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## **Anchoring Female Millennial Students in an IT Career Path: The CLASS Anchor Model**

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### **Abstract**

Goals and desires are strong incentives for careers and life choices. When goals and desires are not met, change often occurs. Women are leaving the IT profession two times faster than men and often within the first twelve years of employment. Women are also underrepresented in the IT profession with only 25 percent of the current jobs being held by women. This study examines how organizations can retain females in IT professions through motivational anchors. While there are research studies that have investigated the gender gap, there is a need to investigate female millennial students' relationship to IT through their motivational goals and desires, and how their perceptions fit with anchoring them to an IT career path. This study addresses the demographic influences on millennial female students as they prepare to enter the workforce. Following an analysis of qualitative data, collected in a Midwestern University using surveys, this study examines the perceptions of female students who are seeking an IT career path. The CLASS (Competencies, Life System, Accomplishment, Service, and Security) Anchor model informs how female students' motivations affect the pursuit of an IT education and career.

**Keywords:** Diversity, Social Inclusion, Gender, Career Anchors, Millennial, Women IT, Grounded Theory

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## 1. Introduction

Supposedly, millennials are a generation that holds values, attitudes, and expectations that are significantly different from those of the generations of workers that preceded them, cf., Ng, Schweitzer and Lyons, 2010. The millennial generation (born after 1980) are entering a labor market that is highly competitive, with an increasing proportion of workers holding post-secondary degrees. The IT workforce has a severe shortage of workers, and female millennials are needed to fill the demand and to provide a diversity of thought in this technical occupation. Understanding female millennials will help with recruitment and retention efforts by educational institutions and industry.

This study looks at ‘holding’ female Information Technology (IT) students and professionals ‘in place’ using anchors. Anchors hold things in place. Specifically, this study explores career anchors that may impact female students majoring in Information Technology (IT).

Information technology (IT) refers specifically to computing and computing-related degrees and professions, and women are largely under-represented in these degree programs and industry (Adam, Howcroft, & Richardson, 2004; Armstrong, Riemenschneider, Allen, & Reid, 2007; Clayton, Beekhuizen, & Nielsen, 2012; Craig, Fisher, Scollary, & Singh, 1998; Myers, Moody, Beise, & Woszczynski, 2006; Panteli, 2012; E. Trauth, 2006; Woodfield, 2002; Wuhib & Dotger, 2014). Turnover is high for women pursuing IT degrees. Also, retention within the IT profession is a challenge as women already employed are leaving the profession at startling rates (Catherine Ashcraft & Eger, 2016; Hewlett, 2008). Organizations and Universities are being challenged more than ever to understand women interested in Information Technology and to then implement steps to improve recruitment and retention efforts.

The Bureau of Labor Statistics indicates that employment in computer and information technology occupations is projected to grow 12% per year from 2014 to 2024, faster than the average for all occupations. These occupations are expected to add about 488,500 new jobs, increasing from about 3.9 million jobs to about 4.4 million jobs by 2024 (*Occupational Outlook Handbook*, 2016). The average percentage of women working in information technology jobs is 30%, based on diversity reports published by 11 of the world's largest tech companies in 2015 (Cheng, 2015). In 2015, 57% of professional occupations were held by women; however, women only held 25% for computing occupations. Interestingly, IT patents from 1980-2010 were largely obtained and invented by male-only teams at a percent rate of 88%. Only 2% were invented by female-only teams (Catherine Ashcraft & Eger, 2016) which is a surprising statistic considering that over half of the technology users are women.

The under-representation of women in the IT field is a recognized phenomenon (Panteli, 2012; Trauth, 2013). There have been prior research efforts of this phenomenon (Kvasny & Richardson, 2006; Trauth, 2013; von Hellens, Trauth, & Fisher, 2012). However, there remains a need to understand the societal structures that may inhibit or adversely impact recruitment and retention of women (Trauth & Niederman, 2006). Recruiting and anchoring (retaining) women in IT could help fill the need for more workers within this occupation. Studies show that approximately 50% of women leave IT jobs within 12 years (Glass, Sassler, Levitte, & Michelmore, 2013). Women in STEM (Science, Technology, Engineering, and Math) professions were more likely to leave in the first few years than women in non-STEM related professions. The resignation rate for females in IT is more than two times what it is for men (Hewlett, 2008). While popular opinion may assume that women are leaving for family concerns, Glass and colleagues discovered this is not true (Glass et al., 2013). Many of the women were leaving for non-technology related careers. Women are leaving for varied reasons including workplace experiences, lack of access to creative, technical roles, and dissatisfaction with career prospects (Catherine Ashcraft & Eger, 2016). While these reasons have been identified, turnover rates are not changing, and more work needs to be done to identify key issues related to retention and recruitment (Myers et al., 2006). There is significant opportunity to make contributions in the area and to theorize and better understand women’s relationship to information technology (Trauth, 2006).

