

Recruitment and Retention of Women in the Steamfitter/Refrigeration
Apprenticeships of Madison and Southeastern Wisconsin

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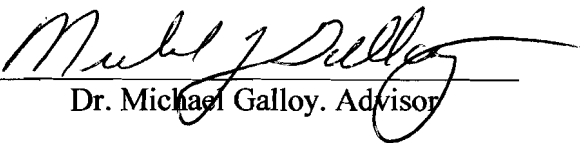
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ABSTRACT

Building a skilled and diverse workforce is critical to our society and economic welfare. The blueprint for this “building” is simple: first communicate the job expectations. Second is to provide training and support. Third is maintaining safety standards and the fourth, appreciating work well done.

As simple as the steps sound the plan seems more complicated when those in the workforce are “non-traditional.” This paper focuses on the issues related to women in the mechanical skilled trades, from recruitment to retention. A literature review will be presented related to factors that assist and also deter women from success in the skilled mechanical trades. The study done with incumbent Steamfitter/Refrigeration women workers from Madison and Southeastern Wisconsin will provide data on the issues and concerns of these women.

Finally, recommendations on the literature review and study will be presented. The implications of this study go far beyond the skilled mechanical trades of Madison and

Southeastern Wisconsin. Building supportive, gender-neutral worksites should be the goal of all employers.

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Chapter 1: Introduction

Background

America is the land of opportunity. We are all created equal. A woman has the same career opportunity as a man. Are these platitudes true? Are women in the mechanical skilled trades as welcome as women in a courtroom or a boardroom? Apparently not. In the last ten years a paltry 1.65% of those employed in Wisconsin in a skilled mechanical trade were women (B.A.S. 2007).

By the lack of numbers, it appears as though women are avoiding the study of the skilled mechanical trades (Welty, 1996; Zuga, 1996). The Wisconsin Bureau of Apprenticeship Standards statistical (B.A.S.) report from January 01, 2007 to June 30, 2007 indicates:

In the five categories comprising the skilled mechanical trades in Wisconsin (Electrician, Plumber, Refrigeration/Service Fitter, Steamfitter, & Sheet metal) there were a total of 329 apprentices recruited and only 9 women recruited to enter the skilled mechanical trades of Wisconsin from January 01, 2007 to June 30, 2007. (B.A.S., 2007)

Young girls view the mechanical trades as a male subject (Hendly, Stables, Parkinson, & Tanner, 1996; Bame, & Dugger, & deVries 1993; Bame & Dugger, 1990). This perception and reality are due to a history of exclusion and stereotyping with respect to women in technical trades studies (Wellesley College Center for Research on Women, 1995; Deem, 1978).

There is a complex set of reasons why women today do not enter the skilled mechanical trades and other nontraditional occupations. The American Federation of Labor-Congress of Industrial Organizations (AFL-CIO) Department of Research (1990) has concluded:

Women feel much less prepared than men for entry into the trades, having fewer trades-related courses in high school, less work experience in construction before entering, and significantly less support from counselors and teachers while considering a career in the construction trades. (p. 24)

The current percentage of women in the U.S. who work in the skilled mechanical trades is less than 2 percent. (U.S. Dept. Labor, 2007). This is less than the percentage of women who worked in the skilled trades in 1978, when women first entered and were counted as part of the trades employment pool and were not yet segregated by craft (Shaw, 1998).

The rate of women's entry into the mechanical trades has been slower than other parts of the labor market (Marshall, 1989). This fact has given birth to the *idea* that women are not interested in going into the skilled mechanical trades. The studies show that the reasons women are not entering the skilled mechanical trades at a greater rate is multifaceted and has vast cultural implications.

Over a span of 30 years, studies have found three common obstacles women face while working in the skilled mechanical trades. A study at the University of Wisconsin Madison by the Department of Industry, Labor and Human Relations investigated the Wisconsin

apprenticeship programs from 1970 -1972. In 1970, there were 8500 male apprentices in Wisconsin. There were 393 females that were involved in various apprenticeships but none in the “construction trades” (a generic term used to classify people who worked in the building trades). This finding prompted a study and a pilot program to recruit women into the “construction trades.” This pilot program included surveys of women’s issues through the duration of this program. The surveys indicate that women were isolated because they were the only female on the job site. The work place environment and the lack of acceptance by co-workers were a main concern to the women involved in this study (Mapp, 1972).

Research by Nancy Marshall (1989) also revealed that women were isolated because they were the only women on the job site. She also found that the women experienced a negative working climate on the job site and a lack of cooperation from co-workers. Lynn Shaw (1998) found that women in the trades are presently experiencing resistance and a lack of acceptance by co-workers on the job site. The women in her study indicated that they also were isolated and alone on the job site. The issues of women working in nontraditional employment are related to the social and work environments in which they live within.

Every society has a set of cultural values that support a certain perspective and create bias. Typically in the American society girls play with dolls and dress in pink,“ At an early age, girls have fewer opportunities to engage in sports or hobbies that enhance their mechanical aptitude” (Eisberg, 1993). This cultural value is actually a form of gender bias that supports stereotyping of gender roles. Stereotyping is a bias that plagues all human

beings, especially women. Even though they “may not be accurate, fair, or politically correct, they are powerful” (Owen, 1993). This culturally accepted viewpoint is the biggest barrier women in male jobs face (Owen, 1993).

Another form of bias that is very damaging to women is their invisibility. Throughout history, women have made significant contributions to the enhancement of humanity and life on this planet, yet their contributions are rarely noted (Banks, 1997). The paucity of women in the skilled mechanical trades could be perceived as bias, not just a lack of participation of women in the skilled mechanical trades. Because culture plays such an important role in the development of an individual, it is crucial for women to see female role models being successful in the skilled mechanical trades.

A lack of information and exposure have a significant impact on the impressions that young people form about the world. It should come as no surprise that role models, mentors, and peers serve an integral function in the choices that young women make about their lives and how they relate to the world around them (Welty, 1996). A woman today finds herself in a society that grants equality, but also holds to the stereotypical notion that women are still the primary care giver and homemaker. A woman constantly struggles to determine her self-identity (Moffit, 1986). Many women are not receiving the appropriate exposure to careers at an early age especially in the mechanical trades (Sandler, 1999).

To address this gender inequity in the mechanical trades, the Milwaukee Area Technical College (MATC) and the Madison & Southeast Wisconsin Steamfitting Joint Apprenticeship Committee (JAC) has formed a partnership to investigate issues

surrounding the recruitment and retention of women in the area of Refrigeration and Steamfitting, trades of Madison & Southeast Wisconsin.

MATC is a public post-secondary educational institution with a vision that commits to improving quality of life for individuals in Milwaukee, Wisconsin. The college has a long history of working with non-traditional students, as well as over 100 programs in the technical trades. The student population of MATC is comprised of 52 percent women (MATC, 2007). The diverse student population that is engaged in learning at MATC is provided opportunities for internships and job-related experiences. They have access to all facets of the technical trades and are encouraged to explore the mechanical trades as a profession.

The Madison and Southeast Wisconsin Area Steamfitting - Refrigeration Joint Apprenticeship Committee is a collaboration between the construction industry and the Steamfitting - Refrigeration trade unions of Madison and Southeast Wisconsin in conjunction with the state of Wisconsin Apprenticeship Bureau. This committee works with MATC in the development and design of courses that will meet industries needs of Madison and Southeast Wisconsin. The majority of mechanical trades apprenticeships are taught at MATC. This allows the students at MATC to have exposure to the skilled mechanical trades. Although students are exposed to more options while attending MATC, the rate of recruitment of women into the skilled mechanical trades has not increased. As cited by (B.A.S., 2007):

- In the five categories comprising the skilled mechanical trades in Wisconsin (Electrician, Plumber, Refrigeration/Service Fitter, Steamfitter, & Sheet metal)

there were only nine women recruited to enter the skilled mechanical trades of the state of Wisconsin from January 01, 2007 to June 30, 2007.

- The Refrigeration/Service mechanical trades of Madison & Southeast Wisconsin recruited only one female apprentice from January 01, 2007 to June 30, 2007.
- There were none recruited in the Steamfitters trade from January 01, 2007 to June 30, 2007.

Statement of Problem

The absence of women in the ranks of successful people in the skilled trade of Refrigeration/Service and Steamfitting/Pipefitting of Madison and Southeast Wisconsin, is due to the cultural bias permeates the skilled trades of Refrigeration/Service and Steamfitting/Pipefitting as being solely a male endeavor.

Purpose of the Study

The intent of this research is to investigate the recruitment and retention of women in the Refrigeration/Service and Steamfitting/Pipefitting trades of Madison and Southeast Wisconsin. This study will focus on the women in the Refrigeration/Service and Steamfitting/Pipefitting trade unions of Madison and Southeast Wisconsin and will determine factors that attract women into the trades. Additionally, factors that cause women to stay or leave the trades will be analyzed.

Objectives of the Study

The objectives of this study are:

1. Evaluate Department of Workforce Development data to reveal the participation of women in the five skilled mechanical trades of Wisconsin from January 1, 1997 to June 30, 2007.
2. Determine factors influencing women's decision to enter the Refrigeration/Service - Steamfitting/Pipefitting trades unions of Madison & Southeast Wisconsin.
3. Determine factors influencing women's decision to stay in the Refrigeration/Service - Steamfitting/Pipefitting trades unions of Madison & Southeast Wisconsin as a career choice.
4. Determine factors influencing women's decision to leave the Refrigeration/Service - Steamfitting/Pipefitting trades unions of Madison & Southeast Wisconsin.

