PERCEPTIONS COLLEGE-BOUND SENIORS AT CAMPBELLSPORT HIGH SCHOOL HAVE OF TECHNOLOGY EDUCATION CLASSES AND FACTORS INFLUENCING PARTICIPATION IN THOSE CLASSES

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ABSTRACT

A study of the history of technology education's predecessors and applicable literature support the requirement of technology education for all students. The goal of this study was to determine which technology education classes college-bound seniors at Campbellsport High School, Campbellsport, WI had taken during their high school careers and the reasons for taking or not taking a particular class. Also, the perceptions these students have regarding the technology education department and courses were determined.

On a survey given to college-bound seniors one month prior to graduation, it was found that nearly half had taken zero or one technology education class in high school.

The most popular class taken was Exploring Technology 1, which is the foundational class in the department, but not a prerequisite for the other classes. The most popular reason students gave for taking a class was that they felt it was important for a future job or career. Interestingly, the most popular reason for not taking a class was that students did not think it would help in a future job. Another oft stated reason for not taking technology education classes was that they were not required for college entrance. The perceptions these students had regarding technology education and the courses offered were generally favorable. They tended to believe these courses could be academically challenging and could benefit students regardless of career path. However, the students generally tended to disagree with making technology education a requirement for high school graduation and college entrance.

The most important recommendation that comes as a result of this study is to develop an effective marketing plan focused on students, parents, and guidance counselors which clearly communicates the benefits and career applications of technology education.

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Chapter I: Introduction

Background

One would be hard pressed to find anyone today who would overtly discourage a comprehensive education for all people. It may come as a surprise to some that during periods of human history the prevalent view among the "educated" was that certain educational content areas, i.e. mathematics, science, philosophy, etc. were thought to be appropriate for society's elite, while the more mundane vocational training was reserved for the rest. Education in hand skills or manual skills and their purpose, has typically been the watershed issue in this great curriculum divide. It has not always been this way, however. Education in manual skills predates the academic subjects by centuries. The birth of manual occupations as a part of education has "not been definitely located by writers of educational history. Probably it never will be determined" (Row, 1909, p. 21). The "skills of the hand" were passed along from father to son through careful imitation from the earliest of recorded history (Phillips, 1985). This training was essential because the survival of the family and clan depended on it. Generation after generation, these primitive people continuously applied their knowledge to make new and better tools, thus developing the technology of their time.

The idea of technology is an often misunderstood and misapplied term. A formal definition to consider may be "the generation of knowledge and processes to develop systems that solve problems and extend human potential" (Thompson, 1999, p. 18). Hendricks and Sterry (1989) are a bit more concise; "knowhow that extends human potential" (p. 2). Thus, the learning by imitation was the first "technology education." It is significant to note that this learning applied to all, because all were impacted by

technology. In fact, many lived and died because of it. Also, this education, while quite informal in its structure, constituted the whole of a people's culture, including language, culinary arts, mythology, agrarian methods, etc. We can conclude then that technology education was, from the start, a component of general education. It was certainly beneficial, and some would argue, necessary, for all to learn.

The first rift in educational philosophy occurred as a result of the evolution of the Greek society into a slave economy (Welty, 2002). The polarization of the slave and free found its way into the education of the day, ultimately culminating in two very different educational systems. The free man received training in the academic areas, while the "contemptible" hand skills were relegated to the slaves. This divide in education persisted through the middle ages. The nobility and religious leaders participated in the classical liberal arts education, while the teaching of hand skills was passed on through the apprenticeship system (Phillips, 1985).

Technological innovations such as Gutenberg's movable type and the resulting social reformation and renaissance gave wings to the ideas of a flood of new educational philosophers. Men such as Martin Luther and educational fathers Bacon, Comenius, Pestalozzi, and others called for educational reform (Nelson, 1981; Phillips, 1985). While many common threads of thought prevailed in the philosophies of these men, two of the most notable are an insistence on education for all children and the inclusion of teaching hand skills as part of the general curriculum. The reformers understood that while the manual arts may not have been necessary for the immediate survival of the species, as it had once been, they were necessary for complete and effective learning. Lloyd Nelson (1981) explained, "Teaching-learning methods were enhanced by increased use of sight

and touch in the perception of basic concepts. . . . educational leaders developed situations in which the learner was forced into action involving tangible materials, thus improving learning effectiveness" (p. 45).

There were two primary sources for the content of the manual training courses. One was Victor Della Vos' series of exercises used in the Russian Imperial Technical School of Moscow. The other grew out of the Swedish sloyd system and the arts and crafts movement in England (Phillips, 1985). There were some fundamental differences in the aim of these two systems. Della Vos' system focused on vocational mastery of skills without producing a useful product while the sloyd system strove for well-designed, useful objects. However, their inclusion in the curricula of schools was for a common purpose; the betterment of the student as a part of general education. Speaking of sloyd, Otto Salomon (1896) said, "It's purpose is not to turn out Carpenters, but to develop the mental, moral, and physical powers of children" (p. 2).

The benefits of manual training, as it came to be known in the late 19th century, were many. So numerous that Calvin Woodward (1890) listed 14 of them in his *Manual training in education.* Three of his benefits worth noting, as they pertain to this study, deal specifically with the impact that education in the manual arts has on comprehending the other subjects. Woodward (1890) said, "Correct notions of things, relations, and forces, derived from actual personal experience, go far towards a comprehension of the language employed by others to express their thoughts and experiences" (p. 133). Woodward went on to say, "science and mathematics profit from a better understanding of forms, materials, and processes, and from the readiness with which their principles may be illustrated" (p. 133). Finally, Woodward included the comments of an unnamed

teacher in support of his benefits, quoting, ". . . no academic loss has been sustained; the majority agree that a positive, appreciable gain has been made in the academic studies" (p. 142-143). Manual training, or the application of technological principles, had finally found its way back into the general curriculum.

As the manual training programs of the late 19th century developed, their growth was influenced by men with drastically different goals. Some sought to lead them in the way of trade and vocational training, while others desired to remain on the course set by Woodward and others that called for the manual arts, by which it was now commonly referred, to be broadly conceived and "interpret the industrial culture as an important part of general education" (Phillips, 1985, p. 16). The two sides struggled with the direction of their programs. Even though "[Bonser] did believe that Industrial Arts rightly interpreted possessed sufficient content to warrant a place on the same basis as other studies" (Stombaugh, 1936, p. 129), the influence of supporters of vocational skill development was beginning to take hold. Even the National Education Association (NEA) came down on the side of vocational training when they released a subcommittee's report stating, "The major purpose of instruction in the manual arts is to contribute directly to the vocational efficiency of the pupil" (1914, p. 3). The report went on to concede that some study in the manual arts may be beneficial to college-bound students, but the curriculum should be altered for them to "stress . . . the consultation of scientific and technical literature pertaining to the materials and to the shop processes involved in the course" (p. 3). While the NEA was conceding that some instruction in manual arts was worth while for the college-bound, certain modifications were necessary. Influences such as this, along with the Smith-Hughes Act of 1917, created a new era in manual and industrial arts

education. Bennett (1937) summed up the atmosphere surrounding the debate, stating, "... there was the conflict of ideals between those who sought more practical education in the public schools and those who feared that vocational training would lower the standards of cultural education" (p. 550).

Industrial arts programs in the schools began to follow one of the two resulting paths. Some teachers pursued a vocational program, following the trend toward mastery of isolated skills (Stone, 1934), while others retained the broad concept of the place and function of industrial arts and its presence as an integral part of general education (Ericson, 1960). Regardless of the path followed, these classes no longer found their place along side the academic subjects in school as they once did, but were now relegated to students training for a trade or those with low aptitude. Even today this focus and these perceptions continue. Often, industrial arts, and its successor, technology education, is perceived as pre-vocational for those not going to college or as "shop" classes for low ability students (Erekson & Shumway, 2002). With perceptions such as these it is no wonder that college-bound students are not likely to enroll in technology education classes. Once again, just as it happened thousands of years ago, a vital part of the curriculum has been eliminated for a large segment of the student population.

Even a brief survey of the history of technology education and its predecessors establishes the precedent, and exposes its necessity, to be among the core academic subjects in our schools. Unfortunately Americans have been slower to recognize this than our English-speaking counterparts. England, Wales, Northern Ireland, New Zealand, and Australia have all put in place technology education as a priority for all students at all grade levels (Wright, 1999).