It has been said that computing has an image problem related to social relevance, being a “geeky guy thing,” with women feeling like they don’t ‘belong,’ and that there is bias in the workplace (Stout & Camp, 2014). Cohoon (2001) suggested changes in higher education IT department characteristics that might affect retention of women, which would include gender composition, faculty characteristics, faculty attitudes, mentoring, and presence of female faculty. Other suggested strategies include tailoring the message, avoiding negative impressions, mentoring, providing early experience, providing a purpose, and changing the climate. (Barker, Hovey, & Thompson, 2014; Margolis, Fisher, & Miller, 1999; Tillberg & Cohoon, 2005). Knowledge of anchors could help us to tailor the message toward female IT students and employees. Managers and Professors could change the IT image to reflect more clearly what women hope

to attain. Mentors and managers would have a better understanding of what is important to women and could help women to fulfill their goals and desires.

Not only would improved recruitment and retention of females in IT help close the gap in meeting demand, but it would also allow women to experience career opportunities and provide valuable alternative perspectives to the IT field (Adam et al., 2006; Woodfield, 2002). As research has indicated, diversity improves problem-solving, productivity, innovation, and the bottom line (Page, 2008; Rhim, Varshney, & Goyal, 2012; Smith & Schonfeld, 2000). This complex picture of women's involvement in IT offers the motivation to continue studying this area with a fresh combination of theoretical lens, particularly on anchoring factors that impact how women view the IT career area regarding meeting their goals and dreams.

This exploratory study examines what female IT students indicate as their desires and goals and how these relate to selecting an IT degree and profession. This study focused on females because there are many challenging problems to solve related to women working in the IT field. Because of the increasing need for IT workers, we are focusing only on IT occupations, while recognizing (Ferratt & Short, 1986) research that shows in occupational groups, the motivational patterns appear to have common patterns between non-IS and IS employees. This narrow study looks closely at anchoring the female student to an IT path by determining potential anchors. Most previous research focuses on what female students are currently experiencing, and not on what they hope to attain. By looking at what female students hope for, we can more readily seek to anchor them to this field by showing that an IT career path can fulfill their life goals.

This article is structured as follows: First, we present the theoretical background on career anchors, the individual differences theory, and millennial research, leading to the creation of the theoretical lens for our research. Next, we present the survey research findings, analysis, and the CLASS Anchor model. The data for this study comes from a qualitative investigation of undergraduate women studying in the IT field in a technology-focused university in North America. We discuss the contributions of the theory by showing how an understanding of millennial female students' motivations toward entering an IT field can anchor them to the career and can help retain them in their IT major. Anchoring has potential to assist in increasing the representation and retention of women in the IT workforce.

## **2. Theoretical Background**

Career anchor theory was first developed by Schein, who defines a career anchor as a persons' self-concept, which consists of self-perceived talents and abilities, basic values, and sense of motives and needs as related to their career (Schein, 1996). His research shows that this self-concept evolves, however, once it is formed it functions as a stabilizing force, an anchor. It represents the values and motives that a person will not give up if forced to make a career choice (Schein, 1996). Schein's research found that most people's self-concept revolves around eight categories. Schein's anchors were defined for individuals working in a career for several years which differing from our research focused on students just entering the field. This framework still proved to be a valuable lens for our research allowing us to compare undergraduate student anchors to professionals working in the field.