Significance of the Study

This study will reveal the factors that influence women to enter and stay in the Refrigeration / Service – Steamfitting/Pipefitter trades unions of Madison & Southeast Wisconsin as well as why they leave the trades and do not return. The Plumbing & Mechanical Contractors Association (PMC) has asked this question at several different advisory committee meetings and it is time to answer the question with solid information from a researcher's facts and documentation.

1. These data will be shared with the Plumbing & Mechanical Contractors Association (PMC), Milwaukee Area Technical College (MATC) and the Joint Apprenticeship Committee (JAC) of Madison & Southeast Wisconsin.
2. The knowledge gained will be used to develop strategies to promote the recruitment and retention of women in the Refrigeration/Service & Steamfitting trades.
3. The implication of this study could have a tremendous impact in the way contractors consider the recruitment of women into the Refrigeration/Service & Steamfitting trades.
4. The results of this study could be used to alter the marketing plans that Madison & Southeast Wisconsin mechanical contractors use in recruiting women into the trades, thus enhancing the family and economic stability of women that enter the trades.
5. The results could also be used by other technical trades to enhance their recruitment and retention programs in regards to women in their given programs.

Limitations

The limitations of this study are:

1. The study is limited to women who have entered the Refrigeration/Sevicing – Steamfitting trade unions of Milwaukee, Wisconsin since January 01,1997 to June 30, 2007.
2. This study does not account for other factors affecting the Refrigeration – Steamfitting trades unions in Madison and Southeast Wisconsin, such as economic prosperity/recession and labor contract issues.
3. The study is limited by the number of women who are employed in the

trade of Refrigeration/Service – Steamfitter unions of Madison and South east Wisconsin.

4. There is no documentation of women employed in the non-union sector of the mechanical trades of Wisconsin.
5. This study is limited by the responses of the participants.

Definitions of Terms

The following section defines terms that are used in this paper:

Apprentice: An individual bound by a legal agreement to serve an apprenticeship for a certain length of time with the intent of learning a craft or a trade (DWD, 2007a).

Apprenticeship: A training system that involves a combination of classroom and hands-on training under the direction of a skilled worker (DWD, 2007b).

Bureau of Apprenticeship Standards (B.A.S.): The organization that has the primary responsibility for monitoring apprenticeship programs in Wisconsin. Through a cooperative agreement between the federal government and the state, the Bureau of Apprenticeship and Training of the U.S. Department of Labor has two field staff in Wisconsin who work with state staff to ensure the smooth functioning of the system.

Wisconsin Department of Workforce Development (DWD): The Wisconsin Department of Workforce Development (DWD) is a state agency charged with building and strengthening Wisconsin's workforce in the 21st century and beyond (DWD, 2007c).

Electrician: A person who installs, assembles, constructs and repairs electrical work within the property lines of any given property (DWD, 2007d). This work normally begins at the secondary site of a transformer when such transformer is furnished by a local utility

and the service conductors are installed underground. When service conductors are installed overhead, in open air from wooden or metal poles, this work shall start immediately after the first point of attachment to the building or structure. (DWD, 2007d).

Employer: Includes any contractor, subcontractor, agent or other person, doing or contracting all parts of the work (DWD, 2007e).

Hands-on training: Training that emphasizes a manipulative activity. The purpose is to provide the apprentice with the experience of using tool and materials of his/her trade.

Joint Apprenticeship Committee (JAC): A local committee made up of labor, employers, employee organization representatives to oversee the training of apprentices and to ensure that the conditions of the Indenture are being satisfied by all parties.

Mechanical Building Trades: The profession of Steamfitter, Refrigeration Fitter, Plumber, Sheet-metal, and Electrician that works on the construction side of the industry (not the residential).

Mechanical Building Trades Union: A given labor organization that manages and promotes the betterment of its members. (ie, Steamfitters union, Electricians union).

Nontraditional Occupation: According to the guidelines issued by the Department of Labor, any field with less than 25 percent of either gender is considered nontraditional for that gender.

Plumber: Installs and repairs domestic potable water lines, gravity waste disposal systems inside curb or fence lines, plumbing fixtures such as bathtubs, sinks and toilets and appliances such as dishwashers and water heaters (DWD, 2007f).

Plumbing & Mechanical Contractors Association (PMC): An organization that joins the individual mechanical contractors into an collective unit in which the trade unions can bargain with over wages, job conditions.

Refrigeration fitter: A person who fabricates and assembles components of refrigeration systems according to blueprints or schematic drawings using hand or power tools and welding equipment (DWD,2007g).

Steamfitter: A person who lay outs, assembles, installs and maintains pipe systems, pipe supports, and related hydraulic and pneumatic equipment for steam, hot water, heating, cooling, lubricating and industrial production and processing systems (DWD, 2007h).

Sheet Metal: A person who fabricates, assembles, installs and repairs sheet metal products and equipment such as control boxes, drain pipes, ventilators, furnace casings, duct work and other ferrous and non-ferrous products of varying degrees of gauge thickness, including PVC or fiberglass duct work (DWD, 2007i).

Setting of the Study

A survey will be sent to each woman who entered the Madison and Southeast Wisconsin State Apprenticeship for Refrigeration/Service - Steamfitting from January 01,1997 to June 30, 2007. This will be collaboration between the Plumbing & Mechanical Contractors Association (PMC), Madison & Southeast Wisconsin Joint Apprenticeship Committee (JAC) & Milwaukee Area Technical College (MATC).

The Madison and Southeast Wisconsin Area Joint Apprenticeship Committee is collaboration between the construction industry and the trade unions in-conjunction with

the state of Wisconsin Apprenticeship Bureau. This committee is entrusted with the development and implementation of policies governing trade apprenticeships in Madison and Southeast Wisconsin.

The Milwaukee Area Technical College is a public post-secondary educational institution with a vision that commits to improving quality of life for individuals in Milwaukee, Wisconsin.

Chapter 2: Literature Review

Introduction

The review of the literature shows factors that have contributed to the formation of perceptions of women in the skilled mechanical trades. A further review of the studies show that research has been conducted; investigating the lack of women in the skilled mechanical trades, recruitment, retention and social bias as it pertains to women in the skilled mechanical trades.

The present rate of women who enter the skilled mechanical trades in Madison and Southeast Wisconsin is alarmingly low and shows little improvement since 1970. There were 8500 male apprentices in all of Wisconsin and there were no women in the “construction trades” in 1970 (Mapp, 1973). The Department of Workforce Development asked the question, “Why aren’t there women in the trades?” This question led to a project that recruited women into the trades during 1971-1972 and followed their progression from start to finish. There is a 30-year history of women being recruited into the “construction” trades of Wisconsin.

Today the same question asked in 1970 is being reiterated, “Why aren’t women entering the mechanical trades?” Since January 01, 1997 to June 30, 2007 there have been 9168 apprentices who have entered the skilled mechanical trades of Wisconsin. (The skilled mechanical trades are defined as the construction electrician, plumber, refrigeration/service fitter, sheet metal and steamfitter). During the same ten-year span of time there were only 152 women who entered the ranks of apprenticeship in the skilled

mechanical fields of Wisconsin. Women only comprised 1.65% of the total skilled mechanical trades workforce from January 01, 1997 to June 30, 2007. (B.A.S., 2007).

From January 01, 2007 to June 30, 2007 there were nine new female apprentices in the skilled mechanical trades of Wisconsin. Only one woman entered the Refrigeration/Service apprenticeship and none has entered the Steamfitting/Pipefitting apprenticeship (B.A.S., 2007). A more specific question needs to be asked: "Why aren't there women entering the Refrigeration/Service & Steamfitter/Pipefitting trades of Wisconsin?"

The Mapp study analyzed and exposed barriers that prevented women from entering the construction trades. The issues from the 1970's mirror the difficulty that women are still faced with in the new millennium. The barriers were identified as, lack of exposure to the trades, social bias and isolationism.

There have been numerous attempts to recruit and support women in the skilled trades.

Two of the most prevalent factors that cause women to enter and stay in the skilled mechanical trade are recruitment programs and economic stability of the trade.

Recruitment Programs

America during World War I and then again in World War II women were actively recruited to fill traditional male jobs due to the shortage of workers because the men were off fighting the war; about six million women entered the workforce for the first time (Gluck, 1987). To motivate them between 1942 and 1944, there occurred what employers and government have called "positive propaganda". This was a government-led effort to recruit women workers, to get women out of the home. Magazines wrote articles that appealed to the desire for glamour and good pay, but even more to patriotism. "Women,

you could hasten victory by working and save your man." Rosie's appearance on the Memorial Day cover of the Saturday Evening Post implied that her work might help save soldiers' lives (Harvey, Sheridan, 2006). After the war, women returned to their traditional roles and rarely entered the "trades" and a career.

To recruit women into the trades, Wisconsin began a program in 1972 and followed the participants' progression from start to finish. There is a 30-year history of women being recruited into the "construction" trades of Wisconsin. There have been other spin-off projects conceived through direct experience of the Mapp study, at the University of Wisconsin Madison by the Department of Industry, Labor and Human Relations, which investigated the Wisconsin apprenticeship programs from 1970 -1972.

A recent example of such a program is *Women in the Skilled Trades* (WIST) at North Lake Community College in Dallas, Texas. "The purpose of this program is to educate and train low-income women...and to help build up their life by giving them the skills necessary to succeed" (Roth, 1995).

