A STUDY ON THE FACTORS INFLUENCING FEMALE ENROLLMENT
IN TECHNOLOGY EDUCATION COURSES AT SPENCER SCHOOL
SYSTEMS, SPENCER, WISCONSIN

By

Robert M. Buker

A Research Paper

Submitted in Partial Fulfillment of the
Requirements for the
Master of Science Degree
With a Major in

Industrial/Technology Education

Approved: 2 Semester Credits

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Investigation Advisor

The Graduate School
University of Wisconsin-Stout
May 2000

The Graduate College
University of Wisconsin-Stout
Menomonie, Wisconsin 54751

ABSTRACT

Buker	Robert	M.
(Writer) (Last Name)	**(First)**	**(Initial)**

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TECHNOLOGY EDUCATION COURSES AT
SPENCER SCHOOL SYSTEMS-SPENCER, WI

(Title)

Technology Education	Dr. Steve Schlough	May/00	108
(Graduate Major)	**(Research Advisor)**	**(Mo./Yr.)**	**(No. of Pages)**

American Psychological Association Style Manual (4th Edition)
(Name and Style of Manual Used in this Study)

In our technologically advancing society, there is a growing need for females in traditionally male-dominated careers. In spite of this growing need, females are not enrolling in technology education classes. This study investigates some of the factors influencing female student's perceptions of and interests in technology education courses as they prepare to enter their high school years.

This descriptive study was conducted to determine reasons or factors that are influencing females not to take technology education courses during their high school years, (grades 9-12), at the Spencer School Systems, Spencer, WI. A questionnaire was distributed to all the seventh and eighth grade students (166 total) to gather the

information for this study. Boys as well as girls completed the survey in order to reduce the awkwardness of just having the girls complete the survey. For this study only the surveys completed by the females were analyzed. The participants marked their gender and grade on the survey instrument, but not their names.

Thirty-seven seventh-grade girls and 40 seventh-grade boys were asked to participate. Forty-seven eighth-grade girls and 42 eighth-grade boys were asked to participate. These numbers represent the total students enrolled in the seventh and eighth grades. The survey addressed questions concerning where the students learned about technology class electives; who influenced their final choice of technology class electives; reasons why they plan to select a technology class elective; reasons why they will not select a technology class as an elective; and what technology education class electives they would be interested in taking. There was also a space for write in answers. With the exception of a few fill in the blank questions, all questions incorporated a 5-point Likert scale, Strongly Disagree to Strongly Agree.

The results of this research indicated the following: Students who have taken the class previously are the best sources of information, followed by teachers, friends/parent/guardian. Friends were not seen as discouragers. The least influential sources were, (from worst to best): "student from a different school", "principal", "schools beyond the twelfth grade", "the public library", and "the student handbook".

The students felt the technology electives would be fun, they needed the courses for a future career, and they wanted to learn something new. Females are not intimidated by boys or by being the minority in the classes.

The most common factors deterring enrollment in technology courses were: that

the respondents "just don't think they will need to know that material", just not interested, and scheduling conflicts. A large percentage of the females did not know what the classes entailed, or were undecided on this point.

All the technology electives were found to capture the interest of some of the females, with TV Productions and computer applications receiving the most votes, followed by Small Engines and desk top publishing.

It is recommended that: An informational promotional campaign be undertaken, the staff and administration become more involved, positive supportive feedback be given by the guidance counselor, more flexible class scheduling, update the environment, and incorporate more flexible teaching strategies.

Recommendations for Further Study include: A study of grade school children to find out how much they know about technology class electives, and the continuing evaluation of the factors influencing female enrollment in technology education courses at Spencer School Systems, especially after an informational campaign has been launched.

The survey results, tabulations, conclusions, and recommendations were forwarded to the Spencer School.

ACKNOWLEDGEMENTS

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CHAPTER I

INTRODUCTION

Background of the Problem

In our changing world, technology is expanding at an ever-increasing rate. In

the midst of this change, technology education is developing to keep pace with these

changes. History reveals that the focus of technology education has always been to meet

humankind's social needs, and this focus has remained unchanged since the 1820's

(Cheek & Cheek, 1996). While most people have studied history, few are concerned

about what lies in the future (Hendricks & Sterry, 1996). Both male and female students

share this non-concern about the future. In addition, students also show a great lack of

knowledge about careers and occupations in technology that could be both personally and

financially rewarding ("Technical Careers," 1995).

"There will be unlimited opportunities for individuals who can see the changes

coming in technology" (Kiplinger, 1998, p. 104). The opportunities are out there,

evidenced by the high number of openings that currently exist in the job market. The

numbers may be surprising. At the high-technology end of the job market, three cities

alone boast 58,000 vacancies: Minneapolis, St. Louis, and St. Paul ("Top 20", 1999).

The American Electronics Association reported that the United States added about one

million high-technology jobs from 1993-1997, for a total of 4.8 million jobs (Kilborn &

Carden, 1999). They also reported that the average high-technology job in the United States was paying $53,145, the highest reported salary was $81,375.

In addition to the lucrative salaries, there are also numerous job openings. For example, the Commerce Department says about 130,000 new jobs will be added every year for the next 10 years in these three professions alone: science, engineering, and systems analysis (Overstreet, 1999). Depending upon which industry analyst you quote, 300,000 to 600,000 information technology jobs are currently vacant nationwide (Overstreet, 1999). But the job openings are extending beyond the newer high-technology jobs. With an aging population and fewer young men entering the work force, companies are relying on more women to keep the factories operating (Thornton, 1999). Thornton also reports that some companies are even re-tooling with lighter tools and equipment to accommodate female workers.

The market is shortage-driven. The construction industry posted a shortage of workers in the neighborhood of 240,000 workers, according to the United States Department of Labor (Jolivette, 1999). The construction industry is soliciting high school students to enter the construction industry as a career (Jolivette). In a similar fashion, the nation is experiencing a shortage of automotive technicians. Solicitation from the automotive industry is taking the form of apprenticeship programs in cities like Las Vegas (Cruz, 1997).

The opportunities are everywhere. Careers in: telecommunications, construction-skilled and professional, materials testing, engineering, technical drafting, graphic arts, industrial safety, as automotive technicians, and many more all promise decent pay: $30,000, $40,000, $50,000 and higher, a good lifestyle, and a sense of personal

accomplishment (Kilborn & Carden, 1999). Still, low enrollment seems to be the norm for many of these technology-oriented career avenues.

Girls, in particular, are enrolling in low numbers in the courses offered in technology education. Even though the numbers of girls choosing technology education courses as electives in high school may be rising, the numbers still remain low (Silverman & Pritchard, 1993). According to Knowlton (1995), a study in Montana, conducted in 1980, discovered fewer than 10 percent of the females were enrolled in technology education classes. The investigator of that study predicted that gender gap would end. However, 15 years later, a huge disparity still existed between males and females (Knowlton, 1995).

Montana is not alone. According to 1998 reports from the Society for Information Technology and Teacher Education International Conference, females generally account for 10 percent or less of the total number of students in classes like: construction, metals, plastics, robotics, electronics, foundry, welding, and technical drafting (Beasley, Wark, and Zimmerman 1998). The K-12 grades are not the only grades experiencing this low percentage of female participants. A survey of female faculty members from four-year technology education programs in the United States, conducted by Heidari, (1994) revealed that males were holding 92 percent of the faculty positions while females only held eight percent of the faculty positions.

As might be expected, the number of female technology education graduates is also low. As an example, out of 309 bachelor's degrees earned in engineering throughout the Long Island, NY region in 1995-1996, only 25 were granted to women (Martorana, 1998).

In the face of these low graduate numbers, the demand for females in the technology fields continues to be very high. According to Christian & Timbers (1999), a San Francisco based hiring office; companies are seeking to hire women because so few women are working for them at the present. In addition to not having enough, women have been shown to be very pro-active when it comes to technology, thus making them even more attractive to businesses (Edgington, 1997). This conclusion was arrived at by: The National Foundation for Women Business Owners; and the IBM Corporation, who surveyed 800 businesses owned by both male and females across the country. They strongly stated their findings saying that women employ technology more often than men. (Edgington). Women use technology more readily than men because, unlike men, they have not had the luxury of getting things done by asking people to do things for them (Edgington). In order to stay ahead of the game, or at least even, women on the job are taking an aggressive stance when it comes to implementing new technology. This all suggests a very positive job market for females in technology.

With all this evidence, why aren't females entering the technology fields? There has to be a reason(s) why females are avoiding technology. Perhaps Sweeris, who is a National Association of Women in Construction Education Foundation trustee, is right when she said, "If you wait until high school, the kids have already made up their minds about careers" (Hoekman, 1998, p. B3). And, there are other reasons in addition to waiting too long to reach the girls. They may have no knowledge of the offerings in technology education, they may receive no advice, or receive poor advice along the way (Silverman, 1993; Thompson, 1999). Girls also tend to be stereotyped at an early age and see males as "technology nuts" (Brunner & Bennet, 1998).

But its not just poor advice or lack of knowledge that is keeping girls away from technology education. Lack of interest and boredom in the technology education field is seen as a major player for girls (Beasley, Wark, & Zimmerman, 1998; Brunner & Bennet, 1998; Mitchell, 1999; Silverman & Pritchard, 1993).

It appears that those girls that are interested in technology education are using it for social interaction. Concerning computers, they will become more interested if the computers can be used as a way to connect with people in an effort to solve real life problems ("Technology and the Gender", 1998). From a distance, it looks as if girls are entering into the 1990's version of typing, "word processing" (Wolff, 1999).

Upon closer examination, it can be seen that the way girls relate to technology has a lot to do with the values they bring with them. Too often these values are ignored or undervalued in technology education (Koch, 1994). Knowing that girls can become interested in technology education, it would seem logical to design courses specifically for girls in order to capture their interest (Brunner & Bennet, 1998; "Forging a Partnership", 1994; Michael, 1995). Sometimes the course doesn't even have to be redesigned. A timely word of encouragement may be all that is needed for them to become interested and remain interested ("Girls Take First", 1994).

The school this study is concerned with is the Spencer Public School. The Spencer School is located in Spencer, Wisconsin near the center of the state. Spencer is a small community seeing a total high school enrollment typically between 300 and 350 students. The area is largely agricultural-based with the nearest large city being Marshfield, with a population close to 20,000. Marshfield is about nine miles southeast

of Spencer and is the home of the well-known Marshfield Clinic. The student population at Spencer is nearly entirely White Caucasian.

For this study at Spencer, the technology education courses being studied include the following: Small Engines, Electricity, Building Trades, Material Processing, Communications, Computer Applications, Desktop Publishing, and TV Productions. Typically, the female students comprise less than one-third of the students in any of these classes with some classes registering no female students. (D. Wessel, personal communication, June 26, 1999)

Statement of the Problem

The problem is that too few female students are enrolling in some of the high school technology education courses at the Spencer School. With the demand for students trained in the field of technology dramatically rising across the country, it would be natural to assume that all students would be interested in careers in the technology fields. Yet this is not the case at the Spencer Public School System. There exists a large difference between the number of female students and the number of male students who enroll for many of the technology education courses offered by Spencer. There has to be a reason(s) for this low involvement, by the female student population, in the technology areas at the Spencer School.

Purpose of the Study

The purpose of this descriptive study was to identify the reason(s) why female students are not enrolling in higher numbers in the Spencer High School technology education courses. Data was gathered through a self-report questionnaire given to all the seventh and eighth-grade students enrolled in the spring of 2000, at the Spencer School

System. All seventh and eighth-grade students, both male and female, were asked to complete the questionnaire. This eliminated an awkward situation where the females would be taking the questionnaire while the males would not be taking it. The homeroom teachers distributed the questionnaires. The completed questionnaires were returned to the Jr. High School Principal's office as soon as they were returned. Instructions were read to the class and were also included on the questionnaires. When data was analyzed, the answers given by the females received the primary focus. However, some comparisons were made between the males and the females.

Based on the results of this data analysis:

- The Administration will be in a better position to make changes designed to increase the number of female students enrolling in the technology education courses.

- It may be discovered that additional courses may be warranted and different time periods may be needed.

- The Administration and the Technology Education Instructor may find it desirable to alter the instructional methods and materials currently used in some of the courses.

- It may be determined that courses in technology education need to be offered at earlier grade levels in order to instill interest in the female students for courses later on in their school years.

After implementing these changes, the female students may be better educated about the potential careers available in the fields of technology. Because of this increased awareness, and the changes implemented by the administration, it could be

expected that the enrollment by female students in the technology education courses offered at Spencer would rise.

Finally, perhaps it will be discovered that there are issues beyond the School's control that cannot be changed. Therefore, for those students, there would be no changes that could make them become more interested in Spencer's technology education curriculum.

Research Questions

The questions that this study will answer are as follows:

1. Are the females aware of the course offerings in technology education at Spencer?

2. Where did the females learn about the technology education elective courses offered at Spencer?

3. What electives, currently offered by Spencer, would the females be interested in taking?

4. What are the factors encouraging females to enroll in technology education courses at Spencer?

5. What are the factors preventing females from enrolling in some of the technology education courses at Spencer?

Significance of the Problem

The results of this research can be used to assist decision-making in a number of areas including, (but not limited to):

1. Determining the reason(s) why female students are not enrolling in the technology education courses at Spencer High School.

