

An Analysis of the Barriers Impacting Student  
Enrollment in Graphic Arts Programs at  
Fox Valley Technical College

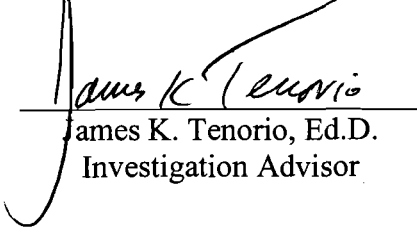
by

Gary W. Kilgas

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James K. Tenorio, Ed.D.  
Investigation Advisor

The Graduate School

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**The Graduate School  
University of Wisconsin-Stout  
Menomonie, WI**

**Author:** Gary W. Kilgas

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ABSTRACT

Printing and graphic arts firms across the United States have been experiencing growth over the last 3 years, but their ability to optimize business opportunities in an expanding economy has been restricted by an environment where there is a shortage of skilled workers to fill the voids left by retirements. Even more challenging is finding the right people that can contribute quickly. Printers are reluctant to hire unskilled workers, as they have adapted advanced technologies that require specific skills and knowledge.

The midwest, especially east central and southeast Wisconsin, is a hotbed for printing and graphic arts. Firms in this region are experiencing the same employee shortages and technology upgrades. They have increasingly been relying on Fox Valley Technical College's Graphic Arts Program to supply trained graduates. Unfortunately, FVTC does not have enough students to meet the demand.

Despite having at least 11 high schools with graphic design or printing curriculum in their district, the Printing and Publishing and Package and Label Printing Programs do not receive enough applications and enrollments to fill capacity.

The purpose of this study was to determine what barriers keep high school students from enrolling in the graphic arts programs at Fox Valley Technical College. To understand the issues and post-high school career decision influencers, information was needed from high school students in the region. A survey was designed to collect the necessary information and that survey was administered at 10 different high schools in October of 2006.

The study discovered that the awareness level of regional printing, career opportunities, and Fox Valley Technical College's programs was not sufficient. It also pointed out that students who have had exposure to printing in high school are generally undecided about pursuing a career in printing and most students have had little real exposure to the world of print outside of their classroom. Yet, many of these same students feel graphic arts/printing is a good to excellent career choice.

The results and information gained from the study will be very beneficial in assisting Fox Valley Technical College develop a process to more effectively advertise, recruit, and enroll students in graphic arts/printing.

The Graduate School  
University of Wisconsin Stout  
Menomonie, WI

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It has been an intense two plus years since initiating my effort to gain a Masters Degree in Career and Technical Education. Most people told me I was crazy trying to complete the program that quickly while working 60 or so hours per week in a very stressful leadership position within a Wisconsin technical college. However, since I was an older student, a sense of urgency was certainly present, and very powerful, as I mapped out courses and began driving to Milwaukee for weekend classes.

I had the good fortune to meet and build friendships with some exceptional faculty and fellow students in my cohort group. We had some great discussions, many laughs, and some excellent “real life” stories shared about education. As I look back on that experience, the wealth of knowledge gained from 30 years of work helped me focus on completing assignments and motivated me to share my thoughts on subject matter.

Learning new things has always been a passion of mine. I have an insatiable appetite to discover and often spend quiet moments pondering “what if.” Certainly, this addition to my formal education has opened my mind to many new possibilities. I owe this desire to my parents. Even though they have both been gone for several years, they instilled that “you can do it” and “never stop learning” attitude in me when I started high school eons ago. They also reminded me that everyone has the same capacity to learn, and that “it is what you choose to do with your opportunities that makes all the difference in the world.” You would be proud mom and dad!

The only people that have sacrificed as much as I did these past 28 months are my wife and children. It was a real challenge to be unavailable, or focused on writing term papers, with kids in high school and college. I missed many of my boy's high school sporting events; moments I can never gain back! Just like education, they know the passion I have for athletics and striving to reach your potential. I thank them for understanding, but it still hurts to have missed so many opportunities to watch them perform. Hopefully, the time we all missed in communicating with one another on weekends is offset by the example I provided on the effort and focus it takes to achieve a goal...a lesson that will serve them well as they continue their own educations.

Finally, I would like to thank my wife, Kathryn. She has been very supportive and understanding since I started taking classes. We sacrificed a lot of personal and social time together, so I could complete this degree. She has also had to take on additional responsibilities with raising our children and managing our household, so I could get my coursework done. And, I know giving up the computer for entire weekends was a bigger deal than she will admit! Your unwavering love has been an inspiration. The good news is that now, I (we) get my (our) life (lives) back.

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## Chapter I: Introduction

### *Background of Study*

Graphic Arts/Printing firms across the U.S. are experiencing a significant shortage of skilled workers. The lack of talented and “ready for work” labor is being felt in all printing fields, from commercial printers to corrugated-display manufacturers.

One reason for the skilled labor shortage is industry growth. After going through a period of consolidations and closings in the early 2000s, with several new incorporations, evidence exists that the printing industry has rebounded nicely and is growing in Wisconsin. “In a recent report, the Flexographic Technical Association (FTA) forecasted that growth of the flexo-printing industry will outpace the performance of the Gross Domestic Product, coming in somewhere between four and five percent as compared to the less than two percent improvement expected in the U.S. government’s benchmark index.” (McCluskey, 2002, p. 1). More evidence of recent printing industry fortunes comes from the digital electronic pre press segment. “The growth rate of this market segment is undeniable,” stated Molly Joss (Joss, 2005, p. 1).

The heavyweights of the printing industry, companies like R.R. Donnelley, and Banta Corporation, are leading the growth. Donnelley is the world’s largest printer and Banta Corporation is a Fortune 500 firm. According to Ed Lane, president of R.R. Donnelley’s book solutions group, “2005 has been a very strong year, with pretty consistent demand across most of our segments” (Curwen, 2005, p.1). “At Banta Book Group, the educational boost has been significant- probably a 20% increase, and better than we had forecasted,” according to president Bob Krieder (Curwen, 2005, p. 1).

Smaller printing firms, that are experiencing success and growth, are found regionally as well. A recent telephone conversation to the Graphic Arts Department at Fox Valley Technical College (FVTC) in Appleton, Wisconsin, included the statement, “We’re at two shifts and planning to add a third. I need your top two sheet-fed press graduates” (C. Graves, personal communication, January 26, 2006). The problem was that FVTC had no students to refer for employment. The college’s “printing” concentration did not have enough students to fill even one section of twelve completely and it has the capacity for two sections. Those students who graduated in December were already employed.

#### Skills are part of the Equation

While growth creates a need for more people, just plucking warm bodies off the street will not suffice. Printers are getting an earful from their customers about the importance of having enough technically-competent employees. “More efficient print buyers, seeking faster turnaround and fewer sources, can only be satisfied with top drawer technology and high caliber workers running it,” stated Bill Esler (Esler, 2005, p. 1).

The technical skills required of industry employees truly are changing at a fairly rapid pace. This is primarily being driven by a significant increase in the current “top drawer” technology-digital printing. Bill Lamparter (2005, p. 1) in his article, PrintCom Tallies Show Digital Soaring, stated “printing industry growth in 2004 was driven primarily by digital printing and a diversified range of auxiliary services.” Later in the same article he wrote “variable imaging digital printing grew to around \$20 billion in 2004” (2005, p. 1). That’s not bad for a technology that is barely ten years old.

Employees with particular skill sets will be critical to the industry for at least the next 10 years. “Improvements in technology are pushing print-on-demand (POD) label systems into a rapid growth stage” (InfoTrends, 2005, p. 1). “Employment of desktop publishing specialists is expected to increase much faster than the average for all occupations over the 2002-12 period as the elements of print production, including layout, design, and printing, increasingly are performed electronically” (College Grad, 2006, p. 10). This is evidence that printers have become keenly aware that new technology and skills will fuel their future growth and success.

#### Finding Talent

While future printing industry managers usually get their education from four-year universities like the Rochester Institute of Technology, Ferris State University, the University of Wisconsin-Stout, Carroll College, Fairmont State University, or Pittsburg State University (U.S. News, 2006), the printing industry also relies on two-year technical or community colleges across the nation to educate and train much of their skilled labor. These two-year schools typically build their programs around hands-on activities and have significant investments in capital or donated equipment from manufacturers on which students can practice.

Fox Valley Technical College (FVTC), located in Appleton, Wisconsin, has been a key skilled-labor source for several upper-midwest printing companies for more than 30 years. FVTC is one of 16 two-year colleges in the Wisconsin Technical College System. The college’s district covers five counties in east central Wisconsin and is home to 435,000 residents and a heavy concentration of printing firms.

FVTC is also one of 11 technical colleges in the state that offers graphic arts or printing programs (WTCS, 2006). FVTC has offered printing-related Associate degree and one-year Diploma programs for more than 30 years and is one of only two technical colleges in the state to have a full range of printing-education offerings (WTCS, 2006).

Students in Graphic Arts at FVTC can study electronic prepress, offset lithography, narrow and wide web flexography, corrugated printing, and Xerography. The FVTC Graphic Arts Program generally graduates students from four study areas:

- Printing (One-year Diploma program focused on offset press operation)
- Printing and Publishing (Two-year Associate degree: offset press or electronic prepress concentration)
- Package and Label Printing (One-year Diploma program focused on three flexography related disciplines - narrow web, wide web, and corrugated)
- Package and Label Printing Technician (Two-year Associate degree program focused on three flexography related disciplines - narrow web, wide web, and corrugated)

Overall, the entire Printing and Publishing program, which includes a prepress concentration, enrolls approximately 35 students and graduates approximately 16 annually. The same story holds true in the college's one and two year programs in Package and Label Printing. The three-year average annual enrollment is about 20, with 12 graduates (FVTC, 2005).

### Shortage Hits Home

The past two years have been marked by a significant up-tick in requests by printers for FVTC printing program graduates. Many regional firms have even taken to

starting their recruiting process in October for May graduates and even employing first semester students in hopes of retaining them upon graduation.

“Phone calls and e-mails come in weekly from printers looking to hire graduates of Fox Valley Technical College’s Printing and Publishing and Package and Label Printing Programs” (S. Caraballo, personal communication, January 27, 2006). Evidence of a need for employees, and the lack of graduates from technical and community colleges to address it, is extensive. “Like other manufacturing fields, the corrugated industry faces a period of baby-boomer retirements in the near future. Forward-thinking plant owners need to wonder where the next generation of employees will come from. There’s a great demand coming and a short supply” (Ricca, 2004, p. 2).

Traveling across the continental United States and Canada to conferences and meetings, the message is the same. Businesses are worried about a labor shortage and where they are going to get skilled employees. At the November, 2005 meeting of the Association of Independent Corrugated Converters (AICC) that was attended by over 500 business owners and senior managers, a new video and information packet was introduced called “Careers in Corrugated.” The package was aimed squarely at recruiting middle and high school students. It included a DVD titled *Corrugated Rocks*, product samples, and a career guide. The packets were distributed to all attendees and they were asked to provide the information to their local high schools. Another good example was a recent meeting initiated by the International Corrugated Packaging Foundation (ICPF) focused solely on establishing an educational venue for the corrugated display and box industry in Canada. The meeting was held at the Graphic Communications Institute in Montreal on January 9, 2006. Three corrugated box industry firms in attendance,

Norampac, Saint-Bruno, Quebec; Kruger Inc., Montreal; and Esko-Graphics, Ludlow, Massachusetts, all had the same message, “we need to train the next generation of employees for our industry in Canada” (C. Malo, personal communication, January 9, 2006). The meeting ended with plans to investigate equipment donations to help start a program at the institute.

A final verification of the need for skilled labor comes from a quick check of just one employment website, Monster.com. On January 14, 2006, the site showed over 1000 current job openings posted in the printing field (jobsearch, Monster.com, 2006). Every major printing process was covered: commercial, label, industrial packaging, corrugated, newspaper, gravure, web offset, and screen printing. A review of the postings showed almost all the jobs, at just this one website, required some post-secondary education.

#### A Career in Printing?

Despite the demand, high school graduates and career changers aren't rushing to an education in printing or graphic-arts-related fields. Two-year community and technical colleges, that offer an education in printing, need to attract more high school graduates and career changers and equip them with the necessary skills the industry needs. “The challenge,” according to Robin Jackson, president of the International Corrugated Packaging Foundation (ICPF), “is getting the word out about the benefits of a career in corrugated.” (cited in Ricca, 2004, p. 1). Jackson's comments were universal to all the print mediums.

A posting at Graphic Comm central, a web portal for graphic communications education and hosted by Virginia Polytechnic Institute and State University, is telling. A public relations firm, working on behalf of the Graphic Arts Education and Research

Foundation (GAERF), did research on how young people make career decisions. In mid-1999, they conducted a nationwide survey of 1,000 teenagers and four focus groups with young people and career influencers (parents and counselors). One of the findings was that “young people are unfamiliar with the printing and graphic arts communications industry, and are unaware of the career opportunities it offers.” (Graph Comm central, 2006, ¶2).