During the 1980's in Australia's booming economy, there was a shortage and high demand for skilled trades people. Having a good economy brought to the forefront the fact that there was a problem in Australia. Despite the booming economy, they had a high rate of unemployment of women. This led to government programs that recruited women in to the "trades." "In 1980, there were less than a dozen young women in these 'non-traditional' trades; by 1982 they had 219" (Moran, 1986). This led to the New South Wales government to fund community based programs to recruit and study trends of women in non-traditional occupations.

Economic Stability

Traditional women's jobs have been viewed merely as a way for a family to earn extra cash for the home. There was a presumption that women were not serious about gainful employment especially if they were of childbearing age (Probert & Wilson, 1993; Mapp, 1973). During the equal rights movement of the 1960's there were programs and studies that revealed there were problems within our society of single mothers being employed with jobs having low wages and limited health benefits (Kane, 1976). There was awareness that the welfare and soundness of the family hinged on the stability of the breadwinner. The number of single parent households has grown at an alarming rate: 10% in 1960's, 15% in the 1970's, 26% in the 1980's & 33% in the 1990's (Bureau of the Census 1960 to Present).

The most common reason for women entering the "trades" is wage (Rott, 1995; Marshall, 1989). There are other factors such as "I like to work with my hands"... "the challenge of the work"... "learning a skill" ... "I can take my skill anywhere and get a job"... which affects the choices women make in entering the "trades" (Rott, 1995; Marshall, 1989).

A review of the literature also documents factors related to the lack of women in the mechanical trades.

Cultural Bias

There is a misconception held in our culture today that women in the mechanical trades twenty-five to thirty years ago were pioneers or "trail blazers." As reported by Herndandez in 1980:

Women have been working in skilled crafts in America since Colonial times. In addition to home related crafts of sewing, spinning, and weaving which all women performed, a number of Colonial women worked as printers, saw and grist mill operators, furniture builders, eye glass grinders, leather workers, barbers and even undertakers. However...this active participation by women in skilled craftwork took place primarily before paid work became separated from the home environment and occupations became closely linked to wages and sex roles.

By the beginning of this century, jobs in the industrial setting had been designated as male and female. Women were virtually excluded from the trades as well as other traditional male jobs (Soltow, 1972). This all changed during World War I and than again in World War II when women were actively recruited to fill traditional male jobs due to the shortage of workers because the men were off fighting the war. Before the war, society looked negatively on women who preformed these dirty factory jobs, as it wasn't respectable work for a lady to do. The desperate need for workers in the defense department had to be addressed if the war effort was to be successful. Themes of patriotism and glamour were used to appeal to women to help counter the negative cultural stigma that been associated with women doing a "mans job"(Twanyne, 1987). Rosie the Riveter, a Norman Rockwell painting that appeared on the *Saturday Evening Post*, showed young women how they could stamp out fascism while remaining feminine at the same time. When the war ended there were massive layoffs at the defense plants and large media blitzes to remind women that the men coming home needed jobs and women's proper place was at home. Culture bias again became the norm in American culture until the civil

rights movement of the 60's and 70's brought equal rights to the forefront of public awareness.

There were great gains in the rights of women in the 1960's, the establishment of equal rights for women, affirmative action and revised guidelines on sex-discrimination. There was also a focus placed on educational institutions to address sex stereotyping in schools. These advances gave rise to studies like the Mapp study done in Madison Wisconsin by the U.S. Labor Department and the University Wisconsin Madison investigating the reasons for the lack of women in apprenticeships or male dominated careers.

Stereotypes

According to Greene (1998), young women choose jobs and careers based on stereotype. These stereotypes are developed early on in a person's life. It is difficult to persuade a person out of these stereotypes, as they grow older. "Stereotyping [is] the biggest barrier women in *male jobs* face" (Owen, 1993). Growing up in a world in which educational material and mass media show men and women performing different roles may influence young women and young men's expectations about the jobs that they should fill. As Sandler (1999) points out "...We are all influenced deeply by the educational and social environments in which we grew up and we were educated as well as by societal patterns of beliefs and behaviors."

Historically the mechanical trades have been a male controlled occupation. Women face many obstacles at school, work and with society's perception of women working in the dirt and grime of the mechanical trades.

A study by Entwisle and Greenburg (1972) found “that the attitudes of the male classmates deterred some adolescent girls from taking classes judged to be inappropriate for them.”

The study by Moran (1983) revealed that many male students were hostile both to the entry of females into areas of men’s work in the trades and the “special attention” that they perceived females to have received.

The lack of acceptance and resistance by co-workers to work with women in traditionally male dominant occupations has long been recognized by numerous researchers (Goldenhar, 1998; Welty, 1996; Shaw, 1995; LeBreton, Loevy, Sugerma, 1992 & 1995; Crull, Hendrick, Conette, 1993; Schultz & Petterson, 1992; Mansfield, et al 1991; Dabney, 1990; Dempsey, 1990; Marshall, 1989; Moran, 1983; Mapp, 1973). Women in the mechanical trades continue to experience treatment as inferiors and are treated with little respect by their co-workers.

Lack of Exposure

The study by Mapp in 1973 documented that “women were aware that their school offered technical and shop courses but they described the courses as being generally considered to be the endeavor of boys.” The women who were surveyed and interviewed stated “they wanted to take technical courses” but that they had been “discouraged and refused entry” by counselors and faculty.

There was a similar study done in Payneham, Australia, in 1983 by Patricia Moran, which recruited and tracked women in nontraditional trade occupations. The data indicated that females did not have the same exposure to subjects like metal work,

woodworking, drafting and other trade areas. Young women were not allowed to explore career options in the traditional male areas of employment.

A study done by Silverman (1993) found that because of the lack of exposure to careers in the world of work, young women do not recognize the application of the knowledge they are acquiring. The lack of exposure at an early age leaves young women uninformed about various mechanical trade courses that are available to them at the high school level. The lack of educational options keeps female students in traditional classes, thus limiting their career choices and options.

Isolationism

The isolation created by the small number of women in the mechanical trades and the lack of socialization with co-workers creates a very difficult work environment for women in the mechanical trades (Marshall, 1989; Moran, 1983; Mapp, 1973).

“Women who are isolated on the job are more likely to experience hostility and harassment...this reality discourages women from entering the trades” (Marshall, 1989).

“ I didn’t like it one bit when I was working in the trade on my own. If I’d had another girl with me or males that I knew, I would have felt a lot safer... but not with all the fellows around. I got out of that as soon as I could.” (Moran, 1986, a personal interview from a female who quit).

Perceived Harassment

“Many male apprentices were extremely hostile both to the entry of females into the areas of “men’s work,” particularly in the context of male unemployment in the trades, and so to the ‘special attention’ that

they perceive females to have received”(Moran, 1986).

Milgram (1992) testified before the Employment’s Opportunities Subcommittee of the House, Education and Labor Committee and stated:

“Unfortunately, sexual harassment often has its harshest consequences when women are trying to break into all male occupations.” (p. 1).

Literature on the retention and loss of women in the skilled mechanical trades falls into the categories of programs to support women and reasons for women leaving the trades.

Government Programs

In October 13, 1967, President Lyndon Baines Johnson signed executive order 11375, which added the class of gender to those protected groups given opportunity through Affirmative Action to do work on federal construction sites. This sparked an era of reform in government policies during the late 1960’s and early 1970’s.

Public responses to that movement included Revised Order 4 requiring affirmative action for women, the EEOC’s 1972 revised guide line on sex-discrimination, the NEA’s focus of sex-stereotyping in schools, HEW’s Task Force on Discrimination Against Women in Education, the incorporation of a chapter on Women in the President’s Economic Report and the Congressional passage of the Equal Right’s Amendment and states ratification (Mapp, 1973).

These are measures by the U.S. government that have been put in place to ensure that that all people have a fair opportunity to gainful employment. These actions make it possible for workers to hold the employer accountable for unjust actions.

Chapter 3: Methodology

Introduction

The intent of this research is to investigate the recruitment and retention of women in the Refrigeration/Service and Steamfitting trades of Madison and Southeast Wisconsin. This study will focus on the women in the Refrigeration/Service and Steamfitting trade unions of Madison and Southeast Wisconsin and will determine factors that attract women into the trades. Additionally, factors that cause women to stay or leave the trades will be analyzed.

Method of Study

Under the Freedom of Information Act, statistical reports collected during January 1, 1997 to June 30, 2007 by the Wisconsin Department of Workforce Development (DWD) and the Bureau of Apprenticeship Standards (BAS) concerning the recruitment and retention of women in the skilled mechanical trades of Wisconsin were requested. The information extracted from the Wisconsin BAS statistical data was used to determine the need for an informational survey.

A survey instrument was chosen as the primary method for determining the factors of recruitment and retention of women in the skilled mechanical trades of Wisconsin. The selection of this method is based on research methods utilized in similar studies (Shaw, 1998; Marshall, 1989; Mapp, 1973) where factors of recruitment and retention on women in the skilled mechanical trades were determined utilizing survey instruments. In the

construction of the survey instrument, varieties of reference materials were used. Scholarly articles, periodicals and journals were reviewed for the purpose of determining current opinions, ideas developments and trends in industry as they relate to the issues of recruitment and retention of women in the mechanical trades. (See Appendices A for survey sent to research participants.)

Population for the Study

This study is about the women that are in the Refrigeration/Service and Steamfitting/Pipefitting trades of Madison and Southeast Wisconsin from January 01, 1997 to June 30, 2007.

