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FEMALE BIAS IN TECHNICAL COMMUNICATION AND AN EXPLORATION OF PEDAGOGICAL STRATEGIES FOR REVERSING THE BIAS

by

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A thesis submitted in partial fulfillment of the requirements
for the degree of Master of Arts
in the Department of English
in the College of Arts and Humanities
at the University of Central Florida
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ABSTRACT

This thesis explores technical communication and seeks to establish that females outnumber males in the field while also holder more high-level positions. It further seeks to show why a field does not benefit from having one sex outnumber the other. The benefits of having an equal number of females and males contributing to the growth and expansion of the field are discussed. Finally, this thesis discusses potential pedagogical strategies which could be employed at the college level as a means of attracting more young men to the field and allowing for maximum growth of technical communication as a field of study and work.

The thesis begins by exploring the history of technical communication as a means of understanding how it came to be a field where women outnumber men. It then briefly explores the differences between the learning styles of females and males as a means of demonstrating the importance of including both sexes equally. Lastly, using research from other, related fields pedagogical strategies are suggested for drawing more young males into the study and practice of technical communication.

The conclusions drawn in this thesis are as follows: 1.) Women currently outnumber men in both the study and practice of technical communication. 2.) Research indicates that any field will benefit the most from including the skills and experiences of both sexes. 3.) Pedagogy may be effectively used as a means to help attract more young males into the field, thus increasing the growth and development of technical communication.

This thesis is dedicated to my father, Dr. Robert John Beeson, PhD, whose love for learning and teaching started me on the path to becoming a lifelong learner and an educator. His integrity, perseverance, and courage in the face of adversity have taught me to always fight for what I believe in and to never give up on my dreams.

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I would also like to thank Dr. Dan Jones and Dr. Melody Bowdon for being excellent instructors, as well as thorough and dedicated Thesis Committee Members. Their constant support and encouragement is greatly appreciated and has helped me grow as both a researcher and writer.

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CHAPTER ONE- AN INTRODUCTION TO THE ISSUES OF FEMALE BIAS/DOMINANCE IN TECHNICAL COMMUNICATION

My first inspiration for my Master's thesis came during a course I took during my second year as a graduate student. This course was titled "Gendered Rhetoric", and I took it as sort of an elective; it met a requirement for my degree but also sounded fun and engaging. This course sparked in me an interest in gender studies, as well as a desire to someday pursue a PhD in either Gender Studies or Women's Studies. Later in my graduate career, when I was asked to write a literature review for a course called Technical Writing, I chose to focus on the topic of gender bias in the field of technical communication. While that particular paper supported a very different thesis than this one does, it was the seed from which this thesis sprouted. That literature review was the reason I became fascinated with the gender issues in technical communication, and the reason I chose to focus this thesis on the topic.

When we think of fields such as engineering, science, and medicine, we usually imagine a world dominated by men. We assume that in most modern workplaces, men make more money than women. Additionally, when we picture a typical workplace, many of us picture a place where men outnumber women, and hold all the authority positions. Our culture has conditioned us to believe that the workplace has certain social rules, and that male brains function in a way which better suits men to certain professions, particularly professions that focus on math and the sciences. However, is this true of all fields? There are certainly fields, such as nursing, where women outnumber men. What about these particular fields makes them more appealing or available to women? Is it possible to employ pedagogical techniques to make a particular field appeal more to one gender?

In searching for the answers to those questions this thesis will explore three main points. First, this thesis will seek to answer the question of which gender outnumbers the other in technical communication, and why. Second, it will establish that gender equality in technical communication, as well as all other fields, is beneficial and necessary to the growth of that field. Lastly, this thesis will explore pedagogical techniques which will help bring gender equality to the field. However, the first question we must answer is whether one gender outnumbers the other, and why. In order to do this, we must briefly explore the history of technical communication.

When we think of technical writing, which began in America as the creation of instructions for advising Civil War soldiers on how to use their weapons (Connors 5), we often think of it as a field with a basis in engineering, and as a fields where men outnumber and out-earn women. We are conditioned to think this way because men are the founders and pioneers of the areas where technical writing found its beginnings: warfare, engineering, mathematics, science, and medicine. This common opinion is held, in part, because in many ways, men ruled the world during the late eighteenth and early nineteenth centuries, when the studies of languages and classical literature were losing ground, and the fields of engineering and science were becoming more prominent (Connors 5). While there were many successful women during this time, as well as in more recent times, they were often unable to fully achieve professional success, and they faced a constant struggle in a patriarchal society.

Technical communication saw huge growth during the Second World War, when new, never-before-seen technologies required documentation for soldiers (Connors 6). At this point in technical communication, engineers and inventors did the bulk of technical writing. However, a

curious shift was happening within the field. Women were becoming much more present in technical communication. Ruth Cowan Schwartz explains the change by saying that sometime during the mid-nineteenth and mid-twentieth centuries the shifting point for technical communication occurred and it became a female-dominated field. This is likely due to the fact that during this time period (circa 1880-1960) America became an industrialized nation, and many innovations were occurring in machinery; much of which was devices created solely for the purpose of making housework easier for women, and this is when women became users of technology, and, therefore, real participants in technical communication (*More Work for Mother* 3-5).

During this time another curious thing was happening in the world of academia. Many fields which formerly focused heavily on science and mathematics began to re-evaluate their students' success rates and started to find that there was a need for students to study humanities, in addition to the traditional sciences and math. Was it this change which allowed women to gain a foothold in academia, and, more specifically, technical communication? Lay and Carolyn Miller both discuss the significance of a multi-disciplinary approach for technical communication scholars. They argue that with a more well-rounded education students are able to become better, more persuasive writers. This was apparently true for many fields, not just those dominated by science and math, like engineering and medicine. It also became apparent that technical communicators needed to study rhetoric in order to produce the clearest and most persuasive writing. Technical communicators had to be able to make decisions and write persuasively; they couldn't just regurgitate the words of engineers because most readers simply could not understand the technical, scientific speech of engineers (Rude 83). It is at this time,

with the addition of English and the rest of the humanities, that more women were becoming more comfortable branching out into the male-dominated field of technical communication.

As women became more frequent users of technology, and more frequent students of technical writing, they slowly began to gain a foothold in the field, and eventually would come to outnumber men in the field, and often hold higher positions. Many technical communicators felt that this had something to do with the fact that women had always felt more comfortable in the humanities, and technical communication had taken a turn towards becoming a study of humanities. Daniel Maddux explains this change:

> Consider the history of writing in general. Until recent times, few professional occupations were open to women. Writing was one of the first fields that a woman could work in without being viewed negatively by society. Early on, [as women began to enter the professional world] women often wrote under male pseudonyms. As time passed, female writers rose to prominence, ("Why Women Dominate Technical Writing")

He further explains some of the qualities which modern technical communicators must possess:

> In order to be a really good technical communicator, you must (among other things) be a good listener, be able to put yourself in someone else's shoes, have a knack for drawing out key information without offending the person you're talking to , possess a comfort level with doing something for a living that's not very "macho" most of the time. The common perception is that women typically

> have more "emotional intelligence" than men. Perhaps women tend to be stronger in some of these areas. ("Why Women Dominate Technical Writing")

Technical communicators must now possess a wide variety of skills. They must be able to transfer information and manipulate language so that the layperson can understand it. The field has changed, and women seem to be stronger in the areas which technical communication now encompasses. While Maddux uses the word "dominate," it is important to understand that he does not mean "dominate" in the traditional sense of the word. To dominate something implies a power over it, a certain "macho-ness" or "masculinity." Perhaps, Maddux would have been better suited to choose a different phrasing, since he means that women might outnumber men and hold higher positions as technical communicators, but to use the word "dominate" goes against many of the ideologies he is discussing in his article. It is important to note that although women may currently outnumber men the research shows that female technical communicators still make significantly less than their male counterparts.

Looking towards the future it would benefit us to find strategies which would encourage more men to enter the field of technical communication, as much research shows that men and women each contribute in a unique way (Wood), and that having equal numbers of both men and women allows a field to grow, change, and become better. Lay explains women have experiences which are completely unique and tied to their being women. This makes them a crucial part of any field because they can bring knowledge and experience which men do not have. The same is true of men in fields where women outnumber men. Men can bring experiences, knowledge, and skills to the field of technical communication which will help improve and expand the field.

In the past, the introduction of the humanities into technical communication drew more women into the field. Therefore, it seems likely that pedagogy will be the place to begin to encourage more men to enter the field. First, we must determine what is meant by the humanities. Miller defines the humanities as those fields which focus on language and its use in speech and argument. It would be safe to say that for the purpose of this thesis the humanities would include rhetoric, philosophy, linguistics, English, and writing, as well as courses which are expansions of these.

Michael Hughes identifies the technical communicator as a "creator of knowledge" (276). Women are sometimes considered the more imaginative gender and they prefer to take the time to find the most fitting word choice. Men, on the other hand, generally prefer a right/wrong dichotomy. In order to draw more men into the field of technical communication the pedagogy we employ must interest men in this "creation of knowledge." Hughes states that, "Technical communicators negotiate meaning within development communities and between those communities and user contexts, and they capture the resulting consensus as knowledge assets" (278). This understanding of technical communication allows scholars to understand that they are in control of information and are able to manipulate it into a meaning which best suits the reader. Thus, there is an introduction of right/wrong, as well as a sense of power within the technical communicator. These are attributes which will make the field more interesting to young men, as it allows for technical communication to have some typically masculine characteristics, as opposed to being all creative writing, patience, and gray areas. While playing to stereotypical gender roles may seem a contradiction of the central ideas in this thesis, it is my opinion that sometimes it is acceptable to use whatever means necessary to solve a problem. If appealing to

stereotypes helps draw more men to the field, and allows them so see the expansive possibilities within technical communication, then it is a tool that must be put to use.

Maddux also feels that women are not necessarily better technical communicators than men; he feels many men are raised to possess some of the qualities that are deemed highly desirable in technical communicators. He closes his article by saying, "Technical communicators need guts, so they don't get run over by subject matter experts. They have to be able to aggressively track down the information they need to do their jobs, and they have to have the fortitude required to "herd the cats" ("Why Women Dominated Technical Communication"). This is another aspect of technical communication which needs to be broadcast to potential scholars. Not all of technical communication requires such a delicate manipulation of language; much of it is aggression (technical communicators must be able to pursue and defend their ideas, even when others disagree or are not open to listening), persuasion, and argument. All of these are characteristics which are typically considered masculine; however, it is important to note that all technical communicators will need to learn to take control of creative situations. We cannot even begin to hope that field of technical communication will become equal in numbers or pay if we cannot encourage more young men to enter into the study of technical communication. Therefore, the study of pedagogy goes hand-in-hand with the history of technical communication and the pursuit for equality in the field.