2. Making changes designed to increase the number of female students enrolling in the technology education courses. Courses may need to be added to the curriculum or deleted.

3. In conjunction with the Technology Education Instructor, it may be decided to alter the instructional methodology or content of current courses.

4. Discussions between the Administration and the Technology Education Instructor may arrive at conclusions warranting additional staff for the technology education department.

5. The study may suggest a need for expansion of the building in order to accommodate additional courses. New equipment and an increased budget for the technology education department may be seen as necessary to encourage the females to enroll in the courses.

6. It may be discovered that the school should perform an informational campaign for its students and the community.

Follow-up studies will be advisable. Neighboring schools may wish to use this instrument in their own schools as an aid to gathering useful information about their female students and their technology education department.

Definition of Terms

Gender Bias: The underlying network of assumptions and beliefs held by a person that males and females differ in systematic ways other than physically, that is, in talents, behaviors, or interests (New Pioneers, 1975).

Gender Equity: Equal access and equal opportunity for both sexes resulting in equitable outcomes (Streitmatter, 1994).

<u>Gender Identity:</u> The way a person views himself/herself as it relates to characteristics of gender (i.e. feminine, masculine, androgynous).

<u>Technology:</u> Know-how that extends human potential (Hendricks & Sterry, 1996).

<u>Technology Education:</u> A course of study possessing content focusing on knowledge, processes, tools, and systems of technology in society.

The next chapter takes an in-depth look into literature, recent studies, theories, and observations related to women and technology.

CHAPTER II

REVIEW OF LITERATURE

<u>Introduction</u>

It would be easy to simply initiate new school curriculum and directives based on the outcomes that are desired by the school. While this approach may offer an easy beginning, the outcomes may be far from what was envisioned at the onset. If it is possible to learn as much about the factors that influence a student when making academic choices, then this information will be invaluable when considering new curriculum or improving existing curriculum. One factor is the job market itself. The job market sends important signals for females who desire to enter it.

<u>Changing Opinions of Women</u>

Females who have graduated from college and entered the job market have had considerable changes of opinions as the years have passed. According to a comprehensive study undertaken by the Women's Bureau in 1957, almost 6,000 women across 153 colleges and universities were surveyed. Three months following graduation 84 percent of these women were employed but 71 percent would stop working if marriage or children came (Goldin, 1990). The comments from these women conveyed a sense of complacency and satisfaction. Traditional assumptions embrace the idea that women will choose jobs and careers to support themselves until marriage, and then marriage will become their primary career (Brannon, 1999).

In 1964, the Women's Bureau again conducted the survey of the same women and discovered many now had feelings of frustration with the work environment. Much of this frustration was attributed to feelings of discrimination in the work environment

(Goldin, 1990). Research has found that college-educated women perceive employment discrimination to a greater extent than other women (Kuhn, 1987). This perception was known to exist at least ten years earlier. In 1977, a national cross-section of women proved this perception to be especially prevalent in 25-34 year-old women (Goldin). Thirty-five percent of the 25-34 year olds reported that they felt they were discriminated against because they were women. As a comparison, less than one percent of women over the age of 55 reported perceived discrimination (Goldin). Great strides have been made in the work environment since the 1970's, but discrimination still persists.

Equality in the Workplace

In 1990, a survey was conducted concerning the starting salaries of men and women (Gerhart). This survey found that women's salaries were 88 percent that of their male counterparts. These lower initial salaries would prevent these women from ever equaling the salaries of men performing similar jobs (Gerhart). This evidence supports the perceptions held by the women who participated in the 1977 study.

The struggle by females to gain equality in the workplace has resulted in a work environment where the younger female workers (25-34 years of age) are shown to be earning considerably higher earnings than the older female workers (Goldin, 1990). Traditionally, this has not been the case. The older women with experience and seniority had the higher earnings. According to tradition, the only careers that have been studied were those of men because women were felt not to have any careers (Brannon, 1999). Because of this thinking, it was thought that the existing research and theories conducted on men would simply translate to women. However, it has been seen that the careers of women follow decisively different career paths and will continue to do so in the future.

Nontraditional Career Choices

Both men and women are now choosing careers that have traditionally been limited or thought of as careers for men or careers for women. Even with this rise in the non-traditional, the majority of women are still pursuing careers in gender-traditional occupations, according to a study by Brannon, (1999). Another traditional societal expectation is that wives' careers will be secondary to their husbands (Brannon). The wife is almost always expected to stay home with the sick child or to move if the husband's career changes. These expectations interrupt the careers of women who may never recover or who may take years to claim back lost ground (Brannon). Women are seen as placing their careers second to the males in their lives. To be willing to accept these traditional roles, common to society, women have to possess a certain type of personality.

Personality of the Woman

The personality of the individual woman and her willingness or unwillingness to accept traditional roles often dictates whether or not she will choose a non-traditional career path. Research has found that women who exhibit more masculine tendencies are more likely to pursue non-traditional careers (Phillips & Imhoff, 1997). Research has also discovered that women who have had employed mothers, supportive fathers, highly educated parents, and positive female role models, have all influenced women to enter career paths traditionally thought of as men's (Brannon, 1999).

Gender Role Expectations

In addition to personality, gender role expectations also greatly influence the choices of careers by females. A study has revealed that expectations are the reasons

why men, when hiring women for positions of power and prestige, will hire women and then place them on a kind of "probation" (Anselmi & Law, 1998). Men tend to believe that women need to prove themselves in these positions traditionally held by men.

Knowing that these expectations exist, women tend to choose certain occupations placing them within gender roles strongly identified with these occupations. During the 1980's, over two thirds of the employed women were concentrated into occupations dominated by 70 percent or more females (U.S. Department of Labor, 1996).

Sex Typing

Tradition, blended with current expectations, influences the choice processes females undergo when choosing a career path. Closely related to the traditional roles expected of women is the phenomenon known as the sex typing of females. Meaning for example, if you are a female you are expected to be a nurse or enter clerical fields, jobs traditionally held by females. According to research conducted in 1993, by Serbin, Powlishta, and Gulko, sex typing starts well before females reach school age. They reported that as infants, females learn accepted behavioral patterns and sex-role stereotypes common to their culture.

Parental Influence

Parents have a great deal to do with how infants and children are programmed. As babies there may be blue or pink in the infant's environment causing the child to develop gender identity and the corresponding gender roles (Brannon, 1999). Young children develop sex-typed attitudes, preferences, and behaviors that influence many areas of their lives and last well into adulthood (Serbin et al.). The tendency for children

is to remember information consistent with gender-type roles. This tendency increases significantly between the pre-school years and middle childhood (Serbin et al.).

Serbin, Powlishta, and Gulko (1993) also reported that as children progress through the grades, their knowledge of sex stereotyping of occupations and activities remained very high. Even as early as kindergarten, sex stereotyping is known and mastered by grade two (Serbin et al.). Throughout the elementary grades preferences for sex-typed activities and occupations and for same-sex peers remains strong (Serbin et al.). Children, who develop a knowledge and identity of their gender, become motivated to engage in some activities and avoid others according to gender roles (Newman, Cooper & Ruble, 1995).

The maturing child gains greater awareness of the possibilities that males and females can have the same traits and engage in the same occupations and activities. The acquisition of these more flexible beliefs tends to make these children less sex-typed in their own preferences (Serbin et al.). Research conducted in 1986, reported that not all children will eventually display this flexibility (Ashmore, Del Boca, & Wohlers, 1986). The implication is that new generations of children are being impacted by influences that are altering previously expected behavioral patterns. This previous research explained that as children became adults, most would demonstrate sex-typed behaviors and beliefs using gender to categorize information as it is placed into memory (Ashmore, et al.). Serbin, Powlishta, and Gulko, (1993), reported that as cognitive maturation takes place, other ways to code information concerning the world are learned allowing the use of gender categorization more flexibly. During the maturation process of the child, schools

are undoubtedly having an impact on the child. Schools endeavor to follow a mandated path of gender equity.

Schools and Gender Equity

The schools are following the path laid out by the 1972 law: The Education Amendment Act-Title IX, requiring schools to eliminate gender bias (Streitmatter, 1994). After over 20 years of existence one would think that gender inequities would be a thing of the past (Streitmatter). Not entirely true. Ignorance and apathy are still prevalent hindering the accomplishment of the Title IX agenda.

Research by Schmuck and Schmuck (as cited in Streitmatter, 1994) has found that school administrators in rural schools (in this case) did not regard the issue of gender discrimination to be an overly pressing issue. Quotes expressing their attitudes about gender equity include "stupid and frivolous' to 'worry about equal opportunities for boys and girls' to 'acknowledgement that their districts complied with the letter of the law but did not go beyond concerns of equal access'" (Streitmatter). Earlier research conducted in 1991, illustrates that similar types of opinions have existed for some time (Sadker, Sadker, & Klein).

Schools and Gender Bias

As prevalent as the gender equity issue remains, gender bias is also a common concern for schools. Students are treated differently in the classroom because of their sex (Anselmi & Law, 1998). Not all teachers are guilty of teaching differently, be it intentional or otherwise, but the fact remains that gender-biased instructional techniques do exist (Streitmatter, 1994). Most of the teachers are not to be blamed for intentionally

trying to teach with gender bias in mind, but rather do so because they fail to adequately reflect on how they are teaching (Streitmatter). Communication between teachers and females tends to be a problem. Studies have shown that White females receive the lowest level of overall communication interaction of any race/sex group (Anselmi et al.). Lack of communication between females and teachers is exacerbated in traditionally male dominated classes (Anselmi et al).

Gender bias is expressed in several other ways in addition to lower levels of communication, according to Streitmatter, 1994. These ways include but are not limited to: the extent to which occurrences continue to exist, such as one gender substantially out numbering the other in curriculum offerings; different expectations by the teacher depending on the gender of the student; and teaching methods or discipline techniques that significantly affect one gender more than the other.

Many different theories exist on how females and males process information. The belief in these theories may be responsible for the different teaching methods seen in the schools. One dominant theory is that females do think differently than males (Richmond-Abbott, as cited in Streitmatter). However, research has been done examining the possible relationship between specific abilities and male hormones, but has found no evidence to support such a relationship (Sadker, Sadker, & Klein, 1991).

Social Roles in School

Socialization within the school by females or males often has an impact upon the courses selected by the different genders. Secondary schools usually offer curricula that provides greater options in academic areas, as well as in fine arts, sports, clubs, and the like (Streitmatter, 1994). The attraction to different curriculum may occur along gender

lines. This theory suggests that participation will be anticipated due to gender (Streitmatter). An obvious category is that of sporting events where the participants are separated by gender. Another theory predicts achievement in different curricula according to gender (Streitmatter 1994; Serbin, Zelkowitz, Doyle, Gold, & Wheaton 1990). This theory supports the idea that females will do better at certain tasks just as males are more adept at other tasks. Still another assumption is that attitudes held by students tend to fall along the different gender lines (Streitmatter).

<u>Appalachia Program</u>

A federally funded program, where a gender equity model was instituted, has shown great promise. This model program was implemented in a rural Appalachia high school system in three stages. Stage one assisted in creating a complete computer lab including an entire course and a career-counseling program. During this stage the student's motivation and attitude towards school were assessed. A pre-test and a post-test were implemented to gain this information. This first stage also encompassed a plan where the student's desires and career path was well known between all grade levels through an integrated scheduling system (Beasley, Wark, & Zimmerman, 1998).

Stage two promoted activities and initiatives designed to enhance student motivation, morale and self-confidence. These activities had specific goals designed to include problem solving and decision-making processes, goal setting, team building, and communication processes.

Stage three required hands-on job experiences and placements requiring a minimum of 50 hours work with the local employers in the nontraditional fields of study for females (Beasley, Wark, & Zimmerman, 1998).

The qualitative and quantitative data gained from the Appalachia program proved that the program offered many positive benefits. Qualitative data (acquired from personal interviews and presentations) reflected a high success rate on career awareness and self-confidence as related to the set goals. Several high school seniors made post-secondary nontraditional career choices, following their experiences. Quantitative data revealed decisive gains in various areas including gains in overall school attitude. Student's feelings about school performance and academic ability were improved. Finally, students were shown to illustrate a willingness to take responsibility for school outcomes, self-reliance, and independence in school. Overall, females demonstrated a 61 percent improvement between pre-test and post-test scores (Beasley, Wark, & Zimmerman, 1998).

Connecticut Research

Research conducted by Silverman and Pritchard (1993) in three Connecticut middle schools concerning the experiences of girls in technology education courses revealed valuable insights in many areas. One of the results of their study was that girls would appear to enjoy technology education and exhibited confidence in their abilities, but because of emerging sexism from peers they began to participate on the basis of gender. The type of project was also found to affect the participation level of the girls. If the projects were gender-neutral or traditionally female-identified activities, then the response to those activities was greater interest and enthusiasm.

As mentioned earlier, traditional expectations are still alive and well. This was found in the advice given by guidance counselors who discouraged females from taking more technology education courses in high school because they didn't fit the expected

stereotypes of appropriate careers for women (Silverman & Pritchard, 1993). They also found that girls don't know enough about technological careers. This study supports the findings of Anselmi and Law (1998) who stated that girls and teachers do not communicate well in technology education classes that traditionally do not have many girls. Therefore, the girls didn't feel like they connected with the teacher concerning what they were learning in the classroom and the careers that exist in the real work world outside of school (Silverman, 1993).