Instrumentation

The purpose of the survey was to gather data that addresses the four research objectives. The instrument used was an analysis survey. The content of the survey was derived from several sources. Textbooks and scholarly articles were used to develop the questions on the survey instrument. The survey was developed from a 20-page survey Jan Yoder from the University of Wisconsin developed. The original survey was edited down to four pages with 48 items; 32 Likert scale statements, 12 simple yes-no responses, 3 rank items and optional question for individual commits. The original survey questions were transformed into statements. In addition, questions were revised to reflect skilled mechanical trades women's issues, rather than addressing African American firefighter as in the original instrument.

Procedures Followed

Upon completion of the pilot survey, the revised survey instrument was sent out to women working as Refrigeration/Service fitters and Steamfitters. The participants were asked to return an enclosed response card if they did not wish to participate in the survey. This method was used with the intent of making the subjects feel committed once they received the survey. The participants were asked to return the completed survey by the indicated date. This was approximately two weeks after the surveys were mailed. If no response was received from the participants (i.e. completed survey or reply card) a letter reminding the participants of the importance of the survey and urging them to complete it was sent.

The statistical instrument chosen was a “Statistical Package for the Social Sciences (SPSS).” SPSS is predictive analytics software. Once all the completed informational surveys were received, the researcher tabulated the results using SPSS to streamline the analytical process. These tabulations indicate which factors are of importance to women who are or have been exposed to the skilled mechanical trades of Wisconsin. Items were then reviewed in context to their relative average degree of importance. Then each of the items was processed to obtain the number of respondents, frequencies, percentages, and means and standard deviations.

Limitations

The research population that was surveyed only represents a population of recorded women in the Refrigeration/Service and Steamfitting trades of Madison and Southeast Wisconsin from January 01, 1997 to June 30, 2007. This is a limited source but it is the

only population that can assure respondents are actually employed in the Refrigeration/Service and Steamfitting trades of Madison and Southeast Wisconsin.

Because the population that was surveyed only represents women in the Refrigeration/Service and Steamfitting trades of Madison and Southeast Wisconsin from January 01, 1997 to June 30, 2007, the application of these results are expected to be a limited scope. The conclusions derived from this research are anticipated to be used for the improvement of recruitment and retention of women into the skilled mechanical trades of Madison & Southeast Wisconsin.

Unknowns

The most evident unknown in this survey was the rate of response. The anticipated explanation for non-responses would be lack of interest, time constraints, or relocation of a woman with no forwarding address.

Some sampling bias may become evident if co-workers discover this survey has taken place and they interject their concerns to the women taking the survey.

Another bias that could be noted is that some of the women surveyed have had the researcher as an instructor in some of their classes.

Chapter 4: Data Analysis

Introduction

The purpose of this data analysis is to identify factors relating to the recruitment and retention of women in the Refrigeration/Service and Steamfitting/Pipefitting trades of Madison and Southeast Wisconsin. Once factors have been established, it will then be possible to incorporate changes into the recruitment & retention programs presently being used to employ women in the skilled mechanical trades of Madison and Southeast Wisconsin.

It is the intent of this chapter to provide the reader with a detailed account of the statistical reports collected during January 1, 1997 to June 30, 2007 by the Wisconsin Department of Workforce Development and the Bureau of Apprenticeship Standards concerning the recruitment and retention of women in the skilled mechanical trades of Wisconsin.

Data extracted from the Wisconsin BAS statistical reports aided in the researchers determination that additional research should be collected. An informational survey was developed. The subjects in the survey consist of all known women to enter the Refrigeration / Service and Steamfitting/Pipefitting trades of Madison and Southeast, Wisconsin from January 01, 1997 to June 30, 2007.

The survey instrument was sent out to 5 Refrigeration/Service fitters and 13 Steamfitters women (See Table 1). The data was collected from the informational surveys sent out July 2007 and returned by August 2007.

Table 1

*Total of Apprentices & Women Apprentices by Skilled Mechanical Trades for Period
01/01/1997 thru 06/30/2007*

Skilled Mechanical Trades	Apprentice Totals	Women Apprentices	Percentage of Women in Trades
Electrician	3759	93	2.47%
Plumbers	2996	28	0.93%
Refrigeration/Service	243	5	2.05%
Sheet metal	1239	13	1.39%
Steamfitter/Pipefitter	931	13	1.05%
Totals	9168	152	1.65%

Wisconsin Bureau of Apprenticeship Statewide Statistical Reports

Survey Data Analysis

Once all the completed surveys were received, the researcher tabulated the results. These tabulations indicate which factors were of importance to women who are or have been exposed to the mechanical trades by itemizing the number of respondents, the frequency of response, the percentage of response to each item, the mean response, and the standard deviation of the responses. Items were then reviewed in context to their relative average degree of importance.

Evaluation of Department of Workforce Development Data

Once all the statistical reports were received from the Bureau of Apprenticeship Standards (BAS) a division of Wisconsin's Department of Workforce Development (DWD), the researcher tabulated the BAS's data. These tabulations indicate which factors are of importance to women who are or have been exposed to the skilled mechanical trades

of Wisconsin. Items were then reviewed in context to their relative average degree of importance. Then each item was tabulated to find the percentage and the mean of the item.

The BAS statistical data shows that over a ten-year period of time there were a total of 9168 apprentices that belong to the five skilled mechanical trades of Wisconsin from that total only 152 were women. Revealing that the participation of women in the five skilled mechanical apprenticeships of Wisconsin was only **1.65%** from January 01, 1997 to June 30 2007 (See table 1).

In the six month period from January 1, 2007 to June 30, 2007 the Wisconsin BAS statistical data reports of the five skilled mechanical trades indicates that there were 329 new apprentices indentured (See table 2) and that only 9 of those new apprentices were women (See table 3). Showing a small increase in the women in the five skilled mechanical trade apprenticeships of Wisconsin to 2.73% over a 6 month period of time (See table 5). Compared to the 1.65% in the last ten years (See table 1).

Upon further review the Wisconsin BAS statistical report data concerning the skilled trades individual committees clearly shows that of the twelve state - Joint Apprenticeship Committees (JAC) of Steamfitting/Pipefitting and Refrigeration/Service that there are **only 2 committees** that have indentured women apprentices. The two committees that currently have women in their programs are the Madison - JAC and the South East Wisconsin – JAC.

Table 2

Total Apprenticeship Changes in Last 6 months - For Period 01/01/2007 thru 06/30/2007

Skilled Mechanical Trades	January 01, 2007	New Apprentices	June 30, 2007	Completed	Cancelled	Change in # of Apprenticeships
Electricians	1301	115	1260	113	43	-41
Plumbers	1172	101	1137	67	32	-35
Refrigeration/Service	75	18	89	4	0	+14
Sheet metal	399	37	401	26	9	+2
Steamfitter/Pipefitter	283	58	317	17	7	+34
Totals	3230	329	3204	227	91	-76+50= -26

Wisconsin Bureau of Apprenticeship Statewide Statistical Reports - June 2007

Table 3

Females Changes in Last 6 months - For Period 01/01/2007 thru 06/30/2007

Skilled Mechanical Trades	January 01, 2007	New Female Apprentices	June 30, 2007	Completed	Cancelled	Change in # of Female Apprenticeships
Electricians	39	6	40	3	2	+1
Plumbers	8	1	9	0	0	+1
Refrigeration/Service	2	1	3	0	0	+1
Sheet metal	5	1	5	0	1	0
Steamfitter/Pipefitter	3	0	3	0	0	0
Totals	57	9	60	3	3	+3

Wisconsin Bureau of Apprenticeship Statewide Statistical Reports - June 2007

The Wisconsin BAS recognizes that each of the 12 state - Joint Apprenticeship Committees (JAC) of Steamfitting and Refrigeration commonly combines the two skilled trades to consolidate resources and ease the burdens that may be imposed upon members

contributing to the local JAC. Comparing changes from Table 2 and Table 3 the total of new steamfitter /refrigeration apprentices to women steamfitter/refrigeration apprentices when viewed jointly the Steamfitter/Refrigeration skilled mechanical trade has employed **only 1.38%** women during the period from January 1, 2007 to June 30, 2007 (See table 4).

Table 4

Comparing changes in the last six months from Table 2 and Table 3

Total New Apprentices to New Women Apprentices in the Skilled Trades

Steamfitting - Pipefitter/Refrigeration – Servicing for Period 01/01/2007 thru 06/30/2007

Skilled Mechanical Trades	Table 2 Total New Apprentices	Table 3 New Women Apprentices	Percentage of New Apprentice Women in the Last Six Months
Refrigeration/Service	18	1	5.5%
Steamfitter/Pipefitter	58	0	0.0%
Totals	76	1	1.38%

Wisconsin Bureau of Apprenticeship Statewide Statistical Reports - June 2007

The Wisconsin BAS statistical data reveals that when the data is viewed individually the Steamfitters/Pipefitter skilled trade during the period of January 1, 2007 and June 30,2007 has indentured **0.0%** new female apprentices and the Refrigeration /Servicing apprenticeship has only indentured **one** female apprentice within the last six months (See table 5).

Table 5

Wisconsin State Total of New Apprentices to New Women Apprentices - Comparing changes in the last six months from Table 2 and Table 3 for Period 01/01/2007 thru 06/30/2007

Skilled Mechanical Trades	Table 2 Total New Apprentices	Table 3 New Women Apprentices	Percentage of New Apprentice Women in the Last Six Months
Electricians	115	6	5.21%
Plumbers	101	1	0.99%
Refrigeration/Service	18	1	5.5%
Sheet metal	37	1	2.7%
Steamfitter/Pipefitter	58	0	0.0%
Totals	329	9	2.73%

Wisconsin Bureau of Apprenticeship Statewide Statistical Reports - June 2007

The information extracted from the Wisconsin BAS statistical data was used to determine the informational survey sample size. The survey instrument was sent out to 5 Refrigeration/Service fitters and 13 Steamfitters women (See Table 1). Then the researcher tabulated the response to each of the survey questions. Each of the items was processed to obtain the number of respondents, frequencies, percentages and means and standard deviations.