This thesis will seek to explore some important questions about this change in technical communication and the implications it has had for the field. In changing the way technical communication is studied, did educators open up opportunities for women to begin entering the field? Did the change in academic structure create a niche for women in technical

communication which has subsequently allowed them to be more visible than men in the field? With these questions answered, this thesis will seek to explore several pedagogical strategies which encourage more men to enter technical communication and its related fields in an attempt to bring more gender equality to technical communication. As discussed later in this thesis, the contributions of both men and women are crucial parts of the development of any field. High numbers of women in technical communication may seem like a good thing, like a step in the right direction for women, yet, with further examination we begin to understand that any gender dominance in a field excludes the ideas and contributions of the opposite gender. Therefore, this thesis seeks to explore the question of gender bias in technical communication, its history, and strategies for reversing that bias, if it does exist, so that technical communication can grow and flourish as a field.

CHAPTER TWO- A BRIEF HISTORY OF TECHNICAL COMMUNICATION

As is necessary to understanding any problem, one must begin by going back and looking at the history of the situation. Therefore, this chapter will focus on the history of technical communication, as well as major events throughout that history which have had a significant effect on men's and women's positions within the field. All parts of the problem must be fully understood before any possible solutions can be proposed. The problem of women outnumbering men in technical communication requires a careful examination of the history of technical communication, as well as an understanding of how some of the major events in the field have contributed to it becoming a field in which women outnumber men. The difficult part of examining the history of technical communication lies in deciding where, in the discipline's long and detailed history, the beginning is. Michael Moran wrote in 1985 that the history of technical communication had never been written (26). Robert Connors said, "For as long as men have used tools and have needed to communicate with each other about them, technical discourse has existed" (4). Elizabeth Tebeaux and Mary M. Lay argue that technical communication dates back to at least the time of the Renaissance. However, prior to the 19th and 20th centuries women were rarely educated, and were often faced with great challenges when they did attempt to educate themselves. In the 19th century, when education and the liberal arts began to take hold in academia, women slowly entered the worlds of education and work. It is because of this change in societal norms that this history of technical communication will focus on the "modern" history of technical communication, which, in the Western world, means the period of time from the mid-nineteenth century to today (1850-present day).

Prior to the nineteenth century traditional courses of study focused on Greek and Roman philosophy and literature. The nineteenth century saw a change in academia, and these traditional courses of study began to incorporate a number of new areas of study. These included mathematics, modern languages, literature, a large variety of liberal arts, and technical and applied sciences. The greatest contributor to this change in academia was the Civil War. Robert Connors explains,

> During that conflict as never before, field engineers had been important figures, and with the burgeoning Industrial Revolution, the establishment of A & M colleges, and the growing technical needs of postwar America, the creation of schools and colleges of engineering (usually adjunct to the "arts" college in non-A & M schools) was a natural step. (5)

The Civil War changed the face of education and how scholars and administrators viewed a "good" education. Gone were the days of studying philosophy, rhetoric, and literature. The realm of education had entered the modern era we know today, where mathematics, sciences, and liberal arts constitute a well-rounded education. It was in this world that engineering began, and from engineering grew the discipline we now call technical communication.

While much of the early twentieth century was quiet in terms of the development of technical communication, it did see the first technical communication textbooks, as well as an increase in the number of schools offering technical communication courses. Even with the Great Depression in full swing, technical communication courses continued to fill in colleges around the country (Connors 10). The early twentieth century certainly saw some growth for the field.

However, it was not until the early 1940s and World War II that the field saw its biggest growth since the Civil War.

World War II, much like the Civil War, brought an increase in technology to the world. Many new technologies which had never existed before were now available to officers and soldiers. Each of these new technologies required documentation which informed soldiers about how technology worked and its varied uses. Yet, while the world was creating technologies which were helping keep soldiers alive, as well as giving them an advantage on the battlefield, technical communication courses and writings were seeing a strong decline. They would not see an increase again until the years following the war; however, just because courses were seeing lower enrollment did not mean that the field was not growing and changing.

When discussing the history of technical communication it is impossible to ignore the years following World War II. The late 1940s and early 1950s brought a fresh wave of new technologies. However, unlike the technologies developed during the war, these technologies were designed for use within the home, and were primarily operated and understood by women (*More Work for Mother* 190-191). In addition to increasing the technologies used within the home, the years following World War II led to a great increase in the number of students who were enrolled in technical writing courses, as well as college courses in general. Connors explains, "Part of this expansion was due, of course, to the thousands of new students attending college on the GI Bill, but the striking growth of technical writing was also in part a result of the nature of WWII, the first truly technological war" (12). The years between World War II and the "Baby Boom "of the 1950s were some of the most important for technical communication, and it

would not see such growth again until the beginning of the Computer Age, some twenty-five years later.

Without a doubt, the invention of the computer and related technologies and studies has created the biggest growth and expansion of technical writing. It was due to this evolution that technical writing came to be called technical communication. Prior to the computer revolution very little had changed in technical writing since its earliest days (Longo 1). Obviously, new technologies would appear to be the largest factor of change in this period of technical communication's history. However, as several authors point out, this is also the period when the definition and understanding of what technical communication actually is began to take shape. Russell Rutter elaborates on the beginning of this change of opinion,

> The long-pervasive view that successful technical and scientific writing turns solely on polish, correctness, and objectivity has never completely reflected the needs of science and technology, but it is hard to see how writers in the workplace can ask for something better in their new hires when they were taught that good technical writing is mostly a matter of fitting facts into content outlines developed long ago (28).

As teachers, employers, and students began to understand that the previously-accepted tactic of engineers and scientists simply writing instructions for technologies no longer worked, an evolution of sorts began to take place within the discipline. Carolyn Miller describes this new understanding of technical communication as, "Technical and scientific rhetoric becomes the skill of subduing language so that it most accurately and directly transmits reality" (48). More recently, Michael Hughes says, "All these professionals take technical information and make it

understandable to those that need it" (275), and Bernadette Longo says, "Good technical writing is so clear that it is invisible" (x). With a huge variety of technical devices, many new venues for technical communication, and a newer, more complete understanding of what the discipline fully encompasses we have entered the 21st century with a new understanding of technical communication. The discipline has developed from simple, straight-forward technical and scientific jargon to an art-form which combines rhetoric, creativity, and strong persuasive skills.

Gender Bias in Technical Communication

Like many fields which originated in the sciences and mathematics, technical communication was long considered a man's world; men dominated the field in numbers and they held positions of authority almost exclusively. In fact, a number of authors, including Kathryn Durack, Ruth Cowan Schwartz, and Mary M. Lay have written articles and entire books on the subject of male dominance in technical communication. Durack opens her article on gender bias by stating, "Women are largely absent from our recorded disciplinary past, whether as technical writers, as scientists, or as inventors or users of technology" (36). Whether this male bias was due to the patriarchal nature of society prior to the nineteenth century, or the dominance of men in general in fields which were focused on the sciences and mathematics is still something which technical communication experts argue over. Bernadette Longo covers this period extensively in her book, *Spurious Coin: A History of Science, Management, and Technical Writing.* Longo explains that men came to dominate the field of technical communication because men were the ones being educated, and learning to use technology.

However, as the twentieth century progressed, the field slowly became more of a woman's world (Maddux).

The nineteenth century brought women into both the workplace and the classroom. Prior to this industrialization women were almost completely uneducated, and very few women worked outside the home (*More Work for Mother* 3). Most women (except for royalty and high society) did not continue their education past elementary or middle school. This, of course, left almost all fields of higher education and work dominated by men. Before the Industrial Revolution most colleges were strictly male, and women were not even allowed to attend. Without the benefit of an education or the ability to work, women were forced to remain in the household, or work in domestic positions outside the home. However, the technologies which were developed for use in the home were where the beginning of female participation in technical communication would start.

Ruth Cowan Schwartz's book, *More Work for Mother*, focuses heavily on the "industrialization of the home" and the way in which women began to function as technical writers. In her article on the subject, Durack writes that technical writing has two major characteristics: first, a close relationship with technology, and second, an understanding that technical writing is associated with work and the workplace" (36). As the home became industrialized women were using technology; in fact, they were the main users of a number of new technologies. In addition to the use of technology, they were also beginning to create their own technical writing. Women began to write books and articles on how to use these new technologies. For example, if a woman wrote an article on how to use a washing machine to do her laundry she was, in fact, functioning as a user of technology as well as a technical writer.

Elizabeth Tebeaux points out that women were prolific writers of technical communication in the seventeenth century. This technical writing varied from cookbooks to articles on domestic medicine and house (108).

As the second half of the twentieth century progressed women began to expand their careers outside the home. In the 1960s many women began to take jobs outside the home, and a large number of young women began attending college. The work force began to become "feminized", meaning large numbers of women were beginning to work, and some fields were beginning to be dominated (in numbers) by women (Wajcman 80). For example, women were greatly outnumbering men as teachers, nurses, and secretaries; however, it is important to note that these were, and still are, notoriously underpaid fields. The options for women in terms of career were still limited, but the workplace was beginning to open up for them.

The change in the definition of technical communication, as well as the general attitude towards it, played the most important role to date in reversing the male-dominance which had existed in technical communication. During the computer revolution the definition of technical communication changed again. Mary M. Lay explains this change by saying, "Technical communication scholars take an interdisciplinary approach to their field" (147). Technical communication is no longer simply the writing of instructions; it has become the transference and manipulation of language. It now requires a much larger knowledge base than in previous years. Russell Rutter describes modern technical communication as being, "…one-third writing proficiency, one-third problem solving skill, and one-third ability to work with other people" (21). This new definition of technical communication requires students to have the abilities to be persuasive, have a strong understanding of rhetoric, and be able to work well with others.

In short, technical communication in the twenty-first century has evolved to have a strong dependency of the humanities as Mara H. Washburn and Susan G. Miller write, "The past two decades saw the implementation of a variety of programs that succeeded in attracting more women into the fields of science, engineering, and technology. Many of these women are now in highly visible positions" (60). These fields, which are closely related to technical communication, but pay more, may be an indication that technical communication is not the beginning or the end of this trend; other, more STEM-based fields may be changing as well. While women still face many challenges in the workplace, including receiving lower wages than their male counterparts, they have come to have a very strong presence in the world of technical communication.

Men versus Women in the Field

In order to truly appreciate the current female dominance of technical communication it is necessary to begin where most technical communicators begin: higher education. Today, much more so than in the past, a number of schools offer technical communication programs. Most of these programs are Master's degrees, although some schools do offer Bachelor's degrees and Doctorates in technical communication, as well as a number of writing certificates. Another phenomenon never before seen, is that a number of these programs are offered solely online. This allows students to learn skills they will need in the workplace, and introduces them to a variety of software and document composition programs. Adaptability and flexibility are highly sought after qualities in technical writers, and these new programs seek to prepare students as well as possible for the workplace.