It was also found that the girls were uninformed about the economic realities of the work world (Silverman & Pritchard, 1993). As the girls progressed into high school, Silverman and Pritchard (1993) found that the girls that were willing to take technology education courses in high school were not that concerned about obtaining well-paying jobs as they were about the boys in their classes. They were willing to challenge the typical stereotypes about technology as a male occupation but had less confidence in their abilities. The implication here is that the class or its delivery was not a problem, but that the social and emotional aspects of the girls and those ensuing relationships with the boys tended to dominate their thinking.

Silverman and Pritchard concluded the study by recommending that schools hire more female technology instructors as a first step. It was also felt that the number of females who enrolled in technology education courses and the attitudes towards technology education and careers could be improved. The study advocated better teacher training and familiarization with the issues of gender equity. It also suggested that the curriculum be modified to allow for ways to make closer connections with the work world and hence reduce or break down the existing stereotypes that exist concerning

careers for women. Lastly, it was felt that the guidance area of schools could do a lot to inform students about the options that are available to the students particularly in the areas of technology education. The study expressed concerns, that the guidance counselors related, that there was not enough flexibility within their systems for students that were "college bound" to be able to fit technology education courses into their schedules (Silverman and Pritchard, 1993).

Stereotypical Careers

Research conducted in Virginia again confirms the existence of expected stereotypical careers for women. This study found that the reasons females do not enter technology education as a career was that poor advice had been given to them by guidance counselors and that little or no technology education was given or taken in high school (Flowers, 1996). Flowers also cited the most positive influences for entering the technology education field as an instructor included: a general enthusiasm for technology teaching; support offered by parents, advisors, college instructors, technology instructors, spouses and "myself". Flowers mailed his survey instrument to 375 randomly selected female technology instructors teaching in the state of Virginia.

Based on the responses received through the survey, Flowers offered suggestions that could be used to attract more females into the field of technology education. Many of these suggestion support studies previously listed:

- Have more female role models.

- Treat the female students the same as the male students.

- Obtain the cooperation of the guidance counselors.

- Change course content to interest females.

- Show technology courses as not being traditional Industrial Arts courses.

- Change the attitude that Technology Education is a dumping ground for those students that cannot make it elsewhere.

- Reduction of rudeness by peers in the classroom.

- Offer grants, scholarships, and internships.

- Begin in the elementary. Recruit like sports. Encourage career fairs featuring the non-traditional.

It is evident that the problems concerning females and technology education are widely known. The fact that these studies have been conducted at different locations across the country indicates that these are not problems isolated to a few geographic locations or instances. Taking a look at three studies conducted in the state of Wisconsin, some additional insight concerning the problems associated with technology education and females can be observed.

Studies Conducted in Wisconsin

The first of these three studies, conducted by Debbie Paniagua in 1999, was titled: Student Perspectives on Technology and Technology Education. This descriptive study surveyed all the seventh–grade students at both Bell Middle School and Jackie Robinson Middle School in the Milwaukee Public School District. The survey sample was 176 students and obtained a return rate of 88.9 percent. The most noteworthy findings of this study were: a) the seventh-grade students viewed technology mainly as an object, specifically computers; b) girls were most interested in learning about technology as

people connectors, and; c) approximately one-third of the students would contradict their interests when enrolling in a technology education class (Paniagua, 1999).

The first finding revealed that most seventh graders have not yet developed an abstract manner of viewing technology, and therefore tend to view it as items that are concrete or that they can touch. It was also found that over a third of the seventh graders thought of computers when the term technology was spoken (Paniagua, 1999).

The second discovery of this study found that girls are interested in technology as a means to be able to connect to other people. Boys were interested in technology as to how it works. Relating this to the traditional perceptions of men would seem to make this a logical outlook by boys. Girls would use the technology to accomplish a goal of connecting to other people and were really unconcerned with how it worked but only that it could serve their purpose. It was also found that the students felt the classes were being taught with these two perspectives in mind. Most felt that nearly 90 percent of the classes were concerned with how technology works, where as only 65 percent of the students felt the classes reflected how people connect to each other (Paniagua, 1999).

The last discovery of this study revealed that nearly a third of the females would not enroll in a technology education class even though they were interested in it. Clearly, other factors, besides interest in the class, were influencing these female respondents. Teaching practices reflecting the interests of the students, and earlier experiences with technology education courses influence the choices made by females (Paniagua, 1999).

Haugland conducted the second of these three descriptive studies in 1991, entitled: A Descriptive Study on the Factors Influencing Enrollment in Technology

Education Courses at River Falls High School. A questionnaire instrument was used to collect the data. The survey sample included 172 ninth-grade students.

This study made three discoveries: 1) the students felt that the needs of the students were not being met by the high school's four-year plan; 2) the students didn't believe that the guidance counselor made any positive or negative influence on their decisions to take or not take technology education courses, and; 3) the female students expressed very little interest in taking technology education courses (Haugland, 1991).

This study revealed that the students felt they needed to have more electives available to them in the ninth and tenth grades. If this was possible, Haugland felt that the enrollment would show increased signs of interest by all students (Haugland, 1991). Because the students did not see the guidance counselors as significantly influential, it was recommended that the guidance counselors take a more aggressive interest in the students and their career choices. (What was not mentioned was that the students would need to also take an interest in seeking the counseling provided by the guidance counselor.) The third finding would require the students to have more exposure to technology education possibilities and information. It was felt that the students were not aware of the offerings and therefore expressed little interest in technology education courses. The study also suggested increased teacher interest, and expressed the hope that they would be more influential in the student's educational decisions (Haugland, 1991).

Petruzates conducted the final research study that will be reviewed by this researcher. The title of this study was: Attitudes of Female Students at Wabeno High School. This descriptive study involved a questionnaire, utilizing a five-point Likert scale, distributed to all 70 of the female students at Wabeno High School. This

researcher incorporated many of Petruzates questions, with the addition of others felt to be important by this researcher, following the basic format incorporated in Petruzates' questionnaire. Descriptive statistics were used to measure the data, specifically, mean and standard deviation (Petruzates, 1990).

The most notable results obtained by the questionnaire were that 59 of the 64 students who responded did not list the fear of getting hurt, its too messy, or its not fun as reasons for not taking technology education courses (Petruzates, 1990). This study reported the number one reason for not taking technology education courses was that the course times of the technology education courses conflicted with the times that other courses were scheduled that they wanted to take. Sixty-seven percent of the females gave this response. Conflicting answers to peer pressure influences negated any concrete conclusions about peer pressure from this study. Parents were found to be a significant influence in about 40 percent of the respondents. Again, conflicting responses to peer related questions showed that peers were actually a significant influence on the decisions whether or not to take technology education courses. Eighty-six percent of the respondents didn't feel that the parents discouraged them to take technology education courses. Finally, eighty-four percent of the females responded that they disagreed with the statement that the reason they did not take technology education courses as an elective was because it's not for girls.

Summary

The review of literature has demonstrated that there are many factors that influence the choice by females whether to take or not take technology education courses while in school. The opinions formed by the female concerning the work environment,

technology education in general, equity, gender-role expectations, and sex typing all influence the choices to be made by the female. In addition, traditional expectations held by parents, friends, peers, teachers, and any others who are a part of the female student's circle of acquaintances, all have an influence on the female student.

Entrance into the work world in non-traditional careers by females happens when the female has obtained enough information to nurture the seed of interest they have in the technology-based careers. A certain type of personality is required especially where this information has been lacking. Clearly, the schools play a major role in educating the female student about the possibilities available for females in non-traditional technology-oriented careers. The goals of gender-equity agendas and the elimination of gender-bias in the school setting are making giant strides for females.

Technology education teachers, guidance counselors, and administrators all are influential advisors to the female student. The manner in which technology education courses are portrayed and discussed have a direct bearing on whether the female students will wish to explore this area during their educational years. The best efforts should be put forth to ensure that female students are aware of the courses and that the courses are being taught in a fair, unbiased and encouraging manner. Class schedules should be flexible enough to accommodate these electives. Once students decide to explore or not to explore technology courses, they may be choosing paths that will affect the rest of their lives and ultimately society as a whole. Teachers and administrators are faced with the task of differentiating, if possible, which of these assumptions/conditions are a reality in their schools and then adjusting their methods or curricula accordingly.

In the next chapter the methodology will be explained as to how this study was conducted.

CHAPTER III

METHODOLOGY

This chapter will outline the methods and procedures used in this study of the seventh and eighth-grade female students at Spencer School Systems. The purpose of this descriptive study was to identify the factors influencing the decisions of female students to either take or not take technology education courses during their high school years. These grades were chosen because the students were in the best position to determine what technology education courses, and hence path, would be chosen before starting the high school years. Once starting a particular path in high school, research has shown that it is often too late to get into some of the technology courses because pre-requisite courses would not have been taken.

Subjects

The subjects of the survey were all the seventh and eighth-grade students at the Spencer School System, in Spencer, WI, or 166 students. The primary interest of this study was the responses of the female students, or 84 of the 166 students surveyed. However, the final survey was distributed to all the seventh and eighth-grade students, male and female, to eliminate any awkwardness that would otherwise have occurred due to part of the class taking a survey and the other part watching.

Instrument

This descriptive study was conducted utilizing a self-reporting survey instrument. The purpose of the survey instrument, or questionnaire, was to gain insight into the reasons why the females of the seventh and eight-grades were or were not planning on enrolling in technology education courses when they reach the high school years.

The questionnaire was designed to extract information from the seventh and eighth-grade students concerning their level of awareness in the following areas:

- Course offerings at Spencer,

- How course conflicts and graduation requirements may affect their desires to enroll in technology education courses,

- Career possibilities in the technology fields,

- How their choices are affected by their peers, parents, advisors, etc.,

- How past experiences with technology education courses or instructors has influenced their decisions about future choices of technology education courses,

- Stereotyping that exists…this is a male's area, etc.,

- Their beliefs about the physical and mental demands that exist in some of the technology-based careers,

- How their beliefs and past training have impacted their perceptions of technology and course offerings in technology.

The questionnaire contained items in the affective domain, utilizing a five-point Likert scale for the responses: Strongly Disagree; Disagree; Undecided; Agree; Strongly Agree, (abbreviated respectively: SD, D, ?, A, SA). Some multiple-choice questions, short-answer, or fill in the blank questions were also included. Eighty-two questions were included in the questionnaire, but the respondents only responded to questions that pertained to them. Each of the four main sections had an "Other" category for the respondents to write responses that were not included or anticipated by this researcher. The four main sections included:

1. People or places where you learned about technology class electives

2. Who influenced your final choice of technology class electives?

3. Reasons why you plan to select a technology education class as an elective.

4. Reasons why you will not select a technology education class as an elective.

Those students planning on taking a technology education class as an elective were directed to page four of the survey to mark as many of the listed electives that they would be interested in taking. The electives listed were those that pertain to technology education courses at the Spencer School, namely:

- Building Trades

- Communications

- Computer Applications

- Desk Top Publishing

- Electricity

- Material Processing

- Small Engines

- TV Productions

- Other _____

Demographics

The Demographic section of the survey, contained multiple choice items:

- Sex: male or female.

- Grade level: seventh or eighth.

- Average grades you get: (A, A-), (B+, B, B-), (C+, C, C-), (D+, D, D-),

  (Less than D-).

- Whether or not you plan on going on to school after high school: yes-college,

  vocational-technical, or no.

- Highest level of schooling completed by each parent or guardian:

Mother (or female guardian)	Father (or male guardian)
___ a. Less than High School	___ a. Less than High School
___ b. High School Graduate	___ b. High School Graduate
___ c. Vocational School Graduate	___ c. Vocational School Graduate
___ d. College Graduate	___ d. College Graduate

- What grade level did you first start to think about a future career?

___ a. First or Second	___ d. Seventh or Eight
___ b. Third or Fourth	___ e. Have not thought
___ c. Fifth or Sixth	about it yet

- Lastly, if you were to choose a career today what would it be?

___ a. Business and Financial Services   ___ h. Health Care
Professionals
___ b. Education, Government and Social Services ____ i. Hospitality Industry
___ c. Engineering and Computer Technology   ____ j. Science
___ d. Management and Office Personnel   ____ k. Media and the Arts
___ e. Sales and Personal Services   ____ l. Agriculture
___ f. Manufacturing, Construction, Repair   ____ m. Transportation
___ g. Other (Please Specify) _____

Considerable effort was made to identify an existing instrument that include all

the variables this researcher wanted to include, but none of those that were researched

adequately addressed all the areas. As a result, the survey instrument follows the pattern

used by Petruzates, in 1990. Additional questions were added, and many of his were

altered, to more closely align with seventh and eighth-grade students while addressing

items particularly applicable to female students. This questionnaire format was used

because it has been found to be easy for students to follow and complete. A copy of the

questionnaire is included in Appendix A.

<u>Survey Analysis</u>

In order to increase the content validity of the final survey instrument, at the

beginning of the Spring, 2000 Semester, four female students and four male students

reviewed the survey instrument. Four were juniors, three were sophomores, and one was

a freshman, all attended Spencer School Systems. They were asked to critique the survey

instrument looking for anything that was confusing or unclear.