The breakdown for the rate of response is as follows: There was a response of 83.3% received from the target population. There were a total of 18 surveys sent out. There were 15 surveys that were completed and returned to the researcher and 3 that did not respond to the survey.

The demographic break down is as follows. There were 46.7% apprentices and 53.7% journeypersons, which responded to the survey. The ratio of southeastern Wisconsin to Madison respondents is 53.3% to 46.7%.

Factors that influence women to entered the Refrigeration / Service & Steamfitting / Pipefitting trade of Madison and Southeast Wisconsin.

The results of the informational survey show that for 73.3% of the participants indicate the main reason they chose the trade is because of the good pay, healthcare benefits, and retirement plans that allow tradeswomen to support their families. 20.0% believed that the mechanical skills they gained working in the trades would help them to be more flexible and employable in the job market whether or not they continued to be a tradesperson in the future.

The study showed that 80% of the women entering the Steamfitting/Refrigeration trades **did not** have previous mechanical work experience before entering the trade.

The data that was analyzed relating to training experiences showed that 60% of the women had been through a training opportunity. When a cross tabulation was applied to the variables in the data set the following results were found:

- 100% of the Madison participants received prior training before entering the trade. (The program they attended was a Madison Technical College Program named “Tools for Tomorrow”.)
- 14.3% of the South Eastern Wisconsin participants received prior training before entering the trades.

The respondents also identified obstacles they perceived that they needed to overcome before entering the skilled mechanical trades. The survey clearly shows that the 100% of the women believe that it would be a huge benefit for women to have knowledge of tools and work experiences in the trades areas before entering any trade. These results also show that 93.3% of the women surveyed indicated that a lack of preparedness is a main reason a woman is reluctant to access to the mechanical skilled trades as a career choice. The survey participants indicated that the mechanical trades require initial skills and training that creates an instant obstacle for a woman to apply for skilled mechanical trades apprenticeships.

The survey shows that 66.7% of the survey participants have no knowledge of any available support groups that are available to them in their trade. Women have lesser access to informal networks to establish contacts with industry in comparison with men. Compared to males, women are less likely to have prior trades-related work experiences or to have friends and family in the skilled mechanical trades making it harder for women to navigate through the skilled trades an apprenticeship programs.

Factors that influence women stay in the Refrigeration / Service & Steamfitting / Pipefitting trade of Madison and Southeast Wisconsin.

All the women that responded to the survey are presently still actively employed in their respective trade. Three are unaccounted for and it is unknown where they are. There were a total of 18 surveys distributed. There were 15 surveys that were completed and returned to the researcher and 3 who did not respond to the survey.

The results of the informational survey show that for 93.3% of the participants indicate the main reason they stay in the trade is because of the good pay, healthcare benefits, and retirement plans that allow tradeswomen to support their families.

The survey respondents pointed to the fact that 73.3% of the women feel there is *no physical limitation* that they have encountered on the job site. Modernization of tools and equipment has replaced the need for physical strength and big muscles, which were a prerequisite for many skills trades' jobs in the past.

No survey participant indicated that the working environment in which they are exposed to is too dirty, sweaty, or too hard for them to do. All the survey participants indicated the work conditions were manageable where they were presently employed.

The survey respondents indicated that if they had the chance to enter the trade of Steamfitting or Refrigeration knowing what they know today, 73.3% responded yes that they would apply for an apprenticeship in their respective trade.

The respondents also identified obstacles that need to be addressed concerning their work environment. To date 66.7% of the women working in the skilled trades of southeast Wisconsin & Madison are still the only woman on their given jobsite. The isolation created by the small number of women in the skilled mechanical trades and the lack of socialization with co-workers creates a very difficult work environment for women in the skilled mechanical trades.

The 53.3 % of the women surveyed indicated they were assigned job tasks based on their gender. The 53.3% of the surveyed women felt that on the job training was not equal between male and female apprentices. Women are frequently isolated from their

co-workers and put to work doing one faceted low-skilled jobs of their trade rather than advancing to more advanced skills.

86.7% of the tradeswomen indicated that they must work harder than their male counterparts to demonstrate that they are capable of performing the same tasks that were traditionally performed by men. They are held to higher work performance standards earlier in their careers than men, even when they are still learning the trade.

Factors that would influence a women to leave the trades.

The most important factor that would cause a woman to leave the trade was health or injury with a 73.33% response from the tradeswomen. 13.33% indicated that discrimination or harassment would be reason to leave the trade. There were 13.33% who responded that they would leave the trade for a better opportunity or job.

The results from this survey reveals that 66.7% of the women have encountered a form of sexual harassment at their jobsite. Sexual harassment, both overt and subtle arises in various forms from women being constantly stared at to working around nude photos as well as unwanted physical contact.

While at work, 63.4% of the survey participant's encountered co-workers who are **hostile** and **condescending** towards them. Workplace hostilities take the form of disparaging comments, poor performance reviews, denial of on the job advancement or training opportunities, or overt or silent resentment that is direct toward a person due to their race or gender.

Chapter 5

Summaries, Conclusions and Recommendations

The intent of this research was to investigate the recruitment and retention of women in the Refrigeration/Service and Steamfitting/Pipefitting trades of Madison and Southeast Wisconsin. This study focused on the women in the Refrigeration/Service and Steamfitting/Pipefitting trade unions of Madison and Southeast Wisconsin and determined factors that attracted women into the trades. Additionally, factors that caused women to stay or leave the trades were analyzed.

Statistical data requested and received from the Wisconsin Department of Workforce Development (DWD) was used to reveal the participation of women in the five skilled mechanical trades of Wisconsin from January 1, 1997 to June 30, 2007. The data extracted from the DWD Bureau of Apprenticeship Standards (BAS) statistical reports aided in the researcher's determination that additional research should be collected.

In order to determine the factors that pertain to women's recruitment and retention the skilled mechanical trades of Madison and Southeast Wisconsin, an analysis in the form of a survey instrument was developed. In the construction of the survey instrument, varieties of reference materials were used. Scholarly articles, periodicals and journals were reviewed for the purpose of determining current opinions, idea developments and trends in industry as they relate to the issues of recruitment and retention of women in the skilled mechanical trades.

Department of Workforce Development Data:

The evaluation of Department of Workforce Development data (DWD) reveals that in the last ten years the participation of women in the five skilled mechanical apprenticeships of Wisconsin was only **1.65%** from January 01, 1997 to June 30 2007. When broken down by trade classification over the same ten-year period of time the Steamfitter/Refrigeration trades employed only **1.53%** women.

It also indicates that the rate of apprentices employed from January 1, 2007 to June 30, 2007 was the greatest increase in a six-month period of time within the skilled mechanical trades of Wisconsin in the past ten years (1997–2007). Although apprentice employment numbers are at record rates the number of women apprentices employed in the skilled trades of Steamfitter/Refrigeration of Wisconsin from January 1, 2007 to June 30, 2007 was **only 1.38%**.

Based on the DWD, data it can be concluded that the need for stronger recruitment of women into the trades is an issue that must be addressed. The absence of women in the ranks of successful people in the skilled trade of Refrigeration/Service and Steamfitting/Pipefitting of Wisconsin is due to the cultural bias, which permeates the mechanical skilled trades as being solely a male endeavor.

The construction trades are one of the most male-dominated sectors in the United States. This characteristic has been impervious to change despite the regulatory changes of the 1970's, which were designed to help dismantle the barriers to women who wished to enter the skilled mechanical trades. The government promotes apprenticeship training, provides technical assistance to establish and develop programs, registers and monitors,

certifies graduating apprentices, and sets and enforces training standards (Glover and Bilginsoy, 2005). Women are more likely to benefit from the structure that apprenticeship training offers due to the explicit rules, affirmative action requirement and anti-discrimination regulations, which formal apprenticeships are required to follow by federal law.

Federal law stipulates that after 1980 contractors awarded a federally funded construction job must adopt a “best effort policy” to hire women for 6.9% of the labor hours for that particular federal job. Lax enforcement of this policy has led to the weak results in raising the numbers of women in the construction trades (O’Farrell and Moore, 1993; Eisenberg 1998). A recent study by the Government Accountability Office shows that the Department of Labor’s monitoring of apprenticeship programs, including equal employment opportunities reviews, is very limited and infrequent due to a shortage in funding and staffing (GAO, 2005).

Based on the conclusions it is recommended that state legislators allocate more time and money training and enforcing companies to comply with “good faith” policies. Recruitment efforts should reach out past the standard career days at the local high schools to implementing pre-apprentice programs like “Tools for Tomorrow,” at all Wisconsin Technical Colleges, to provide the necessary basic academic and hands-on skills required to be accepted into the skilled mechanical trades.

Public and private sectors should promote the hiring of tradeswomen through diversity goals for apprentices *and* journey-level workers. Many contractors, particularly those that bid on public construction projects, are already familiar with diversity goals for

apprentices. Adopting similar goals for journey workers will help ensure that women continue working once they finish their apprenticeship training.

