IDENTIFYING FACTORS THAT INFLUENCE ENROLLMENT IN TECHNOLOGY EDUCATION CLASSES AT STILLWATER AREA HIGH SCHOOL

by

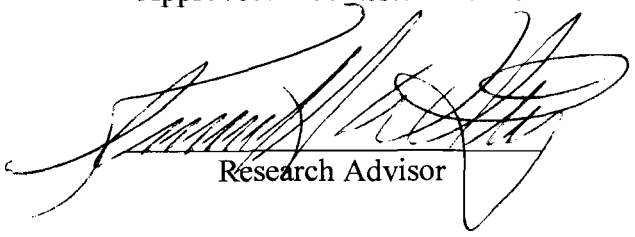
Todd Kapsner

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



Research Advisor

The Graduate School
University of Wisconsin-Stout
August 5, 2005

The Graduate School
University of Wisconsin Stout
Menomonie, WI 54751

ABSTRACT

Kapsner | Todd | G.
(Writer) (Last Name) | (First Name) | (Middle Initial)

Identifying Factors that Influence Enrollment in Technology Education Classes at Stillwater Area High School
(Title)

Technology Education	Dr. Kenneth Welty	August/2005	42
(Graduate Program)	(Research Advisor)	(Month/Year)	(# of Pages)

Publication Manual of the American Psychological Association (APA) Fifth Edition
(Name of Style Manual Used in this Study)

The objective of technology education courses is to develop skills, abilities, attitudes, and work habits to enhance the understanding of the role technology plays in everyone's lives. Since technology education enhances the learning experience in so many ways, it seems reasonable that all students should enroll in technology education classes. However, many students choose not enroll in these courses.

The purpose of this study was to determine the influence student perceptions had on their enrollment in technology education classes at Stillwater Area High School. Developing interests, preparing for the future, and social issues are factors that were identified and used in a questionnaire to measure their effect on student enrollment in

technology education courses. The questionnaire was distributed to seniors at Stillwater Area High School, which resulted in 252 respondents.

The research resulted in the following findings: a) almost half of the students at Stillwater Area High School do not enroll in technology education classes, b) an overwhelming majority of the students at Stillwater Area High School plan to pursue some form of post-secondary education, c) the majority of students at Stillwater Area High School like to work with their hands and make projects while expressing themselves artistically, d) many students at Stillwater Area High School like discovering how things work, while only the males responded with a majority liking to solve technical problems and fix things, e) very few students at Stillwater Area High School took technology education classes to prepare for employment after high school, and f) students indicated that social issues like being in classes with friends, working in groups and gender were not a significant factor for students when deciding to enroll in technology education courses.

College preparation receives priority over the students desire to work with their hands, make projects and discover how things work. Therefore, to increase enrollment and serve a larger population, the technology education faculty at Stillwater Area High School needs to restructure classes to emphasize college preparation.

Acknowledgments

I would like to thank my advisor Dr. Kenneth Welty for his advise, expertise and time dedicated to helping me complete my thesis. His guidance allowed me to successfully complete this endeavor while making it challenging and giving me valuable insight. I would also like to thank Dr. Brian McAlister for his guidance, patience, and time spent to ensure the successful completion of my graduate program.

Most importantly, I would like to thank my wife, Tracey, for her love and support. This would not have been a success without her.

TABLE OF CONTENTS

List of Tables

Chapter I: Introduction

Background of the Problem

Total employment in the United States is projected to increase by 20.3 million between 1998 and 2008 (Thompson, 1999). This means industry success will depend largely on the availability of a skilled work force. It is apparent that human capital is now a vital source of national wealth (Gilpin, 1999). Since a large portion of human capital is preparing for the work force in the nations' schools, it is imperative that public education provides students with the job skills and technical literacy needed to meet this demand. This study will focus on one school in District 834.

According to Andreska (1993), the objective of technology education courses is to develop skills, abilities, attitudes, and work habits, which accompany knowledge, and information to enhance the understanding of the role technology plays in everyone's lives. Since technology education helps prepare our nations' human capital for the world of work, it is reasonable that all students should enroll in technology education classes. There are several compelling reasons why students may wish to enroll in technology education classes. First, technology education is a very relevant aspect of a good basic education for our highly technical society (Bachler, 1987). Technology classes give students an opportunity to use language, math, and science skills in practical applications while developing technical knowledge and skills. The ability to apply academic knowledge and skills will help prepare students for our technical job market. Students also need to understand the impact of technology on human life, such as the history of humankind's use of tools, how science and technology have been joined, and the ethical and social issues technology has raised (Boyer, 1983). In terms of importance, technical achievements were and

continue to be equal to or surpass the achievements credited to other disciplines (DeVore, 1965). With technology education having so much to offer students, the statement, "I firmly believe the study of technology will be an integral part of the general education curriculum in the twenty-first century" (Welty, 1989, p.28), should become a reality.

Over the last several years, the number of students at Stillwater Area High School has not changed. Yet during that same time period, the number of students enrolled in technology education courses has decreased slightly. As a result, student enrollment in technology education classes represent less than one fourth of the total school population. While enrollment figures show a low number of students enrolling in technology education classes, they also show a very small percentage of the students being female. With the increasing demand for a technologically literate workforce, there should be an increase in enrollment instead of the current plateau.

Why do students choose not to take technology education classes? One reason is graduation requirements limit the number of elective classes that students can take. However, there are other underlying factors that contribute to student enrollment choices. Students' attitudes toward school subjects are primarily determined through the influence of perceived teacher behavior, course characteristics, and other factors; including facilities (McMillan, 1976). It may also be that students are not aware of technology classes, not interested in the subjects offered, or do not have enough time in their schedule. Gender bias is another factor that is affecting enrollment. Schools need to encourage young women to participate in technology education (McLester, 2000). In addition to trying to persuade females to participate in technology classes, there is a need to focus on the reasons females have rejected science and technology (Payne, 1993). There is also misconception that technology education is for non-

college bound students. However, technology education is part of general education that is intended for everyone, college bound or not (Eddy & Waldrop, 1981). "Technology is not just word processing and basic program writing for less academic pupils" (Mackay, 1991, p. 1). The researcher will identify factors that limit enrollment of students at Stillwater Area High School. The information gathered from this study will help the technology department develop ways to increase its enrollment, especially young women.

