The top, bottom, and right margins should be set to 1 inch. The left margin should be set to 1 ¼ inch.

Introduce the general topic area.

CHAPTER I: INTRODUCTION

The purpose of this qualitative grounded theory study was to identify what motivates women to stay in or return to science, technology, engineering, and math professions (STEM), leading to a motivation model. As illustrated in the literature review, research has been done on related topics, particularly why women leave STEM professions. Why women stay long term remained largely unanswered prior to this study.

Tip: Always introduce abbreviations. Once you introduce it, you can use the abbreviation alone.

Tip: Think of your "General Statement" section as the background of your study.

General Statement

Men outnumber women in STEM professions, both at the university level and in the workplace (Szelenyi & Inkelas, 2011; Thilmany, 2008). Careers in STEM range from technical niche professions to broader leadership roles. Some examples include: research, engineering, computer programming, physical sciences, life sciences, or design. Despite more women entering the workforce in STEM professions, trends show that women leave STEM professions early in their careers at higher rates than men (Fouad, Singh, Fitzpatrick, & Liu, 2012; Thilmany, 2008).

Use evidence to show that the problem exists.

A study released in 2008 and supported by science, engineering, and technology companies showed that 52% of women between the ages of 35-40 in science, engineering, and technology professions left the workplace (Thilmany, 2008). Women exit STEM professions at a higher rate than men, comparable to other professions (Hunt, 2010). The higher ratio of males versus females in a given workplace has a direct correlation to the number of women who exit versus men (Hunt, 2010). Women in engineering professions leave at the highest rate, primarily because of the wage gap in comparison to their male counterparts (Hunt, 2010). Preston (2004) argued that the loss of STEM professionals is wasteful, citing that the social investment in training this workforce does not have an

Chapter I begins on page 1.

adequate return, if there continues to be a high percentage of men and women who leave at some point during their university or early in their professional workplace careers.

Numerous programs are in place to recruit girls to enroll in science, engineering, and technology educational programs. Many U.S. government-sponsored programs sought to find answers on how to best recruit and retain women in STEM professions. Some of the more commonly referenced government programs and research projects include ADVANCE, WISE, WiSER, RAISE, The Engineer 2020 Project, Beyond Bias and Barriers, BEST, The Quiet Crisis, Rise Above the Gathering Storm, and The STEM Workforce Data Project to name a few (Jolly, 2009; Lincoln, Pincus, Koster, & Leboy, 2012; Mavriplis et al., 2010). The urgency of identifying solutions to improving the recruitment and retention of women in STEM fields is expressed in each of these programs or projects. Despite gains in STEM university and industry settings, the full impact of these programs has not been quantified (Jolly, 2009; Lincoln et al., 2012; Mavriplis et al., 2010). Further research in this area is needed to uncover what factors contribute to women persisting in STEM professions.

Tip: When there are 6 or more authors, use et al. for all citations for that resource.

Point out the need for the issue to be addressed.

According to the U.S. workforce statistics available from the U.S. Census Bureau from 2006-2010, women are 47.2% of the U.S. workforce. As the United States transitioned from a manufacturing economy to a knowledge worker economy from 1950 to 2000, the STEM workforce grew exponentially (Lowell, 2010). Since 2001, the number of professionals entering STEM fields is in a marked decline, predicted to fall short of forecasted demand (Lowell, 2010).

According to the National Science Foundation (2010), women make up only 28% of the science and engineering workforce in the United States. Women continue to be underrepresented in STEM professions (Rosenthal, London, Sheri, & Lobel, 2011). STEM

Tip: To introduce an abbreviation within a parenthetical citation, use brackets, as shown here.

fields do not attract women equally across the growing demographic of eligible college students (Morganson et al., 2010). Women with the highest level of degrees in their fields represent approximately 38 percent of the science and engineering workforce (National Science Foundation [NSF], Science and Engineering Statistics, 2012, Chap. 3). Higher representation of women occurs in life sciences and social sciences, with women achieving equity in these fields at approximately 52% of the workforce (NSF Science and Engineering Statistics, 2012, Chap. 3).