Tracking the role of a program sponsorship is important in understanding the current patterns of women entering the skilled mechanical trades. It is recommended to continue tracking apprenticeship programs' recruitment and retention of women, follow up with non-performers, and formally recognize programs that do well. The Wisconsin State Apprenticeship and Training Council needs to take a stronger role in addressing apprenticeship programs that fail to make "good faith" efforts or show progress in recruiting and retaining women. Further the DWD should formally recognize apprenticeship programs that have a better than average track record or show improvement in their recruitment and retention of women.

The Department of Workforce Development has the power to deregister contractors from participating in state recognized apprenticeships programs, which would prohibit the contractor from bidding on state funded contracts. Executive Order 108 (EO108) states that *"no contracts are awarded for construction work performed on state-owned projects in Wisconsin unless the contractor is currently approved as a Wisconsin Trade Trainer or has applied for approval as an Apprenticeship Trade Trainer to the Department of Workforce Development and agrees to an acceptable apprenticeship program which includes specific ratios of apprentices in skills trades which have been determined as apprentice-able by the Department of Workforce Development"*. It is time for DWD to **enforce** Wisconsin's Executive Order 108 to ensure that employers using state

apprenticeships supplement their workforce with a “*diverse workforce*” in accordance with Federal Employment Guidelines for Non-traditional Occupations.

Furthermore, the Department of Workforce Development - BAS needs to form an exploratory commission to investigate the structure of the local skilled trade Joint Apprenticeship Committees (JAC) and how over the past 35 years there have been no significant changes in the composition or (make-up) of the five skilled mechanical trades committees and determine how that factor correlates to the lack of women hires into their respective trade.

Once the investigation is complete the BAS exploratory committee would determine if changes are required to the structure of local trade JAC committees. The local trade JAC’s would be required by the BAS to implement changes to meet the diversifying needs of the respective apprenticeship programs as recommended by the BAS exploratory committee.

Once this complete the BAS needs to address the difficult procedures in applying for an apprenticeship. The application process needs to be streamlined and the exclusionary hiring practices of the local JATC must be addressed.

Factors that influence women to enter the Refrigeration / Service & Steamfitting / Pipefitting trade of Madison and Southeast Wisconsin:

The participants indicated the main reason they chose the trade is because of the good pay, healthcare benefits, and retirement plans that allow tradeswomen to support their families. The mechanical skills they gained working in the trades would help them to be more flexible and employable in the job market whether or not they continued to be a tradesperson in the future.

Based on survey data it can be concluded that the respondents identified obstacles they perceived needed to be overcome before entering the skilled mechanical trades. It is clear from the women surveyed that the lack of awareness and exposure to the skilled mechanical trades as a viable career choice has contributed to the “*lack of interest*” by women in the skilled trades as a career opportunity. The single greatest obstacle women perceived was the overwhelming sense of lack of preparedness. All of the survey participants indicated the lack of preparedness is the main reason a woman is reluctant to access the skilled trades as a career choice. The mechanical trades require initial skills and training that creates an instant obstacle for a woman to apply for skilled mechanical trades apprenticeships.

Based on the survey analysis conclusions it is recommended that public funding needs to be dedicated to expand apprenticeship preparation training for women. The state of Wisconsin needs to dedicate funding for apprenticeship preparation programs to target women and provide wrap-around support services, which are critical to support women through training. Programs need to be developed to educate girls about the trades, beginning as early as elementary school, so that girls grow up considering the skilled mechanical trades to be a viable career option. Recruitment efforts must reach out past the standard career days at the local high schools to implementing pre-apprentice programs like “Tools for Tomorrow,” at all Wisconsin Technical Colleges, to provide the necessary basic academic and hands-on skills required to be accepted into the skilled mechanical trades.

Reaching women will require more than the willingness and good intentions of a few programs. Developing a regional or statewide outreach and recruitment campaign that targets women is needed for broader change; Wisconsin needs an industry-wide outreach and recruitment campaign to attract women into the building and construction trades. Outreach programs need to focus on people, like single parents, who are motivated to get ahead financially.

A person's access to formal networks within the skilled mechanical trades is an important factor. The development of a skill trades website for all women in the skill trades in Wisconsin would be another recommendation. The formal network websites would be a key source of information for women on how, when and where to apply for apprenticeships within the skilled mechanical trades of Wisconsin. The web site will also point the prospective apprentice to different occupational choices within the trades as well as the amount and type of training that is available to help aid them in attaining an apprenticeship (like Tools for Tomorrow & project Big Step).

Factors that influence women stay in the Refrigeration / Service & Steamfitting / Pipefitting trade of Madison and Southeast Wisconsin:

All the women who responded to the survey are presently still actively employed in their respective trade. The participants indicate the main reasons they stay the trade is because of the good healthcare benefits, retirement plans and excellent wages that allow tradeswomen to support their families.

Based on the survey data, female apprentices **must** receive well-rounded skills training in order to stay in the trades and become employable journey level

tradeswomen. The surveyed women felt that on the job training was not equal between male and female apprentices. Women are frequently isolated from their co-workers and put to work doing one faceted low-skilled jobs of their trade rather than advancing to more advanced skills. They indicated that female apprentices must work harder than their male counterparts and are often held to higher work performance standards earlier in their careers than men, even when they are still learning the trade. Many of the women felt that they were assigned to journey workers who lack the skills needed to adequately train apprentices.

Women also have lesser access to informal networks to establish contacts within industry in comparison with men. The lack of informal mentoring creates a void in a woman's ability to navigate the apprenticeship system and its unspoken rules. While some national trades women's organizations have informal mentoring networks, there are no mentoring programs for tradeswomen in Wisconsin.

Based on the survey's conclusions, it is recommended that developing a state funded advocate position within the Department of Workforce Development so women can register their concerns or get assistance that is not directly tied to their respective trade unions politics is imperative. All apprenticeship programs should provide women apprentices with clear expectations of their respective trades skills development. Women apprentices need a clear understanding of the skills they should acquire during on-the job training. Steps need to be taken to develop protocols for apprentices that detail whom they can talk to and action steps to take if they are not rotated on jobs or are not building expected trade related job skills.

The women surveyed felt there needed to be a middle ground for them to be able to register their concerns, that by placing their job related concerns at the local union level was causing them to be labeled as troublemakers within their local union. They also felt that placing their concerns at the state or federal level was too much of a risk once again labeling them as a troublemaker that if they did file a complaint at the state or federal level their job would be in jeopardy. There is a need for a state-funded advocate so women can registrar their concerns or get assistance that is not directly tied to their respective trade unions politics. This advocate would have the ability to address the woman's particular concerns at the local level all the way to the state level on that woman behalf. This would take the local, state & federal politics and the public scrutiny off the shoulders of the woman whom is asking for help with the respective issues of training and insure a means of formal mediation and documentation of training concerns related to female apprentices.

There is a need to create a stronger on-the-job training environment through journey worker education and/or other formal mechanisms. This can be done through "transition to trainer" instruction that builds training and mentoring skills. The skilled mechanical trades of Wisconsin can explore ways to encourage journey workers to consistently model good training practices. Additionally, labor and/or management could elevate the status of journey workers who train apprentices. One new model might involve paying these individuals a higher hourly wage in recognition of their enhanced role as trainers

The Department of Workforce Development BAS with the mechanical trades industry needs to develop a formal mentoring program for all women in the trades. A mentoring program should be piloted to link all new female apprentices with journey-level

tradeswomen. Mentoring is important for the women coming into the skilled mechanical trades. It would be a program where more experienced women would take young women under their wing. Show them things and let them know how to conduct themselves on the job, because a lot of times new apprentices don't know the ins & outs of apprenticeship.

Factors that would influence a women to leave the trades.

The most important factor that would cause a woman to leave the trade was health or injury. Some of the tradeswomen indicated that discrimination or harassment would be reason to leave the trade. There were several women who responded that they would leave the trade for a better opportunity or job.

Based on the survey data, women indicated that tradeswomen are still enduring resentment from fellow male workers, harassment and isolationism. Sexual harassment, both overt and subtle, arises in various forms from women being constantly stared at to working around nude photos as well as unwanted physical contact. Workplace hostilities take the form of disparaging comments, poor performance reviews, denial of on the job advancement or training opportunities, overt or silent resentment that is directed toward a person due to their race or gender. There are many other ways a workplace can be considered hostile, such as restricted access to sanitary toilets, improperly sized protective clothing and safety equipment, and a fear of reporting workplace health and safety issues. (Chicago Women in Trades, 1992; Occupational Safety and Health Administration, 1999.) It is clear from the survey data collected and analyzed that the strong cultural biases that lead to harassment, resentment and

isolationism of women in the skilled mechanical trades are impervious to change and must be addressed.

Based on the conclusions it is recommended that there is a need to educate both male and female apprentices and journeypersons, as well as contractors, union officials, and contract compliance officers, about sexual Harassment and other types of gender discrimination women face. The women surveyed clearly indicated that there was no formal training that regularly took place at the local union level or the employer level on or about the topic of harassment in the work place. The understanding of federal, state laws and guidelines are essential for women in the skilled mechanical trades and the training of the employees about these issues is the responsibility of the local trade unions and the mechanical contractors.

Sexual harassment training cannot be viewed as a luxury utilized only by those proactive employers who wish to promote a positive workplace. Since the Supreme Court's landmark decisions in the 1998 *Faragher and Ellerth* sexual harassment cases, subsequent court decisions and EEOC Guidelines have made clear that sexual harassment training is essential. To be able to raise a defense or avoid punitive damages in sexual harassment lawsuits, employers need to show that they have provided periodic sexual harassment training to all employees. Contractors cannot plead ignorance about being liable for sexual harassment by a foreman or supervisor. Failing to properly train can result in punitive damage charges by demonstrating "reckless disregard" for the Fair Employment and Housing Act. Courts and EEOC guidelines also have made clear that sexual harassment training should address not just sexual harassment but all forms of unlawful harassment.