In addition to the students, two teachers from Spencer also reviewed the

instrument, Mr. Robert Stallons, and Mr. John Zenner. Mr. Stallons has 10 years of

teaching experience and Mr. Zenner has 31 years of experience. The students were asked

to circle any words that were not clear to them. They were also asked to make comments

about questions they were unsure about.   At the same time, the teachers were asked to

critique the questionnaire and make suggestions and changes they felt would make the

questionnaire a more credible instrument.

These suggestions were discussed with this researcher's Research Advisor and

agreed upon revisions were incorporated into the final survey instrument.

- A copy of the Seventh and Eighth-Grade Questionnaire Cover Letter is included
  in Appendix A.

- A copy of the Seventh and Eighth-Grade Consent Form is included in
  Appendix B.

- A copy of the Questionnaire is included in Appendix C.

- A copy of the Seventh & Eighth-Grade Homeroom Teacher Instruction Sheet is included in Appendix D.

- A copy of the comments from the students and teachers is included in Appendix E.

- A copy of the Demographic Totals (7TH & 8TH grade females) is included in Appendix F.

- A copy of the Career Write-in Responses (7th & 8th grade females) is included in Appendix G.

Procedures

In conjunction with the school system of Spencer, the survey instrument was distributed in the spring of 2000, to the homeroom sections of the seventh and eighth grades. The homeroom teacher was to read a set of printed instructions to the class before distributing the questionnaires. (A copy of this Homeroom Teacher's Instruction Sheet is included in Appendix D.) Similar instructions were printed for the students and included in their questionnaire cover letter. The homeroom teachers distributed the questionnaires and collected them as students turned them in over the next several weeks. (Due to recent time-consuming testing that had taken place at the Spencer School, the teachers felt compelled to not use any class time for the completion of the questionnaires. This manner of distribution and collection differed greatly from the detailed instructions sheets that were given to the teachers and may affect the validity of the findings of this study.) All sections of both grades were given the questionnaires.

The completed questionnaires were then placed in a box and kept in Mr. Endreas' (Jr. High Principal) office. This researcher retrieved the questionnaires when Mr.

Endreas felt that all the questionnaires that were going to get turned in were already in. This was about four weeks from the date of distribution.

Unknowns and Limitations

This survey was conducted at the Spencer, Wisconsin Public School System. The Study is limited by factors beyond the control of this researcher and those who assisted in the information gathering process at the Spencer School. Specifically, the following factors:

1. The study was limited to the seventh and eighth-grade students.

2. Absenteeism on the day that the survey was distributed.

3. The students may not respond to every question.

4. The moods, attitudes, and physical conditions of the students on the day that the students completed the survey.

5. The time of the day and the time of the year that the survey was completed.

6. Other activities occurring simultaneously at the school.

7. The validity of the survey instrument.

8. The manner in which the survey was administered.

9. The generalizability of the questionnaire results to other schools. Similar schools of similar size may find some useful parallels for this survey's results. It is suggested, however, that it be used as an aid to gathering information with customization of the instrument to fit their particular school. It is unlikely that the results obtained at Spencer will be completely generalizable to other schools. It is further suggested that the questionnaires be completed during a class period and returned by all students at the end of

the same class period, in order to effect a higher return rate and eliminate as many extraneous variables as possible.

10. Because the questionnaires were returned over a time period covering several weeks, it is unknown what extraneous variables have impacted the responses of the participants.

11. It is also unknown if the respondents that filled out the questionnaires were the ones who were interested in technology or the ones who were not interested in technology. Therefore, the responses may not accurately represent the consensus of the entire class of seventh or eighth-grade female students.

In the next chapter, the data collected from this questionnaire will be analyzed and explained.

CHAPTER IV

DATA ANALYSIS

Data for this research was obtained from a questionnaire developed from existing questionnaires, incorporating some modifications. The total population was 166 students, all of which were given questionnaires. Seventy-seven were seventh-grade and 89 were eighth-grade. Twenty-two of the 37 seventh-grade females answered a questionnaire, or 59.5 percent, and 22 of the 40 seventh-grade males were able to partake in the questionnaire, or 55.0 percent. Two of the questionnaires that were completed by seventh-grade males were not used, and not included in these percentages, because this researcher deemed the answers to be meaningless. Both questionnaires had answers marked down the left side column, Strongly Disagree on every item, and contained some obscenities in several write in spaces. In addition, the demographics pages were not completed. Twenty-one of the 47 eight-grade females took part in the questionnaire, or 44.7 percent, while 12 of the 42 eight-grade males took part in the questionnaire, or 28.6 percent. Total participation for all students in the seventh and eighth grades was 77 of 166 students, or 46.4 percent.

However, this study focused on the female students at Spencer. The total female respondents for the seventh and eight-grades at the Spencer School were 43 out of 84, or 51.2 percent. Therefore, some caution may need to be exercised when applying the findings to the entire population.

Demographics

Table 1: All Respondents

Table 1 describes the demographic information of the sample group containing all the seventh and eighth-grade respondents. The male responses were not the focus of this study and were only given limited consideration. Of the 77 respondents, 22 (28.6%) identified themselves as seventh-grade males, 12 (15.6%) identified themselves as eighth-grade males, 22 (28.6%) identified themselves as seventh-grade females, and 21 (27.3%) identified themselves as eighth-grade females.

Table 1: All Respondents

Demographic	Frequency	Percent
Grade & Gender		
7th Grade Males	22	28.6
8th Grade Males	12	15.6
7th Grade Females	22	28.6
8th Grade Females	21	27.3

Note: Valid cases = 77

Table 2: Female Respondents

For the purposes of this study, a more meaningful table (Table 2) concerns the number of female respondents as compared to the total number of females per each of the seventh and eighth grades. Of the seventh-grade female respondents, 22 (59.5%) of the total seventh grade females (37) responded, 21 (44.7%) of the total eight-grade females (47) responded.

Table 2: Female Respondents

Demographic	Frequency	Percent
Grade (Females)		
7th	22	59.5
8th	21	44.7

Note: Females: 7th grade N = 37; 8th grade N = 47

Table 3-A and 3-B: Highest Parent Education Level

All respondents were asked to indicate the highest level of education completed by their parents or guardians. Tables 3-A, and table 3-B describe those results. Table 3-A refers to the responses given by 77 respondents concerning the Mother or female guardian.   Of the total respondents, 7 (9.1%) stated that their Mother, or female guardian, had less than a high school education, 41 (53.2%) said that she had a high school degree, 6 (7.8%) said that she had a vocational or technical degree after high school, 18 (23.4%) said that she possessed a college degree, and 5 (6.5%) did not answer the question.

Table 3-A: Mother

Demographic	Frequency	Percent
Mother Highest Schooling Level		
Less Than High School	7	9.1
High School Graduate	41	53.2
Voc-Tech Graduate	6	7.8
College Graduate	18	23.4
Missing (no answer)	5	6.5

Note: Valid cases = 77

Table 3-B refers to the responses given by 77 respondents concerning the Father or male guardian. Of the total respondents, 7 (9.1%) stated that their Father, or male guardian, had less than a high school education, 39 (50.6%) said that he had a high school degree, 6 (7.8%) said that he had a vocational or technical degree after high school, 17 (22.1%) said that he possessed a college degree, and 8 (10.4%) did not answer the question.

According to the Petruzate study of 1990, 18 percent of the parents of that study did not have a high school education and only 16 percent had a vocational/technical/college degree. (Note: The Petruzates analysis combined the genders of the parents.) It is easily seen that the education levels of Spencer parents or guardians are significantly higher than those of Wabeno in 1990.

Table 3-B: Father

Demographic	Frequency	Percent
Father Highest Schooling Level		
Less Than High School	7	9.1
High School Graduate	39	50.6
Voc-Tech Graduate	6	7.8
College Graduate	17	22.1
Missing (no answer)	8	10.4

Note: Valid cases = 77

Looking at these two tables, (3-A and 3-B), about 10 percent of the parents or guardians do not have a high school degree, while 50 percent do have at least a high

school education. About 25 percent of the parents or guardians have a college education,

and only about eight percent have a vocational or technical degree.

Table 4: Average Grades

Table 4 reports the average grades of the respondents. As an overview, over 75

percent of the respondents have averages of "A" or "B". Another 18 percent have a "C"

average. This totals approximately 93 percent with one person not responding. The

breakdowns can be seen in Table 4.

Table 4: Average Grades

Demographic	Frequency	Percent
Respondent's Average Grades		
A, A-	25	32.5
B+, B, B-	33	42.9
C+, C, C-	14	18.2
D+, D, D-	3	3.9
Less Than D-	1	1.3
Did Not Respond	1	1.3

Note: Valid cases = 77

Concerning plans to go on to school, 65 (84.4%) of the respondents indicated that

they were planning to go on after school. This question showed that nine (11.7%) of the

respondents did not plan on going on to some type of post secondary school. Three

persons did not answer the question, or (3.9%).

Table 5: Post Secondary Plans

      Respondents were asked to be more specific and list the type of school they were

planning on attending. The answers they gave are illustrated in Table 5. College was the

choice of 56 (72.7%) of the respondents. Vocational/technical was seen as the route by 6

(7.8%) of the respondents, and one person (1.3%) chose both college and

vocational/technical. Fourteen people did not respond to this question. It may be

suggested that these individuals had not made up their minds yet. Comparing this

number to the question that addressed when the respondents started to think about a

career choice could cause one to arrive at this conclusion.   Though it was unknown if the

same 14 that "didn't know" were the same 14 that "didn't answer". Table 5 illustrates

these three possible post-secondary choices.

Table 5: Post Secondary Plans

Demographic	Frequency	Percent	
Post-Secondary Education			
College	56		72.7
Vocational/technical	6	7.8	
Both College/Voc-Tech	1		1.3
Didn't Answer	14	18.2	

Note: Valid cases = 77

Table 6: Grade Level Thought About Career

      The respondents were asked to indicate the grade level at which they started to

think about a career. The greatest frequency was the fifth or sixth-grade category, with

28 (36.4%), third or fourth-grade was selected by 11 (14.3%) of the respondents, and first

or second-grade was selected by 3 (3.9%) of the respondents. On the high side of the most frequent response (fifth or sixth-grade), was the seventh or eighth-grade receiving 19 (24.7%) of the vote, and the final category of "haven't thought of it yet" had 14 (18.2%) of the respondents choose it. Two people did not select anything. These results can best be viewed in table format, as seen in Table 6.

According to Petruzate's study, 34 percent of his respondents didn't start thinking about a career till the seventh or eighth grades, 50 percent started thinking about a career even later, during their high school years. Clearly, the Spencer students are thinking about career possibilities earlier than was reported in the Petruzate study.

Table 6: Grade Level Thought About Career

Demographic	Frequency	Percent
Grade Level Started Thinking About Future Career		
First or Second	3	3.9
Third or Fourth	11	14.3
Fifth or Sixth	28	36.4
Seventh or Eighth	19	24.7
Have not Thought About	14	18.2
Did not Answer	2	2.6

Note: Valid cases = 77

Table 7: Future Career

When the question about choosing a future career was answered, no clear pattern of responses were observed. Engineering received 10 (13%) of the responses and the

next highest category was health care, with 6 (7.8%) of the responses. The "Other"

category was quite active and received 34 (44.2%) of the responses. Although some of

the write-in responses could have fit into the listed choices, they are listed separately.

Several of the respondents selected more than one choice so the numbers do not total to

exactly 77.

The "Other" category of choices for the seventh and eighth–grade males included

one vote for each of the following:

Major League Baseball	Architect
Army	Athletics
Military	Mechanic
Carpenter	Truck Driver
Architect	Sports-Baseball
Professional Athlete	Football Player
Auto Mechanic	Teacher-Sports Player
Workforce	Hunting or Mechanic
Mossy Oak Hunting The Country	

The "Other" category of choices for the seventh and eighth–grade females included one

vote for each of the following:

Sawyer at uncles Sawmill	Sports Caster
Art-Cartoon Drawing	Doctor
Orthodontia	Tennis Player
DNR Officer	Sports
Singing	Journalist
Entertainment-Acting, etc.	Law
Veterinarian	Architect
Restaurant Owner	Lawyer
Nurse	Veterinarian
Animal Care	Not Sure

The categories listed on the survey and the corresponding frequencies and

percentages are listed in Table 7. Again, the variety of responses was amazing. There

were no real standout common selections of careers. The variety of selections shows that

the students are aware of many different career possibilities. Even between the two grade

levels, there was not a lot of duplication in career selection. Of course some of the

answers have to be taken lightly, like: "Mossy Oak Hunting The Country". It is unknown

if this could be considered a career

      According to Petruzates, 14 percent of his respondents chose education and

another 12.5 percent chose business as possible future careers. One student chose

education and one student chose business at the Spencer School. Perhaps this shows the

changing times. With all the new possibilities in career choices, the students may not be

looking at the long established career paths that exist. Table seven appears on the next

page.