With more schools than ever offering degrees in technical communication it is important to understand who is actually enrolling in these programs. The University of Central Florida notes on their website that in the Fall of 2012 their MA Technical Communication program had 54 students. Of those 54 students, 38 were females and 16 were males (http://www.graduatecatalog.ucf.edu/programs/program.aspx?id=1210&tid=442&track=Technical%20Communication). However, UCF is not the only school to experience this trend. Michigan Tech features mini-bios of its technical communication students on its department webpage. Seven of these students are female while only five are male (http://www.mtu.edu/humanities/undergraduate/stc/). Women generally outnumber men in higher education, yet many of technical communication's features could potentially lead us to believe it would be an area of study where men outnumbered women.

While a rough estimate of the number of students enrolled in technical communication programs is known, it is impossible to know exactly how many are male and how many are female due the privacy rights of students. However, the numbers we do have combined with the fact that technical communication is usually (this is not true at all schools) part of the Humanities and more women are enrolled in humanities-based programs (with the exceptions of Philosophy and history) would lead one to the understanding that the majority of technical communication students are, in fact, female (Mangan). Additionally, one can look at statistics from the workforce to determine where women stand in the field of technical communication.

When discussing one gender dominating another in the workplace it is necessary to first establish what is meant by dominance. One gender can dominate the other in numbers, but still fall behind in wages. Interestingly, although men dominated technical communication in both

numbers and wages, as well as most other fields, for the majority of the nineteenth and twentieth centuries, the more modern history of technical communication has seen a change in this trend. Today, women are outnumbering men in the study of technical communication. While they still have a tendency to fall behind in wages, what they are doing in the field is quite impressive. It is important to note that there is still much progress to be made in the area of wage equality. Writer Ron Kurtus, notes that there are significantly more women working in technical communication than men. (*Salaries of Technical Writers).* Daniel Maddux agrees with Kurtus. Maddux also writes about the current trend in technical communication. He says, "One of the ways in which I'm unique as a professional is that I do technical writing - and I'm a man. The majority of technical communicators are women, and I've gone through college and my professional career being trained by and working mostly with women" (Maddux). While for some technical communication experts the jury is still out on whether women actually dominate in numbers, most experts are inclined to agree that women generally possess a number of skills which potentially makes them better technical writers than men.

Wages in the Field

Kurtus says that women female technical communicators make roughly $4000 a year more than male technical communicators (*Salaries of Technical Writers*). Again, Maddux agrees with Kurtus' ideas, saying that women have most commonly been his superiors in technical writing. As noted earlier, Mara H. Washburn and Susan G. Miller say that many women are now in highly visible positions with the fields of engineering and technical communication (60). While these writers strongly support the idea that women are dominating technical

communication in numbers, positions of authority, and wages, the jury seems to still be out of whether or not women are actually out-earning men, and whether or not they are receiving proper compensation for the work they are doing in these "highly-visible" positions of superiority. As I stated earlier, the evidence shows that, in general, women make significantly less than men. Again, I must point out that while women are making great strides in the field of technical communication and currently outnumber men, the research is contradictory on whether or not they are actually making wages which are equal or higher than their male counterparts. According to the Labor Board of the United States in 2012, the ratio of women's earnings to men's earnings was 81.2% for all occupations. The Labor Board also notes that women did out-earn men in some fields, such as food preparation, service workers, and bill and account collectors. While technical communication is not included in the Labor Board's list, a number of positions which could fall into the field of technical communication are. For example, the positions of computer and information systems managers, editors, and stock clerks and order fillers (who use computers to create a visual of their work) are listed. In the position of stock clerks and order fillers the ratio of women's earnings to men's earning was 105. 1%, meaning in this field women out-earned men. In the positions of computer and information systems managers and editors the ratio of women's earnings to men's earnings was, respectively, 81.8% and 88.3%. In each of these fields, which all very likely contain people who are doing technical communication work, women were ahead of or closely behind men (http://www.bls.gov/spotlight/2011/women/).

It appears that women are outnumbering men in the field of technical communication as students and as workers. This inference can be made from the fact that women are dominating in

numbers in technical communication programs around the country. It would follow suit that they would then be the dominant gender in numbers in the workplace. As Maddux says, the majority of his teachers and bosses in technical communication have been women. Again, we see from Maddux, Kurtus, and Washburn and Miller that women are, in fact, holding a number of high positions within the field of technical communication. It does seem that women are still trying to catch up to men in pay. Some authors, like Kurtus, argue that women are making more than men as technical communicators; yet, the statistics tell a different story. The trend in America is currently for men to make more than women, as we see in the statistics from the Labor Board. We also see from these statistics that women are making strides in certain fields, and that technical communication appears to be among these fields. Hopefully, the next decade or so will bring statistics that prove Kurtus's argument, and will show that women are being paid wages that are appropriate for the positions they hold within technical communication. Women are dominating the field in numbers, and soon they will, hopefully, be making pay that is equal to the pay men make in the same positions.

However, the main point of this thesis is the importance of including both men's and women's experiences in the field of technical communication in order to make it a better and stronger field. The wage issue is important to consider in this argument because, historically, when women take over a field the money goes away. The field goes the way of other fields where women outnumber men, like nursing and teaching, where workers work extremely hard and make little money. If this were to happen with technical communication it would lose financial traction, and if that were to happen the field would not be able to grow and expand as we hope it will when we equally include the experience and knowledge of men and women. As

technical communicators, we all want to see our field grow, expand, and become better. That requires financial stability. So, in order to ensure that the future of technical communication heads in this direction, we must put aside the issue of wage equality for the time being, and focus on how we can better the field by bringing more young men in, and, therefore, including the education, life experiences, and biological and social strengths of both genders.

CHAPTER THREE- HOW WOMEN BECAME SUCH A STRONG PRESENCE IN TECHNICAL COMMUNICATION

How Historical Events Contributed to Female Dominance in the Field

This paper previously examined the history of technical communication, however, it did not seek to delve further into these events and examine how each contributed to the female dominance we now see in technical communication. In fact, each of the events discussed earlier, as well as several other events have greatly contributed to women outnumbering men in the field of technical communication. Each major event in the evolution of technical communication (discussed in chapter two) has, in some way, helped shape the field into one in which women could gain a strong foothold and, eventually, come to outnumber men, as well as to hold a good number of highly-visible positions of authority within the field. This chapter re-examines some of the major events in the history of technical communication, and introduced some new events not previously discussed. It also examines how each of these events has contributed to the current female dominance of the field.

As academia shifted and began to include the study of the humanities and the liberal arts, women found areas within academia which interested them. One area in which women found great success was writing. However, it was not without struggle that they sought to have equality in the writing arena. Daniel Maddux explains:

> Consider the history of writing in general. Until recent times, few professional occupations were open to women. Writing was one of the first fields that a woman could work in without being viewed negatively by society. Early on,

> women often wrote under male pseudonyms. As time passed, female writers rose to prominence ("Why Women Dominate Technical Writing").

The ability to enter academia and learn alongside men gave women the chance to find what they excelled at. Many women found that creative writing suited them, and they became a strong presence in creative writing and literature (Maddux). For proof of a strong female presence in writing, we need only look at the authors of the period and note how many of them were women. Jane Austen, the Bronte sisters, and Louisa May Alcott were all successful and prolific writers during this time period. In fact, a large portion of what is now considered "classical literature" was written by women. Even if they were women writing under male pseudonyms there was still a huge number of female writers during the nineteenth century. While this may not be an example of an outright dominance, it does show some of the great strides women were making.

As noted previously, the late nineteenth century and early twentieth centuries were fairly quiet as far as technical communication was concerned. However, they were not a quiet period for the history of women, or their role in technical communication. These years were significant for a number of reasons, but primarily they were important for women because this was the period when larger percentages of women began to seek work outside the home, and new technologies were introduced into the home (McGaw 804). Ruth Cowan Schwartz refers to this period as the "industrialization of the home". By the late 1800s it was in full swing and Cowan notes, "Industrialization transformed every American household sometime between 1860 and 1960" (*More Work for Mother* 3). As discussed earlier, "housewife" was the traditional (and often only) role for women until very recently. The Industrial Revolution would not only change

technology, it would change the gender of those using technology from exclusively male to a more balanced ratio and men and women.

The industrialization of the home, which occurred during the Industrial Revolution and the subsequent years, introduced a number of new technologies into the household which allowed women to complete their housework more quickly and efficiently. Judith McGaw notes that in the years between 1870 and 1930 the home was redesigned by architects, and middle-class families began to purchase a huge variety of domestic conveniences (813). Inventions like the electric iron and the sewing machine saved women a significant amount of time; projects which had taken an entire day or more could now be done in hours. Later inventions like the washing machine and the microwave would cut the time for housework again. Yet, ironically, they would also raise the standards of housekeeping, and adding to the amount of housework a woman was expected to do.

Another event included in this time period which cannot be forgotten is World War II. As discussed earlier, World War II had a significant impact on technical communication and the lives of its male participants, but it also had a great effect on women and the roles they would come to play in technical communication. As more and more men enlisted in the armed forces and headed off to fight overseas they left a huge number of job vacancies which would come to be filled (sometimes only temporarily) by women. World War II marked the beginning of a period when a larger percentage of women would begin working outside the home. During this period women took non-traditional jobs in large numbers. Edward Malone discusses Lucille J. Pieti, who was one of Chrysler's most prized engineers, and although she faced difficulty entering the field, she was able to make a great impact on the field of engineering. During World

War II Grace Hopper, a Navy volunteer (she was not allowed to enlist), helped invent some of the most advanced and lethal warfare technology of time. Adele Goldstein and Betty Holberton also helped develop software programs during World War II (Connelly). Lastly, it is difficult to find even an American today who can't identify Rosie the Riveter who represented the huge numbers of women working in factories during World War II to help make sure soldiers had the supplies and equipment they needed to fight overseas.

The 1960s and 1970s brought more change for women in technical communication. As more and more women began to work outside the home they were finding that they needed professional degrees in order to expand their careers beyond the basic positions of secretary and typist. Margaret Rossiter explains that during the 1960s and 1970s the fields of engineering and science reached unprecedented levels of funding, degrees awarded, and positions created. Women were now getting advanced degrees and entering fields of work in which had previously been nonexistent. Katherine Durack explains that in order to be participants in technical communication women first had to become significant users of technology (they did this during the "industrialization of the home" and their emergence into the workplace during World War II), and that they must be significant contributors to science and technology (36-40). Another phenomenon occurred during the 1960s and 1970s. Irene Padavic and Barbara Resking say, "As more and more workers were drawn into paid jobs, however, people increasingly treated paid work as the only "real" work; the unpaid work people did in their homes became devalued or invisible" (2). Although this was a sad reality which has persisted to modern times, the 1960s and 1970s brought the opportunity for women to further the contributions they had begun making during World War II in the workplace. Academia was changing too; during the 1960s

and 1970s women were awarded only two percent of the doctoral degrees in science and engineering, but they were on their way to becoming significant players in the field (Fox, 49).