### *Statement of the Problem*

More graduates, with higher skill levels, are being requested by printing industry employers. The Fox Valley Technical College Graphic Arts Program is unable to meet regional printing-industry needs because there is a serious shortage of student enrollments.

### *Purpose of the Study*

To adequately address the shortage of skilled workers, Fox Valley Technical College’s Graphic Arts Program needs to double the number of student entrants and annual graduates in both the Printing and Publishing and Package and Label Printing disciplines. The purpose of this study is to determine the barriers to high school students enrolling in Graphic Arts programs at Fox Valley Technical College. To gain necessary information, a survey of high school students enrolled in Graphic Arts or printing classes will be conducted in the fall 2006.

### *Importance of the Study*

“In the U.S., printing isn’t just big-business; it’s the biggest, employing nearly one million people across the country” (P2Pays, 2006, p. 1). The printing industry has come to rely on community and technical colleges for their operators and technicians. If

community and technical colleges, ones that offer career education in printing and graphic arts, can meet the challenge and provide more skilled labor to the printing industry:

1. Graphic arts firms will hire more program graduates. This will improve the placement rates and cause more students to choose careers in printing.
2. Printers, equipment manufacturers, software suppliers, and graphic arts services organizations will fund more scholarships, provide more equipment, software, and services free of charge, keeping program operating costs low.
3. Career influencers will guide additional students to careers in graphic arts. They will see the success of previous students and encourage additional involvement.
4. Communities with printing firms will prosper, further economic development will occur, and constituents will find additional value in their technical college.
5. Strategies learned can be used by other programs at FVTC and graphic arts programs at other colleges and universities.

If community and technical colleges are unable to provide enough skilled employees to the printing industry, businesses will lose faith in this source for skilled employees. This would eventually lead to several outcomes:

1. Printers would take greater hiring risks and would also need to train their own employees. This is costly to productivity and the bottom line. If you are not productive, you are not competitive. This usually leads to loss of business. Eventually, if you can't compete, business operations will cease.
2. Without enough students to help meet the demand, college printing programs will wither away because printers will stop contacting them for graduates.

Establishing and maintaining these printing education centers is a highly capital-intensive endeavor. Wasting taxpayer dollars that have been invested in buildings, equipment, infrastructure, and human resources could negatively impact the college's future.

3. Printers would lose their cost-effective source to upgrade skills of current employees. This could lead to lack of opportunities for growth for both the business and the individual.
4. College graphic arts programs would be suspended and eventually closed as student populations deteriorate to the point where the college chooses not to continue financial support. Management, instructional, and support staff would be laid off, voluntarily leave, or be forced to take other positions within the institution, wasting a substantial investment in talents and skills.

Based on the aforementioned, it is vitally important that these colleges understand and address the issues surrounding recruiting, retention, and graduation of students who would embrace and enjoy careers in the printing industry.

#### *Objectives of the Study*

This study will address the following objectives:

1. Verify the anticipated shortage of skilled workers in the regional graphic arts industry and specific job titles with highest employment potential.
2. Compare the relationships between regional high school technical education instructors and FVTC Graphic Arts faculty and staff to the enrollment levels in graphic arts programs.

3. Identify the factors that influence high school students enrolled in visual communications (Tech. Ed.) classes to continue their education in graphic arts.
4. Determine the decision-making process that causes high school students to select or not select graphic arts as a career.
5. Analyze the factors negatively impacting perceptions of graphic arts as a career.
6. Identify if graphic arts careers are part of high school career-path discussions within Fox Valley Technical College district high schools.
7. Identify internal and external processes positively impacting enrollment trends.
8. Rank order, compare, and contrast the demographics of district high schools that graphic arts enrollees at Fox Valley Technical College attended over the last 5 years and determine any potential correlation.

#### *Limitations of the Study*

The limitations of this study are:

1. The study will involve only current FVTC graphic arts students and high school students enrolled in graphic arts classes, teachers, counselors, career changers, and parents who have attended a graphic arts open house.
2. The high schools and students who would participate in the study would only be within the FVTC district counties of Outagamie, Winnebago, Calumet, Waushara, and Waupaca. There are approximately 14 printing or graphics programs in FVTC district high schools.
3. Any five year historical data collected may not be completely accurate as student records may have changed, or previous data-collection procedures flawed.

4. The FVTC marketing materials that were created, produced, and implemented in the last five years may not exist any longer or be available when needed. There have been several managers within this area of the college over this time period.
5. Data gathering techniques may be limited to electronic surveys, personal interviews, and prior research material. Time limitations and acquiring permission to survey minors can be a time-consuming process with limited success.
6. Former students' availability and willingness to participate in surveys may be an issue. With rapidly changing job climates, workers tend to change employers unexpectedly and they may not have kept the college informed of their contact information.
7. Some high schools may have only very limited graphic arts exposure for students, and therefore, surveys may be incomplete. Every effort will be made to be consistent in gathering data, but it may be necessary to footnote particular participation by groups.

### *Definition of Terms*

There are several terms used in graphic arts and the printing industry that are important to understanding this research study. These are:

*Commercial Printing* – Printing for an entity involved in the production, processing, or merchandising of a commodity (CFTC, 2006).

*Corrugated board*- Made by a corrugator, corrugated board is a structured board formed by gluing one or more arched layers of corrugated medium to one or more flat-facing linerboards (Packaging Gateway, 2006).

*Desk Top Publishing* - Using a personal computer or workstation to produce high-quality printed documents. A desktop publishing system allows you to use different typefaces, specify various margins and justifications, and embed illustrations and graphs directly into the text. The most powerful desktop publishing systems enable you to create illustrations; while less powerful systems let you insert illustrations created by other programs (Webopedia, 2006).

*Digital Printing* -Printing technology (laser printer, inkjet printer, digital press, etc) that can produce printed sheets directly from a computer file, without going through some intermediate medium such as a film negative or an intermediate machine such as a plate-making machine (Adobe Systems, 2006, p. 5).

*Electronic Prepress* - The use of computers to prepare camera-ready materials up to the actual printing stage, including drawing, page makeup and typesetting, all performed electronically rather than by drafting or mechanical cut and paste methods (PC Magazine, 2006, ¶1).

*Flexography* – A rotary letterpress process printing from rubber or flexible plates and using fluid fast-drying inks. Mainly used for packaging applications (Farlex, 2005).

*Graphic Arts* - the art of drawing or painting or printmaking (Wordreference.com, 2006).

*Gravure* - A method of printing in which the image is etched into the printing plates, as opposed to letterpress printing, in which the image is slightly raised from the rest of the plate. Gravure printing produces consistent quality in long production runs (Rainwater, 2006).

*Offset Lithography* - The most common form of lithographic printing in which the image area and the non-image area exist on the same plane (plate), separated by chemical repulsion. To print, the ink is "offset" (transferred) from the plate onto a rubber blanket and then to the paper (Neenah Paper, 2006).

*Print on demand* - Print on demand enables the items to be printed one at a time, literally 'as needed'. The book, including the cover, is set up as a digital file. When an order comes through, the right file is selected by the computer, which then gives the instruction to the print-on-demand machine to produce it (Holifeld, 2004).

*Screen Printing* - A printing technique involving the passage of printing medium, such as ink, through a web or fabric, which has been stretched on a frame, to which a refined form of stencil has been applied. The stencil openings determine the form and dimensions of the imprint thus produced (All-Pak, 2006).

*Variable Imaging* - The printing of documents in which each one is personalized for the intended recipient. It can be as simple as just a name and address, but the real impact comes when other information is added to create a piece that includes information specific to the recipient (MAR Graphics, 2005).

*Web Offset* - A lithographic printing press in which the paper is fed from a roll as a web (continuous ribbon), as opposed to sheets. Paper requirements and ink drying mechanisms may differ between the two offset printing processes. (Newpage, 2006)

*Xerography* - Pronounced (zĭ-rŏg rē-fē), n: A process for copying printed matter by the action of a light on an electrically charged surface in which the latent image usually is developed with a powder (The Merriam Webster Dictionary, 1994).

## Chapter II: Literature Review

### *Introduction*

This chapter will include information on the state of the printing industry for 2006, and specifically, what employers feel are the greatest human resource issues. The author will briefly present and analyze an industry report. The next area presented will be the importance of printing in Wisconsin and current trends in the printing industry that are shaping the demand for skilled employees. This chapter will also investigate if the demand for graphic-arts-degreed people is nation-wide, or if it is unique to the north central region of the United States, where a significant number of printing firms are found.

A prediction of future employment demand will also be discussed and clarified, along with general knowledge and perceptions of the industry by young people. This is in an effort to understand some of the barriers to young people choosing a career in the printing industry.

### *State of the industry*

The printing industry is indeed healthy. Ronne Davis reported in mid December 2006 that its research indicated business conditions were healthy- “if not spectacular- for the year” (Joss, 2006, p. 12). Later in the article, Frank Romano, a well-respected industry analyst, gave his take on the current situation. “Romano also believed 2006 will be a good year for printers that offer digital printing, and package printing and converting.” (cited in Joss, 2006, p. 14).

According to the recent National Association for Printing Leadership (NAPL) State of the Industry Report 2006, “Despite the Internet, China, consolidation, and

everything else shaking our industry, there is plenty of opportunity for companies of all sizes.” (Paparozzi, 2006, p. 2). “Digital printing is expected to grow significantly, as is 4-or-more color lithography.” (Paparozzi, 2006, p.1).

There is concern moving forward, however. Responding firms indicated rising energy prices and “the economy” as two of the top four concerns that could stop growth. (Paparozzi, 2006). In a 2006 industry report commissioned by the National Association for Printing Leadership (NAPL) titled State of the Industry, two other concerns also made the top ten in every size printing firm. These were: a shortage of skilled production personnel, and retaining, recruiting, and educating employees. (Paparozzi, 2006). Many employees of printing firms are beginning to retire in large numbers. This, coupled with rapid technological advancements is causing retraining, as well as recruiting skilled replacement talent, to be a concern.

We are on the cusp of constant re-education of incumbent workers in a number of industries, but mainly in manufacturing. In order to compete globally, companies are needing to become extremely effective and efficient, turning to lean manufacturing techniques and six-sigma training for their employees to help get there. As evidence, in the Business and Industry Services area of Fox Valley Technical College, there has been a definite increase in the number of employer requests for employee retraining over the past two years (D. Wuestenberg, M. Frozena, S. Farrell, personal communication, April 12, 2006).

The NAPL report also stated that the industry must be prepared for the likelihood that the economy will not be as strong in 2006 as it was in 2005 or 2004. This means that

the second half of 2006 could see a slowdown in college printing program graduates being employed.

Printing is important to Wisconsin

Printing is the tenth largest manufacturing industry in Wisconsin, with 989 firms and \$4.9 billion in annual sales revenue. (Shepard, 2006). But, there is a downside. Just like the other top manufacturing industries, there is a skilled labor shortage. According to S. Mark Tyler, president of OEM Fabricators Inc., Woodville, Wisconsin, “The work ethic and the level of skilled labor in our state are excellent. But the problem is, there’s not enough of it.” (Shepard, 2006, p. 22).

Earlier in 2006, Coating Excellence International, a packaging company headquartered in Wrightstown, Wisconsin, announced a major expansion that will add dozens of new positions by the end 2006. Wrightstown is located about 20 miles from Fox Valley Technical College and is on the district’s educational border. The company recently captured additional market share and added flexible packaging to its product mix that prompted its second expansion since 1999. According to President Michael Nowak, “CEI’s sales were up about 25 percent to \$125 million in 2005.” (cited in Byrne, 2006. ¶2). “Coating Excellence International’s growth has been a boon to the local job market with adding an average of five or six employees a week. By late January, total payroll had topped 300 and is still growing.” (Byrne, 2006. ¶18). The company has also embarked on a path of doing its own product development and testing in house, which will add to the number of technically skilled workers needed.

Another Fox Cities employer, Thilmany, LLC, recently announced a merger with Chicago-based Packaging Dynamics Corporation, making it one of the 10 largest flexible

packaging companies in the country (Lee, 2006). Patrick Schillinger, president of the Wisconsin Paper Council stated, “What this means for the future, the current jobs at Thilmany will be more secure. Since this is a growing business, there could be the potential for more acquisitions in the future.” (Lee, 2006, p. A7). This is significant because Thilmany, a transitioning former paper mill that employs more than 1200 workers, had seen its product lines wane and job cuts commonplace in recent years. The merger strengthened the need for future printing and packaging educated workers and also continued a trend in the northeast region of Wisconsin of becoming a packaging Mecca.

The larger magazine printers in the state are also challenged to find qualified people to fuel their planned growth. On February 10, 2006 an article in *The Post Crescent*, a Wisconsin regional newspaper, was headlined “Quad/Graphics to add 750 jobs.” (Associated Press, 2006, p.D-6). Quad/Graphics is one of the top printing companies in the world, employing more than 12,000 people and 7000 in Wisconsin. The story explained that the positions will be “product technicians.” According to Joel Quadracci, president and chief operating officer, “Most people don’t think of printing as high tech, but these will all be high-tech jobs.” (Associated Press, 2006, p. D-6). What this means is that the company needs people who have formal printing and graphic arts education and will seek out organizations that can provide those skilled people.