Statement of the Problem

The purpose of the research was to survey Stillwater Area High School students to determine what perceptions were influencing their enrollment in technology education classes. A small percentage of the student population enrolls in technology education classes at Stillwater Area High School. Many factors may influence student enrollment such as required course load, student needs, course content, stereotypes, advisement, and gender bias. The study gathered the information needed to help restructure the technology education program to meet the needs of more students.

Research Questions

The study sought answers to the following questions as they relate to student perceptions about technology education classes.

1. To what extent does developing interests effect student enrollment in technology education classes?
2. To what extent does preparing for the future effect enrollment in technology education courses?
3. To what extent do social issues effect student enrollment in technology classes?

Significance of the Study

Stillwater Area High School has consistently had a low percentage of students enrolled in technology education classes. As our nation continues to demand greater technical literacy of the work force, schools must meet the demand. The results of this study will hopefully increase enrollment in technology education classes.

Definition of Terms

Technological: Having to do with technology (Neufeldt, 1991).

Technology: Know-how that extends human potential or the ability to do things (Sterry, Hendricks, 1997). Operationally, it is the study of drafting, metalworking, woodworking, electronics, and automotive maintenance.

Technology Education: Provides a general framework of skills and experiences that equip students with the ability to utilize technology as it exists and evolves (ITEA, 1999). Operationally, coursework in metalworking, woodworking, electronics, and automotive maintenance.

Technological Literacy: The ability to use, manage, assess, and understand technology (ITEA, 1999). Operationally, the ability to understand drafting, metalworking, woodworking, electronics, and automotive maintenance.

Limitations of the Study

1. This study is based on the response of seniors that were enrolled in English classes at Stillwater Area High School during the 2004-2005 school year. Their perceptions are a reflection of their age, maturity, and experiences and may not be representative of younger students.

2. The response of the students may also be affected by environmental factors that are out of the researcher's control. All students may not be in the same setting while taking the survey and may not receive the same amount of time or background information to complete the survey.
3. The results of the study can only be applied to Stillwater Area High School.

Chapter II: Literature Review

Introduction

Many school districts are searching for workable ideas to expand technology programs (Green, 1993). Presently, the technology education program at Stillwater Area High School is searching for direction to improve course offerings. The new principal of Stillwater Area High School stated, "Students need to develop technical skills for post high school and the technology department needs to find a way to reach more of them" (Lennox, personal communication, October 20, 2004). The review of literature focused on the need for technology education and the impact that developing interests, preparing for the future, and social issues effect student enrollment in technology education classes.

Need for Technological Literacy

We live in an age of unprecedented technological innovation that calls for a level of technological literacy that is unparalleled in the history of humankind. This is not a literacy that is restricted to certain groups or individuals but one that is demanded of most people (Maley, 1987). Because of the impact that technology has on society, society needs to be aware of its significance in our daily lives. Our culture can no longer rely on people learning about technology through random experiences and happenstance. Education must make a conscious effort to teach all people about technology and the impact that it has on their lives.

The American public is virtually unanimous in agreeing that the development of technological literacy is an important goal for all people (ITEA, 2004). In a Gallup poll the ITEA conducted, 98% of respondents see developing technological literacy as being important. Since there is such an overwhelming belief that technological literacy is important, it seems

reasonable that schools should be teaching students about technology and developing technological literacy for all students. In fact, the same ITEA poll found that 98% of respondents also believed that technology should be included in school curriculum. Technology education draws upon technology for its instructional content and one of its main goals is directed toward developing an understanding of technology and the impact it has on peoples lives (Sanders, 2001). Therefore, it is reasonable that the technology education department should be the core program for developing technological literacy.

Developing Interests

One of the purposes of technology educations should be to motivate personal interests in learning (Zuga, 1989). Those interests may include a desire to develop a technical skill, solve problems, explore how things work, or build a project. Both boys and girls are attracted to technology education because they enjoy working with their hands and the chance for creativity the classes provide (Silverman, Pritchard, 1996). According to Wiens (1987), programs or courses that successfully develop technological literacy are carefully matched to interests of students and to topics they perceived as relevant. In the 2004 ITEA/Gallup poll, six questions asked people to reflect on the importance of personal interest as they relate to technology. On one question, 64% of the respondents said it was important or very important. The other five questions that addressed the importance of personal interest related to technology received endorsements from 86% to 93% of the respondents. If the poll accurately indicates peoples desire to know about technology and the purpose of technology education is to motivate personal interests, then it would seem reasonable to expect the majority of students to enroll in technology education classes. However, the average for student enrollment in technology education programs is about half of the students from middle school through high school (Sanders. 2001).

Preparing for the Future

Another major impetus of education is to help students with their preparation for the future. After high school, students will transition into new life experiences that may include immediate employment or preparation for a career at a technical school or college. It is generally accepted that people need basic skills in social studies, mathematics, science, and English to enter the workforce. However, employers want their new employees to have better basic skills that will enhance the workers' ability to learn new information and techniques to make them more adaptable as advances in technology change the workplace. Employers now look at technical skills as the most basic job competency (Johnson, 1991). This means technology education has become one of the basic skills needed for future employment. It ought to be a basic and essential element of a person's general education in addition to social studies, mathematics, science, and English (Hansen, 2003).

Students that are planning to continue their education in college can also benefit from technology education. Just like the workplace, basic academic skills are needed for success in college. Technology education teachers incorporate reading, writing, mathematics, science, and social studies content into their courses. This reinforces the content learned in other curricular areas and enhances higher order thinking skills (Johnson, 1991). Technology education also articulates with many higher education programs like business, engineering, architecture, design, environmental studies, biotechnology, computer science and other technical programs. In fact, students going into engineering are often thought to be at a disadvantage if they have not taken technology education courses (Streicher, 2003). Technology education is even being taught as a general education subject in liberal arts schools. More than 100 universities and colleges offer the study of technology as a schools general education course (Wiens, 1987).