The computer age created the biggest growth for women in the field. The 1980s brought some of the most advanced technological inventions mankind had ever created. Computers were taking root as the new technological star, and many other technologies, studies, and careers were being created around this new machine. In the 1980s women earned six percent of all the doctoral degrees awarded in science and technology, and between 1990 and 1999 that number had climbed to eleven percent (Fox, 49). Women also began to earn more and were on a more even playing field with men where wages and positions were concerned. Francine D. Blau and Lawrence M. Kahn state that during the late 1970s and early 1980s the wage gap for women significantly and rapidly decreased at a much higher rate than any time period prior. This is an interesting and poignant achievement for women because this time period was a time of economic and wage difficulty for most of America. Khan also notes that the number of patents being awarded to women significantly increased during this time period (Khan 176). Blau and Kahn postulate that this close in the wage gap was due to the fact that women were receiving more on-the-job training. In the past women had been at a serious disadvantage because they had not had the same educational opportunities men had. During the seventies and the eighties women were receiving more education, and were entering the workforce as new employees. These new employees were drafted into on-the job workshops and training programs. These women proved that, when put to the test, they not only had the education technical communication required; they also had the ability to learn the job skills required by technical

communicators. Blau notes that this was the period when women were first able to exercise the formal career-oriented educations they had received in college.

Lastly, the male-female difference in math SAT scores had decreased, implying that women were improving their math and science skills, giving them a potential upper-hand in the fields of engineering, science, and technical communication (Blau and Kahn). While women were not quite outnumbering men in technical communication by the end of the 1980s, they had gained a strong advantage and were working towards a dominance of the field. While this may not have been an outright goal, women were seeking to gain equality in the workplace. During this time period women began working in fields where they had never worked before, and many were venturing into fields which were "strictly male fields". Outnumbering men in technical communication was not a direct goal, but it was an achievement in the bigger picture of gaining equality in the workplace. I would like to remind the reader that the fight for equality in the workplace is still an ongoing struggle for women.

As the 1990s progressed and the new millennium was ushered in, women continued to make great strides in the field of technical communication. The 1990s brought a trend in education that has remained into the current day. Women began to outnumber men in college and graduate school. Currently, women outnumber men in the number of bachelor's degrees awarded. From 1998-2008 young women aged nineteen to twenty-three had at least thirty percent of their age group enrolled in college, or having completed bachelor's degrees (http://www.bls.gov/spotlight/2011/women/). Women are more likely to continue on to graduate school and complete advanced degrees. As noted earlier, the majority of technical communication programs in the United States are Master's degree programs. In the years

between 1998 and 2008, 23.4% of young women aged twenty-three held a Bachelors degree or higher (http://www.bls.gov/spotlight/2011/women/). The only area in which women are still lagging is PhD's awarded (Jacobs, 155). However, in 2012 women earned more doctoral degrees than men for the third year in a row, and they also outnumber men in graduate school (Perry), although not in all disciplines. This general trend may account for the disparity in the ratio of women to men in technical communication programs; however, with women gaining in the number of doctoral degrees earned, they may soon be making more than male technical communicators, as well as outnumbering them in the field.

Female Dominance in Other Technical Fields

The statistics from the Department of Labor show evidence that there are currently fields in which women out-earn their male counterparts. Women currently make more than men in the fields of food service, bill and account collecting, and stock clerks and order fillers. Additionally, these statistics also show that there are a number of fields where women are only slightly behind men in terms of wages. Postal service employees and social workers make respectively 94.5% and 91.1% of their male counterparts (http://www.bls.gov/spotlight/2011/women/). In terms of numbers, women do outnumber men in a wide range of fields. Currently, women still outnumber men in the "traditionally feminine" fields of nursing, elementary education, and public relations; yet, they are gaining numbers in surprising fields like veterinary medicine, accounting, and mining and logging (http://www.bls.gov/spotlight/2011/women/).

While experts on gender studies and supporters of gender equality in the workplace are encouraged by these results, they are still concerned about the role of women in the more

technical fields of science, engineering, technology, and mathematics. Again, women are making great strides within these fields, especially in education as the statistics concerning college and graduate degrees shows. Yet, as Cathleen Hill, Christianne Corbett, and Andresse St. Rose note, "By graduation, men outnumber women in nearly every science and engineering field, and in some, such as physics, engineering, and computer science, the difference is dramatic, with women earning only 20 percent of bachelor's degrees" (Abstract). Mary Frank Fox notes that, "Between 1990 and 1999 women earned eleven percent of them [doctoral degrees awarded in engineering]" (49). These are concerning statistics; it seems that even in our ever-more-gender-equal society, some fields are still being almost completely dominated by men in terms of numbers. Technical communication stands out among the technical fields as one in which women outnumber men, especially as students. However, it is not alone, as fields such as nursing are becoming increasingly technical.

Despite some disappointing statistics concerning women in technical fields, the number of women studying these subjects does give advocates of gender equality in the workplace some hope. It is clear that technical communication stands out among the technical fields in that it is a field in which women outnumber men However, it is not the only field where this is the case. A number of recent studies and articles show that women now outnumber men in technical and related fields. According to Forbes, women now outnumber men in the mathematical fields of tax revenue collectors and examiners, tax preparers, financial specialists, insurance underwriters, claims adjusters, and budget analysts (Goudreau). Jenna Goudreau also lists a number of management, writing, and planning positions which all would fall into the category of technical communication. The Bureau of Labor Statistics corroborates most of Goudreau's observations

about women in the workplace, but also notes that women currently outnumber men in the scientific fields of veterinary medicine, psychology and nursing (http://www.bls.gov/spotlight/2011/women/).

In almost all the fields discussed above women are not making pay which equals what their male counterparts are making. They are not found in as many high-level positions as their male counterparts. However, we must remember that until recently women and men were very much stereotyped into the types of jobs they were expected to hold and succeed in. Goudrea cites the fields of elementary education and nursing as expected fields for women to dominated in numbers (her technical and science field listings are titled "surprising"). Padavic and Reskin discuss the "gendering" work. That is to say, some jobs, like teaching, nursing and cooking, have become highly "feminized" , while others, like engineering, construction work, and scientist, have becoming highly "masculine" (6-15). They also point out that, "Within the same country and general line of work, either sex may perform a particular job" (8). Padavic and Reskin further go on the say, "The division of labor between men and women varies over time…" (8), and that the progression of a job from "feminine" to "masculine" is natural, but that it does take a significant amount of time. They close the section of their book, *Women and Men at Work*, which discusses the gendering of work by saying, "Changes in which sex performs a task usually occur slowly, however, because the existing sexual division of labor shapes social expectations about who should do certain types of jobs and because in many occupations turnover of an existing male workforce is slow" (8). The statistics we are currently seeing in the technical fields and technical communication may not be reflective of what is actually happening. As the

aforementioned quote shows, gender changes in a field take time, and it may be several more decades before real change in seen in the gender ratio in these fields.

There may be a great deal of information concerning women in technical fields which is somewhat discouraging to those studying gender equality in the workplace, but as Padavic and Reskin show there may be change coming in the future. Padavic and Ruskin note that a male workforce may take time to turn over. This is especially true of the fields of science, technology, engineering, and mathematics where the physical wear and tear which comes with age does not keep a person from continuing to work. It is also important to note that many people who work in these fields may be teaching, or may choose to teach following their retirement. This would keep them, in some way or another, in the fields, and would allow the fields' statistics to show that men may be dominating in numbers. With the numbers of women currently studying in the technical fields it is likely we will see the turnover of this male workforce in the near future. Changes are coming in the ideas of what are "feminine" and "masculine" fields of work. Padavic and Reskin point out that the food service industry has seen a great increase in the number of men it employs, particularly as waiters (6). Additionally, men have recently begun to be seen more frequently in the fields of nursing and elementary and middle school education. It is likely that the inequality we still see in the workplace is due more to the fact that the previous "gendered" workforce has not yet seen a turnover than it is to the fact that the majority of positions are still gendered. Only time will tell if the technical fields will begin to become more female-friendly, but the statistics concerning college students and degrees earned seem to bode well for the future of not only "masculine" fields, but "feminine" ones as well.

CHAPTER FOUR- EDUCATION AND THE FUTURE OF TECHNICAL COMMUNICATION

Where to Begin?

In a reversal of contemporary roles, women have come to dominate the field of technical communication. They currently outnumber men in programs of study that focus on technical communication. In the workplace they not only outnumber men in the field of technical communication, but also hold more high-level, highly-visible positions. This situation has come to exist because the definition of technical communication has changed. It is now a field which encompasses a number of areas in which women have historically excelled, areas such as interpersonal communication and persuasion, which, as Irene Padavic and Barbara Reskin explain are "gendered" towards the feminine (Padavic and Reskin 5) . This "feminization" of work began with the industrialization of the home. Ruth Cowan Schwartz says, "One of the most profound effects of industrialization was, and is, the separation of 'work places' from 'home places'—and the attendant designation of the former as the 'place' for men and the later as the 'domain of women' (*More Work for Mother* 18). This "gendering" of the home as a woman's domain has created an opening for women in technical communication in much the same way that the creation of "masculine" places and activities, such as construction, created for fields for men. The change in the definition of what the field of technical communication entails and a number of historical events have created opportunities which have allowed women to carve out a place of dominance within the field. In this chapter I will focus on examining how women have created a situation which allows them to be so prominent within technical communication. I will examine, in detail, the questions of when and how women came to hold such a strong position in

technical communication. Lastly, I will also discuss several pedagogical strategies which could help men become a prominent presence in technical communication.

While it is a great success for women to have come so far within technical communication, it does not serve a society well to have "gendered" employment. This is because gendered employment creates roles for workers, which, in turn, create barriers which people feel they have to break in order to move into a field which is gendered. The gendering of activities begins early; girls are taught to play house and to mother dolls, while boys are taught to play doctor and to build things. Padavic and Reskin say, "A primary reason for the gendering of human activities is that it maintains males' advantages" (5). Any gendering of activities historically favors males, giving them advantages over women in society and the workplace. For example, men typically held positions of authority over women in the workplace, and, historically, have always been paid more than women doing identical jobs. The struggle for women's rights in the last century and a half has shown how difficult it can be to erase the effects of gendering human activities. While it is tempting, for some, to think women should have their time in the spotlight and that men should experience the unfairness of a matriarchal workplace and society, the only scenario which truly represents progress is one where gender does not matter in the workplace, where men and women are treated equally, where success is marked by progress in jobs, and professions are not associated with one gender or another. Technical communication has reached a level of female dominance that most other fields, particularly engineering and science fields, are decades away from. By being the first field to change, yet again, and become a "gender neutral" field, technical communication will be blazing the trail for other fields which are primarily considered either "feminine" or "masculine"

domains. The question then becomes where to begin reversing the "feminization" of technical communication. Many of the commonly held beliefs about the "gendered workplace" begin in the classroom, and are encouraged throughout the college years. Early on students discover which subjects they are "supposed" to excel in. For example, subjects like English, Art, and Home Economics, which focus on creativity and expression, are seen as feminine, while subjects like math, science, and shop, which focus on facts and right/wrong answers are seen as masculine.