As further evidence that the magazine and insert printer is serious about finding skilled help, it is assisting Fox Valley Technical College, Appleton, Wisconsin, with launching a basic printing program for students at Wautoma High School. Wautoma is about 40 miles from Quad/Graphics, Lomira, Wisconsin plant and also lies within

FVTC's district. The Lomira operation is the world's largest printing facility with over 2 million square feet of space. They constantly are advertising for workers, as observed by this research over the past two years.

Yet another segment of graphic arts, the corrugated industry in Wisconsin, also is experiencing difficulty in hiring qualified production people. At a recent Association of Independent Corrugated Converters meeting, held in Las Vegas, Nevada from April 5-8, 2006, Jerome Hessel, Executive Vice President of Menasha Packaging Company LLC, Neenah, Wisconsin, stated "We have the jobs; it is just difficult finding the people to fill them." (J. Hessel, personal communication, April 7, 2006).

Does the demand for skilled graphic arts employees extend nationwide? It is hard to say. On one hand, the printing industry is consolidating. According to Frank Romano, senior contributing editor, Electronic Publishing magazine, "2006 will be one of the biggest years in the industry for mergers and acquisitions. This is on the heels of a loss of 6,677 printing companies between 1998 and 2005" (cited in NAPL, 2006, p. 49). "By the end of the year, more than 2400 printing firms will be acquired or will merge-the highest number of consolidations in a single year-ever." (Joss, 2006, p. 14). Clearly, this will eliminate some industry jobs. The change is that, while some printing companies are going away due to mergers, others are growing in order to meet the demands of a population that has increased their use of individually packaged, single-serving food products, has demanded more daily conveniences, has more leisure time to be involved with activities, has more capability to travel, search the internet for products, and increasingly does their shopping on television. This fact, coupled with increased product

development and engineered innovations, causes demand for more printing and more people to create it.

Other colleges in the United States, that offer graphic arts or printing as one of their majors, have seen graduate demand trending upward. According to Hal Hinderliter, Director of the Graphic Communications Institute at California Polytechnic State University,

“Graduates of our Graphic Communications program are in high demand. Most of our Graphic Communication students are recruited while they are still Juniors. The employers always tell me how impressed they are with the students and Cal Poly’s program. Graphic Communication grads have been in short supply.” (H. Hinderliter, personal communication, April 19, 2006).

More evidence of a current need for college degrees in graphic arts and printing comes from the Rochester Institute of Technology, Rochester, New York. Shauna Newcomb, Program Coordinator, said

“Indeed, it has been awhile since the outlook was this bright....even with the consolidations of many printers. I have seen a big upswing in the number of jobs for printing management graduates and alum in the last year and one-half-and the variety of jobs is greater than ever. Firms are looking for graduates with a variety of skills, and for a variety of areas in graphic media.” (S. Newcomb, personal communication, April 19, 2006).

What is one print-related industry (corrugated) doing to try to recruit talent? In short, they are getting aggressive. The first formal indication of a looming labor shortage in the corrugated box industry came in the form of a speech at Fox Valley Technical

College and their annual Graphic Arts Open House on January 27, 2005. One of the speakers was Anthony Garcia, then Training Director for Weyerhaeuser, Inc. He stated “Weyerhaeuser has 60,000 employees world-wide. Within five years, 32,000 of them are expected to retire. We’ll take every printing graduate Fox Valley can turn out.” (A. Garcia, group presentation communication, January 30, 2005).

More recently, in the Spring 2006 International Corrugated Packaging Foundation (ICPF) newsletter, it became clearer that the corrugated box industry was serious about doing something to slow down the pending shortage of workers. Two articles, aimed squarely at recruiting were on the cover page. The first, entitled “More Schools, More Students, More Interest” (ICPF, 2006.), summarized an ICPF satellite briefing on February 15, 2006 featuring veteran employees of the corrugated industry discussing their fast-track careers and exciting daily challenges. The message promoting a multitude of job opportunities was broadcast to graphic arts classes at 10 colleges in the U.S. and Canada. This is the most compelling argument that the industry was serious about recruiting to date.

A second cover article in the same newsletter presented another tool the industry recently developed. It was a CD and career guide entitled “Careers in Corrugated.” The product was created to excite middle and high school students about the corrugated industry and its great career opportunities. (ICPF, 2006, p. 1). A complete review of the newsletter showed almost the entire document was devoted to attracting new talent to the corrugated industry.

There is already evidence that the pending exodus of baby-boomer retirees is a factor driving a current and future employee shortage. Another factor appears to be

industry growth that is creating the need for more skilled labor, more specifically, growth caused by technological changes.

Kodak and other leading printing industry vendors offered insights in the recent VuePoint Conference bulletin produced by Graphic Arts Show Company of Reston, Virginia (February, 2006). Kodak's assessment of the future included the statement "Opportunities for print providers to expand services and enhance revenues have never been greater. In many cases, documents will be tailored to the interests of each recipient. While many of these new services, such as on demand and variable data printing, are made possible by digital technology, commercial printers that offer a mix of conventional and digital solutions are best poised to meet the needs of their customers." (VuePoint., 2006, p. 20).

In the same publication, another printing industry innovator, Xerox, offered their explanation for growth. "A continuation of a current trend: printers will use digital technologies to deliver new value to customers. Much of this value will come from digital presses that provide no-excuses print quality, and digital workflow systems that achieve true integration of the digital and offset worlds." (VuePoint, 2006, p. 22). The Xerox summary goes on to state that "Digital workflow tools are responsible for delivering considerable automation to the printshop floor, improving productivity and integration with other digital systems to create great communications engines. They help printers do more with less and to quickly develop new applications in response to customer demands." (VuePoint, 2006, p. 22).

Dennis Hastings, president of iDirect, said his digital printing company started growing when they began tracking responses to their offerings and producing marketing

materials. A key component, according to Hastings, is that printing companies must educate media buyers on how valuable print can be when coupled with other media and services. “Doing so will mean hiring marketing talent with an understanding of solution selling and training and compensating the sales staff accordingly.” (Joss, 2006, p. 15) These examples clearly show that technology is helping printers grow and create jobs for qualified candidates.

A final article driving home the point that technology, including digital printing, is creating employment opportunities is “Nexpress opens new market for printer.” The Nexpress is a digital output device developed by Heidelberg Digital and recently purchased by Kodak. Sean Galloway, co-founder and owner said “The Nexpress has totally changed the business. It’s allowed us to be more responsive to customers’ needs, to generate more work, and to provide work we couldn’t do before, such as higher end agency work. It’s incredibly reliable. We’re at a half-million impressions a month on the Nexpress.” (Hitchcock, 2006, p. 36).

A third element creating demand for skilled workers is: college degrees are becoming more important. With all the technology present in modern-day printing operations, employers no longer can simply hire warm bodies off the street and spend the next few years training them. Business results are expected much faster today, and experienced workers are critical. According to Joan Lloyd, “Most jobs are becoming more specialized.” Lloyd went on to say, “In years past, a high school education was enough of a foundation, but not to companies wishing to upgrade their workforce and create job standards. They see a college degree as a common starting point. It provides a foundation of knowledge that is quantifiable.” (Lloyd, 2006, p. A19). Understandably,

those specialized jobs require specialized training that can be found at two and four-year colleges.

#### Future Employment Trends

The long-term future of college educated printing graduates is excellent in the north-central region of the United States. With an abundance of large printers across all types, the retirement of many in the current workforce, continued innovation and development of new products by regional printing firms, and consuming businesses like Kimberly Clark and Procter and Gamble, growth should continue. Across the country, the story will be the same. The current available adult workforce will shrink over the next 20 years, creating very good opportunities for those with a post-secondary education and specific skills that have been developed through hands-on experiences.

#### General knowledge and perceptions of the industry by young people

Fox Valley Technical College faculty in the Package and Label Printing Program ramped up their recruiting activities from October, 2005 to December, 2006 in an attempt to increase enrollments in the one and two-year programs. What they found was that when they went to district high schools that they had not previously presented at, the students had no idea that FVTC had a printing program, much less one that was nationally recognized, (S. Gehrt and R. Dix, personal communication, April 3, 2006). Similar findings were made at the annual Graphic Arts Open House, held on January 31, 2006. The researcher observed several potential new students were telling administrators and faculty after the formal presentations that they had no idea what a cool program printing appeared to be, the great careers there were, and the number of jobs available. From this information, one could conclude that there are definitely some barriers to

attracting high school students to printing careers besides parents' dreams of Johnny and Suzy attending a four-year university and the peer view of students who attend technical colleges as "can't cut it" anywhere else.

### *Summary*

The literature review completed clearly indicated that, going forward, there are significant employment opportunities in printing for educated people. It also pointed out that there is a shortage of graduates going into printing as a career.

While there is a small amount of data that shows there are barriers, such as lack of knowledge, that causes high school students not to select printing as an educational goal, more direct evidence from high school students will be necessary to more fully understand all the roadblocks to recruiting more people into college printing programs. Therefore, a survey of high school students will be conducted in the fall of 2006 to gather additional information regarding industry knowledge, post-secondary education influencers, what high schools are new graphic arts students coming from, and why. This new information will assist in developing strategies that all post-secondary institutions can utilize to attract more students.

## Chapter III: Methodology

### *Introduction*

The Graphic Arts Program at Fox Valley Technical College is facing a major challenge. Printing industry employers in Wisconsin are requesting more graduates, with higher skill levels. The program is unable to meet the industry needs due to a serious shortage of student enrollments. With this in mind, the researcher desired to understand what causes high school students to choose, or not choose, a career in printing and seek further graphic arts education and skill development.

This chapter will include background information on the study, how the sample will be selected, a description of the sample, and the instruments being used. In addition, data collection and data analysis procedures will be given. The chapter will conclude with the limitations the data collection method poses.

### Subject Selection and Description

The author desires to gain information regarding how enrollment levels by high school students into graphic arts programs at Fox Valley Technical College can be improved, and if a formulated hypothesis on the subject is correct.

Through recent research, it has been determined that there are graphic arts or graphic design classes being taught in at least eleven district high schools surrounding Fox Valley Technical College. The author will be contacting and working with technical education instructors at these schools who have responsibility for teaching graphic arts classes, to develop and administer a survey to students in their classes regarding barriers to enrolling in FVTC's Graphic Arts Program. Principals and other appropriate administrators at each respective high school will be contacted to approve the study and

process prior to contacting the teachers. Subjects will be junior or senior academic levels and both male and female students will be asked to participate. In order to maintain anonymity of subjects, the teachers will be responsible for administration and collection of surveys.

### *Instrumentation*

The study will be conducted via a student survey. The survey will be designed for easy completion and take about 10 minutes. There will be a total of 20 questions or areas to rate. Demographic data will be collected as a key component of the information gathering. Most areas to rate will be Likert scale related items and there will be a brief information section at the end. Since no existing instruments met the specific needs of this study, an original survey will be designed utilizing elements of existing research instruments. There are no measures of validity or reliability because the survey was designed specifically for this study. A complete survey is located in Appendix B.

### *Data Collection*

Based on information obtained over the past 3 years, it is the author's hypothesis that many high school students in Fox Valley Technical College's district do not even know a world-class graphic arts facility and program exists in their backyard, and students do not know about the wide variety of career opportunities in the field.

It is absolutely critical that the author understand what drives post-secondary school and program enrollment of potential graphic arts students at each district school that offers basic printing-related educational classes. Therefore, verification of existing graphic arts or graphic design courses within the Fox Valley Technical College district high schools will be completed by August, 2005. If the number of programs holds,

written permission will then be sought from principals at eleven district high schools. This will occur in the Fall semester or first trimester of the 2006-2007 school year. If the number of programs changes, up or down, the contact number will change accordingly, so that each school with a graphics class has the opportunity to participate. Once permission is granted, the author will contact each respective technical education instructor; provide written background information on the study, and work to secure participation. Participation will be optional for each selected location.

Dates will be selected to administer the survey at each participating school based on school and class schedules. Two weeks prior to doing the survey, permission slips will be provided to teachers for students to have parents or guardians complete and return. Only those students who have a completed permission slip will be allowed to complete and submit the survey. To protect the study participants, there will be no identification marks on the surveys. Teachers will administer the survey, collect them, and immediately place them in a sealed envelope and stored in a locked area until the author can retrieve them.

#### *Data Analysis*

The data will be analyzed using a computerized statistics package selected by the author and administered by Shannon Helms of the Fox Valley Technical College training and development staff. Data will be both nominal and ordinal, so all appropriate descriptive statistics will be utilized. Cross tabulations will be done to compare male with female students, juniors with seniors, and rural with urban schools.

## Limitations

A limitation of this study and the survey instrument will be that there are no measures of validity or reliability. Even though only about one-third of the district high schools will be surveyed (approximately 11 of 34), all schools with graphics programs will be invited to participate. Some school graphics programs or classes may be relatively new and therefore, may be reluctant to participate.