Other science, engineering, math, and computer field workforce statistics show women in the minority (NSF Science and Engineering Statistics, 2012, Chap. 3). Science, math, and computer fields are 26% women, and engineering is only 13% (NSF, 2012). The U.S. National Science Foundation and the European Commission (as cited in Thilmany, 2008) suggested that the lack of women in these skilled professions negatively impacts economic growth, both because of the sheer numbers of STEM professionals (men or women) required by industry to remain competitive and because of theories that diversity spurs innovation.

Tip: This is a secondary source citation.

The number of graduates decreased since the 1980s in the physical sciences and engineering, where global competition for talent is intensifying (Varma, 2010). The United States is competitive in the world STEM markets, but is in danger of losing this advantage, especially in the ever growing information technology market. This loss of competitiveness is largely because the virtual nature of the information technology (IT) profession lends itself to performing these services by anyone, anywhere in the world (Varma, 2010). Encouraging more women to explore careers in STEM professions, and subsequently stay in them, may help the United States address the growing concern of interest in STEM professions.

Tip: In referencing quotes or paraphrasing others, sentences should be written in past tense.

Jonsen, Tatli, Ozbilgin, and Bell (2013) suggested that without a diverse workforce with equal opportunities, society may not realize the greatest benefits. Grosvold (2011) echoed this sentiment and emphasized the ethics of equal access to professions. While the Equal Pay Act of 1963 and the Civil Rights Acts of 1964 drove equal opportunity for entry into the workplace, no legal measures since had a major impact on the success of women in the U.S. workforce, and corporations themselves have rarely made diversity and inclusion a performance accountability of leadership (Jonsen et al., 2013). Some corporations do institute programs to retain women, but the culture of the *old boys* and now *new boys* networks prevails, according to studies performed in the 1980s and late 1990s, suggesting that male discriminatory attitudes towards female executives still exist despite societal advances (Baumgartner & Scheinder, 2010).

There is a stigma in the U.S. workplace for any worker that takes a career break (Hewett, 2007). Linear careers are the norm in most organizations, a dated perspective that goes back centuries (Pringle & Dixon, 2003). Paid work is equated with a career, where men were typically the workers, and women's careers are framed with the bias of how men's careers have been historically (Pringle & Dixon, 2003). The studies on non-linear careers tend to be focused on the whole of the female workforce or to higher-income earners (Hewlett, 2007).

For the purposes of this study, a non-linear career includes the definition as a career, where the participant left the STEM workplace for more than 26 weeks and then returned to continue working in a STEM field. Reasons for leaving can vary and can be personal or professional. Most women have underestimated the effort required to re-enter the workforce at the same or higher level (Hewett, 2007). The career cost of leaving is likely never

regained upon re-entry (Hewett, 2007). More than one third of women have worked part-time during some part of their career to balance work and family, 25% have worked reduced hours, and 16% have declined a promotion (Hewett, 2007). Reasons women want to return are interest in what they do, financial needs, wishing to contribute to society, and a desire to recapture part of their identity (Hewett, 2007). Women who have non-linear careers have added barriers to overcome if they are going to persist in their careers.

Statement of Problem

Although physically violent forms of sexism have generally diminished because of the legal requirements in the workplace, covert sexism remains a prominent barrier for women in general in the workplace (Malcolm & Malcolm, 2011). If emerging female STEM professionals are immediately met by an environment with insurmountable barriers, then the system that propels careers for these individuals is bound to fail. Barriers related to salary and career advancement opportunities have remained consistent challenges for women in the workplace for decades (Brawner, Camacho, Lord, Long, & Ohland, 2012; Giles, Ski, & Vrdoljak, 2009; Lincoln et al., 2012; Powell, 1992; Preston, 2004; Rhea, 1996).

Clearly identify and state the problem.