Table 7: Future Career

Demographic	Frequency	Percent
Career Choices		
Business/Financial	1	1.3
Educ/Govt/Social	2	2.6
Engineer/Computer	10	13.0
Sales/Personal	2	2.6
Manufacturing	3	3.9
Health Care	6	7.8
Hospitality	1	1.3
Science	2	2.6
Media and the Arts	3	3.9
Agriculture	4	5.2
Transportation	1	1.3
Multiple Responses	7	9.1
Other	34	44.2
No answer	1	1.3

Note: Valid cases = 77

It is interesting to consider the choices available in technology education at

Spencer and then look at the possible selection of careers that have been chosen by the

students. At a quick glance it is easy to see the skills learned in the technology education

courses at Spencer would find value in many of these career paths.

Dependent Variables

     The analysis of the dependent variables employs the statistics of standard

deviation, or the measure of variability, and the mean, or the measure of central tendency.

Each of the five dependent variables was looked at separately. Again, for the purposes of

this study, only the female responses were considered for analysis when examining these

five dependent variables. In addition, the responses for the seventh and eighth-grade

females were combined so that the females that answered the survey would be looked at

collectively. Each question of the questionnaire is presented in table format with the

five-point Likert scale, standard deviation, and the mean.

     During the analysis of this data, the primary focus will be on the extremes of the

Likert Scale, Strongly Agree or Strongly Disagree. Items with a standard deviation of

0.00 to 0.60 will be considered as items that are in high agreement. Items with a standard

deviation of 1.20 or higher will be considered as items that are in the least agreement.

    Table A: People or Places

     Table A deals with the first of these dependent variables: People or places

where you have learned about Technology Class Electives. It includes the responses

given by the seventh and eighth-grade females.

Table A: People or Places
===
People or places where you have learned about Technology Class Electives.
(Female Responses)

		MEAN	SD
1. Friends…………………………		3.16	1.00
2. Parent/Guardian………………..		3.16	1.07
3. Relative……………………………		3.07	1.24*
4. Counselor……………………………		2.60	1.00
5. Student Who Had The Class………..	3.53	1.08	
……………………………………………………………..			
6. Student From A Different School…..	2.19	1.18	
7. Teachers……………………………..		3.35	1.23*
8. Principal…………………………….		2.23	1.25*
9. Was A Required Class………………		3.02	1.14
10. Student Handbook……………………	2.47	1.20	
……………………………………………………………..			
11. Other K-12 Grade Schools……………	2.49	1.24*	
12. Schools Beyond 12th Grade…………	2.28	1.16	
13. School Library………………………		2.56	1.16
14. Public Library………………………	2.40	1.14	
15. Other……………………………..	2.67	0.90	

===

This dependent variable didn't collect any sizable agreement among the respondents. This variable addressed the research question: Where did the females learn about the technology education elective courses offered at Spencer? The responses ranged from "Strongly Disagree" to "Strongly Agree" on every question except two. Those two questions ranged from "Strongly Disagree" to "Agree". The selections are all over the scale, but the "relative", "teachers", "principal" and "other K-12 grade schools" all have about the same level of least agreement. (Petruzates also listed relatives as a choice having the least agreement in his study.)   "Friends", "parent/guardian",

"counselor", and "prior student who had the class" all rated about the same level of agreement.

At the same time, those who were the best sources for information were, (in descending order), "student who had the class", "teachers", and "friends/parent/guardian". The least influential were, (in ascending order), "student from a different school", "principal", "schools beyond the twelfth grade", "the public library", and "the student handbook". Several of these had the worst levels of agreement at the same time.

The best agreement was in the category where the respondents had to write in their own response. Here the students ranged from "Strongly Disagree" to "Agree". Like some of the responses written in for the demographic section of the questionnaire, some of these write-in responses could also have been included in the supplied choices. Of the 15 that wrote in a response, eight wrote "undecided" as the rating. Those responses, listed as they were written, are:

Internet	Relative
Aunt	Cousins
Books	Workshops Outside of School
Grandparents	blank = 3
——— = 4	x

Table B: Who Influenced?

Table B deals with the second of these dependent variables: Who influenced your final choice of Technology Elective Classes? This variable addressed the research question: What are the factors encouraging females to enroll in technology education courses at Spencer?

Table B includes the responses given by the seventh-grade females and the eight-grade females.

Table B: Who Influenced?

Who influenced your final choice of Technology Elective Classes? (Female Responses)	MEAN	SD
16. Parent/Guardian………………………	3.17	1.25
17. Counselors…………………………	2.37	1.09
18. Friends……………………………..	2.86	1.16
19. Brother/Sister/Other Relative………	2.66	1.28
20. Yourself……………………………	3.78	1.15
21. Student Who Took Class Previously	2.88	1.15
22. Teacher…………………………….	2.73	1.20
23. Someone Employed in that Field….	2.24	0.98
24. Other…………………………….	2.80	0.94

There is more disagreement than agreement as to who influenced the final choices of the respondents. Again, the responses ranged from "Strongly Disagree" to "Strongly Agree" on every question except one. That one question was #17, the counselor, and ranged from "Strongly Disagree" to "Agree". The students appear to be in the most agreement with this question also. They see the counselor as not having much influence on their choice of Technology Class Electives. This is the same finding that the Haugland Study had in 1991 at the River Falls High School.

If only the mean scores are examined, most of the students give themselves credit for their final choice of Technology Class Electives, with a rating of 3.78. According to the Petruzates study, this was the number one choice of respondents with only a 0.39 standard deviation, and a mean of 4.81. This Spencer study did not obtain such overwhelming results but still rated the respondent's choice of "yourself" as among the top choices.

The second highest mean score was captured by question #16, the "parent/guardian" with a 3.17. However, there is more disagreement with the "parent/guardian" choice than the "yourself" choice.

The standard deviation value for item #19 shows that there is little agreement on learning about Technology Class Electives from brothers, sisters, or other relatives. The best agreement was again in the category where the respondents had to write in their own response. However, once again, many of the responses were also listed in the choices that the students could have selected. Of the 15 that wrote in responses, 11 rated them as "undecided". Those responses, exactly as they were written are:

Television	None
?	$\sim$ = 2
relilatives	blanks = 5
teachers	brother or sister
principle	nobody, I had to

After this section, the respondents were asked to complete only one of the two remaining sections of the questionnaire. Which part they completed was dependent upon whether or not they selected a technology education class as an elective.

The numbers were evenly split with 21 choosing to take a technology elective class and 21 choosing not to take a technology elective class. One respondent chose both

yes and no. Those who decided that they wanted to take (a) technology class elective(s)

were directed to the third set of choices under the heading: Reasons why you plan to

select a Technology Education Class as an elective. These results are recorded in

Table C.

Table C: Reasons Why Chose

Table C deals with the third of these five dependent variables: Reasons why you

plan to select a Technology Education Class as an elective. This dependent variable, in

conjunction with the fourth dependent variable, addresses the purpose of this research:

…to identify the reason(s) why female students are not enrolling in higher numbers in the

Spencer High School technology education courses.   Again, these are the responses

given by the seventh and eighth-grade females.

Table C: Reasons Why Chose
===
Reasons why you plan to select a Technology Education Class as an elective.
(Female Responses)

		MEAN	SD
26.	Important for future job………………	3.55	0.86
27.	Teacher was good……………………..	2.73	0.98
28.	To be with friends…………………….	3.09	1.02
29.	For an easy credit……………………..	3.00	1.11
30.	Teacher encouraged to take it…………	2.82	1.10
………………………………………………………………………………………...			
31.	Parents encouraged to take it….….……	3.05	1.33
32.	Counselors encouraged you to take it...	2.18	0.91
33.	For the challenge………………………	3.59	1.05
34.	You dislike the other electives…………	2.14	0.99
35.	Interested in the subject……………….	3.73	0.94
…………………………………………………………………………………………			
36.	Interested in the activities……………..	3.81	0.93
37.	To learn how to use tools and equipment	3.91	1.06
38.	To work with other students…………..	3.55	1.06
39.	To learn something new……………….	4.05	0.90
40.	You are good at it……………………....	3.38	1.07

....

41.	It will be fun.................................	4.00	0.82
42.	In order to take future classes.............	3.18	1.18
43.	Other...	3.20	1.48

===

Comparing the choices selected in this table to the previous two tables reveals an overall higher level of agreement for all the choices. Note that the mean scores are significantly higher, and that the standard deviations are lower, meaning that there is more agreement than disagreement on the choices. The highest level of agreement is found in question #41, "it will be fun", followed by #26, "important for a future job", and then #39, "to try something new". The mean score was the highest for #39, the "to try something new" choice. When this is combined with the standard deviation it is seen that this is a major motivator for students.

These responses are closely aligned to those of the Petruzates study. However, that study only had four respondents choose to select a technology elective. This alone is significant in that it shows that more females are choosing technology electives today than ten years ago. Fifty percent of the respondents plan on taking a technology class as an elective and their responses to these questions show that they are pretty excited about taking those electives. This finding addresses the research question: Are the females aware of the course offerings in technology education in Spencer? It would appear that by the seventh or eighth-grades the awareness level is pretty good. Though it is not certain if those who aren't planning to take a technology class as an elective chose to do so without knowing about the available technology electives.

Females found "it will be fun" to be a significant motivator. Question #34, "you dislike the other electives", only ranked a 2.14 mean. This shows that the respondents are

taking technology electives even though there are other equally attractive electives to choose from.   The students are saying that the counselors had little influence in their decision to take technology class electives. This is reflected in question #32, with a mean of 2.18.

Table D: Reasons Why Not Chose

Table D addresses the reasons why those who are not planning on taking a technology course as an elective are choosing not to do so. This also addresses the research purpose: …to identify the reason(s) why female students are not enrolling in higher numbers in the Spencer High School technology education courses. The answers of the seventh and eight-grade females are listed in Table D.

Table D: Reasons why not Chose
==
Reasons why you will not select a Technology Education Class as an elective.
(Female Responses)

		MEAN	SD
53.	I don't know what the class is about…	2.48	1.29
54.	Afraid of getting hurt…………………	2.00	1.10
55.	I don't need it for my future career…...	3.10	1.04
56.	Not enough time in my schedule……..	3.57	0.93
57.	Conflict with another class……………	3.10	0.70*
58.	Previous class required………………..	2.62	0.97
59.	Had a bad experience in a past class….	2.71	1.23
60.	Not interested in the subject…………..	3.48	1.44*
61.	Already understand/know the subject…	3.00	0.89
62.	To avoid teacher……………………….	2.10	1.22
63.	Fear of receiving a low grade………….	2.24	1.14
64.	To avoid certain students……………...	2.19	1.25
65.	Friends will not be in the class………...	2.29	1.06
66.	Don't like working on machines………	2.95	1.43*
67.	It's too messy…………………………	2.33	1.15
68.	The room is too dark and dingy/dirty…	2.10	1.04
69.	The room smells bad…………………...	2.38	1.24
70.	The equipment is old and outdated……	2.10	1.04
71.	It's not fun……………………………...	3.05	1.24
72.	Friends discouraged me………………...	1.95	0.74*
73.	Parents discouraged me………………...	1.76	0.70*
74.	Teacher(s) discouraged me…………….	1.86	0.85
75.	Counselor(s) discouraged me………….	1.76	0.70*
76.	It's not for girls………………………....	1.65	0.88
77.	The boys tease the girls in the class……	2.20	1.06
78.	I don't want to be the only girl in the class	1.95	0.91
79.	Don't want the boys staring at my body.	2.15	1.31
80.	Boys in class know more than the girls...	1.90	1.21
81.	Teacher favors the boys………………..	2.15	1.14

==

The respondents are disagreeing with most of the choices listed as reasons for
not taking a technology class as an elective. The standard deviations show many of the

responses falling below 1.00 indicating a sense of agreement. The "counselors discouraged me", #75, and the "parents discouraged me", #73, were the strongest responses and showed that the students did not feel that the counselors or parents were discouraging them. The second highest agreement would be choice #57, "conflict with another class". Twenty-five percent of the respondents agreed with this choice, but 66.7 percent of the respondents were undecided. This suggests that the students are not yet aware of their schedules, or the times that classes will be offered.

Question #72 shows that friends are not seen as discouragers. Seventy-six percent of the respondents disagreed with the statement, and the remainder were undecided. Question #76 relays a strong sense that the female respondents do not see the technology class electives as only classes for boys, with 85 percent of the respondents disagreeing with the statement. Question #80 also relates to the boys versus girls issue. In this statement 85 percent of the respondents do not think that the boys know more than the girls. None of the eighth-grade girls thought the boys knew more than the girls.

The second highest standard deviation was seen in question #53, "I don't know what the class is about". This indicates that there is disagreement among the respondents and suggests that some of the females do not really know what the classes are about. Sixty-two percent of the respondents disagreed with this choice, 14 percent were undecided, and 24 percent agreed with the statement. So, even though the majority knows what the class is about, as many as 38 percent may not know what the classes are about.

The females do not agree on the issue of "boys staring at their bodies", as indicated by the highest standard deviation for question #79. Apparently this is a concern

for some, (10 percent), of the females but most, (60 percent), disagreed with the statement. Thirty percent were undecided.

Question #78 shows that the females are not real concerned about being the only female in the class. They felt even stronger about question #76 that the class is just for boys. The agreement level was approaching significance with their answers to this question, with a standard deviation of 0.88. They disagree to even strongly disagree on this choice. Eighty-five percent disagreed with this statement.