Many students are not sure what the future holds for them. Exploratory technology education courses encourage students to discover different interests and aptitudes while exploring the modern world. Technology education courses may also provide activities that will lay the foundation for and help determine vocational or avocational interests (Zuga, 1989).

Social Issues

Social development plays an important role in public education. Adolescence is a critical period as individuals move from a childhood identity to an adult one. During this development stage, young people test and revise their concept of who they are and the role they play in society (Welty & Puck, 2001). They compare who they think they are with how they think others see them.

One of the goals of technology education is to develop social understanding and the ability to work in groups (Zuga, 1989). Modern technology education labs focus on problem solving skills, which lends itself to a cooperative learning environment (Sanders, 2001). However, many people still see technology education as a place for individual expression and development with students working alone on projects. Furthermore, the overwhelming majority of students, teachers and leaders in technology education are male (Karnes, 1999). This absence of females in technology education reinforces the subliminal misconception that participation in the study of technology education is a male endeavor (Welty & Puck, 2001).

Chapter III: Methodology

Introduction

The purpose of this study is to determine what factors are influencing enrollment in technology education courses at Stillwater Area High School. The information gathered in this study will be used to help restructure the technology education program to meet the needs of more students. The study offers recommendations for increasing enrollment in technology education classes.

Sample Selection

The subjects for this research were twelfth grade students at Stillwater Area High School. Stillwater Area High School consists of approximately 2,200 students in grades 10, 11, and 12. Each class is approximately the same size with a male to female ratio that is close to equal. To obtain a representative sample of the population, students were selected from grade twelve English classes. All seniors are required to enroll in a twelfth grade English class. Stillwater Area High School uses a trimester schedule which places approximately one third of the seniors in a English class each trimester. This resulted in semingly random selection of 252 respondents from the senior class. Students were selected from a core class instead of elective classes to minimize bias.

Instrumentation

To acquire the data needed to address the proposed problem, a questionnaire was developed by the researcher (Appendix B). It was designed to gather information that addresses each research questions. It also used questions to gather demographic information. The istrument was made up of simple statements followed by a Likert scale that enabled students to record their perceptions about technology education classes.

The first three questions gathered demographic information such as gender, post high school plans, and the number of technology education classes taken during high school. The following sixteen questions featured simple statements that asked students to rank how they felt about elective classes as they related to their interests, future plans, and social fit.

Data Collection Procedures

A consent form (Appendix A) was distributed to seniors in grade 12 English classes at Stillwater Area High School on Thursday, May 26. Students were instructed to take the consent form home for their parent/guardian to sign and bring back the following day. On Friday, May 27, English teachers collected the consent forms and distributed questionnaires (Appendix B). Only the students that returned the consent froms were given a questionnaire. After students complete the questionnaire, they placed it in a envelope that the researcher collected from each English teacher at the end of the school day.

Data Analysis

The questionnaire was developed to measure the extent to which student perceptions effect enrollment in technology education classes at Stillwater Area High School. The data collected was analyzed using frequencies, percentages, and *t*-Test scores. The results were then arranged into tables that give a visual representation of the responses to each question.

Chapter IV: Results

Introduction

The purpose of this study was to identify factors that influence student enrollment in technology education classes. A survey was given to seniors at Stillwater Area High School to address the following research questions:

1. To what extent does developing interests effect student enrollment in technology education classes?
2. To what extent does preparing for the future effect enrollment in technology education courses?
3. To what extent do social issues effect student enrollment in technology classes?

A *t*-Test was used to check the significance of the results from questions four through nineteen. The result had to be greater than 1.96 or less than –1.96 for the item to have statistical significance.

Demographic Information

Three items on the questionnaire were used to identify the respondents as either male or female, the number of technology courses taken in high school, and their post high school plans. Table 1 describes the respondent's gender and the number of courses taken during high school. Of the 252 respondents, 110 (43.7%) were female and 142 (56.3%) were male. Males were far more likely to take technology education course as 109 (76.8%) took at least one technology course and 93 (65.5%) took multiple technology courses. Only 28 (25.5%) females took at least one technology education course with just 11 (10%) taking multiple technology education courses.

Table 1

Number of technology classes taken

	How many technology education classes did you take during high school?					
	0 courses	1 course	2 courses	3 courses	4 or more	n
Female	82 (74.5%)	17 (15.5%)	7 (6.4%)	1 (.9%)	3 (2.7%)	110(43.7%)
Male	33 (23.2%)	16 (11.3%)	28 (19.7%)	26 (18.3%)	39 (27.5)	142(56.3%)
Total	115	33	35	27	42	252
	(45.6%)	(31.1%)	(13.9%)	(10.7%)	(16.7%)	(100%)

The third question asked respondents to report on their plans after high school. Table 2 shows both females and males aspire to attend a four-year college after graduation with 82 (74.5%) females and 87 (61.3%) males planning to attend a four-year college. Almost all the students reported a desire to continue their education after high school. Only 12 (5.0%) of the respondents plan to enter the military or the work force after graduating from high school.

Table 2

Plans after graduating

	What are your plans after graduating from high school?						
	Work	Military	Community College	Technical College	Four Year College	Multiple Responses	n
Female	3 (3.6%)	1 (.9%)	15 (13.6%)	6 (5.5%)	82 (74.5%)	3 (2.7%)	110 (43.7%)
Male	7 (4.9%)	1 (.7%)	21 (14.8%)	19 (13.4%)	87 (61.3%)	7 (4.9%)	142 (56.3%)
Total	10 (4%)	2 (.8%)	36 (14.3%)	25 (9.9%)	169 (67.1%)	10 (4.0%)	252 (100%)

Developing Interests

Seven questions on the survey focused on student perceptions about technology education courses and their ability to help them explore an interest. The questions were simple statements followed by a Likert scale to record their attitudes towards technology education classes.