It will be challenging to acquire permission and accumulate data from every potential school within a four-week period of time. Conducting the survey early in the school year may mean the students have not garnered much knowledge about printing careers. This could limit the amount of useful data accumulated.

## *Summary*

Conducting, analyzing, and developing conclusions from the aforementioned survey is an extremely important endeavor that can significantly impact the future of graphic arts at FVTC and other post-secondary institutions. Every effort will be made to proceed cautiously and correctly in order to successfully complete the study. Guidance from UW-Stout faculty, administration, and advisors will be fully utilized in order to improve the chances for excellent results.

## Chapter IV: Results

### *Introduction*

This chapter will include base demographics and itemized data analysis of a graphic arts career survey administered to more than 280 high school students from ten high schools in October of 2006. The survey consisted of 20 items that were designed to gather data regarding eight objectives. Where appropriate, findings will be correlated to hypotheses the researcher developed prior to the study.

### *Survey-Rate of Response*

There are 32 high schools in Fox Valley Technical College's district. Surveys were offered to 28 schools that had technical education classes, 16 of which have graphics or printing curriculum. Nine district schools, all with graphic arts classes, chose to participate, providing information from almost one-third of those contacted. Students from one "out-of-district" high school also participated in the survey.

A total of 350 surveys were provided to schools from mid to late October, 2006. The researcher directly provided the surveys to technical education instructors to administer. There were 290 returned, with 7 incomplete surveys, yielding 283 valid sets of responses for a response rate of 80.8% (n=283).

### *Survey Demographics*

Item #1- Gender. Of the 283 participants, 280 indicated a gender type. Of the 280 responding, 191 were male (68.2%) and 89 were female (31.8%). This was an encouraging demographic, considering the printing industry was dominated by males through the 1980's. Table #1 presents how the participants were divided by gender.

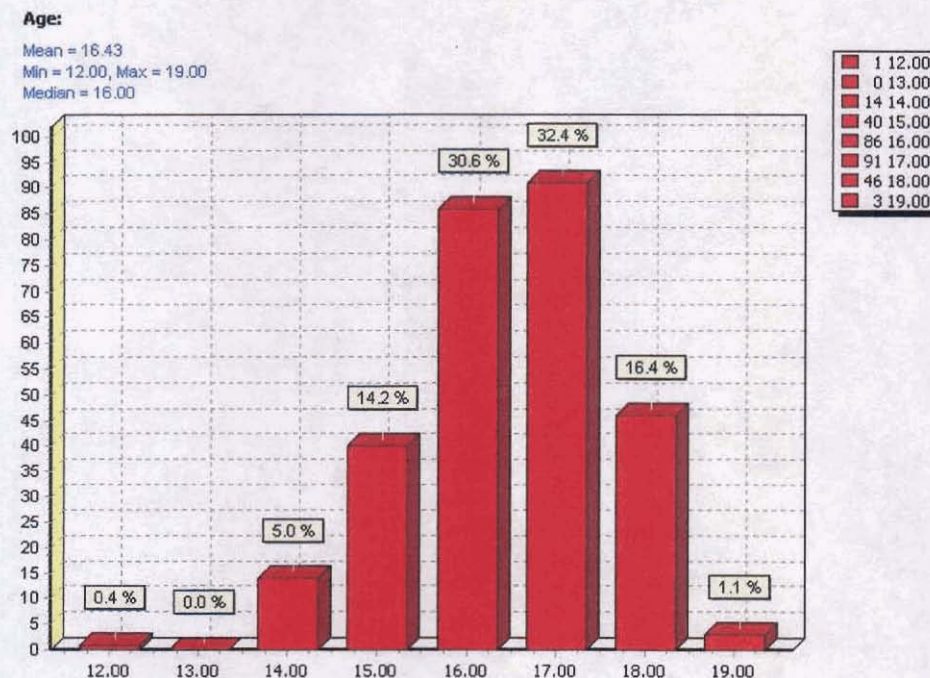
Table #1

*Survey Participant Gen*

	Respondents (n)	Valid Percent (%)
Male	191	68.2
Female	89	31.8
Total	280	100.00

Item #2- Age. The ages of respondents crossed eight years, from twelve to nineteen. A total of 281 students completed this information yielding a mean of 16.43 years, median of 16 years, and mode of 17. The full results of participant ages are shown in graph #

Graph #2

*Ages of Survey Participants*

Item #3- Participating High Schools. The researcher was fortunate to get good feedback from both “urban” and “rural” schools in the region. Students from ten high

schools participated in the survey. Of these students, 280 indicated their high school on the survey. Four of the high schools are considered “rural” and 6 high schools “urban”. For purposes of this survey, urban high schools were considered to be in the Fox Valley Metro contiguous area. Rural schools were defined as being at least 10 miles outside of the Fox Cities and the majority of their students reside in rural areas. There were 120 surveys (42.8%) completed by rural high school students and 160 (57.2%) by urban high school students. Table #3 shows the data for each school.

Table #3

*Schools Participating in Survey (\* Denotes Out-of-District school)*

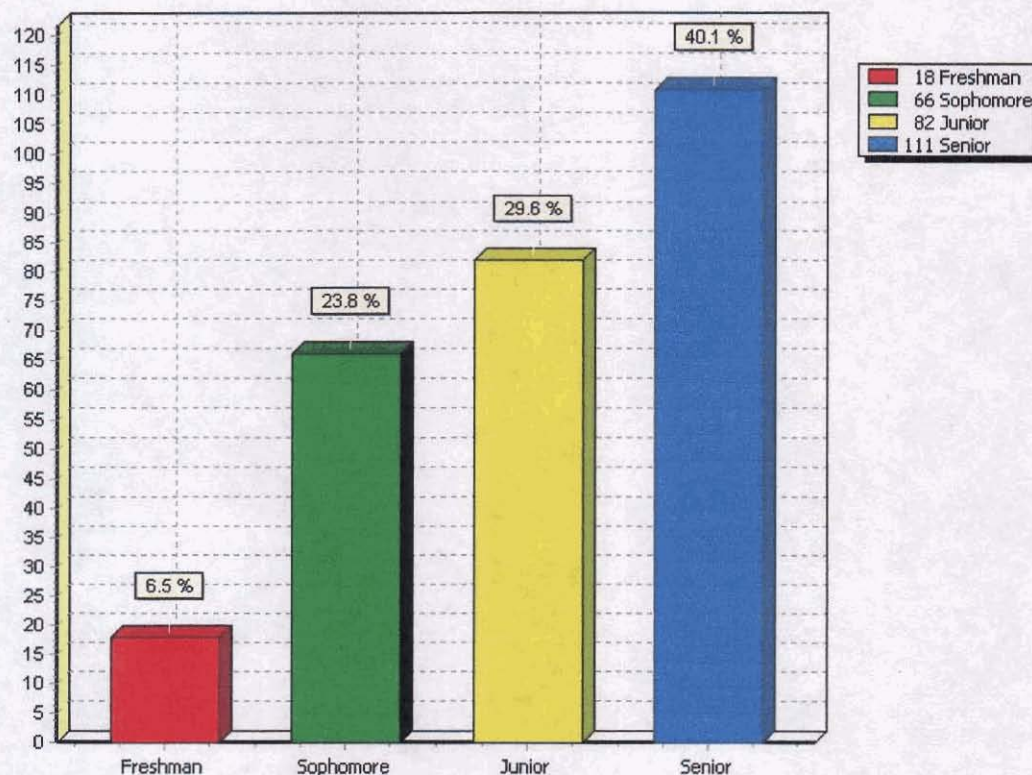
School Name	Urban (U) or Rural (R)	Survey Participants	Percent of Total	Male	Percent of Total	Female	Percent of Total
Appleton East	U	23	8.2	17	73.9	6	26.1
Appleton North	U	33	11.8	25	75.7	8	24.3
Appleton West	U	40	14.3	33	82.5	7	17.5
Hortonville	R	14	5	7	50.0	7	50.0
Little Chute	U	3	1	1	33.3	2	66.7
Manawa	R	17	6.1	2	11.8	15	88.2
Neenah	U	11	3.9	10	90.9	1	9.1
New London	R	87	31.2	53	60.9	34	39.1
Oshkosh North	U	50	17.8	42	84.0	8	16.0
* Plymouth	R	2	.7	2	100.00	0	0.00
Totals	N/A	280	100.00	192	68.6	88	31.4

Item #4- Participant grade levels. The results of participant grade levels matched a hypothesis the researcher had. The hypothesis was that students would tend to migrate to a printing class as an upper class person-- after all the required courses were completed. A total of 277 students completed the class-level information. Of the respondents, 111 (40.1%) were seniors, 82 (29.6%) were juniors, 66 (23.8%) were sophomores, and 18 (6.5%) freshman. The importance of this statistic should not be overlooked. Upper classmen are in the decision making period for post-high school

career or education planning. Almost 70% of respondents were either junior or senior, the point at which post-high school planning is either being started or well underway for many students. How much these students knew about, or viewed graphic arts and printing as a career, had much to say about the effectiveness of the college's marketing. The results of participant grade levels are shown on graph #4.

Graph #4

*Current Grade Level of Participants*



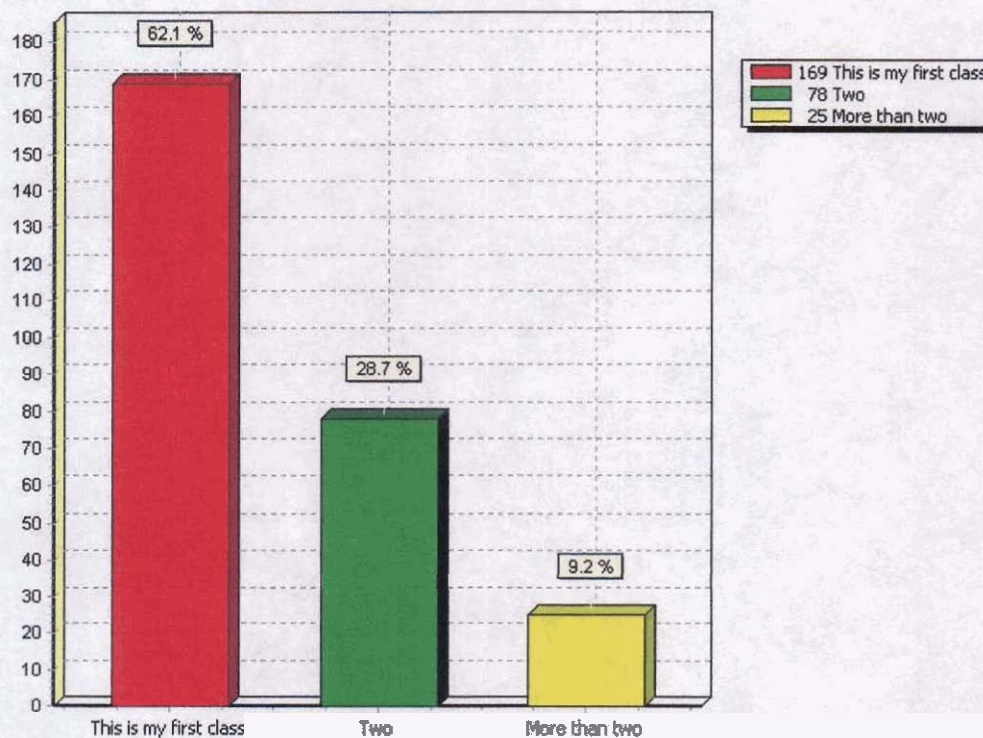
*Item Analysis*

Question five on the survey was “How many Graphic Arts/printing classes have you taken in high school?” This question was asked to find out the knowledge or experience level and continued interest in taking graphics related classes by students and to see if there might be any correlation to continuing a print-related education. The

results were as follows: 62.1% (n=169) of the participants indicated that the graphic arts or printing class they were currently enrolled in was their first; another 26.7% (n=78) said they had taken two classes; and 9.2% (n=25) had taken more than two classes. Graph #5 shows most students have only one class.