Although the mean was quite high on question #60, "not interested in the subject", with a tendency towards "Agree", the standard deviation of 1.44 would suggest that there was significant disagreement on this choice. The scale was from strongly disagree to strongly agree. Ten respondents (48 percent) selected either: strongly agree or agree, whereas six (29 percent) chose strongly disagree or disagree. Five (24 percent) were undecided.

Like question #60, question #66, "don't like working on machines", was also seen as a response that held much disagreement. With a mean 2.95 and a standard deviation of 1.43, it can be expected that some females really like working on machines whereas others either don't like working on them or don't like the idea of working on them. Nine respondents (43 percent) selected either agree or strongly agree, eleven (52 percent) selected either disagree or strongly disagree. One (5 percent) was undecided.

The respondents were given an opportunity to list "other" reasons for not selecting a technology class as an elective. Here are those responses:

    I just don't like the subject.
*My schedule is full.
    Just never thought about it.
*It would mean that I couldn't have another class that I like.

*I don't think that I will need it for what I plan to do for a future career.
 I'm not sure, I may go to a different school next year anyway.
*Not enough time in my schedule.
 I don't know much about it but I know quite a bit about it.
 I really don't know what it is and I don't want to get too involved.
 It's just not fun enough and too slow going.
*I have other types of jobs in mind that don't require this class.
*I really just don't want to because it's not the kind of thing I'm in to. I tried it
        and decided I get enough at home and I just don't want to start it at school.
 Because there is a specific way to do everything, you can't do something
        different than anyone else.
 They don't let you do what you want everything has to be their way.
*I might not because some of the stuff I am not interested in. I might because
        some of the stuff I am interested in.

Clearly some of these responses could again have been incorporated into the

given choices. The most common responses (*) show that the respondents think that the

technology education electives are something that they either don't think they will need,

or that the class will not fit into their schedules, or that they are just not interested. This

tends to support the choices as given in Table D. These reasons address the purpose of

this study, to find out why female students are not enrolling in higher numbers in the

technology courses offered at Spencer School Systems.   Several didn't like the structured

format that the classes follow.

Technology Education Electives

Page four of the survey listed eight possible technology education electives where

the respondent could select as many as they felt they were interested in taking. Only

those 21 planning to take a technology elective were directed to the last page. The

electives are listed numbering from 44 to 51, with an "other" place to write in something

not listed. The respondents could mark all those that they would be interested in taking.

This page of the survey addresses the research question: Are the females aware of the

course offerings in technology education at Spencer? Through deduction and evaluation

of the responses, it can be seen that females are aware of the technology electives

available at Spencer. However, it remains unknown if those who did not select

technology class electives did so because they were unaware or because of some other

reason. Perhaps the social relationships, as mentioned in the Streitmatter study, come

into play and alter what choices the females ultimately make.

The total numbers of responses for each category are listed in Table E.

Table E: Elective Responses

Table E: Elective Responses
```
================================================================
Technology Education Electives
                                                   Number of responses

44.     Building Trades……………………..…              8
45.     Communications……………………………             9
46.     Computer Applications……………………..     16
47.     Desk Top Publishing………………………..     11
48.     Electricity…………………………………...             7
49.     Material Processing………………………….             4
50.     Small Engines………………………………..     12
51.     TV Productions……………………………...     16
52.     Other………………………………………             2
================================================================
```

If this were an indication of the classes of the near future, then there would be an

evident increase in the number of females enrolling in technology education courses.

Perhaps this is a wish list by these young respondents before the realities of scheduling

and graduation requirements have been seriously considered. It is this researcher's

opinion that the content of the courses is not known well enough or there would be a

larger enrollment in the material processing course, as well as the Communications

course, and perhaps in all the technology education courses. All of these courses offer

skill development opportunities that will prove valuable to the student no matter what career or path the student chooses to take. The familiarity with the activities pursued in some of these classes accounts for the higher numbers. Students especially notice the TV Productions class due to the fact that the students prepare and show a student production during the noon-hour at the Spencer School. This is evidence that exposure captures interest and can influence students to take certain courses.

The other two write-in responses were: Internet information/how to look for information on the Internet, and car repair. These are also skills that can be used for a lifetime. Perhaps the Internet-based skills are covered in some other course. This would be an area to explore for future possibilities. The car repair course would have to be once again added to the curriculum.

In the following last chapter, this study will be summarized, conclusions will be drawn, and recommendations will be made for further research.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

<u>Summary</u>

The pace of technological change is accelerating. With technological change comes a growth in new technology related careers. With this technology related expansion of the job market a corresponding growth of people trained or educated in these new technologies is also necessary. Traditionally, this growth has always been filled by the male sector of our society. It has only been relatively recently that society has been willing to accept the female gender into many of these male-dominated jobs. However, the low enrollment numbers of females in technology-related classes, which would prepare the female for these job openings, continues to follow patterns established years ago.

Research has shown that females choose not to select technology related courses for many different reasons. Some reasons have to do with the environment in which they were raised. An environment shaped by tradition and opinion. Traditionally, women have been expected to move if the husband's job required him to move. Women have been expected to quit their jobs in order to raise children. And most found this to be entirely satisfactory until the last 30 or so years. In fact, the comments from women up until about the 1970's conveyed a sense of complacency and satisfaction. It was common to assume a career until marriage, then often discontinuing the career.

Studies have shown that females will choose to enter job fields that are already dominated by females. Discrimination has certainly turned females away from entering male-dominated fields. Women have been found to start at lower wage levels and thus

never get caught up to their male counterparts because of this lower starting level. Research has revealed that the younger females feel this perceived discrimination more than the older females. Thus a large disparity in the wages received by women of different ages is evident in the job market.

Personality has been shown to have a significant bearing on the choice of career path by the female. It has been found that those exhibiting more masculine traits are more likely to choose a non-traditional career path. It has also been found that those females who have had strong supportive relationships will be more likely to venture into a non-traditional career path.

Gender roles and sex typing have placed women on a kind of probation in the job market. In the past, women hired into positions held by males have been closely scrutinized. Males have believed that the women needed to "prove" themselves before they could be trusted. These occurrences have turned women away from technological openings traditionally held by men.

All of these job-related inputs are often reflected through the opinions and influences of parents or guardians. Most parents or guardians will "train" their young to identify with female roles or male roles, and the jobs that are typically male or female. By the time the female child enters the school years, she will usually have established a set pattern of beliefs associated with female roles and identities.

Schools try to offer equity, as mandated by recent law, but still find themselves buried in the quagmire of bias and indifference. Communication styles, teaching techniques, and teacher-student relationships illustrate a different set of expectations. When the issues associated with male versus female hormones are added to the picture

course selections have been seen to closely follow traditional gender lines.

Federal programs, like the Appalachia Program, have shown many promising results. Females have demonstrated a 60 plus percent improvement in attitudes, self-reliance, and career awareness after participating in the program. The Connecticut research conducted by Silverman and Pritchard in 1993 has revealed some interesting insights to the female psyche and her choice of courses during school years. Namely, that the female found many of the technological courses to be interesting but because of gender-related social pressures would choose not to take additional courses in technology even though they enjoyed them. An increase of female technology instructors and female guidance counselors was seen as a recommendation of Silverman and Pritchard to increase female participation in technology education courses. Further studies in Virginia confirmed the existence of expected stereotypical careers for women.

Studies in Wisconsin have found that females need to see technology as something that they can physically touch. Secondly, females view technology as a means to communicate, or as a social enhancer. Thirdly, nearly a third of the students would not take courses they were interested in taking for many different reasons, some confirming the findings of Silverman and Pritchard. Another study has shown that females do not see guidance counselors as a hindrance to their taking technology education courses. Students felt that the needs of the student were not being met by the school's existing four-year plan, and, females were just not interested in taking technology education courses.   Another study in Wisconsin cited that the number one reason females did not take technology education courses was that the times that the courses were offered conflicted with other courses that they wanted or needed to take.

Agreement can be found concerning the complexity of the decision-making process concerning selection of courses. While some may be influenced by their environments others by their circle of acquaintances, and others will simply no particular interest in pursuing technology education courses because the courses do not "fit" into their programs. For these reasons and more, it is evident that the manner in which technology education teachers instruct these types of courses can be significantly affected by the amount of understanding that can be gained concerning the decision-making process of the females. If an understanding of the female position is gained, then it may be easier to alter teaching techniques, programs, and facilities so that the interest and enthusiasm of the females can be furthered during their participation in technology education courses.

Restatement of the Purpose of the Study

The purpose of this descriptive study was to identify the reason(s) why female students are not enrolling in higher numbers in the Spencer High School technology education courses. The data gathered from this study may be used to influence change in the technology education program. These changes may occur in the areas of content, instructional techniques, scheduling, facilities, and offerings.

Restatement of the Research Questions

The questions that this study will answer are as follows:

1. Are the females aware of the course offerings in technology education at Spencer?

2. Where did the females learn about the technology education elective courses offered at Spencer?

3. What electives, currently offered by Spencer, would the females be interested in taking?

4. What are the factors encouraging females to enroll in technology education courses at Spencer?

5. What are the factors preventing females from enrolling in some of the technology education courses at Spencer?

<u>Research Method</u>

   Data was gathered for this descriptive study from a survey that was developed by the author. All of the 84 females in the seventh and eighth grades at the Spencer School System were given questionnaires to complete. The males were also given questionnaires but their responses were only given limited consideration in this study. The total number of usable surveys returned by the females of the two classes, was 43. The survey was done in the Spring of the year 2000.

      The students were asked to complete the questionnaires dealing with their attitudes concerning the technology course electives offered at Spencer. Due to time constraints however, the teachers elected to have the surveys treated as extra credit work for the students, who could return them at their leisure. This unfortunately resulted in the rather low return rate of 51.2 percent. In order to generalize the survey sample results to the population, a significantly higher return rate would be needed. However, some interesting findings resulted from the surveys that were returned. Caution needs to be exercised when attempting to apply these findings to the entire population.

      Many of the questions were taken from existing surveys from previous research studies. Four primary research areas were addressed with multiple questions listed under

each of these four areas: 1) people or places where you learned about technology class electives, 2) who influenced your final choice of technology class electives, 3) reasons why you plan to select a technology class as an elective, 4) reasons why you will not select a technology class as an elective. These were the dependent variables.

Conclusions

This study was undertaken to find out the reason(s) or factor(s) why female students are not enrolling in higher numbers in the Spencer High School technology education courses. The conclusions will be directed at answering the five research questions:

1. Are the females aware of the course offerings in technology education at Spencer?

2. Where did the females learn about the technology education elective courses offered at Spencer?

3. What electives, currently offered by Spencer, would the females be interested in taking?

4. What are the factors encouraging females to enroll in technology education courses at Spencer?

5. What are the factors preventing females from enrolling in some of the technology education courses at Spencer?

Question #1 can be answered by collectively considering all the responses given for the entire questionnaire. By the seventh or eighth-grades awareness appears good. The students also appear to have a good idea about the different types of careers that are available. This is derived from the wide variety of responses to question #89, which asks

the respondents if they had to choose a future career today, what would it be? However, it is unknown if those respondents who aren't planning to take a technology class as an elective chose to do so without knowing about the available of the different technology electives at Spencer.

According to the respondents, the top sources for information about technology education courses at Spencer were (from best to worst): "student who had the class", "teachers", and "friends/parent/guardian". Previous participants in the class ranked the highest among the respondents. Perhaps this is not surprising considering these are the people with whom the students spend the most time associating.

The most disagreement among the students concerned the choices of: "relative", "teachers", "principal" and "other K-12 grade schools". The respondents were all over the scale on their ratings for the choices listed. This suggests that to some these responses are highly valuable, and to others they are insignificant.

The least influential were, (from least to most): "student from a different school", "principal", "schools beyond the twelfth grade", "the public library", and "the student handbook". Several of these had the worst levels of agreement at the same time, meaning that some of the students highly valued these choices while other didn't.

The choice of electives was answered in the section on electives, covering questions #44 through #51, with a space to write in selections not listed. The respondents could choose as many electives as they wished. Of the 43 respondents, 16 votes were cast for TV Production and Computer Applications, 12 votes went to Small Engines and 11 to Desk Top Publishing. Nine votes were cast for Communications and seven for

Building Trades. Four were cast for Material Processing and one vote each for the write-ins of Internet Instruction and Car Repair.

It is this researcher's opinion that the content of these technology education courses is not known well enough or there would be a larger enrollment in the material processing course, as well as the Communications course, and perhaps in all the technology education courses offered by Spencer. It is also the opinion of this researcher that there would be just as many females interested in car repair if it were listed as a choice. These are areas where awareness will prove beneficial for a lifetime.

The factors that are seen as motivators to select a technology education course are: the students felt it would be fun, they needed the course for a future career, and they wanted to learn something new. The responses given by the females showed that they were excited about selecting the technology course electives because many of them had equally attractive electives that they could have selected, but they still chose the technology electives.

The respondents appeared to be influenced mostly by their friends. Though considerable disagreement was evident by the spread of the responses. One thing that did stand out was that the respondents didn't credit the counselor with having any significant influence. At the same time, they did say that the counselor didn't negatively influence their decisions either.

Twenty-five percent of the respondents cited a scheduling conflict as a reason for not selecting a technology class as an elective. Another whopping 67 percent were undecided on this point. This suggests that some real scheduling problems may exist. It also suggests that the students may not be aware of the challenges of making a schedule

at this point in their school careers. The respondents overwhelmingly do not see their friends as discouragers. The females also do not see the classes as "for only boys".