Statement of the Problem

This generalization regarding American schools can certainly be applied in the Campbellsport, Wisconsin. While the School District requires a minimum level of credits in Mathematics, English language, Social Sciences, Natural Sciences, and Physical Education for graduation, regardless of future schooling plans, high school students are not required to take any technology education classes (Campbellsport School District, 2003). Consequently, many college-bound students do not take any technology education classes during high school.

Purpose of the Study

The purpose of this study is to determine the perceptions that college-bound seniors at Campbellpsort High School have of technology education classes and find out the reasons why these seniors have, or have not, taken technology education classes during their high school career.

Research Questions

This study will seek answers to the following questions:

1. Which technology education courses have college-bound students at Campbellsport High School taken?

2. Which factors influenced college-bound seniors to take or not take technology education courses?

3. What are the perceptions of college-bound seniors at Campbellsport High School regarding technology education courses?

4. Is there a relationship between perceptions of technology education and participation in those classes?

Significance of the Study

This study is important for the following reasons:

1. Information from this study may be used to develop a marketing strategy for technology education classes and/or departments geared at attracting college-bound students.

2. Results of this study may be used to modify technology education programs to enhance or refine content that enhances a student's college preparatory curriculum.

Limitations

The limitations of this study are as follows:

1. The population of one class of senior students who are college-bound. The study will not include those seniors who are not college-bound, even if they took technology education classes.

2. The sample was established by virtue of those members of the population who voluntarily responded to the survey.

3. The technology education classes which the students may have taken may not be pure technology education as defined in this study. Some of the technology education classes are quite vocational in their aim and do not reflect an emphasis on application and development of new technologies or an integration of mathematic and scientific principles.

4. Each student has a unique working definition of technology.

5. The respondents may not answer questions honestly. They may attempt to please the researcher, a technology education teacher in their school.

6. The results of this study may not be able to be generalized for another population due to great variance in content of technology education programs, student age, gender, and other demographic variables.

7. The survey instrument has no formal validity and reliability established. However, similar surveys, other technology education teachers, and school administration professionals were consulted and used in its creation.

Definition of Terms

The following list contains terms and their definitions as they will be used in this study.

1. College-bound senior – any senior that has applied and/or been accepted to a four-year college.

2. College-prep academic courses – any of the following nine courses: Chemistry, CAPP Chemistry, Physics, Senior English, CAPP English, Pre-Calculus, Calculus, Sociology, Foreign Language, or Economics (Campbellsport School District, 2003).

3. Technology Education – the academic discipline that teaches students how to apply technological knowledge and processes to solve real-world problems through the utilization of open-ended activities. The goal is technological literacy for all students (Wisconsin Department of Public Instruction, 1998).

Chapter II: Literature Review

Introduction

The previous chapter established that there is a historical precedent for including technology in the education of all. This chapter will explore several other reasons for incorporating technology education in general education. The first reason discussed will be that technology education is essential in preparing technologically literate citizens. In addition, technology education has a content all its own; justifying its place as a "core" subject. Next, and perhaps most importantly as it relates to this study, the chapter will include a discussion on technology education as a college preparation class. Finally, the chapter concludes with a discussion of technology education course requirements related to high school graduation and college entrance.

Technology Education and Technological Literacy

What is to be the goal of technology education? Several writers (Banks, 1994; Hall, 2001; Lewis, 1991; Pucel, 1992b) place technological literacy near the top of their list when responding to this question. This need for technological literacy cannot be overstated. It is a growing belief among many that it is at least as important as in the past, perhaps more so. Consequently it needs to be addressed in the education of all students (Pucel, 1992b). This technological literacy is a fundamental part of cultural literacy. Teresa Hall (2001) succinctly stated, "Literate, educated people are the core of a civilized society" (p. 99). She went on to note that technological advances have been developed and applied in virtually every area of our lives. They have revolutionized the way we communicate, travel, learn, socialize, and interact with the world, natural or human-made, around us.

The best evidence favoring citizens who are technologically literate may be found in an evaluation of the consequences of a citizenry that is not. Pucel (1992b) believed that if citizens fail to have a minimal background in fundamental technology, leading to a level of cultural literacy, people will be at widely varied places when discussing or adapting technology related to their work and lives. The technologically literate will have a distinct advantage over the others. Those who are technologically literate will view technology as a tool to accomplish goals, the others will be "technopeasants." Rapid advances in technology require that the consumer understand, evaluate, and select the appropriate technology to meet evolving needs. It is assumed that a technologically literate person would be able to make better, wiser decisions when it comes to the consumption of technology (Hall, 2001). Is this always true? It is hard to say. How can one know whether technological literacy has been achieved?

While the importance of technological literacy generally is supported by consensus (ITEA, 2000), it is not as easy finding a definition that is as widely accepted. Definitions abound. Some are better than others. A challenge has even gone forth to scholars to discuss and promote a definition on which to found technology education (Foster & McAlister, 1989). Some descriptions really only vary in semantics, while others use differing operational and validation criteria. The wide range of definitions extend from the simple; "one's ability to use, manage, assess, and understand technology" (Rose & Dugger, 2002, p. 1), to more complex. Pucel (1992a) stated, "Technological literacy, . . ., is the possession of understandings of technological evolution and innovation, and the ability to apply tools, equipment, ideas, processes and materials to the satisfactory solution of human needs. It is part of cultural literacy" (p. 3).

It is worthwhile to note that Pucel viewed technological literacy as part of cultural literacy. In Hall's discussion of this issue, she readily admitted the confusion and inadequacies that surround attempts to get a definition that is all-together adequate and measurable. She arrived at this compromise. "Technological literacy [is] an overreaching concept and then broken down into measurable elements" (1992, p. 101). The ITEA offered this, "Technological literacy is the ability to use, manage, assess, and understand technology" (2000, p. 9). Each agreed that a technologically literate person has the rudimentary knowledge of the function and potential impact on various systems of a particular product of technology (Hall, 1992). It is also key that these writers acknowledged both the citizen's knowledge about technology and the ability to use technology are essential. Both are necessary to be truly literate (Foster & McAlister, 1989). Pearson and Young (2003) go a step further by putting technological literacy on par with the other core academic subjects saying, "Like literacy in reading, mathematics, science, or history, the goal of technological literacy is to provide people with the tools to participate intelligently and thoughtfully in the world around them (p. 3).

As technology hurdles along at breakneck pace, where are citizens to learn of these functions and impacts and begin to develop abilities? "A variety of efforts have been undertaken to increase technological literacy in the United States. In general, however, these have been small-scale projects, especially compared with efforts to boost scientific literacy and math skills" (Pearson & Young, 2003, p. 6). Naturally, the place to begin is in K-12 education, where all students can be reached and encouraged to think critically about technological issues (Pearson & Young, 2003). Technology education has adapted itself to fill this role.

This technological/cultural literacy element is not something new to technology education. It has been integral to the evolution of its predecessors, manual arts, manual training, and industrial arts. The coming of the industrial revolution in the late 19th and early 20th centuries brought the realization that people needed to become familiar with the technology of the times. People were being required to work in factories which made use of machines and objects with which they were not familiar. Schools of the time were not prepared to provide the needed education as they were focused on preparing people for citizenship and further education (Pucel, 1992a). Pressure from society eventually forced the schools to introduce curriculum which provided students the option to prepare for employment or gain an understanding of the disciplines of business and industry.

Today technology education has moved beyond the teaching of manual skills. Just as it did a century ago, it has responded to similar demands to educate an informed citizenry. However, this time the argument draws from different technologies; ones that are more relevant to the current lives of the general population. The new technologies are becoming too pervasive to be ignored in the curriculum of our schools (Pucel, 1992a). Technology education continues to respond to the need. As we begin this new century, we are obligated to provide this essential education to each generation. It is a key goal of technology education to produce technologically literate persons who can function in our modern world and contribute to society (Hall, 2001). These demands come not only from within the field of technology education, but also from the general public. Most Americans believe that technology is a major factor in the innovations developed within a country and consequently, technological literacy is important for people at all levels to achieve. In fact, 61% of Americans surveyed believed that students should be evaluated

for technological literacy as part of high school graduation requirements (Rose & Dugger, 2002). In just two years that percentage had risen. In a second installation of the study, "88% of both men and women surveyed believe questions about technological literacy should be included on federally-mandated tests (Rose, Gallup, Dugger, Starkweather, 2004). The importance of technological literacy is critical for all. So critical, in fact, that students who leave our schools without this are not really fully educated (Hunter, 1992). Pearson and Young (2003) claim that we have not achieved technological literacy, because we do not appreciate the value of it.