Understanding how to motivate women to stay in or return to STEM professions creates a problem for workplace human resources (HR) professionals and managers in STEM fields, as there is little research to suggest solutions in avoiding voluntary turnover of women STEM professionals. Studies have indicated that once women graduate and enter the workforce, barriers in a male-dominated work culture are some of the main causes of why women leave STEM fields (Fouad, Singh, Fitzpatrick, & Lui, 2012; Thilmany, 2008). The general problem is that women who enter the workforce in STEM professions encounter many barriers (Fouad, Singh, Fitzpatrick, & Liu, 2012; Thilmany, 2008). The specific

Identify the specific problem you want to address.

problem is that the barriers in STEM, including lack of mentoring, lack of access to career advancement channels, and lack of effective policies to promote work/life balance, especially for childcare, has been generally examined from the perspective of women who have left STEM professions (Glass & Minnotte, 2010; Kerr et al., 2012; Powell, 1992; Preston, 2004). A knowledge gap exists as to what motivates some women to *stay* in STEM professions.

Identify a gap in the literature.

Some publications offer hypothetical preventive solutions regarding what might help women overcome barriers in STEM professions (Fouad, Singh, Fitzpatrick, & Liu, 2012). One study has compared and contrasted why women in engineering professions leave versus stay (Fouad, Fitzpatrick, & Liu, 2011). Fouad, Fitzpatrick, and Liu (2011) focused their study on engineers, not across STEM professions, and their sample did not include women who leave and return. This study looks across STEM professions.

State how the study will add to the existing literature.

Purpose of the Study

Include a clear statement of purpose.

The purpose of this qualitative grounded theory study was to develop a theory on what motivates women to stay in STEM careers long-term, leading to a motivation model for women in the STEM workplace. The study included women who have stayed in STEM professions for more than 10 years, including women who have returned to STEM professions following a career break. This study used a constructivist approach to grounded theory, using semi-structured interviews with women in STEM professions in the continental United States. Interviewing women who have remained motivated in their STEM professions provides insight to the theory or phenomenon as to why they stay or return.

Importance of the Study

The U.S. science and engineering workforce is critical to the United States in remaining competitive as a global economy and sustaining the capability to continue

Tip: When citing multiple sources in a citation, separate them with a semicolon and put them in alphabetical order.

technical and innovative advancements (Cordero, Porter, Israel, & Brown, 2010; Fouad, Fitzpatick, & Liu, 2011; Fouad, Singh, Fitzpatrick, & Liu, 2012; Hira, 2010; Lowell, 2010; Preston, 2004; Servon & Visser, 2011; Thilmany, 2008; Varma & Freehill, 2010). The U.S. Government established well-funded initiatives and enacted legislation to emphasize the importance of STEM careers in the United States. For example, the National Science and Technology Council (NSTC), established in the U.S. by Presidential Executive Order in 1993, has a committee dedicated to STEM Education (NSTC, 2013).

Another example is the America Creating Opportunities to Meaningfully Promote Excellence in Technology, Education, and Science (COMPETES) Act. COMPETES was signed in 2010 to reinforce the government's commitment to STEM education and improvements in the STEM workforce (NSTC, 2011). An interagency committee for the COMPETES Act found that overall, 250 distinct federal investments were catalogued and estimated to cost the U.S. taxpayer $3.4 billion in funding marked for 2010 alone (NSTC, 2011).

Throughout this section, the author has identified several groups who may benefit from the research.

Several stakeholder groups may benefit from this study on why women stay in and return to STEM professions. Using this study's results, HR professionals may leverage findings to institute cultural change programs by adapting workplace factors that typically contribute to turnover. This study may also benefit organizations, adding knowledge to more effective work policies related to work motivation because better provisions can be made for job enrichment, work incentives, increased productivity, job satisfaction, and the reduction of absenteeism and tardiness (Friedman & Lackey, 1991).

By understanding what contributes to the sustained engagement of women in STEM professions, leaders will be better equipped to understand the changes that are needed to

develop this sub-section of the U.S. workforce. Law makers may be encouraged to champion policy change that further enables women to succeed in the workplace, providing a platform for more skilled workers in STEM professions and, in turn, paving the future for maintaining international competitiveness in this field of study. Women in STEM professions, both current and future, might benefit most by simply providing tangible role models in a profession, where the lack of female role models is cited as one of the biggest barriers to career success (Sealy & Singh, 2009). While laws can be passed and policies can be instituted in private practice, both the individual embarking on the journey and those that help in their professional development need the tools to equip them for career success.

