had been difficult, and countless families sent their teenage daughters to work in the new factories. Often these daughters earned more cash money than their fathers and brothers who remained on the farm. While Knight was one of these factory girls, she was different from most with her keen eye and mind for inventions. She reportedly made her first invention at age twelve, when she saw a shuttle fly from a machine and injure a worker in Manchester, New Hampshire. These accidents were not uncommon, and young Knight solved the problem in that factory by creating a stop-motion device. She was too young and her family too uneducated, however, to patent the idea and make money from its resale. That was in 1850; it was not until 1870 that Knight finally applied for her first patent—and then she had to fight for it. She was working during the late 1860s for a paper bag manufacturer in Springfield, Massachusetts. Her keen mechanical mind envisioned a machine that could do the necessary folding of square-bottom paper bags, the kind of bag that still is used today. Knight built a wooden model of her creative folding device and took it to Boston to be cast into iron. There a man, Charles Annan, saw her work and stole her idea: when, a few months later, she perfected the machine and applied for its patent, his was already on file. The Patent Office investigated the Knight vs. Annan dispute, and in a rare victory for women in that era, issued the patent to her. Over her lifetime, she received at least twenty-seven patents; some sources claim that she held more than eighty. Most of her patents related to working with heavy machinery. She methodically thought out the problems of an industry and worked on solutions for several years: she devoted the first half of the 1890s, for example, engineering mechanical changes that improved shoe manufacturing. Works Cited: Article reprinted from NWHM Winter 2007 Newsletter, Author Doris Weatherford. PHOTO: "Women Inventors Index - 1790-1895," Miami University Libraries, 12 December 2003, http://www.lib.muohio.edu/epub/govlaw/FemInv/kinv.php (9 May 2007).
Anna Wagner Keichline. Born in Bellefonte, Pennsylvania, in 1889, architect, inventor, suffragist, and World War I Special Agent Anna Keichline started early in her pursuit of the non-traditional. As a fourteen year old, she won a first prize at the Centre County Fair for a card table made of oak and a walnut chest. The Philadelphia Inquirer cited her skills at building furniture in her 'professionally outfitted model shop'. In 1903 that was news. "Such a liking has she taken to industrial art that [she] expects to make it her life study", the article stated.

After high school graduation in 1906, she studied mechanical engineering at nearby Penn State, the only female student in the class. In 1907 she transferred to Cornell University to study architecture. While at Cornell, she was elected a class officer, was a member of the drama club and a sorority and an athlete on the women's basketball team. She graduated in 1911, as the fifth woman to earn a degree in architecture from Cornell but was probably one of the very first women to actually practice the profession during the last century. She can claim design authorship to over 24 commercial buildings and residences spanning central Pennsylvania, Dayton Ohio and Washington D.C. In 1920, when registration became a requirement to practice architecture in the state, Anna passed the exam thereby becoming the first women registered as an architect in the state of Pennsylvania. Keichline published research articles on air conditioning that incorporated her patented 'Building Block' (1927) one of her inventions. She was granted six utility patents and one design patent in all; a Sink for Apartments (1912), a Toy (1916), components for Kitchen Construction (1926), a child's Portable Partition (1927), a Folding Bed for Apartments (1929) and an Air System (1931). As an advocate for women's rights, Keichline led a parade of Suffragists in Bellefonte as part of the nationally organized march of the vote on the Fourth of July 1913. In addition to her work as an architect and inventor, in 1918 Anna volunteered for the U.S. Army's war effort. She was assigned to be a Special Agent in the Military Intelligence Division in Washington D.C. and lived there until the end of the war. In describing her qualifications for this duty she stated: "Am twenty-eight and physically somewhat stronger than the average. Might add that I can operate and take care of a car [she owned her own automobile]. The above might suggest a drafting or office job, but if you should deem it advisable to give me something more difficult or as I wish to say more dangerous, I should much prefer it. You have asked for my salary in order to rate me... last year my fees amounted to something over six thousand." In today's dollars, her fees were over $92,000 that year. Letters from superiors at the end of the war praised her service. Keichline responded "I was pleased with your mention of your appreciation of my services, but... I feel that the appreciation should all be on my side - my having been given the opportunity to serve. I know of no other way to express this than to say that I will bear my experience in mind, study when possible, so that should the occasion arise, I will have more to offer." Anna Keichline was honored with an official state of Pennsylvania historical marker in 2002. It was placed in front of one of her architectural designs, the Plaza Theater, Bellefonte, which was built in 1925. Works Cited: Article and image are courtesy of the Association of Women Industrial Designers. Written and researched by Nancy J. Perkins FIDSA, great-niece of Anna Keichline.
Appendix V

Photos Related to Electrician Technician Final Completion Project

Figure V1. Photo of blueprint design for electrician technician final completion project.

Figure V2. Photo of the electrical panel wiring system for electrician technician final completion project.
Appendix V continue

**Conduit Bending Project**

Figure V3. Photo of the conduit bending for electrician technician final completion project.

**Motor Control Project**

Figure V4. Photo of the motor control wiring for electrician technician final completion project.