The Content of Technology Education

Technological literacy is not the sole focus of technology education. If it were, one could probably make the argument that these concepts could be taught throughout the curriculum, thus eliminating the need for separate technology courses. In fact, many other curriculum areas claim to address technology from one or more perspectives. In reality, though, technology education has a content all its own, justifying its place in the general curriculum (Pucel, 1992a). Pucel stated the content addresses two specific areas. First, it "develops a common sense knowledge of technology," and secondly, it creates an understanding of the "method through which technology evolves to satisfy human needs" (p. 8). The "common sense" knowledge of which he spoke enables a person to physically interact with real things. It is a visual and sensory interaction. This knowledge is gained through the use of the tools, materials, and processes of technology. For years technologists, engineers, architects, and other skilled workers who apply technology have argued over and over that hands-on experience must be included in any effective teaching about technology (Pucel, 1992a).

The second major component of technology education is content that leads to an application of the "common sense" knowledge. In other words, an understanding of how technology evolves and how it is developed to meet human needs. This application is born out in the implementation of the "technological method" (Pucel, 1992a). Just as the scientific method has aided the understanding of how science evolves and plays a role in our lives, Pucel has proposed the technological method to do the same for the understanding of technology. He has developed this method as a series of steps that can be applied to any area of technology. The steps are:

1. Identify an unmet human need requiring a technical solution (e.g., product, system, design);
2. clarify the specific technical problem;
3. identify relevant existing technical methods and knowledge;
4. invent a probable solution;
5. determine the social acceptability and economic feasibility of the solution;
6. modify the solution if needed to maximize efficiency and acceptability; and,
7. implement the solution. (1992a, p. 12)

This method emphasizes the concern that must be placed on developing socially and economically acceptable solutions, whereas the scientific method generally concerns itself with the systematic pursuit of new knowledge. While this method may not be totally inclusive, it does present a set of logical steps by which students can be introduced to technology.

Another strong piece of evidence that lends credence to a unique content in technology education has been the development of content standards. One such listing

was compiled by the International Technology Education Association (ITEA). In 2000 they published *Standards for technological literacy: Content for the study of technology.* In 1998, the state of Wisconsin's Department of Public Instruction (WIDPI) also established a set of standards, *Wisconsin's model academic standards for technology education,* which all students should be able to meet upon high school graduation. Both of these documents have, at their core, the concern for students to be technologically literate. Each divides their standards into broad content categories, then include specific, narrowly defined standards, along with measurable benchmarks. The ITEA (2000) model's five major categories are "(a) the nature of technology, (b) technology and society, (c) design, (d) abilities for a technological world, and (e) the designed world" (p. 14). The WIDPI (1998) model uses four categories: "(a) nature of technology, (b) systems, (c) human ingenuity, and (d) impact of technology" (p. 2).

The establishment of standards legitimizes the content of a course. It is the specific knowledge and ability which a student should be able to know and do upon completion of a particular grade (WIDPI, 1998). Since these standards are not expected to be fulfilled in another course, it follows that every student, including those bound for college, should be expected to participate in technology education.

Technology Education as College-prep

As technology education has evolved to its current form, it holds a unique position in its ability to aid all students in their understanding of the world around them. A well designed technology education curriculum not only teaches about the application of knowledge, but also of technology's effects on many aspects of our world, including societal, political, environmental, and economic arenas (Gilberti, 1999). Why then is

technology education not required of all students? Gilberti (1999) stated that "despite numerous references in national reports to include this type of education . . .currently, the study of technology is not tied to graduation requirements in most states. It is missing from most elementary education and college preparatory programs" (p. 8). Before too much blame is placed on the graduation and college entrance requirements, we must realize that many college-bound students do not perceive the need for technology education classes while they are in high school. Unfortunately, it is specifically these students whom leaders in education and government feel should be leading the way in technological literacy. D. Saxon (cited in Gilberti, 1999) pulled no punches when describing the dire situation in which we find ourselves. He said, "That our technological illiteracy extends even to those most educated of Americans – our college graduates – verges on a national scandal" (p. 4). Obviously these individuals did not receive technology education in secondary school or college.

For those students who do take technology courses, the benefits are typically reaped immediately. John Benson (1988) told of a former student who "was the only one in his college physics classes that had actually worked with one of the real world devices or equipment his instructors described. . . . he had enough experience in high school . . . to place him several weeks, if not months, ahead of students with no high school [technology] experience" (p. 9). On the contrary, Benson went on to tell of an engineering graduate who endured a nine month long job hunt because of an inability to let prospective employers know he was qualified. The individual had only one seventh-grade, required technology class. Technology education classes, curriculum, and teachers

are uniquely equipped to help college-bound students expand and develop technological applications of many academic competencies (Benson, 1988).

One of the major hindrances to college-bound students taking technology education classes, as mentioned earlier, is the perception held within the academic community. Bell and Erekson (1991) observed that unless technology education is perceived as academically rigorous, it will never become an integral part of college-prep. Understanding the existing perceptions and then re-educating the academic community, and the public, as to the appropriateness of technology education as college preparation coursework needs to be a campaign mounted by all technology education professionals.

Another hurdle which must be overcome is college entrance requirements. These requirements exert great influence on both the courses offered in a high school and the courses taken by college-bound students. Currently, technology is not a requirement for entrance at virtually all colleges and universities (Erekson & Shumway, 2002). The challenge is there for the taking. Once a rigorous technology curriculum has been established it is imperative that students, counselors, principals, and parents be made aware of the benefits to all students, especially the college-bound.

Technology Education Course Requirements

While numerous studies indicated above have shown the importance and need of technology education for all, this need has not translated into course requirements for all students, nor for college entrance.

A brief review of the Campbellsport school district graduation requirements shows no requirement for technology education (Campbellsport School District, 2003). The *Programming Booklet* goes on to give recommendations for students preparing to

attend college and again does not indicate that technology education courses be taken. It does however address electives necessary for college-entrance minimums as possibly coming from "Fine arts, computer science, and other academic areas" (p. 3), but does not list technology education specifically. In addition the booklet misrepresents the University of Wisconsin system requirements regarding foreign language requirements when it indicates that two credits of foreign language are required for admission. The University of Wisconsin system (n.d.), however only specifies this requirement for UW-Madison and UW-Eau Claire. At the other campuses these courses are certainly accepted, but not required for all programs.

Similarly, two neighboring school districts, Lomira, WI (Lomira school district, 2003) and Fond du Lac, WI (Fond du Lac school district, 2003) do not require technology education courses for graduation. They do, however, unlike Campbellsport, indicate that some university campuses will accept vocational courses as acceptable elective credits for admission.

This chapter has reported literary findings that support, not only technology education for all students, but specifically take aim at the college-bound student. The key points which were stressed were that technological literacy is important for an informed, literate citizenry. Also, technology education is uniquely qualified to fulfill this educational goal because of its history, its unique content, and its well-defined, measurable standards. In addition, the application of key academic competencies in technology education classes provides invaluable opportunities for the college-bound student to apply scientific and mathematical principles in the development of technological solutions. Finally, a brief look at three school districts indicate no

requirement of technology education for graduation, nor does the University of Wisconsin system require technology education for entrance into any of its schools or programs.

Chapter III: Methodology

Introduction

This chapter includes details regarding the methodology of this research study. It includes a description of the research method used, followed by a description of the subjects and their selection. The measurement instrument, its source and design is then discussed, followed by data collection and analysis procedures. Finally, the chapter concludes with a brief summary.

Research Method

This was a descriptive study which measured perceptions of technology education classes by college-bound seniors. It also investigated the factors that influenced college-bound seniors to take, or to not take, technology education courses during their high school careers.

Subject Selection and Description

For this study "college-bound" seniors included all students on track to graduate in May 2004 from Campbellsport High School, Campbellsport, Wisconsin that had applied to and/or been accepted to a four-year college for the fall semester 2004. In order to be sure the maximum number of "college-bound" seniors were included, the survey was given to all seniors who had returned the parental permission slip. Those surveys with affirmative answers for questions one and/or two were then compiled for statistical analysis.

Instrumentation

Data was collected using a researcher-developed survey based upon other (Haugland, 1991; Paniagua, 1999; Petruzates, 1990) similar studies. While no formal

measures of validity and reliability exist for this instrument because it was initially developed for this study, the researcher consulted with other technology education teachers to aid in compiling the options from which students could chose for taking, or not taking classes. Also, underclass students in several technology education classes were asked to give reasons why they enrolled in the classes they had taken. These reasons were compared to those compiled by the researcher and reasons common to both lists were used on the survey. A final step in the creation of the instrument was to let the school counselors evaluate it for readability and completeness.