Schein defined the career anchors as follows:

- Security and Stability – Employment security as a lifetime employee can no longer be relied upon as companies shift and change. Anchoring in this area must be dependent on oneself. The only thing a person can take from an organization is the opportunity to learn and gain experience. These opportunities will cause him or her to be more employable in some other organization.
- Autonomy/Independence – Individuals do not thrive when being dependent on any particular organization. This group of people has high self-reliance.
- Life Style – Economic security is one aspect of a 'life system,' which is the larger part of the lifestyle, including personal and family concerns. Autonomy and concern for self are also factors. This area involves organizations supporting the family unit, sabbaticals, and creative ways for employees to complete their work.
- Technical/Functional Competence – Individuals desire to feel competent and recognize the importance of knowledge and skill and being life-long learners.
- General Managerial Competence – This anchor is indicated through leadership and managerial skills. The individual with general management anchor is generally after power, glory, responsibility, the accomplishment of a task, the ability to build and manage a team, or a combination of these.

- Entrepreneurial creativity – This anchor relates to developing one’s own business.
- Service/Dedication to a Cause – This anchor shows that individuals want to do something meaningful.
- Pure challenge – This career anchor involves individuals that want to overcome the impossible odds and solve the unsolved problems. They are active learners and want to challenge themselves.

While Schein’s research is geared toward career anchoring in general, there are few research projects devoted solely to anchors for females. Igbaria’s research found women were more lifestyle-oriented and less technically oriented than men in 1991 (Igbaria, Greenhaus, & Parasuraman, 1991). Some research found that gender was not a determining factor of career anchors (Crook, Crepeau, & McMurtrey, 1991; Rommes, 2005). Quesenberry’s (2007) research indicated that to address the IT gender gap; there needs to be a better understanding of how career anchors are enacted and how women experience this field. (Jiang & Klein, 2002) research results indicated that it is important to develop career plans that match what employees want. The combination of these views allowed us to explore anchors from an undergraduate female student’s perspective.

Several factors seem to lead to women choosing an IT career. Ahuja, Ogan, Herring, & Robinson (2006) discovered the following factors: 1) parent’s occupation and attitudes, 2) early computer experiences, 3) social expectations and encouragement, 4) self-efficacy, and 5) role models. The research found that women are more likely to value extrinsic job attributes such as opportunities to make friends and help others, as well as intrinsic factors such as variety and task enjoyment, cf., (Ahuja et al., 2006). This finding relates directly to Iberia’s indication that women are more lifestyle oriented.

There are several theories concerning women in IT and the gender gap. The essentialism theory characterizes factors to all women, cf., (Marini, 1990). Gender imbalance has been defined as gender essentialism – the biological differences between males and females. While this theory has been widely used, our research will focus on the individual differences among women, and will not characterize all women as having the same goals. We will focus on the individual differences theory which indicates that different factors have different variations for individuals (Trauth, 2013; Trauth, Quesenberry, & Huang, 2009). This theory takes into account the varied experiences of women in IT and is concerned with gender group biases that women encounter and the variation among women concerning how they respond to these biases (Trauth et al., 2009). There are three constructs associated with this theory: 1) individual identity, 2) individual influences, and 3) environmental influences. According to Trauth et al, (2009), the constructs contribute to the understanding of the underrepresentation of women in the IT field. They assist in recognizing differences among women in the way they relate to the IT field, experience gendered discourses about IT, and their reactions.

A generational cohort refers to a group of individuals who experience the same events at the same time intervals, and are typically grouped by birth dates across a 15-20 year period (Ryder, 1965). As noted previously, the Millennial generation is defined by those who are born approximately from 1980 to 2000 and, our focus is on the young millennials that are currently entering our educational experiences and workplaces (Alsop, 2008). Past research has not tied female IT data with the millennial generational cohorts and the differences regarding values. According to Twenge, Campbell, Hoffman, & Lance, 2010, this generation is thought to be more altruistic and have a greater desire to help others and do work that is worthwhile to society than previous generations. It is more satisfied with their jobs, values leisure, wants more job security than older generations and places high importance on work-life balance beginning in high school.

The millennial generation cohort has experienced a splintering (Debevec, Schewe, Madden, & Diamond, 2013). The Great Recession in 2008 was a defining moment for the younger millennials. It shaped their values and influenced the development of their behaviors, preferences and attitudes (Meredith, Schewe, & Karlovich, 2002).