While there is little background available, a series of studies done by Major and Forcey found that participants gave a lower rating to a woman performing a job than a man performing the identical job. This was true even though they rated the woman's ability to perform the task more quickly and accurately than the man's ability to do the same. In addition, the subjects in these studies reported that they believed a job deserved less pay when it was a job traditionally done by women, as opposed to one traditionally done by men. The studies also found that women reported that they felt they deserved less pay than a man even when they are doing identical jobs (Major and Forcey 1). However, since these studies are nearly thirty years old, and opinions on gender, in general, as well as in the workplace have changed dramatically, these results are probably dated. If these studies were conducted today I believe very different results would be gathered, particularly those results concerning the opinions of women.

Despite the cultural revolution of the 1960s, the occupational segregation by gender has remained the same for roughly the last fifty years, thus reinforcing the stereotype that some jobs are "masculine" and some are "feminine". Ellen Mutari and Deborah M. Figart state that, "Nearly 60 percent of either men or women would have to change jobs to achieve equal

representation by gender in all occupations" (Mutari and Figart 224). This statistic is staggering, but when "typically masculine" fields, like engineering, where more than twice as many men as women are enrolled in graduate programs (Marder) and "typically feminine" fields, like nursing (95 % female) (www.minoritynurse.com), are considered it is easy to see how this imbalance exists.

These numbers are disturbing because the "gendering" of the workplace has created problems for job equality that will take many years to overcome. However, in the case of technical communication, much like the vocations of food preparation and nursing, the problem of workplace gendering is reversed, meaning that women outnumber men, as well as holding a larger number of authority positions. I believe that the heart of the gendering in technical communication is not that women feel inferior to men in the field, but that men feel inferior to women. With that in mind, the question becomes one of how to create a more gender-neutral technical communication. Since most of the beliefs about the gendering of the workplace and technical communication being a "feminized" profession begin in the preschool and elementary classroom that seems the most logical place to start. Yet, it will be extremely challenging to change the entire American academic system and culture, and is a process that will take many decades; it will require changing the way in which children view gender. I believe it is possible, however, to change how students view programs of study in technical communication. If these programs are tailored to become more appealing to young men, then more of them will receive degrees in technical communication and related fields, and like women did in the past, these graduates will begin work within the vocation, eventually evening out the numbers in technical communication.

A Brief Review of Historical and Modern Conditions

At this point it is necessary to have a brief review of the historical circumstances, statistical data, and current conditions of technical communication. This review will allow a better understanding of the suggestions for correcting the gender imbalance which will be proposed later in this thesis.

The change which occurred in the early nineteenth century giving a new definition of technical writing is where the "feminization" of the field truly began. Michael Hughes describes the roles of modern technical communicators as those who transfer information from those who have it to those who need, all while making this information more accessible and more easily understood (Hughes 275). This definition is clearly a departure from Connors' description of engineers and scientists who were competent in their fields, but extremely poor writers who churned out technical writing which no one without an engineering degree could understand (Connors 5). The field of technical communication has evolved into a complicated and delicate mix of rhetoric, creative writing, technical knowledge, and computer technology know-how. With a change in the understanding of what users of technical communication needed came a change in the understanding of what students of technical communication needed to learn. Students of technical communication needed to learn how to be easily understood by those outside the field of endeavor; in other words they needed to be able to be understood by the layman--they needed to learn how to use language to achieve their purpose. Carolyn R. Miller explains the need for the study of humanities in this new field of technical communication. She describes technical communication in much the same way Michael Hughes does, as a "transference and subduing" of language and information so that it "most accurately and directly

transmits reality" (Miller 48). Both authors view technical communication as the manipulation of language to make information more easily understood, which is, of course, the goal of all human communication. However, technical communication is unique in that it deals with highly technical and complicated information, which must be transformed so that it is easily understood by the user, who has little or no technical knowledge. Hughes views technical communication as the unpacking and explaining of technical information so that it is "understandable to those who need it" (Hughes 275). Both authors see technical communication as a manipulation of knowledge so that is more easily understood by users. In order for students of technical communication to be able to achieve this task they need an extensive knowledge of the humanities, especially rhetoric, writing, and language. As the field has shifted from a focus on engineering and science to one which includes these areas of study, which are more commonly seen as "feminine" fields and tend to be dominated by women in numbers, technical communication has begun to attract more women.

As noted earlier, women tend to outnumber men in the humanities, particularly the fields of writing and language study. This is not true of power positions. They receive more PhDs in the humanities than men do (with the exception of the areas of philosophy and history), a trend which has been in place since 2010 (Mangan). Within the humanities women have historically tended to be a stronger presence in writing, particularly creative writing (Maddux). The infusion of the humanities into the study of technical communication has helped create opportunities for women to succeed both academically and professionally. Earlier, the statistics of women in technical communication programs were discussed. Currently, the trend seems to be that women greatly outnumber men in programs of study which focus on technical communication.

According to the 2011-2012 graduate catalogue, in the University of Central Florida's technical communication MA program women outnumber men by a factor of two, 38 to 16. Compare this statistic with the gender statistics for the Computer Science MS at the University of Central Florida. In this program men greatly outnumber women, 53 to 7. These discrepancies are likely linked to the differences in the two fields; modern technical communication focuses on rhetoric, writing, and interpersonal skills, while computer science focuses on more technical knowledge and raw data analysis. Still, as noted earlier, women are making great strides in other technical fields. In science and engineering, they've now reached nearly twelve percent of PhDs awarded (Hill, Corbett, and St. Rose 49).

The fact that women outnumber men in technical communication programs has led to the current workplace situation where women also outnumber men. As Daniel Maddux and Ron Kurtus say, the number of women in the field of technical communication is growing. These two authors also state that women currently hold higher and more visible positions within technical communication than men do (Maddux, Kurtus). The statistics from the labor board (which, unfortunately, do not include technical communication as its own field) show that in several professions where technical communication graduates may be working women outnumber and out-earn men. Additionally, Jenna Goudreau, who wrote an interesting article for *Forbes* on fields where women, surprisingly, have taken over, writes that there are a number of typically "masculine" fields, such as accounting, educational administrators, and tax preparation, where women have recently come to outnumber men. Her article is particularly interesting in that a large percentage of the fields she lists are based in mathematics, a field strongly male-dominated.

These statistics and opinions all point to the fact that women currently outnumber men in the field of technical communication. While they may not make what their male counterparts make, there is hope that soon there will be equal pay within the field. This situation is common in many areas, but with all the progress towards gender equality, it seems highly probable that equal pay in all fields in on the horizon: it seems impossible that with such a large number of women currently working within the field, and so many more waiting to graduate and enter the workforce, unequal wages will continue to be tolerated within the field.

Unequal wages are not the only concern for the field of technical communication. Those who study the field and its future are concerned about the lack of men currently working in and studying technical communication. As Durack says, the experiences of men and women with technology are not identical (38). Each sex has unique insights and skills which may not come as easily or be as second-nature to the opposite sex. This is true of all areas of life, not just the workplace. Each gender has much to learn from the other's experiences. By allowing a field to become "masculine" or "feminine", the knowledge and experiences of the remaining sex are left out. The inclusion of the experiences of both genders allows for a more well-rounded understanding of technology and its users' experiences. I believe that for technical communication to remain an up-and-coming, ever-changing, modern field, it is crucial to include the experiences and knowledge of both genders, and in order to do this, both must be equally present in the classroom and the workplace.

What are the Differences between Men and Women?

At this point it is necessary to examine the differences between men and women and how they learn, communicate, and process information. This will allow for a better understanding of how to tailor technical communication courses to appeal more to young men. It will also make for a better understanding of how women have come to outnumber and out-earn men in the vocation of technical communication. Julia Wood explains, "We need to distinguish between the actions and attitudes of individuals and the social practices and values of our culture" (Wood 7). In other words, it is important to understand what the actual, biological differences are between men and women, especially in terms of how they learn and communicate. It is necessary to separate biological differences from cultural differences. Understanding these differences allows educators to design technical communication courses which are more inviting to young men. These changes in pedagogy will help draw more young men into the study and practice of technical communication.

It is a commonly held belief that males excel at the mathematics and sciences, and that females are incapable of learning and understanding these fields as well as males. However, in the early years of education, girls do just as well as boys in every subject (Wood 191) indicating that the later success of males in these fields is environmental and not biological. Women used to take significantly fewer advanced math classes than men, but today they take an equal number, and with equal training they do as well as men in these courses (Lewin). Women earn 46.7% of all undergraduate degrees in mathematics and they earn 22.6% of undergraduate degrees in physics (Wood 191). While these numbers do not seem all that impressive it is important to remember that women have really only entered the arena of higher education in the

last thirty years or so (Lewin). This seems to be an extreme overstatement on Lewin's part, as the last thirty years would place us in the mid-1980s. That being said, even if we take Lewin at her word, an argument can be made that women have only arrived in higher education in force since the cultural revolution of the 1960s, an arena in which they were previously not always granted free access, and within which their choices were often limited. In her article, Libby Quaid notes that girls measured equally to boys in all subjects at all grade levels (Quaid).

All of these statistics point to the conclusion that the longstanding belief that women are not as capable as men in the fields of math and science are based on the social concept that these fields are not "feminine". In short, it's a nurture versus nature situation and not the other way around. Wood supports this opinion by pointing out that many women leave these fields of study because they encounter teachers or other faculty members who are not supportive of women in these fields (Wood 191). These authors illustrate that men and women are capable of achieving the same level of success in the same subjects, indicating that there are probably only minor biological differences in the learning mechanisms of men and women. Wood notes that most discrepancies in the achievements of men and women in the fields of math and science are due to social construction and have very little to do with the actual learning abilities of men and women (Wood 191-192). So, if men and women learn and process information the same way, then the differences between the two sexes which allow women to excel in technical communication must lie in the communication and interpersonal skills aspects of the field.

The modern definition of technical communication is one which combines the traditional aspects of technology and technical know-how with rhetoric, persuasion, and interpersonal communication skills. Modern technical communication takes information and manipulates it in

order to make it more accessible to the user (Hughes 275), a trait which would generally appeal more to hands-on attitudes of male students. Still, interpersonal and communication skills (which come more easily to women) play a huge role in success in technical communication. In order to fully understand the current definition of technical communication, why it appeals so strongly to women, and how it can be tailored to be more male-friendly it is important to understand what, exactly, is meant by interpersonal skills.

Wood says that communication is the primary means for establishing relationships with others (Wood 128), while *The Handbook of Interpersonal Communication* describes the different aspects of technical communication as social support, affect, influence, conflict, and mediated interaction (Knapp et al. 4). In his article on collaborative writing, which is another social and interpersonal aspect of technical communication, Jim Henry describes technical communicators as "wordsmiths" who use their varied expertise to package others' content and create better, more accessible content (Henry 207), and idea which is similar to Hughes' transferring and taming language.