The survey instrument was a four-page, eight and one-half by eleven inch, folded booklet (see Appendix B). It contained 32 questions. Questions one and two asked participants about their immediate future plans for college. Questions 3 through 17 dealt with the student's participation in technology education classes. Each question dealt singly with the 15 technology education classes offered to these students during their high school career. These questions gave the student the opportunity to indicate whether they had, or had not, taken the class listed. Then the student could indicate the two most important reasons influencing his/her decision. Seven reasons were given for taking, or not taking, the class. The student could also write in a free-form answer. Finally, questions 18 through 32, sought the participant's perceptions of technology education classes. These questions were phrased as statements to which the student indicated a degree of agreement, or disagreement on a four-point Likert-type scale.

Data Collection

Since the subjects for this study were high school students, most of whom were minors, a letter of consent (see Appendix A) was sent to each student's parent or guardian

on April 19, 2004. The bottom portion of the letter was a permission slip to be signed by the parent and returned to the high school office by April 26, 2004.

Data was collected on Monday, May 3, 2004 at a senior assembly called for that purpose. At the assembly, each student who had returned a signed permission slip was given a survey and a pencil. This procedure was administered by school counselors, Kathy Gravelle, and Linda Gross, and Principal, Tom Hercules. The researcher was not present in order to minimize influence on student's responses. Upon completion, the students placed the surveys in an envelope. Two students who had returned a permission slip and were absent on May 3, 2004, were called to the guidance office on May 4, 2004, and given the survey. These two surveys were then added to the envelope with the others. The completed surveys were delivered to the researcher later that week.

Data Analysis

The data collected was analyzed using three types of statistics. Frequencies and percentages were tabulated individually for questions three through seventeen. Total frequency for the "important reasons" indicated by students across all fifteen classes was also calculated. The responses to questions eighteen through thirty-two were given a numerical value corresponding to the Likert-type scale values. The strongly agree response was assigned a value of four (4), agree was assigned a value of three (3), disagree was given a value of two (2), and strongly disagree was assigned a value of one (1). The mean value was then calculated for each of these items. The higher the mean value indicated a stronger agreement with the statement. Finally, a correlation was done to determine if there was a relationship between a student's participation in technology education classes and his/her perception of technology education.

Summary

This chapter has provided the reader with a description of the research methodology, the subject selection and the derivation of the instrument. It also included details regarding the data collection and analysis procedures which were used.

Chapter IV: Results

Introduction

This chapter presents the results of this research study, the participation of college-bound high school seniors in technology education classes and their perception of technology education. It provides information pertaining to the study population and participation. It also includes a section on the research questions addressed in this study.

Participants

There were 151 students listed as seniors on April 21, 2004 at Campbellsport High School. A letter of consent and permission slip was sent to each of these student's parents or guardians on April 19, 2004. Eighty-one (53.6 %) students returned the permission slip and were given the survey instrument on May 3, 2004.

The first two questions established the eligibility of a student's responses to be included in the study. As a result, 44 students' surveys formed the sample and were compiled. This represented 29% of the senior class.

Research Questions

Research Question #1 - Which technology education courses have college-bound students at Campbellsport High School taken?

Survey questions 3-17 dealt with this question. The results indicated that 31.82% (n = 14) of the 44 students did not take any technology education classes while 15.91% (n = 7) only took one class. This total accounts for nearly half (47.73%, n = 21) of those surveyed. The other 23 (52.27%) students took anywhere from 2 to 13 classes. No single student took all 15 classes offered. A detailed item analysis for all questions can be found in Appendix C.

As indicated in Table 1, the most popular class was Exploring Technology 1 with participation by 52.3% (n = 23) of the students. The second most popular was Graphic

Table 1

Most Popular Class Taken by College-Bound Seniors

Class	# of Students	% of Students
Exploring Technology 1	23	52.30
Graphic Communications	16	36.36
Exploring Technology 2	15	34.09
Computer-Aided Design	12	27.27
Materials & Processes 1	11	25.00
Principles of Technology	8	18.18
Mechanical Design	8	18.18
Materials & Processes 2	8	18.18
Architectural Design	7	15.91
Manufacturing	5	11.36
Basic Electricity	5	11.36
Construction	4	9.09
Advanced Woodworking	4	9.09
Electronic Communications	2	4.55
Transportation, Power & Energy	2	4.55

Communications with 36.36% (n = 16) participants. Electronic Communications and Transportation, Power & Energy were the least popular with only 4.55% (n = 2) of the students participating.

Research Question #2 – Which factors influenced college-bound seniors to take or not take technology education courses?

Survey questions 3-17 dealt with this question. After indicating whether they had or had not taken a course students were to select the two most influential reasons for doing so. The frequency of the responses is shown in Table 2. Not everyone indicated

Table 2

Most Important Reason for Taking Technology Classes

Reason	# of Responses	% of Total
Felt it would benefit me in college	44	20.18
Important for future job or career	59	27.06
An easy credit	49	22.48
Recommendation of Parent/Guardian	27	12.39
Recommendation of a teacher	3	1.38
Recommendation of a counselor	0	0.00
Only class available	12	5.50
Other[a]	24	11.01

Note. Percentage is based on 218 actual responses. The reasons are listed in the order they appeared on the survey.

[a]A list of "Other" reasons given and corresponding classes is in Appendix D.

two reasons, however a majority of students did respond. The 44 college-bound students participated in technology education classes a total of 130 times. That results in 260

potential reasons for taking the classes. There were 218 (83.84%) reasons indicated. There was a total of 529 "no" responses to participation in the classes. This results in a potential of 1,058 reasons why students did not take the class. There were 862 (81.47%) actual reasons indicated. The frequency and percentages of responses is shown in Table 3.

Table 3

Most Important Reason for Not Taking Technology Classes

Reason	# of Responses	% of Total
I didn't need it for college entrance	149	17.29
I didn't think it would help in future job	260	30.16
Not enough time in schedule	236	27.38
A teacher discouraged me	17	1.97
Counselors discouraged me	7	0.81
Parent/Guardian discouraged me	21	2.44
I didn't know what it was about	113	13.11
Other[a]	59	6.84

Note. Percentage is based on 862 actual responses. The reasons are listed in the order they appeared on the survey.

[a]A list of "Other" reasons given and corresponding classes is in Appendix E.

Research Question #3 – What are the perceptions of college-bound seniors at Campbellsport High School regarding technology education courses?

Survey questions 18-30 dealt with this question. A compiled list of results is included in Table 5. Questions 18-19, 21-24, 27, and 30 were worded in such a way that an "Agree" or "Strongly Agree" response would tend to indicate a stereotypical

perception of technology education as vocational/skill development education and not necessarily beneficial to the college-bound student. The Mean of all these questions was 2.55. A mean of 2.5 would indicate a neutral response. A higher mean would indicate a tendency to agree with the statement.

Questions 20, 25-26, and 28-29 were written so that an "Agree" or "Strongly Agree" response would tend to indicate a perception of technology education that believes those classes provide some benefit to those going to college. The Mean response of these questions was 2.65.

Research Question #4 – Is there a relationship between perceptions of technology education and participation in those classes?

The answer to this question was derived by running a correlation comparing responses to questions 18-32 and the number of technology education classes a student took. A correlation between the number of classes a student took and his or her response to each question was found, as well as to his or her mean response to all questions; the mean response to questions 18-19, 21-24, 27, and 30; and finally the mean response to questions 20, 25-26, 28-29. Correlations on these same survey items were also found using the following subgroups; students who took zero classes versus those who took one or more, students who took zero or one class versus those who took two or more, and finally those who took less than the average number of classes (2.93) versus those who took more than the average. The strongest relationships generally existed when comparing responses from those students that took zero or one class to those who took two or more classes. These correlation coefficients are shown in Table 4. The correlation coefficients for all the subgroups are shown in Appendix F.

The results showed that some mild to moderate relationships exist between participation in two or more classes and perceptions. Notably, there is a mild (r=0.40)

Table 4

Correlations Between Participation in Technology Education Classes and Perceptions

Question or category	Students who took 0 or 1 class vs. 2 or more
18	.02
19	-.09
20	.40
21	.25
22	-.33
23	-.02
24	-.30
25	.34
26	.47
27	.08
28	.30
29	.29
30	-.27
31	.42
32	.15
Mean response on all questions	.35
Mean response to questions 18-19, 21-24, 27, & 30	-.13
Mean response to questions 20, 25-26, 28-29	.55

positive relationship between participation and the thought that technology education classes can be academically challenging. There is an even stronger (r=0.47) relationship between these students and the feeling that technology education classes should be required for admission to four-year colleges. Lastly, there existed a moderate (r=0.55) relationship between participation and agreement with those statements that portrayed technology education as beneficial to college-bound students.