Graph #5

*Number of Graphic Arts or Printing Classes Taken in High School*

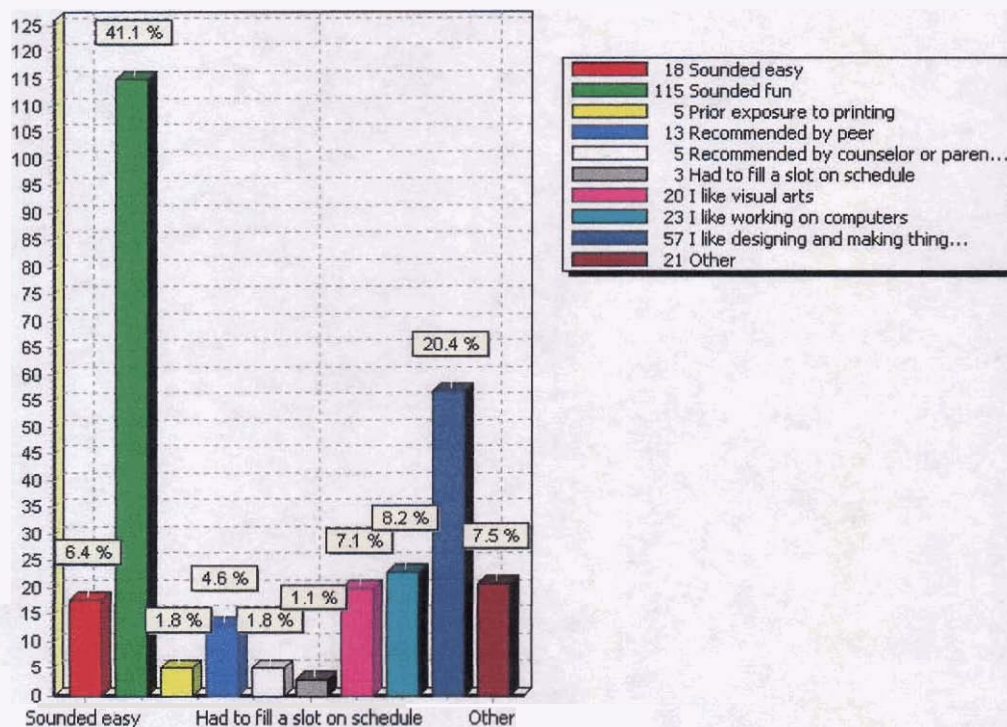


Question six was “Why did you take graphic arts or printing in high school? This question was asked in an attempt to understand if there was a direct correlation between taking a high school class in graphics or printing, and some understanding of the industry. There were 280 responses (n=280). The most selected response was “sounded fun!” A total of 41.1% (n=115) of responders indicated this reason. Another 20.4% (n=57) said “I like designing and making things.” The next most popular response,

“I like working on computers” had 8.2% (n=23). The balance of the 10 total potential responses had less than an 8% response rate. All responses are charted in Graph #6.

### Graph #6

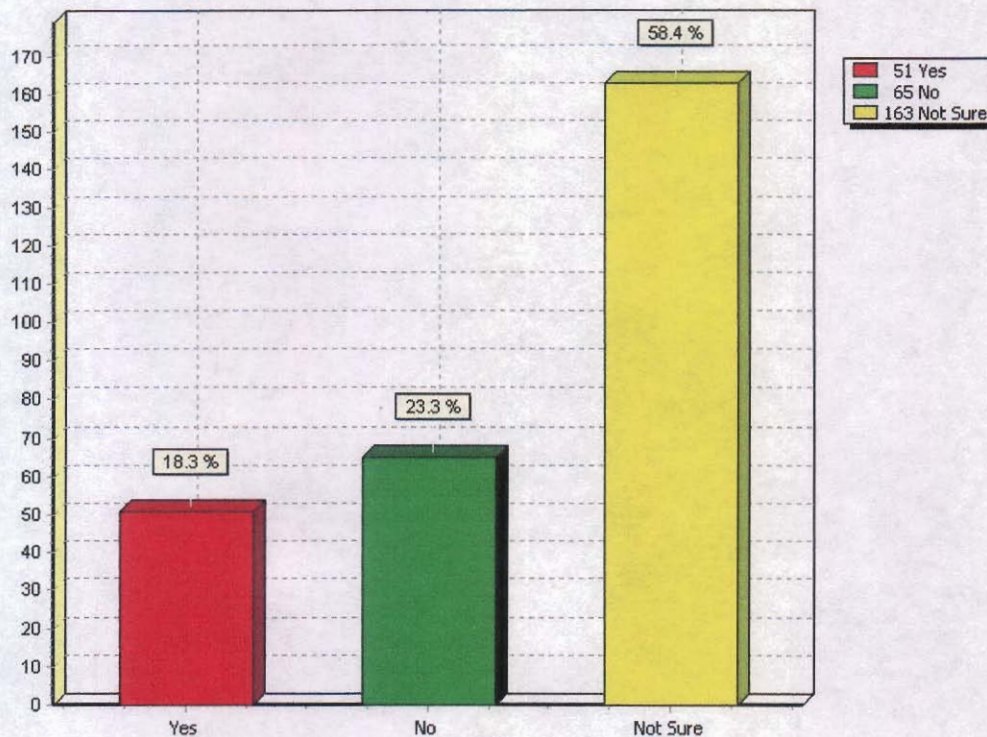
#### *Reasons for Taking a Printing or Graphics Class in High School*



Question seven asked participants if they planned to pursue a career in printing or graphic arts. This question was asked so the researcher could understand any link between a prior understanding of the printing industry and a commitment to potentially working in it. A total of 58.4% (n= 163) indicated they were “not sure” about a career in printing or graphic arts. Another 23.3% (n=65) definitely were not interested in this career. Finally, 18.3% (n=51) said they did plan to pursue a career in printing or graphic arts. Graph #7 graphically depicts the data on pursuing a printing or graphics career.

Graph #7

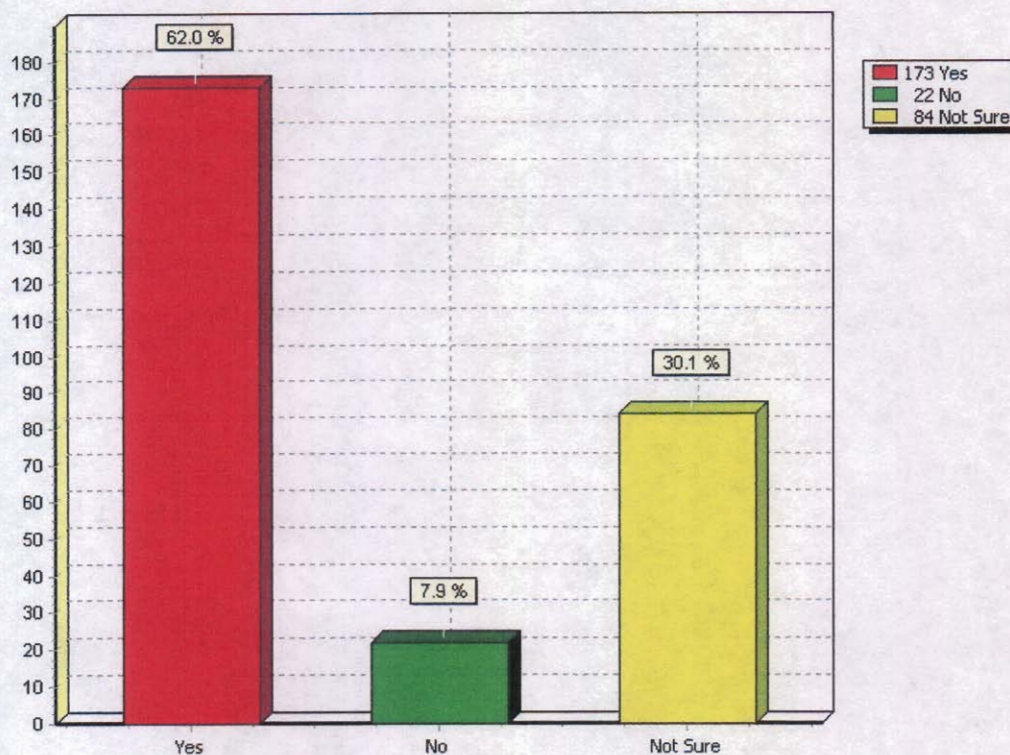
*Do Students Plan to Pursue a Graphic Communications or Printing Career?*



Question eight asked survey participants if they thought graphic arts businesses required additional education beyond high school for employment consideration. Prior research that was noted in the study background from chapter one indicated that employers were definitely seeking technically skilled workers and that needs could not be met by hiring workers without post secondary education and skill development. A large number of respondents, 62% (n= 173) said “yes” to this question. Another 30.1% (n= 84) indicated they were “not sure,” and 7.9% (n=22) said additional education was not a requirement for employment. Graph #8 graphs this information.

Graph #8

*Do Students Think Graphic Arts or Printing Firms Require Additional Education Beyond High School to be Considered for Employment?*

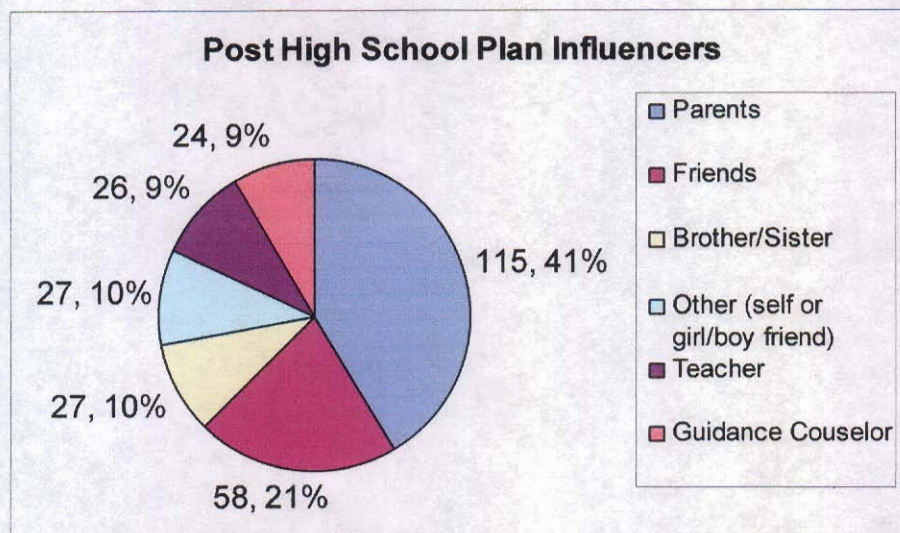


Question nine asked respondents to rate who has the most influence on their post-high school plans. A total of 277 students responded to this question. This is a critical data area to understand if the researcher is to determine barriers to graphic arts careers and potential focus areas to develop a strategy around. The researcher was surprised at how many respondents listed “myself” as a key influence on post high school plans. There was no question who had the most influence on a student’s future. Parents or guardian scored a 41% (n=115) as being most influential. This was almost double the next closest response. “Parents” was followed by “Friends,” 21% (n=58); and then a tie between “Brother/Sister” and “Myself” with 10% (n=27) each. “Teachers” as an

influencer, scored 9 % (n=26); and guidance counselors, for this sample, scored the lowest percentage at just under 9% (n=24). Chart #9 graphically depicts the results.