Additionally, technical communicators are creators. They "construct rather than acquire knowledge" and then transform it so it is more easily understood by the user (Hughes 276). This power over information is one of the qualities of technical communication which would likely appeal to young men. Often, young men are both aggressive and passionate about their careers, particularly in the past when men were expected to be the breadwinners. They like to create, and to have control over what they create. Young men are typically bored by fields which focus on repetition and the restatement of ideas; they strongly desire to control their work. This desire, and their desire to have power in the workplace are cornerstones of technical communication and

its practice. Technical communicators can tailor and personalize their work; they have some control over their product. We can ascertain that interpersonal communication is the ability to work with and communicate with others while using the skills of social support, affect, influence, persuasion, creativity, and mediated interaction to solve conflict and collaboratively create the most effective work.

Interpersonal communication is important to technical communication because of the category of writing technical communication falls into. Technical communication has changed from a field where engineers simply regurgitate highly technical information. This type of technical writing left the user frustrated and confused, as most users are not engineers and not able to understand the jargon of the field. Technical communication has evolved into a combination of rhetoric, creativity, technical knowledge, and communication. It is the manipulation of language so that it accurately and directly transmits reality to the user (Miller 48). It is the transference of technical information from those who have it (engineers and computer programmers) to those who need it (non-technical users) (Hughes 275). It is the changing of tacit knowledge (knowledge we do not know we know) from those who know it, into explicit knowledge (knowledge we know we know) to those who do not know it (Hughes 278). Most importantly, it is the practice of strong communication skills. As Miller says, "We can teach technical or scientific writing, not as a set of techniques for accommodating slippery words to intractable things, but as an understanding of how to belong to a community" (Miller 52). Technical communication is no longer a meat-and-potatoes kind of writing. While there are still right and wrong answers, they are less divided, and tend to lean more toward nuanced expression and richer language, and there are no communication strategies which may not be

employed by the technical communicator to achieve a higher degree of clarity and meaning. This may make the field unappealing to men who tend to favor the right/wrong dichotomy.

Miller is saying that we, as technical communicators, are teaching our users how to belong to a community of peers, whether that community consists of software users, members of project team, or an employee/employer relationship (i.e., a writer/editor relationship). Technical communication currently thrives on the communicator's ability to accurately assess what the user needs and to manipulate information so that it suits the user's needs. This understanding of the user and tailoring of information to fit the users' needs are the interpersonal communication skills of technical communication. Interpersonal communication skills are a crucial part of technical communication, and something which technical communicators must have finely honed in order to create the best work possible.

It would seem that these skills come more naturally, and are more innate, for women than for men. Julia Wood explains that males and females are typically socialized into subtly different speech communities (Wood 125). For example, young girls often play games such as house and school which do not have clear rules and require communication between the players. Young boys typically play games which involve large groups, but have a clear set of rules and goals (Wood 125-126). The conclusion drawn from this research is that girls usually engage in more cooperative play which requires creativity, cooperation, and communication between players. Boys, on the other hand, play games which have set rules and goals, require minimal creativity, and less communication between players (Wood 127). The differences in these games give girls an advantage in developing interpersonal communication skills. These games and the communication and cooperation skills that young children learn may later have an impact on

their ability to hone and perfect their interpersonal communication skills, especially those interpersonal skills, such as cooperation, which are highly valued in technical communication.

There is also the issue of masculine speech versus female speech, and the consequences which come from being socialized into one or the other. Wood says, "People who are socialized in feminine speech communities—most women and some men—tend to regard communication as a primary way to establish and maintain relationships" (Wood 128). Feminine speech establishes equality, provides support for others, is responsive, personal, and attentive. While male speech establishes status and control, is instrumental (the use of speech to accomplish instrumental objectives), uses conversational command, directness, assertiveness, abstractness, and less emotional responsiveness (Wood 128-131). Technical communication, as stated earlier, requires more skills which are typically attributed to feminine speech, such as attentiveness, support for others, and the establishing of equality. It would seem that this would be why women tend to excel in technical communication. Yet, just because our culture places males and females into different speech communities does not mean that these are biological patterns or that these speech and communication skills cannot be learned. There are many females who learn how to function well in a goal-oriented, "typically male" environment. Female athletes are just one example. Additionally, there are great numbers of men who succeed in "typically female" environments. For example, think of the attentive, supportive environment of a counseling office. These skills (active listening, conveying sensitivity and support) can be learned, and this is just one thing that needs to be taught in order to help men achieve the same level of success as women in technical communication.

Pedagogical Strategies for Drawing More Men into the Field

The following section will discuss some strategies for drawing men into the study of technical communication, including the teaching of communication skills and interpersonal communication skills. Earlier, the discussion of female dominance in technical communication led to the conclusion that the college classroom and the pedagogical strategies used within it were the best and most efficient places to attempt to draw more men into the field of technical communication. Again, changing the entire process of gendering which occurs within American society is a process which will take many decades and will involve changing many aspects of children's lives. This is because begins early in childhood with classroom education and children's games, and continues in everyday life until adulthood (Wood 159). It does, however, seem possible to catch up later with male students in their college years and attempt to draw them back into the study of the "feminized" humanities-based fields, such as technical communication, before they chose other areas of study and, consequently, other careers.

Anne Sourbeer Morris writes that in programs of study which are traditionally considered "masculine", some high school educators have developed a mindset which leads them to believe that women cannot succeed within these fields and are, therefore, not worth the effort and attention that male students are (Morris 2) This is a trend which Julia Wood also noted in her text. "Because cultural stereotypes of femininity do not include being skilled at science and math, social disapproval or distance may greet women who excel in those skills" (Wood 191). Morris further argues that this attitude contributes to the feelings of inadequacy in young women studying the "masculine" fields of science, technology, engineering, and mathematics (Morris 3). Collectively, the attitudes of the educators and the resulting feelings of students contribute to

young women leaving the study of these "masculine" fields as quickly as possible. A large number of young women do not pursue the study of science, technology, engineering, or mathematics beyond high school or the earliest years of college. It stands to reason that the same problems may be occurring within the more "feminine" fields of the humanities and that young men are likely to receive less attention and positive feedback in the more "feminized" fields of study than female students are. The attitudes of educators, as seen in Morris's study (219), indicate that without the correct reinforcement, students will leave a field of study. The same attitudes seen towards women in the "masculine" fields may be a contributing factor in the absence of young men from the more "feminized" fields. Thus, it stands to reason that things must change within the classroom in order to make men more present in the study and practice of technical communication.

Positivism vs. Constructivism

The definition of what technical communicators do has undergone great change since the field's inception. Early definitions of technical communication identified technical communicators as packagers of information. This school of thought was known as positivism, and it left little room for creativity or the social act of learning (Hughes 276). It seems that this is where the field would have seemed unappealing to men who like creative outlets and chances to express themselves. With positivism the technical communicator was required to function as an "unbiased describer of a product's functionality" (Hughes 277). Positivism leaves no room for the technical communicator to have any sense of control; it requires that the technical

communicator be a follower, not a leader; and forces the technical communicator only to take direction, and not to be part of the learning process.

Constructivism, on the other hand, is now the dominant theory in technical communication. It allows that, "knowledge exists within the knower" and that "learning is an active social act" (Hughes 276). Constructivism allows technical communicators to creatively determine the product functionality in light of the user context, as well as the developers' intentions (Hughes 277). Constructivism allows technical communicators to have control over their work; it allows them to examine each situation and determine how users will interact with a given technology. It then allows the technical communicator the control, flexibility, and creativity to tailor documentation, and to determine if a possible user context is too simple or complex (Hughes 277).

We know from Wood's text that men prefer to have control over their work; they prefer to be leaders, not followers. They do not like to take linear direction, but prefer to be more a part of the creative process. Because positivism was the dominant theory in technical communication for so long, this is how many people have come to see technical communication. However, the world of technical communication has changed; constructivism is now the dominant theory and technical communicators are encouraged to be a part of the creative process. They are expected to have a full understanding of each user context and to be able to create documentation which functions optimally in each individual situation.

It is for these modern reasons that constructivism is more likely to appeal to young men than positivism. I feel that young men want the opportunity to control their work, and constructivism allows for this. This strategy would be new and innovative because positivism is

much more traditionally masculine than constructivism. However, positivism is still believed to be the dominant way in which technical communicators work. This can be changed by bringing more men into the field and allowing them to have creative control over their work. Men will enjoy working with constructivism because it will allow them to be in control, to be creative, and to be a part of the documentation process. It is also important to note that many women already in the field would welcome the opportunity to be more creative with their work. If this is the definition we use when describing technical communication, we will begin to draw more men into the study of technical communication, as constructivism is far more appealing to young men than positivism.

Presenting Technical Communication as a "Masculine" Field

Closely tied to the idea of Positivism vs. Constructivism is the technique of presenting technical communication as a more "masculine" field in order to draw young men in. One of the problems facing technical communication is that, in some ways, it seems to have become a "feminized" field of study of work. Daniel Maddux says that in order to be a really good technical communicator one must be a good listener, be able to put oneself in another's shoes, have a knack for drawing out key information without offending the person you're talking to, and possess a level of comfort with doing something for a living which is not considered very "macho". He goes on to say that the emotional intelligence required by modern technical communicators often comes more naturally and easily to women than it does to men, and, therefore, women are generally better suited to the field of technical communication than men are (Maddux). Maddux writes that technical communication does require emotional intelligence

and sensitivity, yet we have learned that strong interpersonal skills are necessary and that emotional intelligence and sensitivity are, in fact, part of interpersonal skills.

This need for strong interpersonal skills, combined with the imaginative and creative qualities a modern technical communicator must possess, often leads people to believe that it is a field better suited or more tailored to women. In order to help attract more young men to the study and practice of technical communication it is necessary to elaborate on the more "masculine" qualities which the field requires. These qualities must be as well known as the more "feminine" qualities the field demands of technical communicators. By making these "masculine" qualities more widely known the field can potentially draw in more young men, who may have initially been put off by the field's more "feminine" qualities, into the study of technical communication. It is also important to emphasize the necessity of these skills of being a strong writer/listener/rhetorician in any field and any position. These are skills that people, of both genders, should aspire to have in order to make them more effective in the workplace and their interpersonal relationships.

One of the most masculine qualities required of technical communicators is the ability to take criticism without letting the criticism affect them personally. They also need to have the courage to face co-workers, clients, and bosses, and maintain confidence in their work. They need to have the guts to back up their ideas, even when those ideas are being criticized or shot down by others. As Daniel Maddux says, "Technical communicators need guts so they don't get run over by subject matter experts. They have to be able to aggressively track down the information they need to do their jobs, and they have to have the fortitude required to "herd the cats" (Maddux). Having courage, confidence, and "guts" are qualities which are frequently

attributed to men. In fact, women who display these qualities are often considered to be "unfeminine" or "butch" (Wood 128-129). We know that many women feel uncomfortable displaying these characteristics in the classroom or the workplace. This distinct need for confidence and "guts" puts men at an advantage over women in the field of technical communication. For men, these qualities may come more naturally, or may be more socially acceptable. More young men are likely to be familiar with situations in which they are expected to display these qualities. It is a more accepted behavior for men, and one which will certainly give them a head start in the workplace.