Chapter V: Discussion, Conclusions, and Recommendations

Introduction

This chapter will serve as a summary of the research study. It will include a discussion of the survey results and their relationship to other studies. Following that will be a general conclusion of the study, and finally recommendations for implementation and/or application of the study findings, as well as recommendations for further study.

Discussion

The purpose of this study was to determine the perceptions that college-bound seniors at Campbellpsort High School have of technology education classes and find out the reasons why these seniors have, or have not, taken technology education classes during their high school career. The results of the study showed that a minority of these students took technology education classes in high school, and, as would logically follow, even less took multiple courses. The respondents tended to believe that technology education courses offered little or no benefit for someone going to college. This perception supports Gilberti's (1999) conclusion, which he linked directly to the student's participation in these classes.

Another important finding in this study was the degree to which future jobs and careers influenced participation in technology education classes. This was the most popular reason students gave for taking a particular class, indicated 27% of the time. It was also the most important reason why students did not take a class, in other words, students did not think the technology education class would help them in a future job. This reason was chosen more than 30% of the time. When taking into account that students were to indicate two reasons for taking or not taking a class, the highest

percentage any one reason could have gotten would have been 50%. Considering this, the importance of future job benefit in course selection becomes even more apparent. However, the students did tend to believe that technology education classes would benefit a student regardless of career path. It would appear then, that students generally see the classes as being beneficial, but only viewing a few classes with a specific tie to future jobs.

In addition to a lack of perceived career benefit, the next two most popular reasons students gave for not taking classes was that they did not have enough time in their schedule (27%) and that it was not required for college entrance (17%). These two reasons could very likely go hand-in-hand. While college-bound students are consciously selecting those classes determined to be college-prep academic classes, along with the basic requirements for graduation, they either ignore, or cannot fit in their schedule, the elective technology education courses. As indicated earlier, this is the same conclusion that Erekson and Shumway (2002) came to. The students in Campbellsport, it would appear, allowed this pre-determined path of coursework to determine their selections even though they believed that the technology education courses can be academically challenging and teach students to apply mathematic and scientific principles to solve problems.

These beliefs about technology education align nicely with the national statistics concerning the benefits of technology education and technological literacy (Rose & Dugger, 2002, and Rose, Gallup, Dugger, Starkweather, 2004). However, the beliefs did not translate into actions, or could not because of the established requirements.

Conclusions

The key results of this study are as follows:

- A small minority of college-bound students take technology education classes in high school.
- Future job/career benefits, or lack thereof, are the most influential reasons why students select or do not select technology education classes.
- The fact that technology education courses are not required for college entrance is a very important reason for not taking technology education classes.
- College-bound students believe that technology education classes can be academically challenging and beneficial regardless of career path.
- Parental influence is cited as a reason to take a class more than five times as often as to not take a class.

While there may appear to be some contradiction in students' beliefs about technology education and the influence of beliefs in the action of course selection, it may exist as a result of student's having to prioritize based on something out of their control. If, as indicated, school districts as well as the Wisconsin university system, have determined that technology education is not required, i.e. not necessary, for college bound students, Pearson and Young (2003) are proven correct in their contention that we do not appreciate the importance of technological literacy of all.

Recommendations for Implementation

The results of this study can be used in a number of ways in an effort to develop the technological literacy of all students. First of all, since the college-bound students already perceive some benefits in these classes for all students, regardless of career path,

the issue of scheduling difficulties needs to be addressed. When students report that they do not take technology education classes because they do not have enough time in their schedule, one cannot assume they would take technology education courses if they had the time, but it becomes a moot point if the students feel that those classes will not contribute to their college-prep repertoire. It must be communicated to the students that technology education courses will fulfill the elective requirements of most, if not all, of the University of Wisconsin system schools. Also, students need to be given clear instruction early in their high school career as to how to determine required courses for a prospective course of study in college.

A second use of the study results could be used by the technology education department to enhance their marketing procedures. This marketing plan must be three-pronged. It must address students, parents, and guidance counselors. When focusing on the students, clear descriptions of course content, as well as career applications, must be communicated. This would need to be done in all lower level technology classes, in an effort to retain students in the department, as well as through various media in the school to reach those students that have not taken any technology classes. Since parents do influence some course selection choices, information regarding course content and career application could be sent home via mail, posted on the school's web site, and communicated at orientations/parent-teacher conferences. Finally, the guidance counselors need to be aware of the content and significance of each course in the technology education department. This information must be provided to them, however, because it cannot be assumed that they will take the initiative to research all the courses.

A final use of the study would be as a supplemental argument in the promotion of a required technology education course for all students in the district. Granted, this would be a difficult implementation due to many constraints; fiscal, personnel, facilities, etc., but the history of technology education's predecessors as a core subject, as well as the necessity of a technologically literate populace, as described in the literature, certainly lend credence to technology education's place in the every student's schooling. In the event a single, broad-based foundational technology course does not currently exist in the school, a sample curriculum for a one-half credit class can be found at the internet site of the Wisconsin Technology Education Association, www.wtea-wis.org/FTE.html.

Along with these suggested implementations, it is crucial that the content of the technology education courses is routinely evaluated and adjustments made to ensure it addresses state and national standards. It is understood that if the students achieve the benchmarks established, they will be on their way to being technologically literate. Consequently, the classes must address the standards. This evaluation should be done annually if possible. When changes are made in the curriculum, adjustments to the survey instrument may be necessary if it is to be used in future years. Additionally, results of studies done after curriculum changes could be compared with those done earlier to see if the changes impacted participation or perceptions.

Recommendations for Further Study

The study of reasons why students take particular classes certainly warrants further study. The results of which could benefit the guidance department, as well as other elective course areas. First, this could become a yearly study used to determine changes over a period of time in the student's participation and perceptions. This could

be used as a gauge to measure success of marketing efforts. Repeated use, and appropriate refinement, of the survey instrument would also establish its validity and reliability. Also, it would be beneficial to determine what students who have not taken technology education courses believe to be the content of the technology courses. Finally, an adaptation of this study to determine how student's perceptions change as a result of taking technology education classes could be done using a before-and-after survey.

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Appendix A: Consent Letter

April 19, 2004

Dear Parent or Guardian,

This letter is to inform you of a research project being done at Campbellsport High School. The research will examine senior students' participation in Technology Education classes while in high school. The information for this study will be obtained though the students completing a short survey. The survey will ask students to indicate whether or not they have taken each of the Technology Education courses. They will also indicate major influences for their decision. The students will also be asked to give their perception of the Technology Education classes regarding their benefit pertaining to academics, future schooling, and careers.

Participation in this study is voluntary, but the more information obtained, the more beneficial the results will be to the school district, the technology education department, and to future students. The student's identity will be strictly confidential and all published results will be anonymous, compiled statistics. There will be no risks to the students completing the survey.

Questions or concerns about the research study should be addressed to the researcher, Eric Joslin at 926-0506, or the research advisor Dr. Brian McAlister, (715) 232-5609. Questions about the rights of research subjects can be addressed to Sue Foxwell, Human Protections Administrator, UW-Stout Institutional Review Board for the Protection of Human Subjects in Research, 11 Harvey Hall, Menomonie, WI 54751, phone (715) 232-1126.

Students will be completing the survey at an assembly called for that purpose during the last week of April, 2004. Please complete the bottom of this letter indicating your permission allowing your child to participate in this study. Please have your child return the bottom portion of this letter to the Campbellsport High School office by Monday, April 26, 2004.

Sincerely,

Eric Joslin
Researcher

I do/do not (circle one) agree to allow my child, _____ to participate in this study.

Signature _____ Date _____

Appendix B: Survey Instrument

College-Bound Student's Participation in Technology Education Classes and Perceptions of Technology Education

Thank you for your willingness to participate in this study. Your involvement is completely voluntary. If you do not wish to participate you may place your survey in the envelope without marking any responses. Your answers will be completely anonymous and your identity will never be associated with your responses.