Item four asked students about their desire to make projects that people can see and use. Table 3 shows that 204 (81.6%) of the respondents somewhat agreed or strongly agreed with the statement, "I like to make projects that people can see or use." The majority of both females and males said they had at least some desire to make projects. This item was statistically significant with a t score = (-3.70).

Table 3

Making projects

	I like to make projects that people can see and use.				
	Strongly Disagree	Somewhat Disagree	Somewhat Agree	Strongly Agree	n
Female	4 (3.6%)	24 (21.8%)	60 (54.5%)	22 (20.0%	110 (43.7%)
Male	4 (2.8%)	16 (11.3%)	60 (42.3%)	62 (43.7%)	142 (56.3%)
Total	8 (3.2%)	40 (15.9%)	120 (47.6%)	84 (33.3%)	252 (100%)

Item 5 was intended to discover if students were interested in working with their hands. Table 4 shows that the majority of both females and males either strongly or somewhat agreed with the position that they like working with their hands. A modest percentage of the respondents reported that they do not like to work with their hands. This item was statistically significant with a t score = (–5.82).

Table 4

Working with hands

	I like working with my hands.				
	Strongly Disagree	Somewhat Disagree	Somewhat Agree	Strongly Agree	n
Female	8 (7.3%)	27 (24.5%)	45 (40.9%)	30 (27.3%)	110 (43.7%)
Male	4 (2.8%)	8 (5.6%)	46 (32.4%)	84 (59.2%)	142 (56.3%)
Total	12 (4.8%)	35 (13.9%)	91 (36.1%)	114 (45.2%)	252 (100%)

The instrument also reported the extent to which the students were interested in fixing things. The results from this question showed a difference between female and male respondents. The males, 108 (76.6%), said they liked fixing things to some degree (see table 5). In contrast, a majority of the females, 77 (70.0%), indicated they dislike fixing things to some degree. This item was statistically significant with a *t* score = (–9.34).

Table 5

Using tools

	I like using tools to fix things.				
	Strongly Disagree	Somewhat Disagree	Somewhat Agree	Strongly Agree	n
Female	31 (28.2%)	46 (41.8%)	22 (20.0%)	11 (10.0%)	110 (43.8%)
Male	6 (4.3%)	27 (19.1%)	40 (28.4%)	68 (48.2%)	141 (56.2%)
Total	37 (14.7%)	73 (29.1%)	62 (24.7%)	79 (39.5%)	251 (100%)

In a related item, respondents were asked if they like discovering how things work. Responses to this question showed that the majority of females and males like discovering how things work to some degree. Table 6 shows that an overwhelming majority of males, almost 90%, reported they liked to discover how things work. However, the female respondents were divided. A simple majority, 65 (59.1%), reported that they like to discover how things work, while a large minority, 46 (40.9%), reported that they dislike discovering how things work. This item was statistically significant with a *t* score = (–9.00).

Table 6

Discovering how things work

	I like discovering how things work.				
	Strongly Disagree	Somewhat Disagree	Somewhat Agree	Strongly Agree	n
Female	14 (12.7%)	31 (28.2%)	53 (48.2%)	12 (10.9%)	110 (43.7%)
Male	2 (1.4%)	13 (9.2%)	44 (31.0%)	83 (58.5%)	142 (56.3%)
Total	16 (6.3%)	44 (17.5%)	97 (38.5%)	95 (37.7%)	252 (100%)

The next item focused on student interest in solving technical problems. Again, the majority of females and males responded with different levels of interest in this variable. Almost two-thirds of the females, 72 (65.0%), reported they disliked solving technical problems, while most of the males, 104 (80.2%), liked solve technical problems (see table 7). This item was statistically significant with a t score = (–10.00).

Table 7

Solving technical problems

	I like to solve technical problems.				
	Strongly Disagree	Somewhat Disagree	Somewhat Agree	Strongly Agree	n
Female	35 (32.1%)	37 (33.9%)	33 (30.3%)	4 (3.7%)	109 (43.4%)
Male	7 (4.9%)	21 (14.8%)	55 (38.7%)	59 (41.5%)	142 (56.6%)
Total	42 (16.7%)	58 (23.1%)	88 (35.1%)	63 (25.1%)	251 (100%)

Next, students were asked about their interest in getting a little dirty. A majority of females said they liked to get a little dirty along with the majority of males. Table 8, shows a majority, 68 (62.4%), of the females reported that they like getting a little dirty while a stronger majority of males 122 (85.9%) reported that they like to get a little dirty. This item was statistically significant with a *t* score = (–5.31).

Table 8

Getting dirty

	I like getting a little dirty.				
	Strongly Disagree	Somewhat Disagree	Somewhat Agree	Strongly Agree	n
Female	14 (12.8%)	27 (24.8%)	39 (35.8%)	29 (26.6%)	109 (43.4%)
Male	4 (2.8%)	16 (11.3%)	47 (33.1%)	75 (52.8%)	142 (56.6%)
Total	18 (7.2%)	43 (17.1%)	86 (34.3%)	104 (41.4%)	251 (100%)

The last interest was their desire to express themselves artistically. Both female and male respondents endorsed the notion of expressing themselves aesthetically. However, a larger percentage of females responded positively to this variable. Table 9 shows that 84 (76.3%) females said they like expressing themselves artistically and 90 (63.4%) males said they like expressing themselves artistically. However, this question was not statistically significant with a *t* score = 1.75.

Table 9

Artistic expression

	I like expressing myself artistically.				
	Strongly Disagree	Somewhat Disagree	Somewhat Agree	Strongly Agree	n
Female	9 (8.2%)	17 (15.5%)	37 (33.6%)	47 (42.7%)	110 (43.7%)
Male	16 (11.3%)	36 (25.4%)	38 (26.8%)	52 (36.6%)	142 (56.3%)
Total	25 (9.9%)	53 (21.0%)	74 (29.8%)	99 (39.3%)	252 (100%)

Preparation for the Future

The next five questions on the survey focused on student perceptions about technology education courses and their ability to help them get ready for the future. Again, the questions were simple statements followed by a Likert scale that recorded their attitudes towards technology education classes.