The majority of the females know what the classes are about, still, as many as 38 percent may not know what the classes are about. Here lies an opportunity to get the word out, so to speak. The respondents do not appear to be worried about being the only female in the class or about the males staring at their bodies.

Interest in the subject received mixed views and ran over the entire rating scale. This is not surprising considering 38 percent are not sure about what the subject entails. Here again an opportunity to get the word out would create interest. Not knowing would also impact the "don't like working on machines" choice. A fear of the unknown could result and become an influential force in deterring enrollment in the technology education electives.

The most common factor deterring enrollment in technology courses is that the respondents "just don't think they will need to know that material". Again, this combined with the scheduling factor can produce large decreases in enrollment numbers. Here is where an informational campaign would prove beneficial. Lifelong skills are learned in technology courses and do not have to be just for those seeking careers in technology fields.

Recommendations

Based on the findings of this study, there are some recommendations that can be made. This study deals directly with the factors influencing the enrollment of females in technology education courses at Spencer Schools. This study was undertaken to discover why female enrollment is so low in the technology classes at Spencer, and to arrive at

conclusions designed to increase female participation in technology courses. The following recommendations are made in the spirit of cooperation and what is best for the students.

       1.   A promotional campaign should be developed to educate all students, (including the early grades) as well as administrators, other teachers, and the community, concerning course content and applicability in everyday life. This could take the form of articles in the school newspaper, bulletin boards, displays, posters, class tours, and informational exchanges with other teachers. The spirit of cooperation must exist. The skills taught in the technology courses are every bit as important as those taught in Math, English, etc., maybe even more so in this technologically advancing world. The community needs to be involved with articles in the local newspaper. Students partaking in the courses could write these. The community should also be involved in informational meetings and programs that illustrate what is being taught in the technology education programs.

       2.   Greater staff and administration involvement needs to be sought. The importance of technology in the lives of every student makes for an excellent reason to try to get the technology courses included as part of the "core" of courses required by all students. The technology education teachers need to seek out and invite teachers from other departments to visit the technology education department so that they will have a better understanding and appreciation about what technology education entails.

       3.   The guidance counselor should be encouraged to offer positive and supportive encouragement to the female students when they are seeking information about technology education courses. Counselors should be encouraged to provide

positive feedback to female students when asked about technology related career options.

4.   The administration needs to be encouraged to seek out all possible flexible class scheduling arrangements in order to accommodate those students that would like to take technology electives.

5.   The environment of the technology education department could stand to be updated. The makeover could be as simple as new paint and could become a class project for one of the technology courses, or as a school project.   Make the department so attractive that the females will feel left out if they do not participate in the courses, and for good reason. This will also attract a new collective of male students.

6.   Alter some of the teaching strategies where it may not be so important to stick to rigid patterns of instruction. Allow the student more flexibility, within limits.

7.   The administrative challenge is to take a serious look at the technology education curriculum to see if it is adequate to meet the new 1998 Technology Education Standards as established by the State. In addition, to examine their own beliefs and attitudes as well as the school district's beliefs and attitudes towards females involvement in technology education courses.

 Recommendations for Further Study

1.   A study of grade school children to find out how much they know about technology class electives.

2.   Continuing evaluation of the factors influencing female enrollment in technology education courses at Spencer School Systems, especially after an informational campaign has been launched.

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APPENDIX A

SEVENTH AND EIGHTH-GRADE QUESTIONNAIRE COVER LETTER

SPENCER PUBLIC SCHOOL
300 School Street
Spencer, WI 54479

SEVENTH AND EIGHTH-GRADE STUDENTS

Dear Student:

In cooperation with the Spencer School System, this questionnaire of all the Seventh and Eighth-grade students is being conducted to determine what factors influence students to enroll in or not to enroll in Technology Education courses at Spencer.

Although it is understood that the Technology courses are mandatory for the Seventh and Eighth-grades, the choice to take Technology Education courses in High School will be yours. You are being chosen in and effort to find out the factors influencing student's choices of Technology Education courses, before they enter High School.

Your honest answers to the questions are needed. Your beliefs and opinions are exactly what are requested. There are no "right" or "wrong" answers.

Your names will not be placed on the questionnaires. All questionnaires will be anonymous. It is necessary to indicate your grade and your sex on the first page of the questionnaire by marking the appropriate spaces.

Your Homeroom Teacher will be distributing the questionnaires and assisting in answering any questions that you may have while completing them. Once finished, they will be kept in the office until they are picked up for analysis.

Thank you for helping in this study.

Sincerely,

Robert Buker, Graduate Student
Technology Education, UW-Stout

APPENDIX B

CONSENT FORM

CONSENT FORM (Signature not Required)

I understand that by returning the/this questionnaire, I am giving my informed consent as a participating volunteer in this study. I understand the basic nature of the study and agree that any potential risks are exceedingly small. I also understand the potential benefits that might be realized from the successful completion of this study. I am aware that the information is being sought in a specific manner so that no identifiers are needed and so that confidentiality is guaranteed. I realize that I have the right to refuse to participate and that my right to withdraw from participation at any time during the study will be respected with no coercion or prejudice.

NOTE: Questions or concerns about participation in the research or subsequent complaints should be addressed to the researcher or research advisor and second to Dr. Ted Knous, Chair, UW-Stout Institutional Review Board for the Protection of Human Subjects in Research, 11HH, UW-Stout, Menomonie, WI, 54751, phone (715) 232-1126.

APPENDIX C

QUESTIONNAIRE

FACTORS INFLUENCING ENROLLMENT IN TECHNOLOGY EDUCATION COURSES AT SPENCER SCHOOL SURVEY

<u>DIRECTIONS</u>:	Please read each item. Circle the number after each item that <u>best</u> matches your opinion. The opinions range from: (1) strongly disagree to (5) strongly agree. If you are undecided, circle the (3).

<u>OPINIONS</u>:

1 = SD = Strongly Disagree	4 = A = Agree	
2 = D = Disagree	5 = SA = Strongly Agree	
3 = ? = Undecided		

<u>A.	People or places where you have learned about Technology Class Electives.		.</u>

		SD	D	?	A	SA
1.	From friends………………………….		1	2	3	4 5
2.	From Parents………………….………		1	2	3	4 5
3.	From brother/sister/other relative……….		1	2	3	4 5
4.	From counselors…………………………		1	2	3	4 5
5.	From students who have had the class…..		1	2	3	4 5

		SD	D	?	A	SA
6.	From a student at a different school….		1	2	3	4 5
7.	From teachers you've had……………….….		1	2	3	4 5
8.	From the principal…………………..…	1	2	3	4	5
9.	From a previous required class………..…	1	2	3	4	5
10.	From the student handbook………..……		1	2	3	4 5

		SD	D	?	A	SA
11.	From other K-12th-grade schools…..…….	1	2	3	4	5
12.	From schools beyond 12th-grade……..…..	1	2	3	4	5

13.   From the school library…………….…   1   2   3   4   5

14.   From the public library……………..……   1   2   3   4   5

15.   Other (please specify) _____   1   2   3   4
        5

OPINIONS: 1 = SD = Strongly Disagree   4 = A = Agree
            2 = D = Disagree   5 = SA = Strongly
Agree
                3 = ?   = Undecided

B.   Who influenced your final choice of Technology Elective Classes?
.

		SD	D	?	A	SA
16.	Your parent/guardian…………………...		1	2	3	4
	5					
17.	Counselors………………………………		1	2	3	4
	5					
18.	Friends……………………………………..		1	2	3	4
	5					
19.	Brother/sister/other relative……………..		1	2	3	4
	5					
20.	Yourself…………………………………		1	2	3	4
	5					

21.	Another student who took the same class.		1	2	3	4
	5					
22.	The teacher……………………………………		1	2	3	4
	5					
23.	Someone employed in that field that you do not know…		1	2	3	4
	5					
24.	Other (please specify)_____	1	2	3	4	5

_____ .

25.   Do you plan on selecting a Technology Education class as an elective?

_____ (1) If **Yes**, PLEASE **GO TO PAGE 3.**

_____ (2) If **No**, PLEASE **GO TO PAGE 5**.

2

<u>OPINIONS</u>:

1 = SD = Strongly Disagree	4 = A = Agree
2 = D = Disagree	5 = SA = Strongly Agree
3 = ? = Undecided	

_____

_____C._____Reasons why you plan to select a Technology Education Class as an elective .

		SD	D	?	A	SA
26.	Important for your future job (career)…...	1	2	3	4	5
27.	The teacher was good…………….………	1	2	3	4	5
28.	To be with friends………………………..	1	2	3	4	5
29.	For an easy credit………………………...	1	2	3	4	5
30.	Teacher(s) encouraged you to take it…….	1	2	3	4	5
31.	Parents encouraged you to take it………..	1	2	3	4	5
32.	Counselors encouraged you to take it…....	1	2	3	4	5
33.	For the challenge………………………...	1	2	3	4	5
34.	You dislike the other electives…..……..	1	2	3	4	5
35.	Interested in the subject…………………	1	2	3	4	5
36.	Interested in the activities……………...	1	2	3	4	5
37.	To learn how to use tools and equipment.		1	2	3	4 5

38.　To work with other students……..……．　1　　2　　3　　4　　5

39.　To learn something new…...………….....　　1　　2　　3　　4
　　　5

40.　You are good at it……………………..…　　1　2　　3　　4　　5

41.　It will be fun……………………..……　　1　2　　3　　4　　5

42.　In order to take future classes………..….　　1　　2　　3　　4
　　　5

43.　Other (please specify)_____　1　　2　　3　　4　　5

　　　3

Please make a mark (X) in front of those Technology Education Electives that you would be interested in taking. (Mark all those that apply.)

44. _____   Building Trades

45. _____   Communications

46. _____   Computer Applications

47. _____   Desk Top Publishing

48. _____   Electricity

49. _____   Material Processing

50. _____   Small Engines

51. _____ TV Productions

52. _____ Other (Please Specify):_____

_____

_____

4

OPINIONS:

1 = SD = Strongly Disagree	4 = A = Agree
2 = D = Disagree	5 = SA = Strongly Agree
3 = ? = Undecided	

_____

D.   Reasons why you will not select a Technology Education Class as an elective.   .

		SD	D	?	A	SA
53.	I don't know what the class is about……..		1	2	3	4	5
54.	Afraid of getting hurt…………………….	1	2	3	4	5
55.	I don't need it for my future career……….	1	2	3	4	5
56.	Not enough time in my schedule…………	1	2	3	4	5
57.	Conflict with another class……………….	1	2	3	4	5

58.	Previous class required……………………	1	2	3	4	5
59.	Had a bad experience in a past class…....…	1	2	3	4	5
60.	Not interested in the subject……………...	1	2	3	4	5
61.	Already understand/know the subject…......	1	2	3	4	5
62.	To avoid a teacher………………….……	1	2	3	4	5

63.	Fear of receiving a low grade…………..…	1	2	3	4	5
64.	To avoid certain students………………...	1	2	3	4	5
65.	Friends will not be in the class………..……	1	2	3	4	5
66.	Don't like working on machines……….....	1	2	3	4	5
67.	It's too messy……………………………	1	2	3	4	5
68.	The room is too dark and dingy/dirty…….	1	2	3	4	5

69.	The room smells bad……………………..	1	2	3	4	5
70.	The equipment is old and outdated……….	1	2	3	4	5

…Please go on to the next page…   5

OPINIONS:

1 = SD = Strongly Disagree	4 = A = Agree
2 = D = Disagree	5 = SA = Strongly Agree
3 = ? = Undecided	

E.   Reasons why you will not select a Technology Education Class as an elective (continued)

		SD	D	?	A	SA
71.	It's not fun……………………...……	1	2	3	4	5
72.	Friends discouraged me…………...……	1	2	3	4	5
73.	Parents discouraged me…………………	1	2	3	4	5
74.	Teacher(s) discouraged me……………...	1	2	3	4	5
75.	Counselor(s) discouraged me……………	1	2	3	4	5

(Boys skip #76 through #81)

		SD	D	?	A	SA
76.	It's not for girls………………………….	1	2	3	4	5
77.	The boys tease the girls in the class…….	1	2	3	4	5
78.	I don't want to be the only girl in class.…	1	2	3	4	5
79.	Don't want the boys staring at my body...	1	2	3	4	5
80.	Boys in class know more than the girls…	1	2	3	4	5
81.	Teacher favors the boys…………………	1	2	3	4	5

----

82.   Other reason(s) you will not select a Technology Education Class as an elective

(Please Specify) _____

_____

_____

6

DEMOGRAPHICS

DIRECTIONS: Please answer each question. Mark your response with a (X).