1. Have you applied to a four-year college for the fall semester 2004? _____ yes _____ no
   (this would include a UW center such as UW Fond du Lac, but not a Technical college such as Moraine Park)

2. Have you been accepted by at least one four-year college for the fall semester 2004? _____ yes _____ no
   (this would include a UW center such as UW Fond du Lac, but not a Technical college such as Moraine Park)

Participation in Technology Education classes

The next set of questions will ask you to indicate whether or not you have taken technology education classes while in high school. Please indicate 'yes' or 'no' for each class. Then place an "x" next to the two (2) most significant reasons for the choice you made.

3. Did you take Exploring Tech I (or JH Tech 1)? _____ yes _____ no

If yes, mark 2 most important reasons for taking it:

_____	Felt it would benefit me in college	_____	Recommendation of a teacher
_____	Important for my future job or career	_____	Recommendation of a counselor
_____	An easy credit	_____	Only class available
_____	Recommendation of Parent/Guardian	_____	Other: _____

If no, mark 2 most important reasons for not taking it:

_____	I didn't need it for college entrance	_____	Counselors discouraged me
_____	I didn't think it would help in future job	_____	Parent/Guardian discouraged me
_____	Not enough time in schedule	_____	I didn't know what it was about
_____	A teacher discouraged me	_____	Other: _____

4. Did you take Exploring Tech II (or JH Tech 2)? _____ yes _____ no

If yes, mark 2 most important reasons for taking it:

_____	Felt it would benefit me in college	_____	Recommendation of a teacher
_____	Important for my future job or career	_____	Recommendation of a counselor
_____	An easy credit	_____	Only class available
_____	Recommendation of Parent/Guardian	_____	Other: _____

If no, mark 2 most important reasons for not taking it:

_____	I didn't need it for college entrance	_____	Counselors discouraged me
_____	I didn't think it would help in future job	_____	Parent/Guardian discouraged me
_____	Not enough time in schedule	_____	I didn't know what it was about
_____	A teacher discouraged me	_____	Other: _____

5. Did you take Electronic Communications? _____ yes _____ no

If yes, mark 2 most important reasons for taking it:

_____	Felt it would benefit me in college	_____	Recommendation of a teacher
_____	Important for my future job or career	_____	Recommendation of a counselor
_____	An easy credit	_____	Only class available
_____	Recommendation of Parent/Guardian	_____	Other: _____

If no, mark 2 most important reasons for not taking it:

_____	I didn't need it for college entrance	_____	Counselors discouraged me
_____	I didn't think it would help in future job	_____	Parent/Guardian discouraged me
_____	Not enough time in schedule	_____	I didn't know what it was about
_____	A teacher discouraged me	_____	Other: _____

6. Did you take Graphic Communications? _____ yes _____ no

If yes, mark 2 most important reasons for taking it:

_____ Felt it would benefit me in college
_____ Important for my future job or career
_____ An easy credit
_____ Recommendation of Parent/Guardian
_____ Recommendation of a teacher
_____ Recommendation of a counselor
_____ Only class available
_____ Other: _____

If no, mark 2 most important reasons for not taking it:

_____ I didn't need it for college entrance
_____ I didn't think it would help in future job
_____ Not enough time in schedule
_____ A teacher discouraged me
_____ Counselors discouraged me
_____ Parent/Guardian discouraged me
_____ I didn't know what it was about
_____ Other: _____

7. Did you take Construction? _____ yes _____ no

If yes, mark 2 most important reasons for taking it:

_____ Felt it would benefit me in college
_____ Important for my future job or career
_____ An easy credit
_____ Recommendation of Parent/Guardian
_____ Recommendation of a teacher
_____ Recommendation of a counselor
_____ Only class available
_____ Other: _____

If no, mark 2 most important reasons for not taking it:

_____ I didn't need it for college entrance
_____ I didn't think it would help in future job
_____ Not enough time in schedule
_____ A teacher discouraged me
_____ Counselors discouraged me
_____ Parent/Guardian discouraged me
_____ I didn't know what it was about
_____ Other: _____

8. Did you take Transportation, Power & Energy? _____ yes _____ no

If yes, mark 2 most important reasons for taking it:

_____ Felt it would benefit me in college
_____ Important for my future job or career
_____ An easy credit
_____ Recommendation of Parent/Guardian
_____ Recommendation of a teacher
_____ Recommendation of a counselor
_____ Only class available
_____ Other: _____

If no, mark 2 most important reasons for not taking it:

_____ I didn't need it for college entrance
_____ I didn't think it would help in future job
_____ Not enough time in schedule
_____ A teacher discouraged me
_____ Counselors discouraged me
_____ Parent/Guardian discouraged me
_____ I didn't know what it was about
_____ Other: _____

9. Did you take Manufacturing? _____ yes _____ no

If yes, mark 2 most important reasons for taking it:

_____ Felt it would benefit me in college
_____ Important for my future job or career
_____ An easy credit
_____ Recommendation of Parent/Guardian
_____ Recommendation of a teacher
_____ Recommendation of a counselor
_____ Only class available
_____ Other: _____

If no, mark 2 most important reasons for not taking it:

_____ I didn't need it for college entrance
_____ I didn't think it would help in future job
_____ Not enough time in schedule
_____ A teacher discouraged me
_____ Counselors discouraged me
_____ Parent/Guardian discouraged me
_____ I didn't know what it was about
_____ Other: _____

10. Did you take Principles of Technology (Applied Physics)? _____ yes _____ no

If yes, mark 2 most important reasons for taking it:

_____ Felt it would benefit me in college
_____ Important for my future job or career
_____ An easy credit
_____ Recommendation of Parent/Guardian
_____ Recommendation of a teacher
_____ Recommendation of a counselor
_____ Only class available
_____ Other: _____

If no, mark 2 most important reasons for not taking it:

_____ I didn't need it for college entrance
_____ I didn't think it would help in future job
_____ Not enough time in schedule
_____ A teacher discouraged me
_____ Counselors discouraged me
_____ Parent/Guardian discouraged me
_____ I didn't know what it was about
_____ Other: _____

11. Did you take Computer-Aided Design (CAD)? _____ yes _____ no

If yes, mark 2 most important reasons for taking it:

_____ Felt it would benefit me in college
_____ Important for my future job or career
_____ An easy credit
_____ Recommendation of Parent/Guardian
_____ Recommendation of a teacher
_____ Recommendation of a counselor
_____ Only class available
_____ Other: _____

If no, mark 2 most important reasons for not taking it:

_____ I didn't need it for college entrance
_____ I didn't think it would help in future job
_____ Not enough time in schedule
_____ A teacher discouraged me
_____ Counselors discouraged me
_____ Parent/Guardian discouraged me
_____ I didn't know what it was about
_____ Other: _____

12. Did you take Mechanical Design? _____ yes _____ no

If yes, mark 2 most important reasons for taking it:

_____ Felt it would benefit me in college
_____ Important for my future job or career
_____ An easy credit
_____ Recommendation of Parent/Guardian
_____ Recommendation of a teacher
_____ Recommendation of a counselor
_____ Only class available
_____ Other: _____

If no, mark 2 most important reasons for not taking it:

_____ I didn't need it for college entrance
_____ I didn't think it would help in future job
_____ Not enough time in schedule
_____ A teacher discouraged me
_____ Counselors discouraged me
_____ Parent/Guardian discouraged me
_____ I didn't know what it was about
_____ Other: _____

13. Did you take Architectural Design? _____ yes _____ no

If yes, mark 2 most important reasons for taking it:

_____ Felt it would benefit me in college
_____ Important for my future job or career
_____ An easy credit
_____ Recommendation of Parent/Guardian
_____ Recommendation of a teacher
_____ Recommendation of a counselor
_____ Only class available
_____ Other: _____

If no, mark 2 most important reasons for not taking it:

_____ I didn't need it for college entrance
_____ I didn't think it would help in future job
_____ Not enough time in schedule
_____ A teacher discouraged me
_____ Counselors discouraged me
_____ Parent/Guardian discouraged me
_____ I didn't know what it was about
_____ Other: _____

14. Did you take Basic Electricity? _____ yes _____ no

If yes, mark 2 most important reasons for taking it:

_____ Felt it would benefit me in college
_____ Important for my future job or career
_____ An easy credit
_____ Recommendation of Parent/Guardian
_____ Recommendation of a teacher
_____ Recommendation of a counselor
_____ Only class available
_____ Other: _____

If no, mark 2 most important reasons for not taking it:

_____ I didn't need it for college entrance
_____ I didn't think it would help in future job
_____ Not enough time in schedule
_____ A teacher discouraged me
_____ Counselors discouraged me
_____ Parent/Guardian discouraged me
_____ I didn't know what it was about
_____ Other: _____