Millennial students are highly influenced by mass media. They experienced school lock-downs and increased amounts of security both in school and in the community. This group of students still felt the need for support from their parents and schools and desired extracurricular successes (Elam, Stratton, & Gibson, 2007). Students in the Millennial generation have been raised in a society where entertainment and social interactions are constant (Roehling, Kooi, Dykema, Quisenberry, & Vandlen, 2010). DeBard (2004) presents a set of characteristics that provide a perspective on tendencies of Millennial-generation college students. They are supposedly special, sheltered, confident, conventional, team-oriented, achieving, and pressured (DeBard, 2004). They seem to have a hopeful outlook for the future.

Although the Millennials are relatively new to the labor market, they are considered to be highly mobile, expect great change and variety in their job assignments (Vicki Culpin et al., 2015) and are impatient regarding their advancement (Ng, Schweitzer, & Lyons, 2010). They are said to emphasize work-life balance and make career decisions that favor

lifestyle and leisure over upward career progression (Ng et al., 2010; Twenge, 2010; Twenge et al., 2010). Research indicates millennials place the greatest importance on individualistic aspects of the job. Also, they had realistic expectations of their first job and salary but were seeking rapid advancement and development of skills. Finally, they are seeking work that ‘ensures a meaningful and satisfying life outside of work’ (Ng et al., 2010). The millennial generation desires a job with plenty of praise and rewards while being given flexible work hours and a casual and fun atmosphere (Alsop, 2008). Twenge believes that the “follow your dream” and “you can be anything you want to be” philosophy of the 1990s has to lead this generation to become narcissistic, focused only on the self and at the same time it is the main reason Millennials’ face disappointments later in life (Twenge, 2010). Debevec et al (2013) discovered the changes continue to develop and younger millennials are more likely to appear pleasure-seeking and possess a sense of entitlement than older millennials.

These existing theories and research have given us the foundation for our IT theoretical lens as shown in Figure 1.

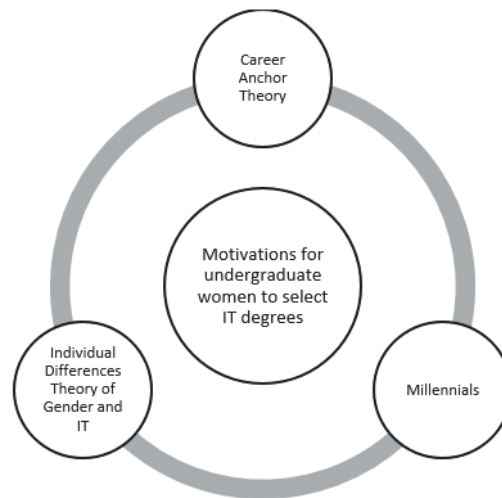


Figure 1: IT Turnover Theoretical Lens

In this study, we explore the anchors that exist for the female millennial students who were surveyed. Anchors are hypothesized as the key to retention and fulfillment of a career, and in the case of this study, student retention in an IT program of study. We identify student’s wants through a survey questionnaire that asks about goals and desires.

While individual differences theory looks at gender group biases that women encounter and the variation among women concerning how they respond to these, we look at how these differences help shape the motivation to study in an IT related degree program. The constructs used within this theory are individual identity, individual differences, and environmental influences. The IT turnover theoretical lens guides our research effort; however, we will stay open to discovery from the data.

### 3. Research Methodology

This study uses a qualitative research method to examine female students’ perceptions of the Information Systems/Information Technology (IT) educational experience. The guiding research question is: What are the career anchors for millennial female students studying in an IT career path?

The investigation of female student motivations is complex, vague and context specific. The qualitative methods used in this research can yield data from which process relationships and models and richer explanations about how and why processes and outcomes occur can be developed (Klein & Myers, 1999). Qualitative methods provide researchers with the ability to discover relationships from data that is systematically gathered and analyzed (Kaplan & Duchon, 1988). The study approach produced an understanding of student perceptions involved with IT career education path selection.