Item 11 asked the students if took technology education courses to helped them explore potential technical careers. Here again the majority of females and males agreed that technology education classes helped them explore technical careers. However, the females did not have an overwhelming majority. Table 10 show that only 62 (57.8%) of the females responded positivley while 95 (67.9%) of the males reponded positively. This question was not statistically significant with a t score = (–1.78).

Table 10

Exploring technical careers

	I took elective classes that help me explore potential technical careers that I could pursue.				
	Strongly Disagree	Somewhat Disagree	Somewhat Agree	Strongly Agree	n
Female	21 (19.3%)	25 (22.9%)	35 (32.1%)	28 (25.7%)	109 (43.8%)
Male	18 (12.9%)	27 (19.3%)	49 (35.0 %)	46 (32.9%)	140 (56.2%)
Total	39 (15.7%)	52 (20.9%)	84 (33.7%)	74 (29.7%)	249 (100%)

The next item asked students if took technology courses to help them obtain employment after high school. This question resulted in a majority of both females and males disagreeing with the statement. While the results were extremely close, table 11 does show that the majority of females 55 (50.5%) and the majority of males 79 (56.4%) took technology education classes the help them obtain employment after high school. However, these results were not statistically significant with a t score = 0.875.

Table 11

Obtaining employment

	I took elective classes to help me obtain employment after high school to make money.				
	Strongly Disagree	Somewhat Disagree	Somewhat Agree	Strongly Agree	n
Female	23 (21.1%)	32 (29.4%)	36 (33.0%)	18 (16.5%)	109 (43.8%)
Male	36 (25.7%)	43 (30.7%)	39 (27.9%)	22 (15.7%)	140 (56.2%)
Total	59 (23.7%)	75 (30.1%)	75 (30.1%)	40 (16.1%)	249 (100%)

Students were also asked if they took technology education courses to help them prepare for a two or four-year college. Unlike obtaining work after high school, the results shown in table 12 show that most of females 90 (82.6%) and a strong majority of males 100 (71.4%) agreed that they took technology education courses to prepare for college. The results in tables 11 and 12 correspond to the responses students gave about their plans after graduating from high school. The majority of students plan to attend a two or four-year college while very few plan to enter the work force after graduating from high school. This item was statistically significant with a t score = 2.18.

Table 12

Preparing for college

	I took elective classes to help me prepare for a two or four year college.				
	Strongly Disagree	Somewhat Disagree	Somewhat Agree	Strongly Agree	n
Female	8 (7.3%)	11 (10.1%)	33 (30.3%)	57 (52.3%)	109 (43.8%)
Male	18 (12.9%)	22 (15.7%)	41 (29.3%)	59 (42.1%)	140 (56.2%)
Total	26 (10.4%)	33 (13.3%)	74 (29.7%)	116 (46.6%)	249 (100%)

Next, the students were asked if they took technology education classes to help them do the things they like to do in their spare time. This question resulted in an overwhelmingly positive response from both females and males. In table 13, 89 (81.6%) females and 120 (85.8%) males agreed that they took technology education classes to help do the things they like to do in their spare time. However, these results were not statistically significant with a t score = 1.75.

Table 13

Enjoying hobbies

	I took elective classes to help me do the things I enjoy in my spare time.				
	Strongly Disagree	Somewhat Disagree	Somewhat Agree	Strongly Agree	n
Female	3 (2.8%)	17 (15.6%)	43 (39.4%)	46 (42.2%)	109 (43.8%)
Male	10 (7.1%)	10 (7.1%)	46 (32.9%)	74 (52.9%)	140 (56.2%)
Total	13 (5.2%)	27 (10.8%)	89 (35.7%)	120 (48.2%)	249 (100%)

The last question in this section asked students if they took technology education classes to help them maintain or repair everyday things in their lives. The results from this question were split and consistent with the students' response about their interest in fixing or repairing things. Table 14 shows 70 (64.3%) of the female respondents did not take technology education courses to help them maintain or repair everyday things; while, 86 (61.4%) of the male respondents did take technology education courses to help them maintain or repair everyday things. This item was statistically significant with a t score = (–5.40).

Table 14

Maintenance and repair

	I took elective classes to maintain or repair everyday things in my life.				
	Strongly Disagree	Somewhat Disagree	Somewhat Agree	Strongly Agree	n
Female	32 (29.4%)	38 (34.9%)	29 (26.6%)	10 (9.2%)	109 (43.8%)
Male	16 (11.4%)	38 (27.1%)	38 (27.1%)	48 (34.3%)	140 (56.2%)
Total	48 (19.3%)	67 (26.9%)	67 (26.9%)	58 (23.3%)	249 (100%)

Social Issues

The last four questions on the survey focused on student perceptions about technology education courses in a social context. Again, the questions were simple statements followed by a Likert scale to record their attitudes towards technology education classes.

The first question asked students if it was important to take courses that their friends were also taking. This resulted in a negative response from both females and males. In table 15, 79 (72.5%) females and 77 (55.4%) males indicated that they did not select technology educaiton

classes based on their friends enrollment in the class. However, the results of this question were not statistically significant with a t score = (–1.47).

Table 15

Taking classes with friends

	It was important to take elective classes that my friends were also taking.				
	Strongly Disagree	Somewhat Disagree	Somewhat Agree	Strongly Agree	n
Female	29 (26.6%)	50 (45.9%)	19 (17.4%)	11 (10.1%)	109 (44.0%)
Male	33 (23.7%)	44 (31.7%)	53 (38.1%)	9 (6.5%)	139 (56.0%)
Total	62 (25.0%)	94 (37.9%)	72 (29.0%)	20 (8.1%)	248 (100%)

The next question focused on the influence gender had in their enrollment decisions. Again, the majority of females and males responded negatively to the question. This time, an overwhelming number of respondents said that gender did not play a role in their decision to enroll in technology education classes. Table 16 shows 87 (79.8%) females and 120 (86.3%) males responding that gender was not a factor. These results were not statistically significant with a t score = 1.35.