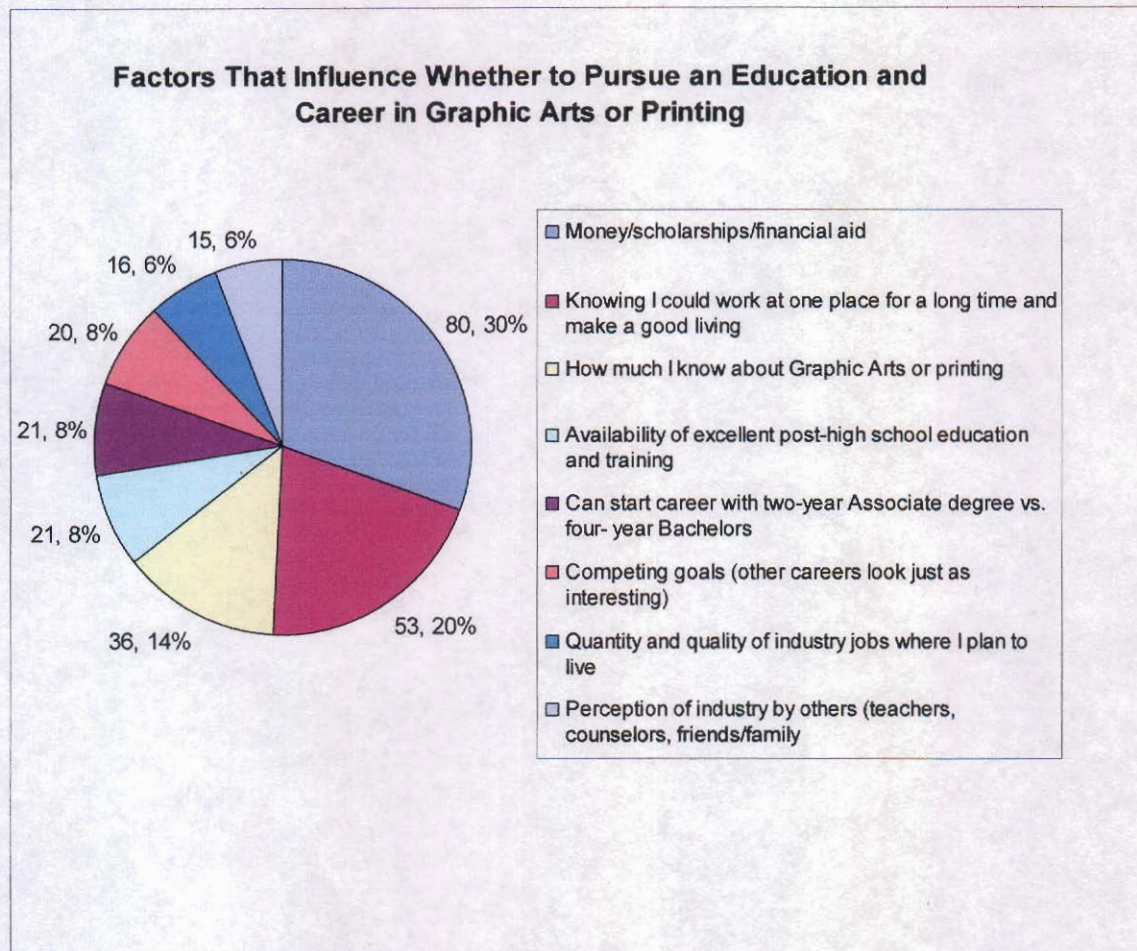
#### Chart #9

#### *Who has the Most Influence on Your Post High School Plans?*



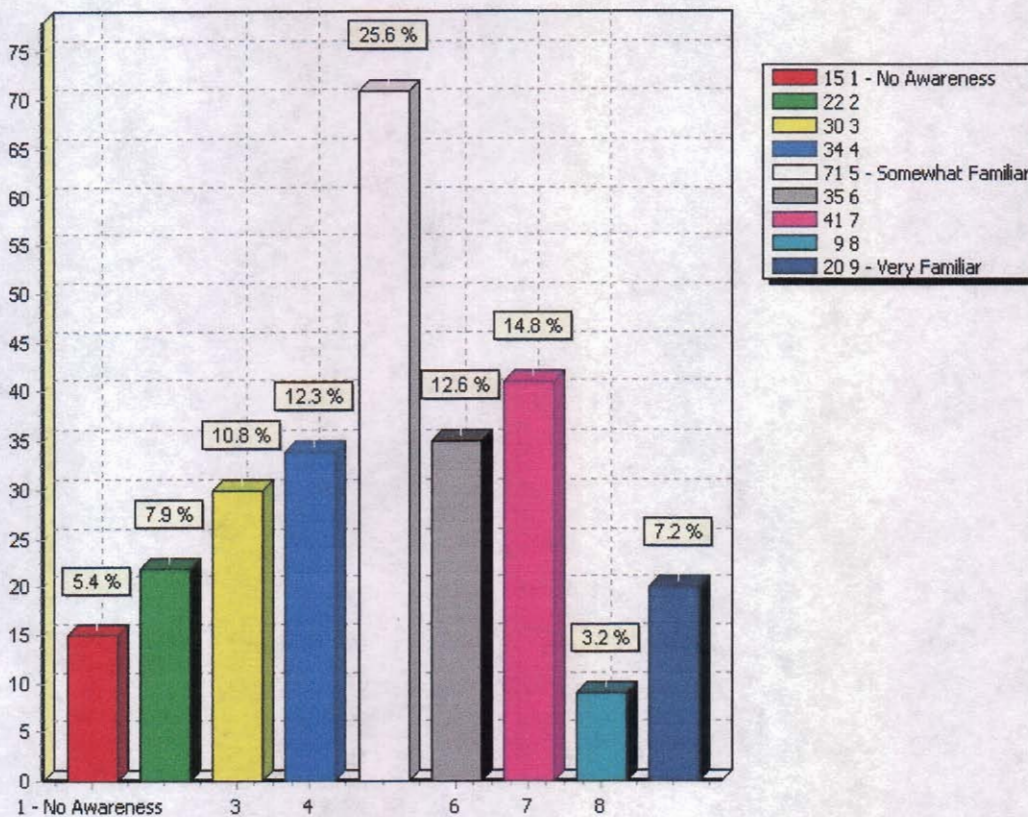
Question ten asked respondents to rate other factors that influence whether they will pursue an education and career in graphic communications or printing. Two hundred and eighty-two students responded to this question. A total of 28.3% (n=80) said “Money/scholarships/financial aid” was the greatest factor. The second most popular response was “Knowing I could work at one place for a long time and make a good living.” The third highest scoring response was “How much I know about graphic arts or printing.” The balance of the responses were tightly packed into a narrow percentage range. Complete results are indicated on chart #10.

Chart #10

*Factors That Influence Pursuit of Graphics Education & Career*

Question 11 asked respondents to indicate their familiarity with Fox Valley Technical College. Two hundred and seventy-one students provided input. On a scale of 1-10, 25.6% (n=71) said they were “somewhat familiar” with the college. However, 63.5% (n=176) were at the “somewhat familiar” level or above, indicating that almost two out of every three students had a good awareness of Fox Valley Technical College. Graph #11 shows complete results.

Graph #11

*Participants Level of Awareness of Fox Valley Technical College*

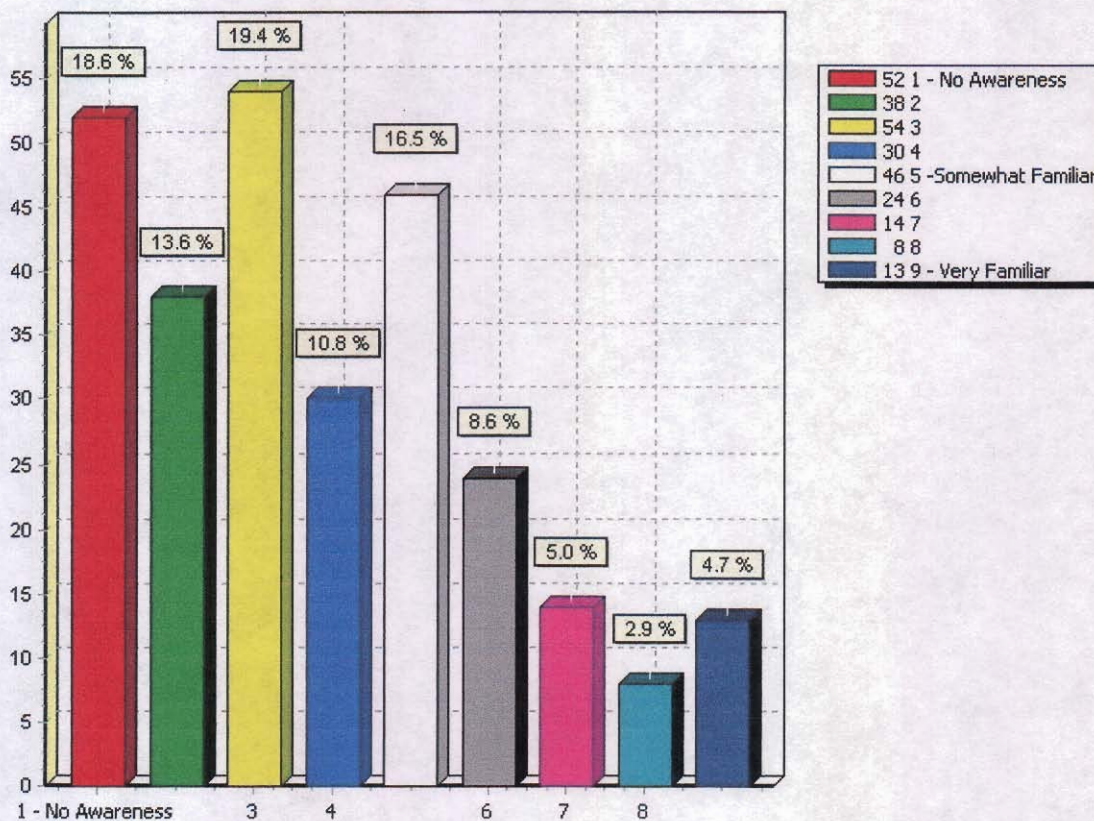
Question 12 asked respondents to indicate their level of awareness of the Graphic Arts/Printing Programs at Fox Valley Technical College. This is an important question, as it will indicate to the researcher just how much awareness is really in the high schools about a well-established and well-respected post-secondary program. It is especially important as graphic arts program administration and faculty have invested more heavily in advertising and personal visits during the past two years, in an attempt to improve enrollments. Two hundred seventy-nine people responded to this question. A total of 18.6% (n=52) of the students surveyed had “no awareness” of the graphic arts programs.

More telling was that 78.8% (n=220) had “somewhat familiar” or less as a response.

Complete results are shown in Graph 12.

Graph #12

*Level of Awareness of FVTC Graphic Arts and Printing Programs*



Question 13 asked if a person from a college or university talked to their class about careers in graphic communications or printing. Two hundred and seventy-eight students responded. A total of 33.1% (n=92) indicated “yes”, and 66.9% (n=186) said that no one had spoken to their class about such careers. This indicates that students in high school classes focused on a specific career may require more career information.

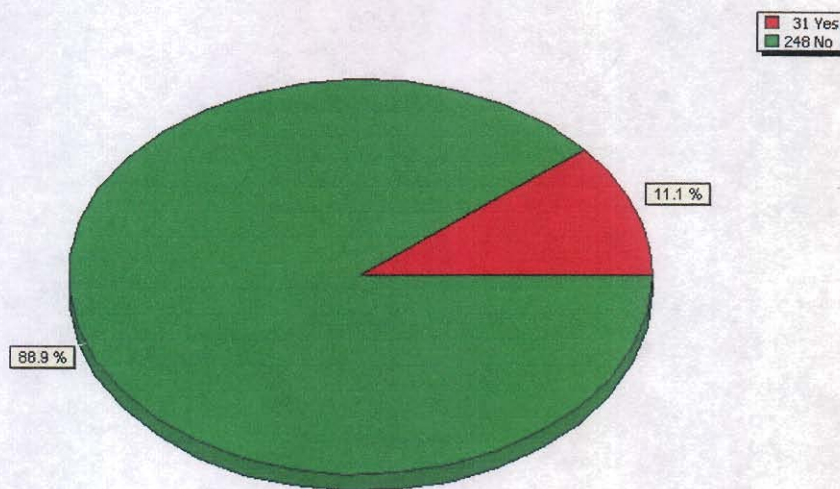
Question 14 asked students if they had toured a college graphic communications program. Two hundred and seventy-eight people responded to this question, with 14.7%

(n=41) saying “yes” and 85.3% (n=237) indicating “no”. This statistic points out the need to create opportunities for more students to visit college level programs.

Question 15 asked students if they had toured a graphic arts or printing business. A total of 279 people responded to this question. Only 11.1% (n=31) indicated they had toured a graphic arts or printing business, while 89.9% (n=248) had not. See chart #13 below for the data in chart format.

Chart #13

*Have Students Toured a Graphic Arts or Printing Business?*



Question 16 asked students what they were likely to do, based on having taken printing classes in high school. They were provided with three choices:

- Continue my training and education at a college or university
- Not get any more education in graphic arts/printing
- Hold off on my decision until I know more about myself and careers out there

Two hundred and seventy-nine students responded to this question, yielding the following results. A total of 56.6% (n=158) said they were going to hold off on any decision; 23.7% (n=66) said they were going to continue their education in graphic arts and printing; and 19.7% (n= 55) indicated they would not pursue any further education in the field. See Table #14 for the data that depicts current thinking of students.

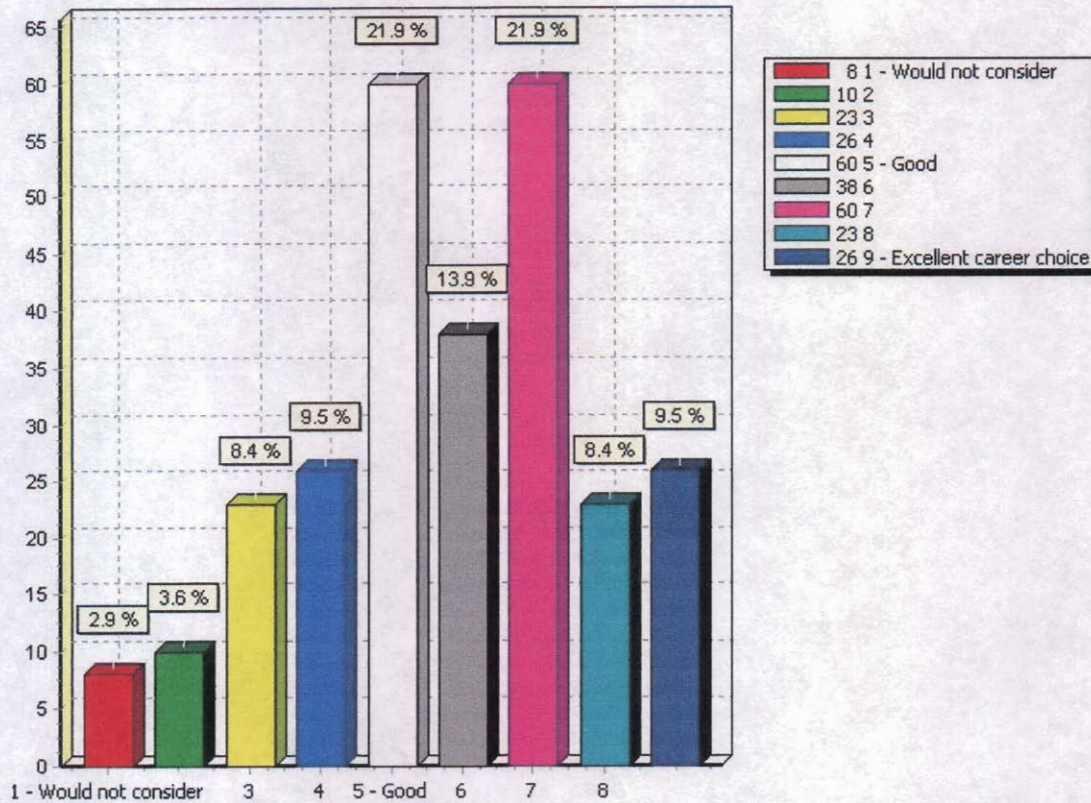
Table #14

*What are Students Likely to do About Pursuing More Printing Related Education?*

<b>Student education plans, based on taking high school graphics class(es)</b>	<b># of Respondents</b>	<b>Percentage</b>
Continue my training and education at a college or university	66	23.7
Not get more education in graphic arts/printing	55	19.7
Hold off on my decision until I know more about myself and careers out there	158	56.6

Question 17 asked students to rate graphic arts/printing as a career choice on a scale of one to nine. A total of 274 people responded to this question. The results were that 21.9% (n=60) selected five or seven, indicating good or above. A total of 75.5% (n=207) rated graphic arts or printing as at least a “good” career, with 9.5% (n=9) saying it was an excellent choice. Only 2.9% (n=1) said they would not consider graphic arts or printing as a career. The results were a bit surprising because of the number of students taking their first class in this career area and also because the majority of them had not toured a printing facility or college program. One question the researcher then pondered was, “How many more people would rate graphic arts or printing even higher if they had more broad exposure to education and print related work careers?” See graph #15 for a graph of complete results.