Because STEM occupations are considered high-contributors to global competitiveness, the U.S. society may see some indirect benefits of women staying in STEM professions (Hira, 2010; Varma, 2010). Women in STEM professions may benefit the most from this research, as they will have tangible examples to aid them in overcoming career barriers. By researching perspectives from women who have successfully dealt with the obstacles highlighted in STEM professions, potential solutions may be discovered, encouraging more women to persist in STEM professions.

These insights may be beneficial for workforce diversity strategies to incorporate practical methods to minimize turnover and target specific engagement areas. Over time, these changes may impact an overall cultural change in these industries, providing an underlying foundation for women to have a better chance at success in the workplace. These findings may also equip women in STEM careers with useful guidelines for professional growth. The women who participated in this research may become role models. Their

Throughout this entire section, the author has discussed clear implications of the research.

perspectives may offer guidance in navigating a potentially hostile workplace culture and thriving in a male dominated environment.

Theoretical Framework

Place your study within a particular theoretical area.

Human motivation has been studied for decades (Locke, 1976; Nebel, 1978; Steers, Mowday, & Shapiro, 2004). Motivation is discussed in this research in relation to a worker persisting in STEM professions and, conversely, the motivation to leave the profession. There are numerous published studies on why workers leave employers (Baumgartner & Schneider, 2010; Fouad, Fitzpatrick, & Liu, 2011; Gill, 2012; Hira, 2010; Lambert & Hogan, 2009). Science and engineering professions tend to be more volatile, as the very nature of these specialties is that the rate of change is fast and vulnerability to downturns in these sectors is high (Hira, 2010).

Include a statement that points the reader to more details in Chapter II.

Several contemporary workplace motivation theories are mentioned here and further described in detail in Chapter II. Herzberg's two-factor theory of motivation separates extrinsic and intrinsic factors (Furham, Eracleous, & Chamorro-Premuzic, 2009; Robbins & Judge, 2009), expectancy-value theory considers competency beliefs and values in motivation (Jones et al., 2010; Matusovich et al., 2010), and the premise of equity theory suggested that individuals are motivated to eliminate inequities compared to their peers (Robbins & Judge, 2009). Other theories include goal-setting theory, based on performance and feedback (Robbins & Judge, 2009), self-efficacy theory indicating that with self-efficacy boosted by positive feedback, the worker will be motivated to perform better (Robbins & Judge, 2009) and Maslow's (1964) theory of a hierarchy of needs which suggests that only upon fulfilling the lower needs of security, safety, and belonging, can a person realize growth, or self-actualization.

Briefly discuss relevant research (historical, seminal, & current) that helps to situate and justify the study based on the contribution to the current literature.

Motivation for women in the workplace has historically been characterized using models involving a workplace that is predominantly male (Smith, Santucci, Xu, Cox, & Henderson, 2012). Career paths are different in the early 2000s than they were in the 1960s, when the Civil Rights movement aided broader female participation in the workforce (Sullivan & Baruch, 2009). A career in the 1960s was often with one company, moving up that company's hierarchy, and the career path was defined by a predominantly male workforce (Sullivan & Baruch, 2009).

Women's careers have historically been expected to model men's, which led to judgments against women if their development did not mirror men's (Smith et al., 2012). Pas, Peters, Doorewaard, Eisinga, and Lagro-Janssen (2014) referred to the ideology of the worker as gendered, suggesting that long hours, a willingness to relocate, work overtime or be on call, are characteristics of the ideal worker, and are easier met by males because of the lesser pressures society places on males in their private lives. Marques (2011) described the task of comparing male and female career success paths directly as tricky, as males tend to enter a fast track in their careers earlier, while women are more likely to begin their career fast track stage later in life.

Fouad, Fitzpatrick, and Liu (2011) performed a qualitative study of current and former female engineers to compare and contrast the factors for leaving or persisting in these professions. The study found that women who persisted with the profession often sacrificed career advancement for family obligations. Although a number of human resources policies have provided some progressive guidelines, the workplace culture remains gender-based (Smith et al., 2012). The work-life balance human resources initiatives common in the

workplace today continue to perpetuate the ideal worker male stereotypes and tend to weaken the perception of a career motivated woman (Pas et al., 2014).