This study uses open-ended question surveys as the primary data collection method and open coding for data analysis. Open coding is used to analyze the data and develop concepts as they relate to female student interaction with the educational process and enables discovery of the relationships in the real-world situation. Theoretical sensitivity allows the researcher to have insight into and to give meaning to the events and happenings in data. These insights come from having a prepared mind and interplaying with the data (Corbin & Strauss, 2014). Seeing through a theoretical lens allowed us to see the obvious and to discover the new.

The examination of the relationship between female students and their motivations in an IT degree program broadens the understanding of the field of IT. The qualitative study focuses on understanding the dynamics present in this setting. The comparison of the emergent and similar concepts, categories, and theories with conflicting concepts, categories, and theories discussed in the literature produces internal validity and generalizability (Eisenhardt, 1989). This process continually builds the researcher's theoretical sensitivity.

Open-ended questions used in this research are:

- Why do you feel a STEM education will enable you to pursue the life you choose to live?
- Given the opportunity to choose your life, what would that life be? (or how would you describe your goal in life?)

## 4. Data Collection and Analysis

The data collection process consisted of an email invitation sent directly to the participant's email account. A survey monkey link was presented in the email invitation to enable the participant to access the survey instrument. The invitation was sent once a week for three weeks. Before administering the survey, an Institutional Review Board examined the questions and the survey administration protocol. All institutional review procedures were followed for data collection.

Out of the 98 student invitations sent to female College of Computing students, 53 respondents voluntarily participated in the survey for a response rate of 54%. Of the 53 female respondents, 43 of 53 or 83% were in the millennial generation with ages ranging from 18 to 36. They represented students in four academic years as represented in Figure 2 below. This data was collected during Fall semester, 2015.

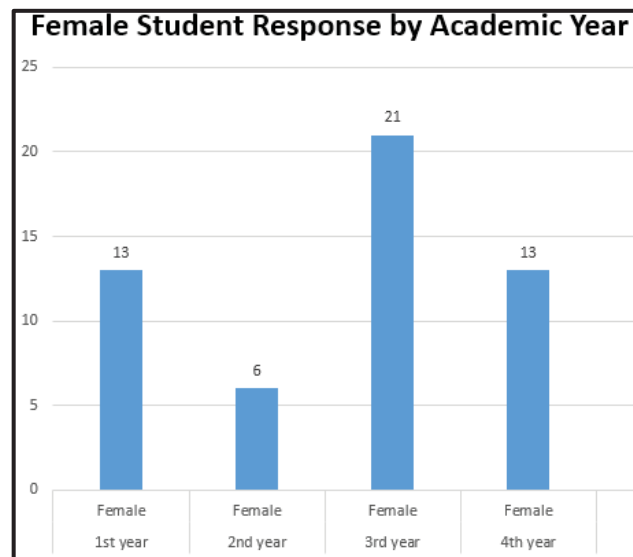


Figure 2: Female student response

The analysis was performed by two researchers on the millennial students' open-ended responses. While analyzing the transcripts of the survey responses, "labels of meaning" were identified and placed next to the relevant occurrence.

Occurrences were events, happenings, actions, feelings, perspectives, actions, and interactions. Categorization of the coding was done in two phases by two coders. First, the data obtained from the surveys were coded into broad categories.

Categories	Sub-categories	Description	#
Competencies	<i>Life-long learner</i>	Expression of desire to continue to learn	19
	<i>Specific Work/Career Goals</i>	Expression of desire to obtain specific competencies, work or career areas.	54
		<b>Subtotal</b>	<b>73</b>
Life System	<i>Flexibility</i>	Expression of desire for a flexible life and work to complement family and life goals	31
	<i>Career Enjoyment</i>	Expression of desire for career enjoyment	21
		<b>Subtotal</b>	<b>52</b>
Accomplishment	<i>Prestige Honor</i>	Expression of desire for recognition of accomplishments and achievements	32
	<i>Future</i>	Expression of accomplishment in future	15
		<b>Subtotal</b>	<b>47</b>
Security	<i>Monetary Resources</i>	Expression of desire for financial stability	36
	<i>Security</i>	Expression of desire for comfortable, secure lifestyle	12
	<i>Employment Opportunities</i>	Expression of expectation of numerous employment opportunities in field	48
	<i>Hope</i>	Expression of hoping to achieve specified expectations	20
		<b>Subtotal</b>	<b>116</b>
Service	<i>Service Community, Profession, World</i>	Expression of a desire to contribute to greater good of community, profession or world	37
		<b>Subtotal</b>	<b>37</b>
		<b>Total</b>	<b>325</b>