Table #15

*How Would You Rate Graphic Arts or Printing as a Career Choice?*

Question 18 asked respondents to select three reasons people do not select graphic arts as a career. A total of 266 responses were provided. The most popular response, selected at 19.5% (n=52) was that “People do not know enough about the industry.” That choice was followed by “Pay is perceived to be less than average,” 17.3% (n=46); and “there are more exciting career choices,” 17.0% (n=45). Another 15.4% (n=41) said “printing was too related to paper, an industry that has had many layoffs and plant closings, and they would not want to take the risk.” Some 15.2% (n= 40) said people would not choose this career because they would think “the jobs is similar to working in a

mill.” Six of seven possible choices were selected at least 13.4% of the time. Table #16 below shows the total responses.

Table #16

*Reasons People do not Choose Graphic Arts as a Career*

<b>Response</b>	<b># Responding</b>	<b>% of Responses</b>
People do not know enough about the printing/graphic arts industry	52	19.6
Pay is perceived to be less than average	46	17.3
There are more exciting career choices	45	17.0
People relate it to paper and layoffs/closings-too risky	41	15.4
People think it is a job similar to working in a mill	40	15.2
It is not “high tech” or glamorous enough	36	13.4
Other	6	2.1
Totals	266	100

Question 19 asked respondents if they knew anyone currently enrolled in a graphic arts/printing program at a post-secondary educational institution. Two hundred and seventy-eight people responded to this question, with 16.9% (n=47) stating they did know someone. Another 83.1% (n= 231) did not know anyone in a post-secondary graphic arts or printing program.

Question 20 asked what other career choices respondents were considering after high school. There were literally hundreds of different responses that ranged from going directly to work to the military to extensive university education plans. The researcher decided that the information was unusable and would not have an impact on the study. Therefore, the data was not used.

### *Research Objectives*

Research objective #1 – Verify the anticipated shortage of skilled workers in the regional graphic arts industry and specific job titles with highest employment potential.

The researcher visited 12 printing firms in September 2006 and met with senior management personnel. One hundred percent of the printers visited had a significant amount of current business-i.e. they were busy. When asked about employment needs, managers stated they were looking to hire press operators or operator trainees. All of the firms visited also had other employment openings and asked if Fox Valley Technical College had students available to hire. Table #17 shows the business visited and related relevant information.

Table #17

### *Printers Visited in September, 2006 and Their Hiring Prospects*

<b>Name of Firm</b>	<b>Location</b>	<b>Business Type</b>	<b>Currently Hiring Y/N</b>
Valley Label	Neenah, WI	Label Printer	Y
Coating Excellence International	Wrightstown, WI	Packaging printer/converter	Y
Bemis-Curwood	Oshkosh, WI	Packaging printer/converter	Y
Zebra Technologies	Greenville, WI	Label Printer	Y
Envision Ink	Kimberly, WI	Commercial Printer	Y
JP Graphics	Appleton, WI	Commercial Printer	Y
WS Packaging	Algoma, WI	Label Printer	Y
Banner Packaging	Oshkosh, WI	Packaging printer/converter	Y
Metro Printing	Kaukauna, WI	Commercial Printer	Y
Outlook Group	Neenah, WI	Diversified printer & fulfillment/distribution	Y
Ameriprint Graphics	Neenah, WI	Commercial Printer	Y
Crystal Print	Little Chute, WI	Packaging printer/converter	Y

The researcher also reviewed “print-related” jobs advertised in the region’s major Sunday newspaper and Fox Valley Technical College’s employer job postings. There were consistently three to six ads in the newspaper for printing positions since October of 2005. In addition, the job postings for print related positions on the Wisconsin Technical College System TechConnect website were found to be at a record level of 293 from January to June 2006 (FVTC, 2006). These information sources verified that a current shortage of workers existed in the region.

Objective #2- Compare the relationships between regional high school technical education instructors and FVTC Graphic Arts faculty and staff to the enrollment levels in graphic arts programs.

While the formal research tool (survey) did not involve high school technical education instructors, the researcher did review a listing of current FVTC graphic arts students that was developed from the Fox Valley Technical College reporting system. Current students would be those that enrolled in 2005 or 2006. Analysis indicated that the majority, 63% (40 of 64) came from high schools where faculty and staff have good relationships with technical education instructors. This information is shown on table #18 with the high schools with good relationships shaded.

Table #18

*Currently Enrolled Graphic Arts Students and Source High School  
(Schools that have strong relationship with FVTC Graphic Arts Program highlighted)*

<b>High School Name</b>	<b>Current Students Enrolled</b>	<b>% of Total</b>
Appleton East	6	9.5
Appleton North	14	22.0
Appleton West	8	12.4
Fox Valley Lutheran	3	4.8
Bonduel	1	1.5
Fond du Lac	1	1.5
Hilbert	1	1.5
Hortonville	2	3.2
Kimberly	3	4.8
Little Chute	1	1.5
Manawa	3	4.8
Menasha	1	1.5
New London	3	4.8
Pulaski	1	1.5
Waunakee	1	1.5
West Bend	1	1.5
Kaukauna	2	3.2
Lakeland	1	1.5
Neenah	1	1.5
Oshkosh North	4	6.3
Oshkosh West	1	1.5
Seymour	1	1.5
Shiocton	2	3.2
Wild Rose	1	1.5
Wrightstown	1	1.5
<b>Totals</b>	<b>64</b>	<b>100</b>

*Source: FVTC Internal Reporting, November, 2006*

Objective #3- Identify the factors that influence high school students enrolled in visual communications (Tech. Ed.) classes to continue their education in graphic arts. Questions 5, 9, 10, 12, 13, 14, and 15 dealt with this objective. Results indicated parents and friends of students were the most influential people, with 41% (n=115) and 21% (n=58) respectively. Respondents rated financial resources; “Money, aid, scholarships” with 30% (n=80) as the most significant “Other” factor, followed by “Knowing I could

work at one place for a long time and make a good living” with 20% (n=53), and “How much I know about graphic arts or printing” at 14% (n=36).

Objective #4 was to determine the decision-making process that causes high school students to select or not select graphic arts or printing as a career. Questions 7, 8, 10, 13, 14, 15, and 16 were designed to address this objective.

A total of 58.4% (n=163) of high school students were not sure if they would pursue a career in graphic arts or printing. This means they were still very open to influence. However 78.8% (n= 220) had little or no awareness of graphic arts programs at FVTC; 66.9% (n=186) did not have anyone from a college or university graphic arts program make a presentation to them on graphic arts careers; 85.3% (n=237) had not toured a college graphic arts program; and 88.9% (n=248) had not been in a graphic arts or printing business.

Objective #5 was to analyze the factors negatively impacting perceptions of Graphic Arts as a career. Question 18 dealt with this objective. The most popular response was “People do not know enough about the graphic arts or printing industry” 19.6% (n=52). Several other factors were tightly grouped in the 15.2% to 17.0% range and included “There are more exciting career choices” (n=45); “Pay is perceived to be less than average” (n=46); “People relate printing to paper, and with layoffs in that industry, it is too risky” (n=41); and “People think it is a job similar to a mill (n=40).”

Objective #6 was to identify if graphic arts careers are part of high school career-path discussions within FVTC district schools. Questions 9 and 13 were designed to gain information on this objective. Guidance counselors rated last on the scale of influencers for a graphic arts career 9% (n=24), and only one-third of students 33% (n=92), had a

representative from a college or university talk to their class about graphic arts careers.

Objective #7 was to identify internal and external processes positively impacting enrollment trends. Questions 14 and 15, and 19 related to this objective. Questions 14 and 15 asked if students had toured a college graphics program and if students had toured a graphic arts business respectively. Analysis showed a moderate correlation between students that toured both 6.4% (n=18) and a career in graphic arts after high school 38.9% (n=7). Likewise, of students that had only toured a graphic arts program, 7.9% (n=22), 40.9% (n=9) said they were considering a career in this field; and of those students that had only toured a graphic arts or printing business, 7.9% (n=22), 36.3% (n=8) indicated they are considering a career in some type of graphic arts or printing. Of note is that of all the positive (yes) responses to questions 14 or 15 or both, 22.3% (N=62), a total of 85.5% (n=53) were students at high schools where FVTC has a good relationship with the technical education instructor(s). Table #19 shows complete data.

Table #19

*Does FVTC's Graphic Arts Program Have a Good Relationship With the Schools Where Students Indicated They had Toured a College Graphics Program or Printing Business?*

High school of students answering "yes" to questions 14 or 15, or both	Students answering "yes"	Good relationship with that high school technical education instructor? (Y/N)
Appleton East	7	Y
Appleton North	5	Y
Appleton West	8	Y
Hortonville	6	Y
Little Chute	3	N
Manawa Little Wolf	10	Y
Neenah	6	N
New London	5	Y
Oshkosh North	12	Y
Total	62	Good at 53 of 62 or 85.5%

Question 19 was designed to help identify any correlation between high school students that knew people currently enrolled in graphic arts at FVTC and the likelihood that they would enroll. A total of 16.9% (n=47) knew a student enrolled in the program. Of those 47, 29.8% (n=14) said they were going to enroll, 53.2% (n= 25) were uncertain, and 17% (n=8) indicated they were not going to enroll in graphic arts or printing. Since 83% of students that knew someone already enrolled, were either undecided or planning to enroll, there is an opportunity to engage this group and communicate more about potential careers, especially since 60% (n=28) of these students had already toured a graphic arts program or business.

In addition to objective #7 and the data collected to address it, Fox Valley Technical College's graphic arts program was given permission to test a new process in the summer of 2006 that it hopes will improve enrollment and retention of students. Under the test, all applicants to the graphic arts program were required to complete a student program specific orientation and advising session. One of the main reasons for this effort is that some students apply to the program believing it is graphic design, which it is not. The hypothesis for beginning the orientation was that students attending will understand exactly what the program is about and will enroll if it fits their goals and expectations. Students that know the expectations and still enroll stand a better chance of staying in the program, which improves retention rates. Early evidence from October, 2006 was very positive. There were no "new student" drop-outs from the program one-half way through the fall semester.

Objective #8 was to rank order, compare, and contrast the demographics of district high schools that graphic arts enrollees at Fox Valley Technical College attended

over the last five years and determine any potential correlation. The information needed for this objective was gained from the student services area at the college.

Results showed that 51.2% (n=103) of students enrolled in FVTC's Graphic Arts Program came from eight high schools where relationships were strong. The other 48.8% (n=98) of students came from 43 other high schools. Note that nine enrollees did not identify their high school. This could mean that they were older adults returning to school, or that they failed to indicate their high school in a format that did not allow this data collection to capture. Also of interest is that four of the top five high school feeder programs came from urban schools, and six of the top seven schools would also be considered urban. Table 20 provides enrollment information from 2002 through 2006.