83.   What is your present grade level?
_____ 7th   _____ 8th

84.   What is your gender?
_____ Male   _____ Female

85.   Please indicate the highest level of schooling completed by: your parent(s) or guardian(s).
85. Mother (or female guardian)   Father (or male guardian)
_____ a. Less than High School   _____ a. Less than High School
_____ b. High School Graduate   _____ b. High School Graduate
_____ c. Vocational School Graduate   _____ c. Vocational School Graduate
_____ d. College Graduate   _____ d. College Graduate

86.   Please mark the response that <u>best</u> describes your average grades.
_____ a. A, A-   _____ d. D+, D, D-
_____ b. B+, B, B-   _____ e. Less than D-
_____ c. C+, C, C-

87.   Do you plan to go on to school after high school?
_____ a. Yes
              _____ 1. College
              _____ 2. Vocational/Technical School
_____ b. No

88.   At what grade level did you first start to think about a future career ?
(Please mark only one response.)
_____ a. First or Second   _____ d. Seventh or Eighth
_____ b. Third or Fourth   _____ e. Have not thought
_____ c. Fifth or Sixth   about it yet

89.   If you were to choose your future career today, what would it be?
___ a. Business and Financial Services   ____h. Health Care
Professionals
___ b. Education, Government and Social Services ____i. Hospitality Industry
___ c. Engineering and Computer Technology   ____j. Science
___ d. Management and Office Personnel   ____k. Media and the Arts
___ e. Sales and Personal Services   ____l. Agriculture
___ f. Manufacturing, Construction, Repair   ____m. Transportation
___ g. Other (Please Specify) _____

THANK YOU VERY MUCH FOR YOUR COOPERATION!!

7

APPENDIX D

SEVENTH AND EIGHTH GRADE
HOMEROOM TEACHER INSTRUCTION SHEET

Seventh and Eighth Grade
Homeroom Teacher Instruction Sheet

Together with the Administration of Spencer Schools, this researcher is asking for your

kind assistance in gathering some information with the attached surveys. One class

period should be enough time to complete these surveys. Once completed, please return

them to Mr. Wessel's office where they will be stored until such time as this researcher

can retrieve them for analysis.

The purpose of the survey is to gain useful information on the factors influencing

enrollment in Technology Education courses at the Spencer School. Your cooperation is

greatly appreciated in this effort. Once you gain the attention of the students, please read

the following directions to the class before you distribute the questionnaires:

> Today you have a chance to give your school your thoughts, your beliefs, and
>
> your feelings about why you would, or why you would not, take Technology
>
> Education courses at the high school level. We ask that you complete a survey.
>
> In order for the survey results to be beneficial to you and the school, please
>
> answer the questions as honestly as possible. Directions on how to answer the
>
> survey questions are on the surveys. If you have any questions, feel free to ask
>
> for some help.
>
> PLEASE DO NOT put your name on the surveys. PLEASE DO mark your sex
>
> and grade level on the front of the survey. You will have up to the whole class
>
> period to answer the questions. If you are finished before your neighbor, please

do not bother them. Do something else quietly till the end of the period. Thank you for your help in completing this survey. Are there any questions about these directions?

APPENDIX E

PRE-EVALUATOIN OF QUESTIONNAIRE BY STUDENTS AND TEACHERS

PRE-EVALUATOIN OF QUESTIONNAIRE
BY STUDENTS AND TEACHERS

Students reviewing the survey: 8

Gender……………………….   (4) Female; (4) Male

Grade………………………...   (4) Junior; (3) Sophomore; (1) Freshman

Comments:

Very, very easy to understand.
I get it.
Fine.
Fine.
What's technology classes?
Sum up elective classes.
The word "elective" throws seventh-grade students off.
Long.

Teachers reviewing the questionnaire: 2

Gender……………………………….   (2) Male

Years teaching……………………….   10 & 31

Comments:

Looks good.
Fine.
Nice and neat.
Do kids know what technology offerings are?
Are you assuming the four basic (T.E., Business, Agriculture, FACE) technology areas?
May some students feel Art is an elective?
Info presented well.

APPENDIX F

DEMOGRAPHIC TOTALS (7TH & 8TH grade females)

DEMOGRAPHIC TOTALS (7TH & 8TH grade females)

<u>DIRECTIONS</u>: Please answer each question. Mark your response with a (X).

83.   What is your present grade level?
    <u>22</u> 7th <u>21</u> 8th

84.   What is your gender?
    <u>   </u> Male   **<u>ALL</u>** Female

85.   Please indicate the highest level of schooling completed by: your parent(s) or
         guardian(s).

85. **Mother (or female guardian)**	**Father (or male guardian)**
<u> 3 </u> a. Less than High School	<u> 3 </u> a. Less than High School
<u>27</u> b. High School Graduate	<u> 25 </u> b. High School Graduate
<u> 3 </u> c. Vocational School Graduate	<u> 2 </u> c. Vocational School Graduate
<u> 8 </u> d. College Graduate	<u> 9 </u> d. College Graduate

86.   Please mark the response that <u>best</u> describes your average grades.
    <u>16</u> a. A, A-   <u>----</u> d. D+, D, D-
    <u>21</u> b. B+, B, B-   <u>----</u> e. Less than D-
    <u> 6 </u> c. C+, C, C-

87.   Do you plan to go on to school after high school?
    <u>38</u> a. Yes
                  <u>35</u> 1. College
                  <u> 3 </u> 2. Vocational/Technical School
    <u> 3 </u> b. No

88.   At what grade level did you first start to think about a future career ?
         (Please mark only one response.)
    <u> 2 </u> a. First or Second   <u> 10 </u> d. Seventh or Eighth
    <u> 7 </u> b. Third or Fourth   <u> 6 </u> e. Have not thought
    <u>18</u> c. Fifth or Sixth   about it yet

89.   If you were to choose your future career today, what would it be?
    <u> 1 </u> a. Business and Financial Services   <u> 5 </u>h. Health Care
    Professionals
    <u> 1 </u> b. Education, Government and Social Services <u> 1 </u> i. Hospitality Industry
    <u> 1 </u> c. Engineering and Computer Technology   <u> 2 </u> j. Science
    <u>---</u> d. Management and Office Personnel   <u> 3 </u> k. Media and the Arts
    <u> 2 </u> e. Sales and Personal Services   <u> 4 </u> l. Agriculture
    <u>---</u> f. Manufacturing, Construction, Repair   <u>---</u> m.Transportation
    <u>20</u> g. Other (Please Specify)

    _____

THANK YOU VERY MUCH FOR YOUR COOPERATION!!

APPENDIX G

CAREER WRITE-IN RESPONSES (7th & 8th grade females)

CAREER WRITE-IN RESPONSES (7th & 8th grade females)

One vote for each of the following:

Sawyer at uncles Sawmill	Sports Caster
Art-Cartoon Drawing	Doctor
Orthodontia	Tennis Player
DNR Officer	Sports
Singing	Journalist
Entertainment-Acting, etc.	Law
Veterinarian	Architect
Restaurant Owner	Lawyer
Nurse	Veterinarian
Animal Care	Not Sure

TABLES

Table AA

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=====

People or places where you have learned about Technology Class Electives.
(Female Responses)

ITEM NUMBER	SD 1	D 2	U 3	A 4	SA 5	MEAN	STANDARD DEVIATION
1	7.0%	18.6%	27.9%	44.2%	2.3%	3.16	1.00
2	4.7	30.2	14.0	46.5	4.7	3.16	1.07
3	11.6	25.6	18.6	32.6	11.6	3.07	1.24
4	16.3	27.9	34.9	20.9	----	2.60	1.00
5	7.0	9.3	20.9	48.8	14.0	3.53	1.08
6	41.9	14.0	30.2	11.6	2.3	2.19	1.18
7	14.0	9.3	16.3	48.8	11.6	3.35	1.23
8	39.5	20.9	20.9	14.0	4.7	2.23	1.25
9	11.9	21.4	23.8	38.1	4.8	3.02	1.14
10	27.9	23.3	27.9	16.3	4.7	2.47	1.20
11	30.2	18.6	27.9	18.6	4.7	2.49	1.24

12	34.9	20.9	27.9	14.0	2.3
	2.28	1.16			
13	25.6	18.6	32.6	20.9	2.3
	2.56	1.16			
14	30.2	18.6	34.9	14.0	2.3
	2.40	1.14			
15	13.3	20.0	53.3	13.3	----
	2.67	0.90			

===
======

Table BB

==

Who Influenced Your Final Choice of Technology Elective Classes?
(Female Responses)

ITEM NUMBER	SD 1	D 2	U 3	A 4	SA 5	MEAN	STANDARD DEVIATION
16	16.7%	7.1%	31.0%	33.3%	11.9%	3.17	1.25
17	29.3	22.0	31.7	17.1	----	2.37	1.09
18	19.0	11.9	38.1	26.2	4.8	2.86	1.16
19	26.8	14.6	31.7	19.5	7.3	2.66	1.28
20	7.3	4.9	19.5	39.0	29.3	3.78	1.15
21	16.7	19.0	26.2	35.7	2.4	2.88	1.15
22	24.4	12.2	31.7	29.3	2.4	2.73	1.20
23	28.6	26.2	40.5	2.4	2.4	2.24	0.98
24	13.3	6.7	73.3	----	6.7	2.80	0.94

==

Table CC

===

Reasons why you plan to select a Technology Education Class as an elective.
(Female Responses)

ITEM NUMBER	SD 1	D 2	U 3	A 4	SA 5	MEAN	STANDARD DEVIATION
26	----%	----%	10.0%	55.0%	35.0%	3.55	0.86
27	18.2	9.1	54.5	18.2	----	2.73	0.98
28	4.5	27.3	27.3	36.4	4.5	3.09	1.02
29	13.6	13.6	36.4	31.8	4.5	3.00	1.11
30	13.6	22.7	36.4	22.7	4.5	2.82	1.10
31	18.2	18.2	13.6	40.9	9.1	3.05	1.33
32	27.3	31.8	36.4	4.5	----	2.18	0.91
33	9.1	----	27.3	50.0	13.6	3.59	1.05
34	36.4	18.2	40.9	4.5	----	2.14	0.99
35	----	9.1	31.8	36.4	22.7	3.73	0.94
36	----	9.5	23.8	42.9	23.8	3.81	0.93

ITEM NUMBER	SD 1	D 2	U 3	A 4	SA 5	MEAN	STANDARD DEVIATION
37	4.5	4.5	18.2	40.9	31.8	3.91	1.06
38	9.1	----	31.8	45.5	13.6	3.55	1.06
39	4.5	----	9.1	59.1	27.3	4.05	0.90
40	4.8	9.5	47.6	19.0	19.0	3.38	1.07
41	----	----	31.8	36.4	31.8	4.00	0.82
42	13.6	4.5	45.5	22.7	13.6	3.18	1.18
43	20.0	----	40.0	20.0	20.0	3.20	1.48

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Table DD

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Reasons why you will not select a Technology Education Class as an elective.
(Female Responses)

ITEM NUMBER	SD 1	D 2	U 3	A 4	SA 5	MEAN	STANDARD DEVIATION
53	23.8%	38.1%	14.3%	14.3%	9.5%	2.48	1.29
54	38.1	38.1	14.3	4.8	4.8	2.00	1.10
55	4.8	19.0	52.4	9.5	14.3	3.10	1.04
56	----	9.5	42.9	28.6	19.0	3.57	0.93
57	4.8	4.8	66.7	23.8	----	3.10	0.70*

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58	14.3		23.8	52.4	4.8	4.8
	2.62	0.97				
59	14.3		38.1	19.0	19.0	9.5
	2.71	1.23				
60	9.5		19.0	23.8	9.5	38.1
	3.48	1.44*				
61	4.8		19.0	52.4	19.0	4.8
	3.00	0.89				
62	42.9		23.8	19.0	9.5	4.8
	2.10	1.22				

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63	23.8		52.4	4.8	14.3	4.8
	2.24	1.14				
64	33.3		38.1	14.3	4.8	9.5
	2.19	1.25				
65	23.8		38.1	28.6	4.8	4.8
	2.29	1.06				
66	14.3		38.1	4.8	23.8	19.0
	2.95	1.43*				
67	23.8		42.9	14.3	14.3	4.8
	2.33	1.15				

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68	28.6		47.6	14.3	4.8	4.8
	2.10	1.04				
69	23.8		42.9	14.3	9.5	9.5
	2.38	1.24				
70	28.6		47.6	14.3	4.8	4.8
	2.10	1.04				
71	14.3		14.3	38.1	19.0	14.3
	3.05	1.24				
72	28.6		47.6	23.8	----	----
	1.95	0.74*				

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73	38.1		47.6	14.3	----	----
	1.76	0.70*				
74	38.1		42.9	14.3	4.8	----
	1.86	0.85				
75	38.1		47.6	14.3	----	----
	1.76	0.70*				
76	55.0		30.0	10.0	5.0	----
	1.65	0.88				
77	30.0		35.0	20.0	15.0	----
	2.20	1.06				

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78	36.8	36.8	21.1	5.3	----
	1.95	0.91			
79	45.0	15.0	30.0	----	10.0
	2.15	1.31			
80	45.0	40.0	5.0	----	10.0
	1.90	1.21			
81	30.0	45.0	10.0	10.0	----
	2.15	1.14			

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Table EE

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Technology Education Electives

Number of responses

44.	Building Trades……………………..…	8
45.	Communications……………………………	9
46.	Computer Applications……………………..	16
47.	Desk Top Publishing………………………..	11
48.	Electricity…………………………………...	7
49.	Material Processing………………………….	4
50.	Small Engines………………………………..	12
51.	TV Productions……………………………...	16
52.	Other……………………………………………	2

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Write-Ins:

Internet How To Use…………………………	1
Car Repair……………………………………	1