The survey data was analyzed using Strauss & Corbin's (Corbin & Strauss, 2014) open coding method. Open coding was used to conceptualize raw data by naming and categorizing the phenomena through close examination of the data. During open coding, data was broken down into discrete parts, closely examined and compared for similarities and differences. The coding process yielded 325 coded quotes. The data representing events, happenings, actions, and interactions that were found to be conceptually similar or related in meaning were grouped under abstract concepts that best represent the phenomenon. These categories have analytic power because they can have the potential to explain what students may or may not expect from their IT education and careers and may potentially predict the effects of certain expectations on student motivations. The 325 labels were categorized to compare codes across the responses. The categories were derived by tabulating the number of occurrences of related concepts.

Reliability of these groupings was achieved through theoretical sensitivity, iterative coding, and theoretical sampling. Strauss and Corbin (2014) suggest that theoretical sensitivity is required to enable the researcher to interpret and define data and thus develop relationships, models or theories that are grounded, conceptually dense and well-integrated. Sources of theoretical sensitivity are the literature, professional, and personal experience.

Categorization of the coding was done in two phases. First, the data obtained from the surveys were labeled and second, they were sorted into broad categories. The researcher does not approach reality as a tabula rasa but must have a perspective that will help him or her significant abstract categories from the data based on the constructs identified in the literature (Strauss, 2004). The theoretical concepts from Figure 2 were used to guide the categorization of labels in the analysis. This data analysis produced the categories of competencies, life system, accomplishment, security, and service. Further analysis revealed subcategories related to each category. Table 1 shows the categories, sub-categories, descriptions, and number of occurrences. The analysis of this research suggests there is a series of influences on female students' desire to pursue IT education and careers. The categories are Competencies, Life System, Accomplishment, Security, and Service (CLASS). These categories illustrate the bundles of meaning related to how the influences motivate the students on their intention to pursue their IT goals.



## 5. Results

The CLASS (Competencies, Life System, Accomplishment, Service & Security) Anchor model is used to illustrate how female student's motivations affect the pursuit of an IT education and career. It seems Undergraduate IT programs would benefit from helping students anchor to their identifiers in the CLASS Anchor model. Let's examine 5 anchors:

**5.1 Competencies.** According to the female student motivations, it is important to gain knowledge and skill and become life-long learners. Relating this anchor to students would involve helping them develop a love for learning - allowing them to be life-long learners. These quotes from the survey illustrate this:

*(A technology education would be) intellectually beneficial.*

*Science leads to the truth. Also, I like to learn. With science, the learning never ends.*

*With the heavily influence technology has in our world today, it seems almost like a requirement for most people to have a solid understanding and education in the STEM. I hope that furthering my education will provide a wealth of opportunities, and I will be able to choose a job I enjoy instead of doing something because that is simply the job/career I could get.*

**5.2 Life System.** This research has shown students are seeking a flexible work life and career enjoyment. These quotes illustrate this:

*I want to be in a career that I love and doesn't even feel like work.*

*I would like to have work-life balance -- time for work, leisure, and my children. I would like to be financially comfortable, and I do not want to be working for the weekend.*

**5.3 Accomplishment.** The desire for students to seek recognition and serve as opinion leaders in areas of technology is consistent with prior digital native and digital immigrant research (Noteboom & Qureshi, 2011; Qureshi & Noteboom, 2005). These quotes illustrate this:

*With the knowledge of the field, I could lead a large firm to make a difference*

*I want to be successful. I want to do something important in my life and be able to provide for myself.*

*I would love to be able to be a director of technology at a company. Or I also see myself getting in the position of teaching and showing new technologies to people all over.*

*A STEM education will help put me on top while pursuing something I enjoy doing.*

**5.4 Security.** It appears students are seeking economic features of financial success, varied and numerous career opportunities and choice of work and career, as indicated by the instances below:

*A STEM degree opens up more possibilities to find a career in a dynamic field. More job opportunities, more room to grow, necessary for future growth in all organizations.*