Another distinctly masculine quality of technical communication is the fact that the subject matter, is more often than not a "masculine" field of study. Most technical communication focuses on subject matter from one of four fields: science, technology, engineering, and mathematics. All of these fields are currently dominated by men, both in the workplace and the classroom. Early gendering activities in school and at home will give young men a familiarity and a comfort with this subject matter that is not found in the same levels in young women (Wood 171-174). As Anne Sourbeer Morris found out in her study of educators' attitudes, young men will be encouraged to study and excel in these subjects far more often than young women will. This familiarity and knowledge gives male technical communicators another advantage over female technical communicators. Men, who generally have more knowledge of science and engineering especially, may be more capable of determining when a subject matter expert is getting too technical. Without some knowledge of subject matter technical communicators are incapable of deciding what must go and what must stay in a piece of technical writing. While women are certainly able to educate themselves on subject matter, they

are less likely to already have that knowledge and familiarity before entering the field. Men, on the other hand, are more likely to already have this knowledge, which puts them ahead of their female counterparts before they even enter the classroom, let alone the workplace.

Lastly, we again touch on Hughes' idea of the transferring and subduing of knowledge (Hughes 275) and the creation of explicit knowledge from tacit knowledge (Hughes 275). Both of these traits require hands-on work and a strong ability to put one's thoughts into action. These are skills which will appeal to young men, as they tend to prefer to have control, independence, and status (Wood 130).

Providing Accurate Information and Support

Since the college classroom appears to be the place to begin reversing the female dominance of technical communication, the focus becomes how to use the classroom as a platform for drawing young men into the study of technical communication. The easiest place to begin is to provide young men with the appropriate and most accurate information available. Anne Sourbeer Morris says, "Girls must be supported with comprehensive and accurate career and educational information" (214). I feel the same is true of male students, as well. Without proper support and motivation students (of both genders) are less likely to succeed in college. In fact, the most accurate predictors for whether or not a student will succeed are support and motivation (Kuh et al. 7). Proper support and motivation means that male students need to have a full understanding of what technical communication entails. In her article, Hanna Rosin discusses the ways in which motivation and support for young women have created an atmosphere where women dominate today's colleges and professional schools (Rosin).

W. Earl Britton discusses the creative elements of technical communication. He notes that technical writing often employs some of devices of imaginative writing and, therefore, requires a great deal of imagination and creativity (Britton 113). Technical communication is no longer a boring discussion of technology; it combines the skills of a number of different areas and molds them together to create a unique art form. In addition to imagination and creativity, technical communication also requires students to have strong rhetorical skills and interpersonal skills. In the early days of technical communication engineers and scientists wrote straight-forward, highly technical instructions and explanations. Now, however, technical communicators need to have rhetorical skills which help them build an argument, support their argument, and persuade co-workers and potential clients. We must acknowledge that young men enjoy building a position and defending their side of an argument. However, they also must possess social and communication skills which allow them to work cooperatively with a wide variety of people from different backgrounds and cultures. Without these skills technical communication students will be unable to land clients and compete in the highly competitive and collaborative world of technical communication. This is where the study of rhetoric comes into play.

Russell Rutter explains the importance of rhetoric in technical communication by saying, "Technical communication has to be rhetorical because its task is not to serve technology abstractly conceived but rather to produce writing that accommodates technology to the user" (Rutter 29). Without strong rhetorical skills technical communicators are unable to accommodate technology to the user. They are also unable to convince their peers why an idea works best, and they are unable to convince a potential client that they are the right person for a specific job. In

short, without rhetoric technical communicators are likely to be left out of the equation when it comes to completing a job and getting paid.

A number of the skills listed above, including cooperative communication and persuasion are often considered to be "feminine" traits of communication. As Julia Wood explains, women are often more supportive and responsive, and are better able to perform conversation "maintenance work", the process of sustaining conversation by inviting others to speak and by prompting them to elaborate their ideas (Wood 128-129). These traits are crucial to the client/writer relationship in technical communication. Without these skills technical communicators will be unable to find out what their clients need and will be unable to bring clients the information they require in a format that best suits the client and his/her needs. As noted earlier, these skills do not come as naturally as men as they do to women. Just because these skills are more "feminine" does not mean they cannot be taught. Wood explains that most of these interpersonal communication skills are taught early in life by the games that children play. Girls tend to play more cooperative and communicative games, while boys play games with more set rules, thus creating the female tendency to have more cooperative and creative interpersonal skills, and males to have more structured and independent interpersonal communication skills (Wood 125-127). By employing classroom activities which encourage the building of cooperative and creative communication, educators can help teach young men the interpersonal communication skills they need to succeed in technical communication. I believe it is also important to teach students that these skills are not "feminine", but human. If we can disassociate the "feminine" from these skills we can alleviate the negativism young men may feel about the field.

In theory, the heavy use of communication in technical communication should provide an advantage for male students because they are, by nature, more talkative in a classroom or workplace setting (Krupnick 2). However, technical communicators no longer simply write instructions for technical devices. They create grant and proposals, write documentation for a variety of technologies, work collectively with other technical communicators and clients, and carefully edit and examine the work of others. This requires a great deal of interpersonal skill and tact. Carolyn D. Rude and Angela Eaton note that technical communicators must be prepared to communicate, interact, and collaborate with other writers and clients (Rude and Eaton 31). They stress the importance of strong communication skills and the ability to carefully persuade others. Michael Hughes also illustrates this point by saying, "So in practice, technical communicators find themselves between experts who cannot articulate what needs to be known (or even that it exists to be known) and users who do not know to even ask" (Hughes 278). A good technical communicator needs to know how to carefully construct and manipulate information without upsetting either the expert or the user. He/she must be able to identify the difference between tacit knowledge (knowledge we do not know we know) and explicit knowledge (knowledge that we know we know) (Hughes 278), and must be able to identify when knowledge which is tacit to the technical communicator must be turned into explicit knowledge which can be articulated and stored. Users of technical communication want to be part of the process; they do not want to simply be a user who has no understanding of they are actually doing. Hughes states that if the terms "explicit" and "tacit" were replaced with "conscious" and "unconscious" we gain a better understanding of the concept. He also notes that, quite often, user ignorance is tacit (Hughes 278). However, we know, as users, that users do not want to be

preached to; they do not want to be reminded they do not know how to do something. They want to be part of the process described in the writing. It is important for technical writers to know how to effectively get a job done without stepping on the toes of others, and also making them part of the process. This requires a strong ability to communicate and work with others, skills which Julia Wood says are learned early in childhood, but can be taught later (Wood 128-135).

In her article, "Ways Women Lead", J.B. Rosener reinforces the idea that women inherently have more interpersonal skills. She states that women often share power and information with others which makes them feel important, included, and energized (Rosener 6). While the tacit knowledge of interpersonal skills is definitively a more feminine trait, as Michael Hughes points out, it is possible to teach tacit knowledge.

Lastly, male students need to be aware of the statistics in the field. They need to fully understand that while it is currently a field where women outnumber men, there are great opportunities for men. They need to know the ratio of female to male students in technical communication and in the workplace so they know what to expect and do not become intimidated. It would also be helpful for male students to know that in 2010 women became the majority of the workforce for the first time ever (Rosin), so they will be entering a different workforce than their fathers or grandfathers. They will enter a much more gender-equal workforce, as the majority of the 8 million jobs lost during the recession belonged to men (Rosin). Male students also need to be aware that, in addition to outnumbering men, women tend to hold more visible positions within the field of technical communication, and more positions of authority (Maddux). It is important that they be informed about average salaries. Ron Kurtus says that the average salary for a male technical communicator is $75,375 and the average salary

for a female technical communicator is $79,855 (Kurtus). I know from experience that salary information is crucial because many young people do not have knowledge of what technical communicators are capable of making, and this may be a deciding factor for young people, especially young men who are someday expected to be breadwinners for their families. Additionally, young men are often taught that in order to be masculine, they must be successful (Wood 172). Understanding their chances of both financial and professional success in the field of technical communication may be a strong deciding factor in whether or not they choose to pursue a degree in the field. Seeing that there are great opportunities to succeed and their education and the writing they do in school will play a major role in helping land a well-paying job will also be a deciding factor for young men, as males often want to know what the long-term benefits of an activity will be before they begin said activity (Wood 130-131).

All of these factors are important, but the most important fact remains that students must have an accurate understanding of the study of technical communication entails and what the workplace looks like. When applying to and entering UCF's Technical Communication program, I had no idea what technical communication really meant. Few students have heard of technical communication, let alone have a complete understanding of what the field actually entails. Without accurate information and support students are unlikely to enter the field. The task of providing this information to students falls to advisors and college counselors. Students must be exposed to this information before they enter the later years of college and have decided on major and career choices. Additionally, teachers of English and other humanities courses must introduce technical communication to students of both genders. If students remain oblivious to the fact that technical communication is a career choice they will never be given the opportunity

to study and work in the field. The first step in reversing the female dominance of technical communication is to provide information and support to students.

Introducing the Idea of Creation and Manipulation of Knowledge

In many areas, men and women display vastly different learning styles within the classroom. Men tend to be more verbose (Krupnick 2), while women are more capable of identifying nonverbal cues and emotions which others are experiencing (Wood, 153). Women enjoy taking the time to choose the most accurate and descriptive word in a given situation. Men like questions which have right/wrong answers as opposed to ones which are open to interpretation. Masculine speech tends to be direct and assertive while avoiding personal feelings and concrete experiences (Wood 131). As noted earlier, women tend to gravitate more towards the humanities and courses which require creative thinking. Men tend to gravitate more towards the fields of science, technology, engineering, and mathematics: fields which involve more concrete thinking. These differences in learning style and preference seem to suit each gender to certain fields. While technical communication is currently dominated by women and certainly does require many qualities which may be seen as "feminine", it also requires a number of qualities which are more socially seen as more "masculine". Michael Hughes' 'creation and manipulation' of knowledge is certainly a quality which would likely be seen as "masculine". Julia Wood notes, men like to establish status and control within a conversation (Wood 130). By being the person who chooses which information will be included in a project, and how it will be presented men are able to employ one of the foremost characteristics of male speech.

Despite these differences, which may be a result of biology or social conditioning, the pedagogy of technical communication can be altered in order to make the field more male-friendly. Pedagogical strategies can also be employed to help young women entering the field feel more confident, and to assist women already in the field in achieving more success and becoming stronger technical communicators. One of the most obvious pedagogical solutions would be to create a more well-rounded curriculum. This would benefit students in many fields, not just technical communication. For example, if technical communication courses were to place a stronger emphasis on teaching students how to 'have guts' and not be run over (Maddux), students would be better able to embrace the concept of constructivism and freedom of creativity in the workplace. In short, technical communication courses need to be altered so that they teach and improve skills associated with both men and women. They also need to have a stronger emphasis on constructivism and creative control. Incorporating both of these ideas into technical communication pedagogy will help the field appeal more to young men who might have previously felt the field was geared towards women and the skills which are more socially acceptable for them to possess. In order to change the future of technical communication we need to change how the field is perceived and the general understanding of being a technical writer means.