15. Did you take Materials & Processes 1? _____ yes _____ no

If yes, mark 2 most important reasons for taking it:

_____ Felt it would benefit me in college
_____ Important for my future job or career
_____ An easy credit
_____ Recommendation of Parent/Guardian
_____ Recommendation of a teacher
_____ Recommendation of a counselor
_____ Only class available
_____ Other: _____

If no, mark 2 most important reasons for not taking it:

_____ I didn't need it for college entrance
_____ I didn't think it would help in future job
_____ Not enough time in schedule
_____ A teacher discouraged me
_____ Counselors discouraged me
_____ Parent/Guardian discouraged me
_____ I didn't know what it was about
_____ Other: _____

16. Did you take Materials & Processes 2? _____ yes _____ no

If yes, mark 2 most important reasons for taking it:

_____	Felt it would benefit me in college	_____	Recommendation of a teacher
_____	Important for my future job or career	_____	Recommendation of a counselor
_____	An easy credit	_____	Only class available
_____	Recommendation of Parent/Guardian	_____	Other: _____

If no, mark 2 most important reasons for not taking it:

_____	I didn't need it for college entrance	_____	Counselors discouraged me
_____	I didn't think it would help in future job	_____	Parent/Guardian discouraged me
_____	Not enough time in schedule	_____	I didn't know what it was about
_____	A teacher discouraged me	_____	Other: _____

17. Did you take Advanced Woodworking? _____ yes _____ no

If yes, mark 2 most important reasons for taking it:

_____	Felt it would benefit me in college	_____	Recommendation of a teacher
_____	Important for my future job or career	_____	Recommendation of a counselor
_____	An easy credit	_____	Only class available
_____	Recommendation of Parent/Guardian	_____	Other: _____

If no, mark 2 most important reasons for not taking it:

_____	I didn't need it for college entrance	_____	Counselors discouraged me
_____	I didn't think it would help in future job	_____	Parent/Guardian discouraged me
_____	Not enough time in schedule	_____	I didn't know what it was about
_____	A teacher discouraged me	_____	Other: _____

Perceptions of Technology Education

Using the following scale, place an 'x' in the blank which most accurately describes how you feel about each statement.

SA = strongly Agree A = Agree D = Disagree SD = Strongly Disagree

I think Technology Education classes . . .	SA	A	D	SD
18. are for students that are planning on attending technical colleges.	_____	_____	_____	_____
19. are for students who are going into the workforce immediately after HS.	_____	_____	_____	_____
20. can be academically challenging.	_____	_____	_____	_____
21. are designed to teach students specific job skills.	_____	_____	_____	_____
22. offer little or no benefit to someone going to a four-year college.	_____	_____	_____	_____
23. provide a mental break from tough academic classes.	_____	_____	_____	_____
24. are really just old "shop" classes with new names.	_____	_____	_____	_____
25. should be required of all high school graduates.	_____	_____	_____	_____
26. should be required of students for admission to four-year colleges.	_____	_____	_____	_____
27. teach about how computers work.	_____	_____	_____	_____
28. teach students how to use math and science principles to solve problems.	_____	_____	_____	_____
29. would benefit a student regardless of career path.	_____	_____	_____	_____
30. are an easy way to boost a student's G.P.A.	_____	_____	_____	_____

I wish . . .	SA	A	D	SD
31. I had taken more technology education classes in high school.	_____	_____	_____	_____
32. I had known what technology education classes actually taught.	_____	_____	_____	_____

Thank You for your time!!

Appendix C: Item Analysis

Question number one on the survey asked, "Have you applied to a four-year college for the fall semester 2004?" Forty-four students responded yes to this question. This was 29.1% of the senior class and 54.3% of those taking the survey. Thirty-seven (45.6% of the survey participants) responded no to this question. The second question asked, "Have you been accepted by at least one four-year college for the fall semester 2004?" Forty-one (50% of survey participants) indicated that the had been accepted.

As mentioned above, the results of these 44 surveys were then compiled for this study because they established the sample of college-bound seniors as defined in this study. Consequently, in the remaining analysis, percentages will be calculated only on this sample of 44, not on the senior class as a whole, nor the 81 students who took the survey.

Questions 3 through 17 elicited a yes or no response indicating participation in a single technology education class as well as, at most, two important reasons for the decision to take, or not take, the class. Students could select from seven different reasons to support his/her response or write in an "other" reason. Included here are the frequencies of yes and no responses as well as the top two reasons for that decision. Therefore, the percentages for the frequencies of each reason is based upon total reasons given for that individual question.

Question three asked, "Did you take Exploring Tech I (or JH Tech 1)?" The results were as follows: 52.3% (n = 23) indicated yes, while 47.7% (n = 21) answered no. The two most common reasons cited for taking this class were, "an easy credit," 28.2% (n = 11) and "important for future job or career," 20.5% (n = 8). In contrast, the most popular reasons indicated for not taking this class were, "I didn't think it would help in future job," 32.4% (n = 12) and, "not enough time in schedule," 27% (n = 10).

Question four asked, "Did you take Exploring Tech II (or JH Tech 2)?" The results for this question were as follows: 34.1% (n = 15) responded yes, while 65.9% (n = 29) answered no. "Important for future job or career," and "an easy credit" were the two most popular reasons given for taking the class. Both received 30.8% (n = 8) of the responses. Reasons for not taking the class were "I didn't think it would help in future job," with 30.6% (n = 15) of the responses and "not enough time in schedule," with 28.6% (n = 14).

Question five asked, "Did you take Electronic Communications?" Only 4.5% (n = 2) had taken this class while 95.5% (n = 42) did not take this class. The reasons for taking the class were evenly split between "an easy credit," and "recommendation of parent/guardian." Both were cited 50% (n = 2) of the time. The most often indicated reason for not taking Electronic Communications was "not enough time in schedule" with 29.0% (n = 20) responses. Next most popular with 27.5% (n = 19) was "I didn't think it would help me in future job."

The sixth question asked students, "Did you take Graphic Communications?" The results were as follows: 36.4% (n = 16) of the students took this class, while 63.6% (n = 28) did not take Graphic Communications. The top reason for taking this class was "an easy credit" with 25% (n = 7) of the responses. Students also chose "other" reasons 25% (n = 7) of the time. Reasons that were listed included, "fun," "I like Mr. Joslin [course instructor]," and "interesting." Students who did not take this class chose "I didn't think it would help in future job" 27.7% (n = 13) of the time. Their second most popular reason was "not enough time in schedule" with 25.5% (n = 12) of the responses.

Question seven asked, "Did you take Construction?" The results were as follows: 9.1% (n = 4) of the students took this class, but 90.9% (n = 40) did not. The four students that took the class indicated that "an easy credit" and "recommendation of parent/guardian" were the most important reasons for doing. Both reasons received 28.6% (n = 2) of the responses. Students that did not take Construction class chose "I didn't think it would help in future job" 32.8% (n = 21) of the time and "not enough time in schedule" 29.7% (n = 19) of the time.

Question eight asked students, "Did you take Transportation, Power & Energy?" Only 4.5% (n = 2) of the respondents indicated they had, while 95.5% (n = 42) did not take the class. The top two reasons indicated for taking the class were "important for future job or career," and "felt it would benefit me in college" with 66.7% (n = 2) and 33.3% (n = 1) of the responses, respectively. The most often indicated reason for not taking the class was "I didn't think it would help in future job" with 29.9% (n = 20) of the responses. The second most chosen response was "not enough time in schedule." This was indicated 23.9% (n = 16) of the time.

Question nine asked, "Did you take Manufacturing?" The results were as follows: 11.6% (n = 5) did take the class, while 88.4% (n = 38) did not. One student did not respond to this question. Tied for the top two reasons for taking this class were, "important for future job or career," and "an easy credit" with 28.6% (n = 2) of the responses. The number one reason for not taking the class was, "I didn't think it would help in future job," indicated by 31.7% (n = 20) of those that did not take the class. The second most popular reason for not taking Manufacturing was "not enough time in schedule." This was chosen 28.6% (n = 18) of the time.

Question ten on the survey asked, "Did you take Principles of Technology (Applied Physics)?" The results for this question were as follows: 18.2% (n = 8) students took the class while 81.8% (n = 36) did not. The most popular reason chosen for taking the class with 42.9% (n = 6) of the responses was "felt it would benefit me in college." Next most popular with 21.4% (n = 3) of responses was the "other" category. Reasons written in by students were "I like Mr. Joslin [course instructor]" and "only class left." The number one reason selected for not taking this class was "not enough time in schedule" with 34.5% (n = 20) of the responses. The second most popular reason was "I didn't think it would help in future job." This choice received 24.1% (n = 14) of the responses.