Table #20

*High School Rank Order of Graphic Arts Student Enrollments 2002-2006  
(Highlighted Schools have strong relationship with FVTC Graphic Arts Programs)*

<b>High School</b>	<b>Urban (U) Rural (R)</b>	<b>Number of Students Enrolled in Graphic Arts</b>	<b>Rank</b>	<b>% of Total</b>
Appleton North	U	26	1	12.9
Appleton West	U	22	2	10.9
Oshkosh North	U	17	3	8.4
Appleton East	U	13	4	6.5
New London	R	11	5	5.4
Fox Valley Lutheran	U	9	6	4.5
Kaukauna	U	9	6	4.5
Clintonville	R	6	8	3.0
Kimberly	U	6	8	3.0
Neenah	U	6	8	3.0
Manawa Little Wolf	R	5	11	2.5
Out of State		5	11	2.5
Oshkosh West	U	5	11	2.5
Menasha	U	4	14	2.0
Pulaski	R	4	14	2.0
Shiocton	R	4	14	2.0
Hortonville	R	3	17	1.5
Little Chute	U	3	17	1.5

Appleton Alternative	U	2	19	1.0
Fond du Lac	U	2	19	1.0
Oshkosh Lourdes	U	2	19	1.0
Reedsville	R	2	19	1.0
Seymour	R	2	19	1.0
Shawano	R	2	19	1.0
Wautoma	R	2	19	1.0
Wild Rose	R	2	19	1.0
Winnebago Lutheran	U	2	19	1.0
Amherst	R	1	28	0.5
Berlin	R	1	28	0.5
Brillion	R	1	28	0.5
Hartford	R	1	28	0.5
Lomira	R	1	28	0.5
Mauston	R	1	28	0.5
Port Edwards	R	1	28	0.5
Rhineland	R	1	28	0.5
St. Marys- Menasha	U	1	28	0.5
Stevens Point	U	1	28	0.5
Stock Bridge	R	1	28	0.5
Weyauwega	R	1	28	0.5
Winneconne	R	1	28	0.5
Unknown		9	41	4.4
GED		2	50	1.0
High School Equiv.		1	51	0.5
<b>Totals</b>		<b>201</b>		<b>100</b>

*Source: FVTC Internal Reporting, November, 2006*

There are many high schools providing students to Fox Valley Technical College's Graphic Arts Programs. It was surprising however, that the number of students that come from urban high schools was higher than expected. Faculty and administration had thought more of the students were coming from the smaller, more rural, districts because of the propensity for urban high schools to push students towards attending a four-year university. This information is very important to understand as it relates to future recruiting efforts.

## Chapter V: Discussion, Conclusions and Recommendations

### *Introduction*

This chapter will discuss the findings from the research. It will also present conclusions drawn from the information and analysis. Finally, recommendations for further research and future study will be communicated.

### *Restatement of the Problem*

Regional printing industry employers desire that Fox Valley Technical College graduate more students with higher skill levels. The college has been unable to meet demands because of a shortage of student enrollments. To address the challenge, the graphic arts program at Fox Valley Technical College needs to double the number of student entrants and annual graduates in both the Printing and Publishing and Package and Label Printing disciplines.

The purpose of the study was to determine the barriers to high school students enrolling in graphic arts programs at Fox Valley Technical College.

### *Methodology*

The research in this study was conducted by creating and administering a survey to regional high school students enrolled in graphic arts classes at their respective schools. There was excellent participation, with students from almost one-third of area high schools participating. Of the 350 surveys provided to ten schools, there were 290 returned. With only seven incomplete surveys and 283 valid sets of responses, research netted an 80.8% response rate. Survey results were then analyzed against objectives.

### *Discussion*

The printing and converting industry is in a growth mode and there is a shortage

of skilled labor. The literature review pointed this out, as did the information received from university colleagues across the country and recent visits to regional printing and converting firms in September, 2006. The trend is expected to continue with the retirement of baby-boomers.

The research suggests a rejection of the null hypothesis, as a correlation between the relationships faculty and administration have with regional high school technical education instructors and enrollment levels Fox Valley Technical College's Graphic Arts Program does exist. The majority of program students come from high schools where concerted efforts have been made to develop strong relationships with key people.

There are many factors influencing high school students when it comes to choosing a post-high school path to work or further their education. Research attempted find out what these factors were for students enrolled in high school graphics and printing classes. The data gathered indicated parents and friends had the most influence on decisions students were making about their post-high school plans. Students also pointed to themselves as a key decision maker about their future. Other factors influencing decisions were monetary, including financial aid and scholarships; the ability to find a career where they could work at one place for a long time; and the amount of knowledge and skills possessed regarding the printing industry.

Most high school students in graphics classes that were surveyed were not sure if they would pursue further education and a career in graphic arts or printing. This suggests that they are still open to outside influence. However, four out of every five students surveyed had little or no awareness of the printing related programs at Fox Valley Technical College. In addition, only two of every ten students had toured a

college graphics program or printing business at the time the survey was administered. This situation suggests a clear opportunity for the college.

Another area of importance to the study was what causes a negative perception of graphic arts as a career choice. Research indicated that most people (students) do not know enough about the printing industry; it is not perceived to be an exciting industry; pay is thought to be less than average; and the work similar to that of paper mills. Armed with this information, one could make a case for a communication campaign. Fortifying the information and potential action presented above is that few high school students receive a presentation on the printing industry from a college or business.

One positive development from the research was that students that did tour a college graphic arts or printing program or printing business were more likely to enroll in a college graphics program. Further evidence of a potential success template was the test orientation and advising session conducted at Fox Valley Technical College in the summer of 2006 that yielded zero (0) student drops after enrolling and beginning classes in Printing and Publishing at the college.

### *Conclusions*

Several conclusions can be drawn from the research. The information to follow suggests a number of them.

1. The demand for skilled printing and converting industry workers in east central Wisconsin remains strong. Fox Valley Technical College is expected to help fill the gap and must find ways to enroll and graduate more students.
2. There are several keys to successfully recruiting more students. First, FVTC and the program must continue to develop strong relationships with high

schools that have graphic arts and printing programs. The relationships need to be developed at two levels, administrative and faculty. Program leadership (Dean's level) should lead the effort for administrative relationships, including principals and guidance counselors. College graphic arts faculty should take the lead in building strong relationships with technical education instructors.

3. In addition to building the strong relationships mentioned previously, there is much work to do in building knowledge in high school students about the printing industry and the college's printing programs. In most cases, students don't know what they don't know. Emphasis should be placed on consistent visits to high schools to communicate industry information, program specifics, enrollment processes and career paths. Communicating the pathway to success should also include a stronger effort to communicate the cost of education, scholarship opportunities and financial aid.
4. Information gained from the study pointed out that marketing and recruiting efforts should be focused on individual students and their parents or guardians to have the most impact. Personalized marketing may be a key component to future success.
5. The study also indicated the potential positive impact on student interest in graphics programs by hosting tours of the facilities to build awareness. In addition, sponsoring printing business tours could prove very beneficial in getting students interested in graphic arts and printing as a career. High school students need to see that the vast majority of today's printing businesses are modern, clean and very high tech.

Because both applications and enrollments need to increase, the program should consider expanding the geographical scope of recruiting efforts.

Discussions with leadership at adjoining technical college districts should be an avenue that is pursued to investigate the possibility of expanding program reach.

6. Finally, in addition to marketing the graphic arts programs at FVTC as “nationally recognized” top-notch technical training, to bolster perceptions and as a launching pad for students to further their education, a concerted effort is needed to get industry facts out to students and parents. They need to know the quality and reputation of printing businesses in the region, the number of different careers available to educated and skilled people, the excellent work environments, the excellent potential earnings, and the number and variety of companies to work for that are within a fifty-mile radius of FVTC’s Appleton campus.

### *Recommendations*

The following is a partial list of recommendations that can be implemented to address the study outcomes. It is not meant to be all inclusive, but to be a starting point for further discussion and analysis.

1. Develop and implement a strategy to build strong relationships with administration and staff at regional high schools that have graphic arts or printing classes. Concentrate efforts at high schools where students have traditionally enrolled from, while strategizing how to attract more students from other schools that have graphics programs.

2. Develop and implement a new marketing and communication process that utilizes the information collected from the study. This could include a newsletter, web portal, recognizing and capitalizing on public relations opportunities, and consistent visits to high schools by faculty to present careers and program information.
3. Focusing efforts on traditional feeder high schools could yield “above average” results. An old adage goes, “80% of your business comes from 20% of your clients.” With focused efforts, the college can grow the number of students enrolling from traditionally strong feeder schools. This may be critically important to success.
4. Share the study with program advisory committees and regional printing firms and solicit their support to implement the recommendations.
5. Share the study with FVTC’s marketing and recruiting leaders. Solicit their feedback and develop a set of action plans based on that feedback.
6. The most important recommendation encompasses much of the study’s outcome. The college needs to work hard to build awareness of the program, the printing industry, and the shortage of workers. A number of data points suggest that FVTC and the Graphic Arts Program has significant room for improvement in this area. It is a key component to successful recruiting, program applications and student enrollment. The college’s graphic arts area and regional printing firms both stand to gain significantly by developing broad and deep awareness of the industry.

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<p>This project has been reviewed by the UW-Stout IRB as required by the Code of Federal Regulations Title 45 Part 46</p>
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## Survey

### Of Area High School Students in Graphic Arts, Graphic Design, Printing, or Related Technical Education Classes

The purpose of this survey is to gather information on attitudes and perceptions of high school students taking graphic arts or printing classes regarding their future education and career plans.

**Please fill out the survey below as completely as possible. Your answers will give Fox Valley Technical College a better understanding of what causes students to pursue or not pursue an education/career in the Graphic Arts/Printing Industry.**

1. Gender:  Male  Female
2. Age: \_\_\_\_\_
3. High School Name: \_\_\_\_\_
4. Current Grade Level:  Freshman  Sophomore  Junior  Senior
5. How many Graphic Arts/printing classes have you taken in high school?  
 This is my first class       Two       More than two
6. Why did you take graphic arts or printing in high school? **Check your best response.**
  - Sounded easy
  - Sounded fun
  - Prior exposure to printing
  - Recommended by peer
  - Recommended by counselor or parent
  - Had to fill a slot on schedule
  - I like visual arts
  - I like working on computers
  - I like designing and making things
  - Other (explain \_\_\_\_\_)
7. Do you plan to pursue a career in printing or graphic communication ?  
 Yes       No       Not Sure
8. Do you think Graphic Arts or Printing firms require additional education beyond high school to be considered for employment?  
 Yes       No       Not Sure

9. Please rate the following people regarding who has influence on you when it comes to your post high school plans? **(Rate 1 to 5, 1= most, and so on)**

Friends  
 Guidance Counselor  
 Parents/Guardian  
 Teacher  
 Brother/Sister  
 Other (please specify) \_\_\_\_\_

10. Please rate these other factors that influence whether you pursue an education and career in graphic communication/printing **(Rate 1 to 10, 1= most, and so on. Use all 10)**

Money/scholarships/financial aid  
 Ability to get into a program without waiting  
 How much I know about Graphic Arts or printing  
 Competing goals (other careers look just as interesting)  
 Can start career with 2 year Associate degree vs. 4 year Bachelors degree  
 Ability to continue my education after 2 years and all credits transfer with me  
 Quantity and quality of industry jobs where I plan to live upon graduation  
 Availability of excellent post-high school education and training  
 Perception of industry by others (teachers, counselors, friends and family)  
 Knowing I could work at one place for a long time and make a good living

11. Please **circle** your level of awareness regarding Fox Valley Technical College

No awareness				Somewhat Familiar with FVTC				Very Familiar with FVTC and offerings	
1	2	3	4	5	6	7	8	9	

12. Please **circle** your level of awareness regarding the Graphic Arts/Printing Programs at FVTC

No awareness				Somewhat Familiar				Very Familiar	
1	2	3	4	5	6	7	8	9	

13. Has anyone from a college or university program talked to your class about careers in graphic communications/printing?  Yes  No

14. Have you toured a college graphic communications program  Yes  No

15. Have you toured a graphic arts or printing business  Yes  No

16. Based on the Graphic Arts/printing class(es) I have taken, I am likely to:

Continue my training and education at a college or university  
 Not get any more education in Graphic Arts/printing  
 Hold off on my decision until I know more about myself and careers out there

17. On a scale of 1-9, how would you rate Graphic Arts/printing as a career choice?  
(Circle your rating)

Would not consider				Good					Excellent Career Choice
1	2	3	4	5	6	7	8	9	

18. In your opinion, what are 3 reasons people do not choose Graphic Arts as a career?  
(Put a 1, 2, and 3 next to your choices)

- People think it is a job similar to working in a mill
- People relate printing to paper, an industry that has had layoffs and plant closings,  
and don't want to take the risk
- Pay is perceived to be less than average
- It is not "high tech" or glamorous enough
- People don't know enough about the printing/graphic arts industry
- There are more exciting career choices
- Other (please explain) \_\_\_\_\_

19. Do you know anyone currently enrolled in Graphic Arts/Printing at FVTC or another post-secondary educational institution?

Yes       No

20. What career(s) are you considering after high school?

1. \_\_\_\_\_
2. \_\_\_\_\_

**Did you know?**

- Printing is the 3<sup>rd</sup> largest industry in the United States.
- More than 10,000 people work in the Printing and Graphic Arts industry in Northeast Wisconsin.
- Fox Valley Technical College has one of the top printing education programs in the world.

On behalf of the researcher and Fox Valley Technical College, thank you for taking time to complete this survey. **Please put your survey in the envelope provided to the instructor.**