Modern technical communication is more than the regurgitation of highly technical or scientific material. Gone are the days of technical writing which was so complicated and jargon-filled that the layperson could not even hope to understand it. Today's technical communicators take information and alter it so that it becomes useful and understandable to users. Michael Hughes says, "By reinterpreting technical information in user contexts, the [technical

communicators] are creating new knowledge by presenting that information in actionable terms and by relating it to specific applications" (Hughes 276). Hughes is saying that prior to any work by technical communicators the subject matter information is quite useless to anyone who doesn't happen to be a subject matter expert. Until a technical communicator intervenes it is simply tacit knowledge that the technical communicator has. It is his/her job to turn it into explicit knowledge that the user has. It is the technical communicator's job to take information and through interpretation make it into knowledge which is accessible and useful to the user, as well as being the information that the user desires to know. As Hughes says, "Knowledge is information in action" (276). Without the technical communicator's intervention the information remains abstract and useless for anyone but those with the technical and scientific experience to translate it; it remains tacit.

In communication men are less emotionally responsive than women, and are more direct and assertive (Wood 131). This may give them a disadvantage in the transformation of information, as women would be more practiced at listening to what a user needs and tailoring the information to meet the needs of the user. Women have the tacit knowledge to subdue and transform the language so that it best fits each situation and each user. However, it is men who are better with abstract concepts. This would give them an advantage at creating knowledge which a user desires, because they are more capable of grasping the abstract idea of tacit information and turning it into the concrete idea of explicit information. Additionally, as Wood says, the tacit knowledge of interpersonal communication skills may be taught in technical communication programs, thus giving males equal opportunities in the field.

Hughes further discusses the difference between explicit knowledge and tacit knowledge, and the role technical communicators play in the manipulation of one to the other. The difference between explicit and tacit knowledge is explained by Hughes:

> Explicit knowledge is knowledge that we know that we know. It can be articulated, codified, stored, transferred, and recalled through symbols. In short, it is the knowledge that can be transferred through documents. Tacit knowledge is knowledge that we do not know that we know. It is difficult to articulate and generally is expressible only through action (Hughes 278).

It is the job of technical communicators to take this tacit knowledge from subject matter experts and turn it into explicit knowledge which is accessible to users. While this does, admittedly, require some "feminine" skills, such as the ability to carefully plan and choose wording which is most appropriate for each situation and user, it also requires many "masculine" skills, such as the ability to strongly argue and persuade. While women are generally better listeners and are more willing to do the conversational work of asking questions and prompting responses (Wood 129) the male strengths of assertion and direction are likely to be equally important in this exchange with clients, and the determination of what information a client actually needs. Additionally, the manipulation of tacit knowledge to external knowledge is a problem with a right or wrong solution, which will appeal more to young men than to young women. If a technical communicator does not properly and accurately transform the knowledge and create strong, effective technical communication, then they have not served the purpose because the information is no more accessible to the user than it was when it was tacit knowledge.

Providing young men with accurate information and adequate support is just the beginning to helping them feel more comfortable and confident in choosing technical communication as a major and/or career field. Core college courses do very little to introduce the field of technical communication to students. Many students do not even know what technical communication is until they stumble across the field on a graduate program's list of majors or course catalogue. Without any knowledge of the field actually entails, it is unfair to expect young people, particularly young men, to choose this career path. If all these male students know is that technical communication is a creative humanities-based field they're inclined to believe it is a "feminine" field and shy away from it. However, if they are aware of what the field is and the many "masculine" qualities that are valued in technical communicators they may begin to see it as a desirable path of study and work. Introducing these "masculine" qualities to young men will begin to open doors into technical communication and draw more men into the study of technical communication, which will, in turn, draw more men into the technical communication.

CHAPTER FIVE- CONCLUSIONS

It is important to review and fully understand the importance of female dominance in technical communication, as well as the implications it has for the future of the field. Without a full understanding of this information it would be impossible to understand why the pedagogy of technical communication classroom (and the college classroom in general) needs to change so that more young men will feel confident joining the world of technical communication. Technical communication has a fascinating past which has included great strides and contributions from both men and women. The field began, as most fields have, as a man's world. A patriarchal society led technical writing to be almost exclusively a male field. At this time women were not expected to attend college, and many faced persecution and ridicule when they tried. The home was seen as a woman's domain, and she should not need or want to venture out into the worlds of academia or employment. As Zorina Khan says, "Compared with the (measureable and measured) technologically progressive market, (unmeasured) non-market household activity was viewed as relatively unproductive, unresponsive to market incentives and unaffected by technical progress" (Khan 159). This was the general opinion in America for many years. It was only during the Second World War when women began to make strides in technical communication, as well as the workplace as a whole. World War II brought great changes for women, not only in technical communication, but in the workplace in general. Due to necessity women began to enter academia and the workforce, and proved themselves to be invaluable resources in both these arenas.

As the new millennium dawned, technical communication (as well as the workplace as a whole) was a completely different place than it had been, even fifteen years ago. Technical

communication has morphed into a humanities-based field which encompassed rhetorical skills, as well as creativity and collaborative work. It was no longer a world of scientists and engineers writing complicated, jargon-filled documents. The workforce was dominated by women, and men had suffered the most job lost during the recession of the early 2000s (Rosin). Academia was a different place too. Women outnumbered men in college, and they were more likely to go on to graduate school. They received around eleven percent of the PhDs awarded in science and engineering. They outearned men in a number of technical communication genres, and were not far behind in a number of others. According to Daniel Maddux and Ron Kurtus, they currently outnumber men and hold more powerful and visible positions in technical communication. The opinions of these two writers seem to be supported by the statistics from technical communication programs of study from around the country. In short, technical communication has become a field in which women can not only flourish, but dominate. Males have become the second-class citizens of technical communication. They are outnumbered by women, and some studies show that women make more in the field than men.

> As the current state of technical communication has shown, it is not only women who face struggles within academia and the workplace. It is true that traditionally women are the ones facing discrimination and difficulty. When discussing female scientists Vivian Gorack says,
>
> The question that had been forming at the back of my mind was now focused. It was this: A female person grows up, discovers that by virtue of temperament, inclination, and talent she is a scientist, and she becomes one. Then what? How much battle must she do to get to the excitement? What is the nature of the battle,

> and what are the odds that she will make it? Is there flux in the atmosphere? Is she struggling in a static world or a fluid one? In a state of agitation of paralysis? What are the chances of her breaking free and penetrating to the center? (Gorack 8).

Gorack eloquently and accurately describes the challenges faced by women. She is referring to challenges within the field of science, but they are challenges women face in every field. Women have faced tremendous odds, and have been discouraged from continuing in their chosen fields of study (Morris 2; Wood 191). Gorack describes the battles women have to win in order to succeed in the "masculine" fields. Women are taught from a young age that they are to be nice, deferential, and helpful (Wood 177). They are encouraged to focus on pleasing others (Lally G1) and to never cause controversy or upheaval. However, these challenges are not unique to women. Many men face the same challenges when attempting to enter "feminine" fields of study and employment. They may face ridicule and persecution, or they may struggle to succeed professionally and, in some fields, receive equal pay. Yet, none of these challenges can be met or overcome if there are no men in a given "feminine" field. Without men, certain fields are given the free-reign that most "masculine" fields were given for decades. Men will be excluded from these fields and will face intense scrutiny when they do attempt to enter then unless more men enter these "feminine" fields and demand equal treatment, acceptance, and pay.

Thus, we see the importance of making the field of technical communication appeal to young men in the same way that it appeals to young women. Since we rarely see technical communication studied in any great detail prior to college, it is necessary to begin with the pedagogical strategies employed in the college classroom to draw young men into the field of

technical communication. As stated earlier, the first and most important step is ensuring that young men are introduced to the field early on in their college careers, that they are provided accurate information about the field, and that they are given adequate support if they choose to pursue technical communication as a major. Within the classroom it is necessary for instructors to help young men identify the "masculine" qualities of technical communication. It is important that young men understand that technical communicators need strong rhetorical skills, good communication and persuasion skills, and bravery and courage. These skills, which are seen as strong attributes in the more typically "masculine" fields of history and chemistry, are also essential in technical writing. By emphasizing the importance of these skills in other "typically masculine" fields, young men may see the "hidden masculinity" in technical communication. Young men need to see that as technical communicators they will not just be creative writers, they will creators and manipulators of knowledge. They will be in charge of deciding on the best course of action, helping others to understand why their choice is best, and ensuring that users and clients are satisfied and will return to do business again. These skills ensure that a technical communicator will flourish in the workplace. Understanding that technical communication employs a number of "masculine" skills will help more young men feel comfortable in choosing the field as a path for education and career.

While this thesis has raised a number of interesting questions, and has explored some of the implications of a female-dominated technical communication, there are still many questions left unanswered, and many more areas for research. For example, it would be interesting to examine these statistics and implications in a different cultural setting. Perhaps, in societies where gender equality is less of a concern, or one where men totally dominate and women are

submissive, the numbers of men and women in technical communication may be different. Additionally, it would be interesting to explore the elementary school systems of countries which have more gender-equal work forces. Do countries which have less of a gender division in the workforce teach their children differently? If so, where in the education process does this begin? Lastly, it would be interesting to revisit this topic in five to ten years to see if some of the strategies which have already been put into place are working. Have more young men entered the technical communication classroom and workplace? If so, what brought them there? Was it the strategies discussed in this thesis or something else? The topic of gender bias in technical communication is extremely fascinating and multi-faceted. A short paper such as this could never explore all the potential topics, but it is my hope that it covered interesting topics which will lead others to do expand the research done in this thesis.

As Durack pointed out, the experiences and knowledge of each gender is crucial to a field becoming the best it can possibly be (Durack 38). In order to create the best technical communication possible it is necessary to have both men and women working in and contributing. The only way the field can continue to grow and be productive is if both sexes are included in the creation of knowledge. While men do face challenges within the field, these challenges cannot be overcome if there are no men in the field making strides towards equality. Women have faced great challenges in almost every field of work or study they have chosen to enter. They have overcome many obstacles and have come to dominate a number of fields (both in numbers and in pay). It is possible for "feminine" fields, such as nursing, food preparation, and technical communication, to even out and become more of an equal domain for both sexes, but that will involve young men joining the discussion and becoming a more prominent presence

in the technical communication classroom and workplace. Mary Frank Fox, Deborah G. Johnson, and Sue V. Rosser discuss the challenges that the relationship between gender and technology pose (Fox, Johnson, and Rosser 194). There are challenges present in the relationship between gender and technical communication, but the progress women have made in this, and other fields, shows that there is a future for men in technical communication. All they have to do is dive in.

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