Question eleven asked, "Did you take Computer-Aided Design (CAD)?" This class was taken by 27.3% (n = 12) of the students while 72.7% (n = 32) did not take it. The two most popular reasons for taking this class were, "felt it would benefit me in college," and "important for future job or career." Both choices received 38.1% (n = 8) of the responses. The most popular reason for not taking the class was, "not enough time in schedule" receiving 30.8% (n = 16) of responses. "I didn't think it would help in future job" was the second most popular response receiving 28.8% (n = 15) of responses.

Question twelve asked, "Did you take Mechanical Design?" The results for this question were as follows: 18.2% (n = 8) of students took the class while 81.8% (n = 36) did not take the class. The most popular reason for taking the class with 50.0% (n = 7) of the responses was "important for future job or career." Next most popular with 28.6% (n = 4) of the responses was "felt it would benefit me in college." The two most popular reasons for not taking this class were "I didn't think it would help in future job" and "not

enough time in schedule" receiving 31.6% (n = 18), and 28.1% (n = 16), of the responses, respectively.

Question thirteen asked, "Did you take Architectural Design?" The results of the survey showed that 15.9% (n = 7) of the students took the class while 84.1% (n = 37) did not. "Felt it would benefit me in college" and "important for future job or career" were the two most popular reasons for taking the classes. Both choices received 45.5% (n = 5) of the responses. The two most important reasons for not taking the class also ended in a tie. "I didn't think it would help in future job" and "not enough time in schedule" both received 28.3% (n = 17) of the responses.

Question fourteen asked students, "Did you take Basic Electricity?" The results for this question were as follows: 11.4% (n = 5) of the students took this class while 88.6% (n = 39) did not. The most popular reason for taking this class, indicated by 33.3% (n = 3) of the responses, was "an easy credit." The second most popular response was a tie between "felt it would benefit me in college" and "important for future job or career." Both choices received 22.2% (n = 2) of the responses. The top reason for not taking Basic Electricity was "I didn't think it would help in future job" as indicated by 36.7% (n = 22) of responses. "Not enough time in schedule," receiving 25.0% (n = 15) of responses, was second most popular.

Question fifteen asked, "Did you take Materials & Processes 1?" The results were as follows: 25.0% (n = 11) indicated yes, while 75.0% (n = 33) answered no. The two most common reasons cited for taking this class were, "important for future job or career," and "an easy credit." Both received 31.6% (n = 6) of the responses. In contrast, the most popular reasons indicated for not taking this class were, "I didn't think it would

help in future job," with 29.1% (n = 16) of the responses and, "not enough time in schedule," 23.6% (n = 13).

Question sixteen asked students, "Did you take Materials & Processes 2?" Results showed that 18.2% (n = 8) indicated yes while 81.8% (n = 36) did not take the class. The most popular reason for taking the class was "an easy credit" which received 41.7% (n = 5) of the responses. The second most popular reason for taking the class was a three-way tie between "felt it would benefit me in college," "important for future job or career," and "recommendation of parent/guardian." Each received 16.7% (n = 2) of the responses. The most important reason for not taking the class, as indicated by 32.8% (n = 19) of the responses, was "I didn't think it would help in future job." Second most important was "not enough time in schedule" receiving 22.4% (n = 13) of the response.

Question seventeen asked, "Did you take Advanced Woodworking?" The results were as follows: 9.1% (n = 4) took the class while 90.9% (n = 40) did not. There were four reasons for taking the class that each received 25.0% (n = 1) of the responses. They were "important for future job or career," "an easy credit," and "recommendation of parent/guardian." The fourth reason was "wanted to weld" and was written in as a response to "other." The most popular reason chosen for not taking the class was "I didn't think it would help in future job" as indicated by 28.8% (n = 19) of responses. "Not enough time in schedule" was the next most popular response with 25.8% (n = 17).

Questions 18-32 dealt with the perceptions of technology education held by the survey respondents. The results are included in Table 5. In questions 18-30 students were asked to respond to a series of statements each beginning with "I think Technology Education classes . . ." on a four-point Likert-type scale. The responses on the scale were

Table 5

Perceptions of Technology Education

	I think Technology Education classes . . .	SA	A	D	SD	M
18	are for students that are planning on attending technical colleges.	4	21	18	1	2.64
19	are for students who are going into the workforce immediately after HS.	4	16	22	1	2.53
20	can be academically challenging.	10	23	8	1	3.00
21	are designed to teach students specific job skills.	7	29	7	0	3.00
22	offer little or no benefit to someone going to a four-year college.	1	12	22	8	2.14
23	provide a mental break from tough academic classes.	4	18	18	3	2.53
24	are really just old "shop" classes with new names.	2	17	18	6	2.35
25	should be required of all high school graduates.	2	13	21	7	2.23
26	should be required of students for admission to four-year colleges.	2	14	21	6	2.28
27	teach about how computers work.	6	25	10	2	2.81
28	teach students how to use math and science to solve problems.	6	28	8	1	2.91

	I think Technology Education classes . . .	SA	A	D	SD	M
29	would benefit a student regardless of career path.	5	27	10	0	2.88
30	are an easy way to boost a student's G.P.A.	2	19	18	4	2.44
	I wish . . .					
31	I had taken more technology education classes in high school	5	20	13	5	2.58
32	I had known what technology education classes actually taught.	3	22	13	4	2.57

"Strongly Agree," "Agree," "Disagree," and "Strongly Disagree." The statements in questions 31 and 32 began with "I wish . . ." and were measured on the same scale.

The arithmetic mean (M) was calculated for each question by assigning values of 4, 3, 2, and 1 for the response options SA, A, D, SD, respectively. Consequently a mean value of 2.5 indicates a neutral response. A value higher than 2.5 indicates a greater tendency for the respondents to agree with the statement.

Appendix D: List of "Other" Reasons for Taking Classes

List of "Other" Reasons for Taking Classes

Reason Given	Response to Questions	Total # of times written
I like Mr. Joslin	6, 10, 12, 13	5
fun	3, 6, 7, 13, 15, 16	8
Schedule surprise	3, 15	2
Wanted to weld	17	1
Friend's recommendation	3, 4	2
Only class left	10	1
Just wanted to	3	1
interesting	6	1
Required for school-to-work	12	1

Note. Responses are listed in the order they appeared as the surveys were tabulated.

Appendix E: List of "Other" Reasons for Not Taking Classes

List of "Other" Reasons for Not Taking Classes

Reason Given	Response to Questions	Total # of times written
Didn't want to	3, 5, 6, 7, 8, 9, 10, 12	16
Didn't look interesting	5, 7, 14, 15, 16, 17	10
I hated Tech 1	4	1
Never heard of it	3, 5, 7, 8, 9, 10, 12, 14, 15, 16	13
Too hard	12, 13, 17	3
Took physics	10	3
Not that fun	17	1
Didn't get scheduled	6, 13, 14, 17	4
Other students discouraged me	8, 14	2
Didn't take prerequisite	4, 16	2
Taking similar class in FdL	10	1

Note. Responses are listed in the order they appeared as the surveys were tabulated.

Appendix F: Correlations Table

Correlations Between Participation in Technology Education Classes and Perceptions

Question	Students who took # of classes taken	0 classes vs. 1 or more	0 or 1 class vs. 2 or more	less than average vs. more than average
18	-0.03	.21	.02	-.10
19	-0.15	.07	-.09	-.11
20	0.28	.36	.40	.33
21	0.00	.18	.25	.17
22	-0.29	-.15	-.33	-.23
23	0.00	-.07	-.02	-.04
24	-0.40	-.36	-.30	-.44
25	0.24	.07	.34	.23
26	0.40	.18	.47	.37
27	0.09	.11	.08	.02
28	0.24	.30	.30	.34
29	0.23	.22	.29	.17
30	-0.29	-.09	-.27	-.32
31	0.30	.21	.42	.31
32	0.13	.10	.15	.02
Mean response on all questions	0.18	.28	.35	.16

	Students who took			
	# of classes taken	0 classes vs. 1 or more	0 or 1 class vs. 2 or more	less than average vs. more than average
Mean response to questions 18-19, 21-24, 27, & 30	-0.22	.00	-.13	-.23
Mean response to questions 20, 25-26, 28-29	0.43	.32	.55	.45