*Higher pay, a field I'm passionate about.*

*I hope to expand my ability to work in software development.*

*I am currently working in the computer field, and I hope my BS will allow me to do a better job.*

*My hope is that furthering my education will provide a wealth of opportunities, and I will be able to choose a job I enjoy instead of doing something because that is simply the job/career I could get.*

*I just want to support my family.*

**5.5 Service.** The millennial student is motivated to positively contribute to their communities, professions, and the greater good. Today, information technology has exposed students to the world's problems. The millennial generation is aware of these problems and desires to help solve the world's problems. Organizations that devote themselves to service will attract the best and brightest of this generation. These quotes illustrate this:

*My goal in life is to be encouraging, insightful, and helpful. Providing security and education in areas of technology help companies or individuals who are in need of secure technology and its encompassing aspects.*

*I want to help other people.*

*(I want to) make a difference*

*I feel sated when I am helping others. The building, improving and restoring the human system through technology is the dream.*

Students are developing competencies, skills and career expectations that are in the IT domain. There is an indication of an understanding of the nature of the IT career and its opportunities. The student perceptions of the skills,

competencies, and capabilities they possess and are pursuing match the required qualification for employment. The students appear to understand the necessary preparation for the IT field.

These views are mixed with a desire for flexibility and opportunity to contribute to community, profession and the greater good. The perceptions of ‘having it all’ for this generation begin to form. And ‘having it all’ appears to be a blend of career enjoyment, living a life they love, monetary reward and work environment, opportunities to achieve prestige and honor and making a difference in their professions, community, and world. Millennials are seen to make decisions from the perspective of more than economic need, they consider the enjoyment of their life by satisfying their desires as an important factor in decisions (Debevec et al., 2013).

There is a desire for economic stability and expectation of career employment market where there are more opportunities than applications. As students appear to create a unique view of their future, they desire to acquire specific competencies and refine necessary work qualifications for career goals. We see an expression of ‘hope’ – ‘hope’ that they can seek and accomplish these intentions blended with expressions of “future accomplishment.”

While the anchors we identified may be similar to Schein’s anchors, the environment and opportunities are quite different, and millennial student’s attitudes are different. This study highlighted the emerged anchors for the millennial generation, specifically focusing on females. The categories of student’s needs, goals, and desires may be similar, but the individual characteristic is different. Looking at individual differences relating to the individual differences theory, allowed us to analyze and group on an individual basis, recognizing that there are identity differences and environmental influences.

This model addresses Quesenberry’s quest for more understanding of career anchors for females in this field (Quesenberry, 2007). The categories allow us to see that female students can fulfill these motivations through an IT career path. The CLASS Anchor model can benefit the industry with a focused effort on motivating women through these anchors towards an IT career choice.

## **6. Limitations**

Surveys in this exploratory study were administered at only one school in the Midwest United States, which limits the generalizability of the study. While some of the students were online from various regions of the U.S., a majority were from one state with a unique culture and context. Thus the results are context bound (Museus, 2010). Another limitation is the lack of a comparison group. Future research could include comparison results between male and female millennial students. And finally, a limitation of the study is Schein’s anchors were defined for individuals working in a career for several years differing from our research focused on students just entering the field. Despite this, Schein’s anchors proved to be a valuable lens for comparing undergraduate student anchors to professionals already working in the IT field.

## **7. Recommendations for Practice**

Human Resource practice and Faculty can benefit from understanding female student perceptions and expectations. Millennials are described as a generation that holds values, attitudes, and expectations that are significantly different from those of the generations of workers that preceded them. A better understanding of Millennials’ career expectations and motivations may help employers to create job offerings and work environments that are more likely to engage and retain these workers. A focus on anchors can ‘hold’ an IT student or professional to a position or career area. Historically, women have found it difficult to advance into leadership roles. Recognizing these anchors and creating a work or university climate that reflects the value of the anchors, will be motivational to women to persevere and enjoy the environment.

Universities can utilize information on anchors to retain students throughout the educational experience, and future employers can utilize anchor information to transition and retain new employees in their organizations. Mentors within collegiate programs and the profession can consider this and similar studies to guide, encourage, and support female IT student and female IT professionals. Ultimately, more consideration of anchors may contribute to improved participation of females in IT education and IT careers.