Research Questions

Include specific research questions that are aligned with your chosen methodology.

Research questions for grounded theory should "reflect a problem-centered perspective of those experiencing a phenomenon and be sufficiently broad to allow for the flexible nature of the research method" (Birks & Mills, 2011, p. 21). The research questions for this study were:

RQ1: What motivates women in STEM professions to stay in their profession long term?

RQ2: What motivates women with non-linear careers in STEM professions to return to their profession after at least a 6 month break from their profession?

Do not just list your research questions; elaborate on how they connect to your Statement of Purpose.

As there is little research on why women persist in science, technology, engineering, and math professions, a quantitative research design may be limiting. There may potentially be many layers and dimensions as to why women stay in STEM professions. A qualitative grounded theory study was used to try to uncover insights and develop theory on why some women do stay or return.

Overview of Research Design

Briefly describe the methodology and design, including data collection method, population and sample, instrumentation, and analysis.

A qualitative study was performed using grounded theory. Grounded theory methodology is a strong way to build theories, because the analysis is grounded in the data (Birks & Mills, 2011; Charmaz, 2006; Glaser & Strauss, 1967; Urquhart, 2013). "Grounded theory is the most widely used and popular qualitative research methodology across a wide range of disciplines and subject areas" (Bryant & Charmaz, 2010, p. 1).

This study sought to generate a theory of motivation, possibly depicted as a model, using the constructivist approach to apply grounded theory for why women stay in STEM

Tip: Minimize the use of direct quotes. Only use them when the author says it so eloquently that you would lose something special by paraphrasing.

professions long-term (Charmaz, 2006). In constructivism, experiences of multiple people are explored according to his or her own reality, and then interwoven to find theory emerging, or being constructed, from the data (Charmaz, 2006). The constructivist approach assumes individuals can have differing motivations for staying in STEM professions long-term and that an individual's motivation may be influenced by their environment. The theory for this study was developed from the start of data collection, and the researcher fine-tuned interviewing and sampling to continuously sample more specifically for the theory emerging from the data (Charmaz, 2006).

The study sample was drawn from a population of women who studied a STEM field and have worked in science, engineering, technology or math professions for at least 10 years in the United States. Some participants had non-linear careers, where they left their profession at some time, for a period of at least 26 weeks, and subsequently decided to return to the profession. Grounded theory methodology calls for the researcher to acknowledge when data saturation has occurred, or when there are no new emerging concepts or categories coming from the interview data (Birks & Mills, 2011; Urquhart, 2013). For the purposes of this study, the researcher anticipated a sample between 12 and 20 participants. The final sample was 20 participants. More details about the specific design of the study are provided in Chapter III.

Include a statement that points your reader to more details in Chapter III.

Definition of Terms

The following terms are defined to help the reader understand the context of each term in this study.

In this section, include definitions for terms that may have multiple meanings or are technical.

Engineering Professions: Engineering managers, surveyors, aerospace engineers, civil engineers, computer and hardware engineers, electrical engineers, industrial engineers, mechanical engineers, drafters, and engineering technicians (U.S. Census Bureau, 2012).

Full-time worker: Full-time, year-round workers are all people 16 years old and over who usually worked 35 hours or more per week for 50-52 weeks in the past 12 months (U.S. Census Bureau, 2012).

Involuntary Turnover: Turnover initiated by the organization, often among people who would prefer to stay (Noe, Hollenbeck, Gerhart, & Wright, 2010).

Job Experience: The relationships, problems, demands, tasks, and other features that employees face in their jobs (Noe et al., 2010).

Job Motivation: The processes that account for an individual's intensity, direction, and persistence of effort toward attaining a career goal (Robbins & Judge, 2009).

Job Satisfaction: A pleasurable feeling that results from the perception that one's job fulfills or allows for the fulfillment of one's important job values (Noe et al., 2010).