Table 16

Gender specific classes

	It was important to take elective classes that allowed me to fit in because of my gender.				
	Strongly Disagree	Somewhat Disagree	Somewhat Agree	Strongly Agree	n
Female	47 (43.1%)	40 (36.7%)	18 (16.5%)	4 (3.7%)	109 (44.0%)
Male	67 (48.2%)	53 (38.1%)	13 (9.4%)	6 (4.3%)	139 (56.0%)
Total	114 (46.0%)	93 (37.5%)	32 (12.5%)	10 (4.0%)	248 (100%)

The students were asked if they enrolled in technology education classes to have the opportunity to work in groups. This question resulted in a small majority of females and males disagreeing with the statement. These responses were not statistically significant with a *t* score = 1.067. As shown in table 17, a small majority of females 56 (54.2%) said that the opportunity to work in groups was important in their decision to enroll in technology education classes. A small majority of males 79 (56.9%) said that the opportunity to work in groups was not important in their decision to enroll in technology education classes

Table 17

Working in groups

	It was important to take elective classes that provided opportunities to work in groups.				
	Strongly Disagree	Somewhat Disagree	Somewhat Agree	Strongly Agree	n
Female	15 (13.8%)	38 (34.9%)	46 (42.2%)	10 (9.2%)	109 (44.0%)
Male	35 (25.2%)	44 (31.7%)	38 (27.3%)	22 (15.8%)	139 (56.0%)
Total	50 (20.2%)	82 (33.1%)	84 (33.9%)	32 (12.9%)	248 (100%)

The last question asked students if working alone was an important in their decision to enroll in technology education classes. Again, there was not an overwhelming majority. However, both females and males responded positively to the question. With 67 (61.5%) females and 87 (62.6%) males, shown in table 18, saying that being able to work by themselves was important in their decision to enroll in technology education classes. The results of this question were not statistically significant with a t score = (–1.22).

Table 18

Working alone

	It was important to take elective classes that enabled me to work by myself.				
	Strongly Disagree	Somewhat Disagree	Somewhat Agree	Strongly Agree	n
Female	9 (8.3%)	33 (30.3%)	52 (47.7%)	15 (13.8%)	109 (44.0%)
Male	18 (12.9%)	34 (24.5%)	46 (33.1%)	41 (29.5%)	139 (56.0%)
Total	27 (10.9%)	67 (27.0%)	98 (39.5%)	56 (22.6%)	248 (100%)

Summary

1. Almost half of the students at Stillwater Area High School do not enroll in technology education classes. Female are more likely to follow this trend with 75% of them choosing not to take a technology education class.
2. An overwhelming majority of the students at Stillwater Area High School plan to pursue some form of post-secondary education. Most of them plan to attend a two or four-year college. Only 25% of them plan to attend a community or technical college.
3. The majority of students at Stillwater Area High School like to work with their hands and make projects while expressing themselves artistically. Many of the males have an interest in fixing things. However, very few females have that same interest.
4. Many students at Stillwater Area High School like discovering how things work, while a majority of males reported that they liked to solve technical problems.

5. Very few students at Stillwater Area High School took technology education classes to prepare for employment after high school. Instead, the majority of them took technology education classes to help them prepare for post-secondary education.
6. Social issues, like being in classes with friends, and working in groups, where not significant factors.

Chapter V: Conclusion

Introduction

The objective of technology education is to develop skills, abilities, attitudes, and work habits, which accompany knowledge, and information to enhance the understanding of the role technology plays in everyone's lives (Andreska, 1993). Technology classes give students an opportunity to use language, math, and science skills in practical applications while developing technical knowledge and skills. Students also need to understand the impact of technology on human life, such as the history of man's use of tools, how science and technology have been joined, and the ethical and social issues technology has raised (Boyer, 1983). Since technology education enhances the learning experience in so many ways, it seems reasonable that all students should enroll in technology education classes.

Over the last several years, the number of students at Stillwater Area High School has not changed. Yet during that same time period, the number of students enrolled in technology education courses has decreased slightly. While enrollment figures show a low number of students enrolling in technology education classes, they also show a very small percentage of the students being female. With the increasing demand for a technological literacy, there should be an enrollment increase instead of the leveling off that has occurred.

Statement of the Problem

The purpose of the research was to survey Stillwater Area High School students to determine what perceptions were influencing their enrollment in technology education classes. With a small percentage of the student population enrolling in technology education classes at Stillwater Area High School, it seems reasonable to study what factors may influence student

enrollment. The study sought to answer following questions as they relate to student perceptions about technology education classes.

1. To what extent does developing interests effect student enrollment in technology education classes?
2. To what extent does preparing for the future effect enrollment in technology education courses?
3. To what extent do social issues effect student enrollment in technology classes?

Methodology

To acquire the data needed to address the problem, a questionnaire was developed by the researcher (Appendix B). It was distributed to seniors in grade 12 English classes at Stillwater Area High School to obtain a representative sample. All seniors are required to enroll in an English course for two trimesters. Approximateley one-third of the seniors were enrolled during each trimester which resulted in 252 respondents, 110 (43.7%) respondents were female and 142 (56.3%) respondents were male.

The questionnaire was developed to measure the extent to which student perceptions effect enrollment in technology education classes at Stillwater Area High School. It featured simple statements reflecting factors that may or may not influence enrollment in technology education courses. Each statement was followed by a simple Likert scale to record the extent to which the respondent agreed or disagreed with the statement. Frequencies, percentages and *t*-Test scores were used to analyze the data.

Findings

The following findings emerged from data collection and analysis process.

1. Almost half of the students at Stillwater Area High School do not enroll in technology education classes. Females are more likely to follow this trend with 75% of them choosing not to take a technology education class and the ones that did tended to enroll in only one class. In contrast, if a male student enrolled in a technology education class, he was very likely to enroll in multiple technology classes.
2. An overwhelming majority of the students at Stillwater Area High School plan to pursue some form of post-secondary education with most of them planning to attend a two or four-year college. Only a small minority of them planned to attend a community or technical college while very few planned to enter employment or join the military.
3. The majority of students at Stillwater Area High School like to work with their hands and make projects while expressing themselves artistically. They also indicated that they do not mind getting dirty.
4. Many students at Stillwater Area High School like discovering how things work, while only the males responded with a majority liking to solve technical problems. Similarly, many of the males expressed an interest in fixing things while very few females expressed that same interest.
5. Students tended to indicate that social issues, like being in classes with friends, working in groups and gender, where not important factors for them when deciding to enroll in technology education courses while a small majority expressed an interest in being able to work individually on personal projects. However the questions in the study relating to social factors did not have statistical significance and the review of literature revealed that gender and perceived student cliental were major factors the contributed to enrollment trends.