Some examples of application are as follows:

1. Competences – This study indicates that continued education opportunities is valued. Industry can benefit from this knowledge by providing opportunities for life-long learning to develop knowledge, skills, and abilities. Universities can benefit from this knowledge by developing and marketing a variety of educational offerings in a variety of format targeted towards this niche.
2. Life Systems – Flexible work life and career enjoyment can be enhanced through policy and practice that reflect the importance of work-life balance.
3. Accomplishment – Recognizing accomplishments through incentive programs, company/university newsletters, and other means proves to be a motivational factor and engages the employees in the mission and vision of the company
4. Security – Economic security, as well as knowledge of career opportunities, will anchor women in IT. This can be shown through fair salary levels, recognized career advancement opportunities and incentives, and regular reviews and feedback.
5. Service – Positively giving back to the greater good can be accomplished through several avenues. Having a culture of giving back will encourage and allow employees/students to volunteer to company, profession, and community initiatives.

## **8. Future Research**

A relevant and interesting direction for future research is expanding the focus on the motivation of IT students. As the focus of IT continues to support many domains and as there are more job openings than people to fill, the need for increasing numbers of engaged professionals will be necessary to exploit the benefits of technology. Young millennials will continue to change the demographics of professional workgroups. An understanding of this generation's career goals and priorities will enable the creation of career paths and work environments to provide development and retention of millennial workers. Research on young millennials is just starting to emerge. Specific research on millennial female students is missing and provides an opportunity for exploration. Combining new millennial female student research with the underpinnings of generational cohort theory would add to this body of knowledge.

The CLASS Anchor model has the potential to be expanded to both genders. Identifying male goals and dreams in comparison with a female would benefit the discipline and provide needed knowledge. Identifying differences and similarities between the genders would enlighten recruitment and retention efforts by universities and industry. The ultimate goal is to guide both genders to work together to fill the large need for workers in IT.

Also, an interesting avenue of future research would be to look at the motivations of female students and professionals that leave this industry. Current literature defines several interesting directions to consider including dissatisfaction with career prospects which is an area of concern for women in IT. A recent survey found that technical women report lower satisfaction in their careers than men (Glassdoor, 2014). Women who leave the field are less likely to report opportunities for training and development, support from a manager or support for balancing work and competing priorities (Nash, 2014). Women report workplace challenges ranging from failure to acknowledge underrepresentation of women in the workplace (Nash, 2014), sexual harassment and macho culture (Redden, 2017) and lack of women in leadership roles (Molloy, 2017). It would be fascinating to understand how the industry did not meet up to their goals and desires, and what the causes and timeline are of females leaving the IT industry.

## **9. Conclusion**

The millennial generation is currently presented with challenges and exciting opportunities, particularly for women in IT, who are underrepresented but have earned 57% of all undergraduate IT degrees (Catherine Ashcraft & Eger, 2016). University IT degree program coordinators and managers in organizations are struggling to recruit and retain women workers in this field. Increasing the participation and retaining women in IT will help better meet the needs of a diverse work force and contribute to innovation in IT.

This focused study employed a qualitative survey design to discover the motivations of female IT students to pursue IT degrees and prepare to enter their careers. Anchor categories illustrate the bundles of meaning related to how female students perceive motivations toward their futures which can anchor them to an IT degree and career.

It is important to provide insights about female student's motivations and intentions toward the field of IT education and IT careers, women seem to have differing motivations and intentions. As Simon (1997, p. 162) predicted, "Technology creates the possibilities, but it is we, through our plans and decisions, who determine which of them will be realized, and what the consequences will be for human welfare". It is up to us to create the consequences and environments to leverage our most important assets – our people, all of our people.

Further, this article advances knowledge of anchors for young millennial women. It adds to the body of knowledge by exploring female millennial student's goals and desires about what might anchor them to an IT profession. To help young women see the value of an IT career and how it relates to their goals and desires, we first needed to understand these ideas. This exploratory study sought to identify key motivational factors and important self-concept anchors for women studying in IT. To identify and help a female student anchor to an IT career direction would be beneficial for helping to close the gender gap and fill the need for IT workers. More research on career anchors is needed, but these results provide useful feedback and comments to think about for managers, faculty and Human Resource professionals.

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