The EEOC typically requires the employer/contractor to agree to provide its employees *yearly harassment* prevention training. The construction trade contractors must by law provide each employee harassment prevention training once a year. The Wisconsin contractors need to follow the Federal, State and EEOC's leads and develop a training program that is specific to the gender problems within the construction trades. The Department of workforce Development - BAS needs make it a mandatory requirement that all skilled trades contractors who are eligible to employ state recognized apprentices provide to the DWD a formal training program distinctly designed to address gender, discrimination and harassment issues within the construction trades. The DWD needs to validate that that training was completed yearly by recognizing those contractors who fulfilled the requirement and by enforcing Ex. order 108 and suspending the state funded contracts of the contractors who do not comply to the yearly training requirements. It is essential to the well being of skilled mechanical trades of Wisconsin to implement practices that promote awareness of these issues, such as sexual harassment training, exit interviews for women leaving the trades, and make available brochures for contractors addressing recruitment, retention, and sexual harassment.

There is also a need to develop an anonymous DWD hotline. It is essential in identifying a hostile work environment. There needs to be a way for a woman and co-workers to place a complaint about their workplace without placing that particular woman or fellow worker in jeopardy of further harassment. This hotline would provide the middle ground were a DWD advocate/mediator could intervene and provide the worker and the trades contractor

a means to resolve the harassment issue before a complaint was filed on the state or federal level.

The social biases that exist today must be dissolved. The only way to conquer social bias is by getting more women into the trades. The need for stronger recruitment of women into the trades is an issue that needs to be addressed.

Over the past thirty-five years the standard procedure for recruiting women into the trades was simple: a local union or contractor only need to show a good faith effort. The manner in which women are recruited by the construction trades needs to be addressed. Today the employer and local union officials have mainly focused their recruitment efforts to the standard career days at the local junior/high schools and community sponsored job fairs just like 35 years ago.

Female-focused apprenticeship preparation training is extremely difficult to fund, but the Wisconsin Building Trades Council needs to develop and fund a program that reaches out past the standard career days at the local junior/ high schools to implementing pre-apprentice programs like "Tools for Tomorrow," at all Wisconsin Technical Colleges, to provide the necessary basic academic and hands on skills required to be accepted into the skilled mechanical trades.

To change the cultural bias there needs to be a stronger commitment to positive imagery of women within the trades. There needs to be a concerted effort by the Local unions and Building Trade Council develop multimedia films, videos, pod-cast, internet and other media venues which encouraged women into their rank and file. Whether it is money, independence, companionship, and pride in learning new skills. It is time for Labor

unions and Mechanical Contractors to find what motivates women to enter and stay in the skilled mechanical trades.

During World War II, an unprecedented number of American women responded to government propaganda films, which encouraged women to become war workers. The war brought a tremendous shortage of labor. Not only was there great demand for labor to build up the war machines necessary to fight, but the men were leaving civilian employment for military service in huge numbers. The United States government encouraged women to enter the high-paying world of heavy war-production industry. Women who had worked at pink-collar jobs, or in lower-paying women's industrial jobs, flocked to war production work as an opportunity to learn new skills and make higher wages. They had gotten the feeling of their own money. Making it them selves. Not having to ask anybody how to spend it. They were finally able to get a decent job because of the war when industry needed workers, regardless of their sex or color.

It is clear that the face of America's workforce is changing. The Bureau of Labor Statistics (BLS) reports that participation rates of working-age men have actually fallen from 87 percent to 75 percent over the past 50 years. During the same period, the participation rates of working-age women have increased from 32 percent to over 60 percent. Robert Szafran has shown that by 2015; the projected participation rates for men and women are expected to be equal. However, to attract more working-age women, businesses must transform recruitment and hiring programs (2002).

Today the mechanical skilled labor forces are faced with a similar crisis. By the year 2020, we can expect that only 32% of the construction/mechanical trade workforce will be

white men under the age of 50 (Morgan, 2006). The local unions and Building Trade Councils need to embrace the present skilled labor shortage as an opportunity to expand their membership with local women by increasing recruitment efforts and finding new ways to implementing pre-apprentice training programs for women. It is also imperative that women take advantage of the available high skilled jobs and need to prepare themselves to replace men in the work place.

Recommendations for future Studies

This chapter discusses the methods of the study, sample selection, instrumentation, procedures followed in conducting the survey, and data analysis methods. It is the intent of this chapter to provide the reader with a detailed account of the methods and procedures that were used so that this study could be replicated or further studies could be made within the same guidelines.

Increasing the participation of women in the skilled mechanical trades of Wisconsin calls for major changes in policies, priorities and behavior of contractors, unions, local high schools and government at all levels. It is necessary to strive harder to recruit women, stop abuse and harassment and improve mentoring. Recruitment efforts should reach out past the standard career days at the local high schools to implementing pre-apprentice programs like "Tools for Tomorrow," at all Wisconsin Technical Colleges, to provide the necessary basic academic and hands on skills required to be accepted into the skilled mechanical trades.

Unless we find a way to keep gender equity in the public eye it will develop into apathy. Who is the Gloria Steinem of today? Social change takes generations and by the

numbers we have shown that there has been a decrease of women in the skilled trades of Steamfitting/Refrigeration of Madison and Southeastern Wisconsin.

Conclusion

This study offers recommendations on ways that Wisconsin's construction industry – including apprenticeship programs, unions, labor councils, contractors, developers, state agencies and the state apprenticeship council – can increase women's participation.

The construction trades are encountering a low rate of entry workers accompanied with a high rate of attrition, due to an aging workforce. Industry leaders across the United States are acknowledging that *women* are the greatest untapped labor source. By the year 2020, we can expect that only 32% of the construction trade workforce will be white men under the age of 50. Despite the past inequities in the construction trades, our current economic and labor shortage presents a great opportunity for women and minorities in the construction trades of Wisconsin (Morgan, 2006).

The late President Kennedy once said that the great enemy of truth is very often not a lie...but a myth. "Mythology," he said, "distracts us everywhere – in government as in business, politics as in economics, foreign affairs as in domestic policy." Mythology also distracts us when we look at the myths and facts about women workers in our society today. Fantasy and illusions about the role of women in this day and age results in continuous and oftentimes not so subtle discriminations which leads to a waste of women's talents and abilities. We are at a time in history where we can no longer afford to have this be the norm. We should no longer misuse these people nor waste this valuable resource.

References

- Banks, J., & Banks, C. (1997). *Multicultural education: issues and perspectives* (3 ed.). Boston: Allyn & Bacon.
- Bame, E. A. & Dugger, W. E. (1990). Pupils' and concepts of technology. *The Technology Teacher*. 49(8), 10-11.
- Bame, E. A. & Dugger, W. E., & deVries, M. (1993). Pupils' attitudes toward technology-- -PATT-USA. *Journal of Technology Studies*. 19(1), 40-48.
- Cox, J. (2007). (personal communication, June 07, 2007). Local 601 Steamfitter Business Agent, Milwaukee Joint Apprenticeship Member.
- Deem, R. (1978). *Women and Schooling*. Boston, MA. Routedge & Kegan Paul.
- Eisberg, J. (1993). Boys don't want to hear about cooking: perspectives on women and science. *Teaching Forum: The Undergraduate Teaching Improvement Council – UW System*, May 1993, 14 (2), 1-4.
- Hendley, D.; Stables, A.; Parkinson, J.; & Tanner, H. (1996). Pupils' attitudes to technology in key stage 3 of the national curriculum: A study of pupils in south Wales. *International Journal of Technology and Design Education*, 6(1), 15-19.
- Josephs, S., (1990) "Women in construction apprenticeship: Some clues for the future" *Work Place Topics*. Vol. 1 No. 4. AFL-CIO Department of Economic Research, Washington D.C.
- Marshall, N., (1989) *Women in the Trades: Final Report of a Survey of Massachusetts Tradeswomen*. (Wellesley College Center for Research on Women Rep No. 195).

- Milwaukee Area Technical College. (2007). *MATC Employment Development Center: Graduate Diversity*. Milwaukee, Wisconsin: Author. Retrieved June 23, 2007 from the world wide web. <http://www.matc.edu/featur/gradhi/index.htm>
- Moffit, M., (1986). *Function of Hero and Heroine in Women's Formula Fiction: A Gaining of Self Through Separation, Identification, and Assimilation*. Paper presented at the International Communication Association, Chicago.
- Morgan, Karen. (2006). *Draft Apprenticeship Focus Group Report: Women and Minorities in Wisconsin Apprenticeship*. DWD/DWS Bureau of Apprenticeship Standards, and the Wisconsin Apprenticeship Advisory Council.
- Owen, J. V. (1993). Nontraditional people for nontraditional jobs. *Manufacturing Engineering*. March, 110 (3) 42-49.
- Owen, J. V. (1993). Nontraditional people for nontraditional jobs. *Manufacturing Engineering*. March, 110 (3) 45.
- Shaw, L., (1998). *Women in the Skilled Trades: Do They Perceive a Discriminatory Work and Training Environment*
- Szafran, Robert., (2002). "Age-Adjusted Labor Force Participation Rates, 1960 – 2045," *Monthly Labor Review*, September, 2002.
- Wellesley College Center for Research on Women. (1995). *How schools shortchange girls: The AAUW report*. New York: Marlowe & Company.
- Welty, K. (1996, April). *Identifying women's perspectives on technology*. Paper presented at the International Technology Education Association Conferences in Phoenix, Az.