Conclusions

Based on the findings, the following conclusions were drawn.

1. The current courses being offered in the technology education department at Stillwater Area High School are not meeting the needs of the majority of students. Male students dominate the majority of technology education classrooms and labs. The fact that some students completed multiple classes suggests there is a strong interest in the courses being offered by a minority of students.
2. Students at Stillwater Are High School are strongly encouraged to pursue a college degree after high school. The findings of the study suggest that many students do not consider technology education courses to be a part of a preparation for further education.
3. With the majority of students indicating that they like working with their hands, making projects, expressing themselves artistically, and getting a little dirty, the majority of students should be taking project based technology education classes that allow them to do most of those things. However, since the technology education classes are not deemed college prep, the majority of the students are not enrolling in them. Their need to prepare for further education takes precedents over the other interests.
4. Males have traditionally been encouraged to be mechanically inclined and problem solvers, while females have been encouraged to pursue a feminine role in our society (Welty & Puck, 2001). The study found that the students responded consistent with traditional female and male gender roles. Additionally, the majority of technology education classes at Stillwater Area High School are viewed as non-traditional for females. As a result, female students will need to be encouraged to cross traditional gender boundaries and enroll in technology education classes.

5. A majority of students indicated that their gender was not an important factor in their decision not to enroll in a technology education classes. The enrollment figures do not support this. Students may have responded to this question in a manner consistent with the social pressures to cross gender barriers and not allow gender bias to effect personal decisions. If the females truly felt that gender was not an issue, more of them would have enrolled in technology education classes to fulfill their desire to work with there hands, make projects, discover how things work and express themselves artistically but that did not happen. Instead, very few females or college bound students enrolled in technology education classes for any of those reasons.

Recommendations

Based on the findings and conclusions, the following recommendations were proposed.

1. Traditionally, the goal of technology education was to develop young males into productive members of society. While the technology department Stillwater Area High School may continue to offer some courses that meet needs of a small number of male students, the technology education department needs to restructure its courses to attract and meet the needs of more students.
2. The technology education department at Stillwater Area High School needs to offer courses that meet the needs of college bound students while being careful not to alienate the students that already express an interest in technology education courses. Such courses cannot be college-prep in name only. They must be rich in content that the community sees and believes is college prep. Technology teachers must work to incorporate meaningful reading, writing, math, and science skills along with engineering and problem solving skills to ensure classes are perceived to be attentive to the demand of post-secondary programs.

3. Continue to offer project based classes in the technology education department while emphasizing the opportunity for artistic expression. However, the college-prep element also needs to be incorporated into the class to interest the majority of students. Furthermore, technology education teachers should show a connection with other core disciplines and collaborate with the core teachers to offer a practical hands-on experience that a technology lab can provide.
4. Technology education teachers need to bring successful women from various technical fields into the classroom to visit and speak with the students. They should also provide opportunities for students to job shadow, attend career days, or participate in a work experience program that exposes them to women in non-traditional occupations. Curriculum should be reviewed to ensure that women are included and highlighted in the instruction. Also, the school should encourage team teaching between technology teachers and female teachers in core disciplines.
5. The technology education department must work at eliminating the shop class stereotype. Classrooms should be organized, clean, well light, and display people in nontraditional rolls. Technology teachers need to provide classes that help students develop core discipline skills in preparation for college while allowing students to make projects, explore how things work, and express themselves artistically.

References

Andreska, T. (1993). Merrill High School's Technology Programs Always Changing. *INTERFACE The Journal of the Wisconsin Technology Education Association*, 25(2), 16-17.

Bachler, Michael R. (1987, March). Industrial Arts is Essential in Quality Basic Education. *School shop,* pp. 34-38.

Boyer, Ernest L. (1983). *High school: A Report on Secondary Education in America. (The Carnegie Foundation for the Advancement of Teaching).* New York: Harper & Row.

Cochran, L. H. (1970). *Innovative Programs in Industrial education.* Bloomington, Illinois: McKnight & McKnight.

Devore, P. W. Technology An Intellectual Discipline. *American Industrial Arts Association, Inc.* Bulletin No. 5.

Eddy, J. P. & Waldrop, P. S. (1981, September). Challenging the Myths of Industrial Arts. *Journal of Employment Counseling, 139-142.*

Gilpin, W. (1999). Workforce Education: The Nexus Between Capitalism and Democracy. *Journal Of Industrial Teacher Education*, 36(4), 66-69.

Green, A. (1993). Staff development: The Key to Successful Technology Implementation in Public Schools. *THE Journal*, 20(11), 65-66.

Hansen, J. W. (2003). To Change Perceptions of Technology Programs. *The Journal of Technology Studies,* 29(2), 116-119.

Haugland, P. (1991). A Descriptive Study on the Factors Influencing Enrollment in Technology Education Courses at River Falls High School. Master's Thesis, University of Wisconsin Stout.

ITEA. (1999) *International Technology Education Association.* (As quoted in DEPCO, Inc. technology education catalog).

Johnson, S. D. (1991). Productivity, the Workforce, and Technology Education [Electronic version]. *Journal of Technology Education,* 2(2), 1-19.

Karnes, R. M. (1999, Winter/Spring). Technology Education in Prospect: Perceptions, Change, and the Survival of the Profession. *Journal of Technology Studies,* 25(1).

Mackay, M., Young, M., & Beynon, B. (1991) *Understanding Technology in Education.* London, New York, Philadelphia: The Falmer Press.