Motivation: The dynamic internal force that impels human behavior in a particular direction (Friedman & Lackey, 1991, p. 7).

Non-linear Career: A career where the participant left the STEM workplace for more than 26 weeks and then returned to continue working in a STEM field. Reasons for leavin can vary and can be personal or professional. The researcher chose twenty-six weeks because it is the maximum amount of time allowed under the most universal criteria for leave in the workplace, The Family Medical Leave Act.

Operationalize key variables or constructs.

Science, Technology Engineering, and Math (STEM): STEM is and often used interchangeably with Science, Engineering, and Technology (SET) and "science and

engineering." The 2012 U.S. Department of Education, National Center for Education Statistics report which published results on entrance and persistence in STEM fields targeted students beginning bachelor degrees between 2003 and 2009 in mathematics, sciences (physical/biological/life), engineering/technologies and computer/information sciences majors. Medical professionals are often not included in estimates of the scientific and engineering fields (National Science Board [NSB], 2010) and are therefore excluded from this study.

Use citations to support your definitions.

Science Professions: Life scientists, physical scientists, social scientists, natural science managers, scientific research and development services (U.S. Census Bureau, 2011).

Technology Professions: Computer systems design and related services, computer specialists, software publishers, computer and peripheral equipment manufacturing, Internet service providers, data processing, hosting, and related services, Internet publishing and broadcasting (U.S. Census Bureau, 2011).

Voluntary Turnover: Turnover initiated by employees, often whom the company would prefer to keep (Noe et al., 2010).

Tip: Assumptions are facts that are not actually verified.

Assumptions, Delimitations, and Limitations

An assumption in this study was that data on what motivates women to stay in STEM professions long-term can be gleaned from coded interviews to develop theory. Another assumption was that all participants answered the questions honestly and completely during the interviews. Motivation theories in the workplace have historically used male dominated workplace models and this study assumed that there may be different motivational factors for women.

A delimitation of this study was that the participants in the study were volunteers and were all female. The participants may not fully represent the norm for all STEM professions.

Tip: Delimitations are boundaries you have set as the researcher.

A larger and more professionally diversified group size may provide more insight into strategies for women. A study that compares women advancing in other professions, for example, may provide commonalities and differences with women in other careers and the strategies they have found to overcome organizational barriers.

Another delimitation of this study was that the data is confined to perceptions of women who have stayed in or returned to STEM professions. Perceptions may vary from other professionals such as the participant's managers, mentors, or co-workers. Findings may not be applicable across generations, as factors related to voluntary turnover are sometimes driven by societal expectations.

Discuss the generalizability of the findings.

Discuss any potential weaknesses.

Having worked in engineering for 18 years, the researcher likely has some unconscious and conscious biases from her workplace experience. The literature review conducted for this study and summarized in Chapter II may also impart some bias. Literature reviews are often performed before starting the research, but are not necessarily complete (Urquhart, 2013). Once the coding process began and theory began to emerge, the researcher performed additional literature reviews to further investigate the resulting theory (Urquhart, 2013). It is important not to let the literature review bias the study analysis by force-fitting the data into an existing theory (Urquhart, 2013).

Briefly summarize the key points of the study.

Summary

This study sought to understand what motivates women to stay in STEM professions long term, using a qualitative grounded theory study. As most previous work on why women are motivated to stay in or leave STEM professions focuses more on why women leave, there is a knowledge gap as to the reasons why they stay long-term, including why women return to the profession after a career break. The results of this study may serve multiple

stakeholders such as HR professionals, managers, employers, and, most of all the women in STEM professions themselves.

Four more chapters follow. Chapter II is a comprehensive review of the literature on women in STEM professions. In Chapter II, the primary topic discussed is the gap in the literature related to a model for motivation for women to stay in STEM professions long term and clarifies how this study will fill this gap in the literature. In Chapter III, the topics discussed include the research design and specific details of how the study was conducted. The remaining chapters focus on the actual research conducted for this study. The research results are provided in Chapter IV, followed by an interpretation of the findings in Chapter V.

In your final paragraph, preview the content of the remaining chapters.

Tip: Chapter I should be 15-25 pages in length.

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