Zuga, K. F. (1996). *Women's way of knowing and technology education*. Paper presented at the meeting of Women's Leadership Symposium in Chicago, IL.

United States Department of Labor. (2007). *Nontraditional occupations for women* (Bureau of Labor Statistics' Employment and Earnings, January pp.). Washington, D. C.

Wisconsin Department of Workforce Development. (2007a, April 7). *Dictionary of Occupational Classifications and Work Descriptions: Apprentice*. Madison, Wisconsin: Author. Retrieved June 22, 2007 from the world wide web:
http://www.dwd.state.wi.us./er/prevailing_page/dictionary

Wisconsin Department of Workforce Development. (2007b, April 7). *Dictionary of Occupational Classifications and Work Descriptions: Apprenticeship*. Madison, Wisconsin: Author. Retrieved June 22, 2007 from the world wide web:
http://www.dwd.state.wi.us./er/prevailing_page/dictionary

Wisconsin Department of Workforce Development. (2007c, April 7). *Dictionary of Occupational Classifications and Work Descriptions: DWD*. Madison, Wisconsin: Author. Retrieved June 22, 2007 from the world wide web:
http://www.dwd.state.wi.us./er/prevailing_page/dictionary

Wisconsin Department of Workforce Development. (2007d, April 7). *Dictionary of Occupational Classifications and Work Descriptions: Electrician*. Madison, Wisconsin: Author. Retrieved June 22, 2007 from the world wide web:
http://www.dwd.state.wi.us./er/prevailing_page/dictionary

Wisconsin Department of Workforce Development. (2007e, April 7). *Dictionary of Occupational Classifications and Work Descriptions: Employer*. Madison, Wisconsin: Author. Retrieved June 22, 2007 from the world wide web:
http://www.dwd.state.wi.us/er/prevaling_page/dictionary

Wisconsin Department of Workforce Development. (2007f, April 7). *Dictionary of Occupational Classifications and Work Descriptions: Plumber*. Madison, Wisconsin: Author. Retrieved June 22, 2007 from the world wide web:
http://www.dwd.state.wi.us/er/prevaling_page/dictionary

Wisconsin Department of Workforce Development. (2007g, January 5). *Dictionary of Occupational Classifications and Work Descriptions: Refrigeration Mechanic*. Madison, Wisconsin: Author. Retrieved June 22, 2007 from the world wide web:
http://www.dwd.state.wi.us/er/prevaling_page/dictionary

Wisconsin Department of Workforce Development. (2007h, January 5). *Dictionary of Occupational Classifications and Work Descriptions: Steamfitter*. Madison, Wisconsin: Author. Retrieved June 22, 2007 from the world wide web:
http://www.dwd.state.wi.us/er/prevaling_page/dictionary

Wisconsin Department of Workforce Development. (2007i, March 5). *Dictionary of Occupational Classifications and Work Descriptions: Sheetmetal*. Madison, Wisconsin: Author. Retrieved June 22, 2007 from the world wide web:
http://www.dwd.state.wi.us/er/prevaling_page/dictionary

Appendix A

Women in the Steamfitting/Refrigeration Trades Survey

Women in the Steamfitting/Refrigeration Trades Survey

Please respond honestly to the questions and prompts below. Your responses will be anonymous and will not be shared. Thank you for your time and participation.

1. What level are you in your trade?
 - Pre-apprentice (less than one year in the trades)
 - Apprentice if so what year _____
 - Journeyman, if so how many years _____
 - Forman
 - General Forman/ Supervisor
 - Other _____

2. **Rank from 1 to 5**, the reasons that were most important in helping you to decide to enter the mechanical building trades?
(1 being the most important and 5 the least important)
 - Financial security
 - Mechanical trade skill
 - Job market flexibility
 - A counselor or placement advisor
 - A family member

3. Were any of the following people ever employed in the trades? (Check all that apply)
 - Spouse or partner
 - Men in the family
 - Women in the family
 - Men friends
 - Women friends

4. Did you receive training through any of these educational institutions prior to entering the trades? (Check all that apply)
 - Middle school
 - High school
 - Technical or vocational college
 - On the job training
 - Other _____

5. Did you have any previous work experience in the mechanical building trades prior entering the trades?
 - No
 - Yes

6. Did you encounter any criticism or unfavorable comments from your family, friends, or co-workers when you first decided to enter the mechanical trades as a career choice?
 - No
 - Yes

7. Are there any physical aspects of the job that you find too difficult (*such as heavy lifting or climbing heights and so on*)?
 - No
 - Yes

8. Are you presently the only woman on the job site as a skilled buildings mechanic?
 - Yes
 - No (if no, how many women are there? _____)

For the following questions please circle the number, that best applies.

	Strongly Agree	Agree	Slightly Agree	Neutral	Slightly Disagree	Disagree	Strongly Disagree	Does Not Apply
9. Women have a harder time combining careers with having a family than men do.	1	2	3	4	5	6	7	8
10. The public is accepting of women in the mechanical building trades.	1	2	3	4	5	6	7	8
11. I have much in common with most mechanical trades people.	1	2	3	4	5	6	7	8
12. Training needed for advancement is equally available to men & women.	1	2	3	4	5	6	7	8
13. Knowledge of tools and experience with tools is helpful before entering the building trades	1	2	3	4	5	6	7	8
14. Women have little exposure to the building trades in their educational experiences in traditional school	1	2	3	4	5	6	7	8
15. The men you work with like having women on the job site	1	2	3	4	5	6	7	8
16. The men you work with make you feel welcomed on the job site.	1	2	3	4	5	6	7	8
17. Sexual harassment is a problem on the job site.	1	2	3	4	5	6	7	8
18. I feel the need to constantly prove myself on the job site.	1	2	3	4	5	6	7	8
19. My co-workers are willing to help me learn.	1	2	3	4	5	6	7	8
20. My work co-workers are helpful.	1	2	3	4	5	6	7	8
21. My work co-workers are protective of me.	1	2	3	4	5	6	7	8
22. While at work co-workers are condescending towards me.	1	2	3	4	5	6	7	8
23. While at work co-workers are hostile towards me.	1	2	3	4	5	6	7	8
24. Management is supportive of me and willing to help me with problems as they relate to the job site.	1	2	3	4	5	6	7	8

For the following questions please circle the number, that best applies.

	Strongly Agree	Agree	Slightly Agree	Neutral	Slightly Disagree	Disagree	Strongly Disagree	Does Not Apply
25. I am assigned job tasks based on gender	1	2	3	4	5	6	7	8
26. Men and women should be given equal opportunities for apprenticeships	1	2	3	4	5	6	7	8
27. I stay in the trades because I find the work to be challenging	1	2	3	4	5	6	7	8
28. I stay in the trades because I find having a skill means I can get a job anywhere.	1	2	3	4	5	6	7	8
29. I stay in the trades because of the financial benefits.	1	2	3	4	5	6	7	8
30. I stay in the trades because of I like my job.	1	2	3	4	5	6	7	8
31. I stay in the trades because I like to work outdoors	1	2	3	4	5	6	7	8
32. I stay in the trades because I like the variety of work.	1	2	3	4	5	6	7	8
33. The trades have made me more independent and assertive	1	2	3	4	5	6	7	8
34. The trades have made me more confident that I can handle whatever comes my way	1	2	3	4	5	6	7	8
35. The trades have made me feel better about myself.	1	2	3	4	5	6	7	8
36. The trades have prepared me to do more around the house that used to intimidate me (working with power tools, household repairs, ect.)	1	2	3	4	5	6	7	8
37. The trades have made me feel more willing to take chances	1	2	3	4	5	6	7	8

For the following questions please circle the number, that best applies.

Strongly Agree	Agree	Slightly Agree	Neutral	Slightly Disagree	Disagree	Strongly Disagree	Does Not Apply
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- | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|
| 38. The trades have made me more independent because of the amount of money I make | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 39. I expect to make this trade my life long career | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 40. I consider this trades (Steamfitting) work personally rewarding. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

41. Have you left the trades?

No

Yes (why) _____

42. **Rank from 1- 10**, the following reasons that would influence you to leave the trades.

(1 being the most important and 10 the least important)

The job is too strenuous physically.

Being exposed to illness or injury.

Having to work with difficult co-workers.

Job is too dirty, sweaty, etc.

Facing discrimination because I am a woman.

Isolation of being the only woman on a job site.

Harassment.

Family members.

Training too difficult.

Others _____

43. **Rank from 1- 10**, What do wish you would have known about the trades before you started?

(1 being the most important and 10 the least important)

More about tools.

More about other trades

More about training opportunities

More about the hazards and physical demands of the trade

What is expected at the job site, ie. dress, tools

How important your own attitude was.

More about harassment

How to get started earlier

More about vocational education

Others _____

44. Is there a place that you can go to with your concerns about issues on the job site.

No

Yes (if yes, where can you go _____)

Do not know

45. Is there a support network in place for women in your trade.

No

Yes (if yes, where _____)
(Who sponsors it? _____)

Do not know

46. Would you encourage your daughter or any other female acquaintance to become a steamfitter?

No

Yes

Do not know

47. If you had the opportunity to take a steamfitter apprenticeship all over again knowing what you have experienced in the work world, would you do so?

No (explain below)

Yes (explain below)

Do not know

Please briefly explain your reasons

48. Any Additional commits you would like to add about your tenure in the field of Steamfitting/Refrigeration. Please fell free to express your positive and or negative experiences on the space provided below on this page.