Maley, D (1987, Winter-Spring). Technology Literacy as a Major Thrust for Technology Education. *Journal of Epsilon Pi Tau,* 13(1), 44-49.

McLester, S. (2000, March). Keeping Girls Interested. *Technology & Learning*, pp.34-36McMillan, J. H. (1976). Factors Affecting the Development of Pupil Attitudes toward School Subjects. *Psychology in Schools,* pp. 322-325.

Neufeldt, V. (1991). *Webster's New World Dictionary* (Third College Edition). New York: Prentice Hall.

Payne, C. (1993). *Education in the Age of Information - The Challenge of Technology. London: Manchester University Press.*

Sanders, M (2001, Spring). New Paradigm or Old Wine? The Status of Technology Education Practice in the United States [Electronic version]. *Journal of Technology Education,* 12(2), 1-20.

Siverman, S. & Pritchard, A. M. (1996). Building Their Future: Girls and Technology Education in Connecticut [Electronic version]. *Journal of Technology Education,* 7(2), 1-10.

Sterry, L. & Hendricks, R. (1997). *Exploring Technology.* Menomonie, Wisconsin:

T & E Publications.

Stillwater Area Schools. (2000) *District 834 home page.* [On-line.] Available: http://www.stillwater.k12.mn.us/

Streichler, J. (2003, Summer/Fall). Making Technology a Major School Curriculum-Part 2. *The Journal of Technology Studies,* 26(2), 61-64.

Thomson, A. (1999, November). Industry Output and Employment. *Monthly Labor Review*, pp. 33-50.

Welty, K. (1989, April). Sputnik and A Nation at Risk: Milestones of Change. *School Shop,* pp. 26-28.

Welty, K. & Puck, B. (2001). *Modeling Athena: Preparing Young Women for Citizenship and work in a Technological Society.* University of Wisconsin-Stout.

Wiens, E. A. (1987). Teaching Technology as a Liberal Art. *Journal of Industrial Teacher Education,* 25(1), 7-16.

Zuga, K. F. (1989). Relating Technology Education Goals to Curriculum Planning [Electronic version]. *Journal of Technology Educaiton,* 1(1), 1-16.

Appendix A:
Consent Form

Consent to Participate In UW-Stout Approved Research

Title: Identifying Factors that Influence Enrollment in Technology Education in Classes at Stillwater Area High School

Let me introduce myself. My name is Todd Kapsner, a teacher at Stillwater Area High School. In addition to being a faculty member at Stillwater, I am also grad student at the University of Wisconsin-Stout. I have always been interested in helping students learn through technology educaiton. Therefore, I am conducting a modest study that looks at various reasons students may enroll in technology education classes to bring closure to my degree program.

The questionnaire will just ask your student 19 questions about some of the things that influence them to take elective classes. Student participation in this study is voluntary. They may choose not to participate without any adverse consequences. However, participation will contribute to the improvement of course offerings at Stillwater Area High School and will be greatly appreciated.

Thank you in advance for your support of our elective classes that enrich our curriculum. The insights gained will help us be more attentive to the interests of students while preparing them for the future. If you have questions or concerns regarding this study please contact the Investigator or Advisor.

Investigator:
Todd Kapsner
651-351-8170
kapsnert@stillwater.k12.mn.us

Advisor:
Dr. Kenneth Welty
715-232-1206
WeltyK@uwstout.edu

IRB Administrator
Sue Foxwell, Director, Research Services
UW-Stout
152 Vocational Rehabilitation Bldg.
Menomonie, WI 54751
715-232-2477
foxwell@uwstout.edu

Statement of Consent:

Student:.....

By signing this consent form you agree to allow your student to participate in the study.

Signature of parent or guardian:..... Date.....

Appendix B:
Questionnaire

Identifying Factors that Influence Enrollment in Technology Education in Classes at Stillwater Area High School

Student Survey

As graduating seniors, you each have had a unique high school experience. This reflection on your experience will give valuable insights on elective course offerings.

Please respond to the following statements as they relate to your course selections. Your thoughtful responses will help in improving the Technology Education Program at Stillwater Area High School.

1. Female ☐ Male ☐

2. How many Technology Education classes did you take during high school?

None	☐
One	☐
Two	☐
Three	☐
Four or more	☐

3. What are your plans after graduating from high school? (check one)

Enter the world of work	☐
Enroll in military service	☐
Attend a community college	☐
Attend a technical college	☐
Attend a 4-year college	☐

Some students take elective classes to explore an **interest**. Read each item and circle the number that best describes the way you feel about each statement.

1	2	3	4
Strongly Disagree	Somewhat Disagree	Somewhat Agree	Strongly Agree

I like...

4. making projects that people can see and use.	1	2	3	4
5. working with my hands.	1	2	3	4
6. using tools to fix things.	1	2	3	4
7. discovering how things work.	1	2	3	4
8. to solve technical problems.	1	2	3	4
9. getting a little dirty from time to time.	1	2	3	4
10. expressing myself artistically.	1	2	3	4

over

Some students take elective classes to help them get ready for the **future.** Read each item and circle the number that best describes the way you feel about each statement.

1	2	3	4
Strongly Disagree	Somewhat Disagree	Somewhat Agree	Strongly Agree

I took elective classes that help me...

11. explore potential technical careers that I could pursue.	1	2	3	4
12. obtain employment after high school to make money.	1	2	3	4
13. prepare for a two or four year college.	1	2	3	4
14. do the things I enjoy doing in my spare time.	1	2	3	4
15. maintain or repair everyday things in my life.	1	2	3	4

Some students take elective classes for **social** reasons. Read each item and circle the number that best describes the way you feel about each statement.

1	2	3	4
Strongly Disagree	Somewhat Disagree	Somewhat Agree	Strongly Agree

When I selected my elective, it was important to take classes that...

16. my friends were also taking.	1	2	3	4
17. allowed me to fit in because of my gender.	1	2	3	4
18. provided opportunities to work in groups on problems or projects.	1	2	3	4
19. enabled me to work by myself on personal projects.	1	2	3	4

Congratulations to all that are graduating with the class of 2005!
Thank You for Responding