

Incorporating Computer Technology Skills into the Interpretation Courses at UW-Stevens Point

A Thesis submitted by:

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May 2002

**INCORPORATING COMPUTER TECHNOLOGY SKILLS INTO
INTERPRETATION COURSES AT THE UNIVERSITY OF WISCONSIN-
STEVENS POINT**

by

James J. Buchholz

A Thesis

submitted in partial fulfillment of the

requirements of the degree

MASTER OF SCIENCE

IN

NATURAL RESOURCES

(ENVIRONMENTAL EDUCATION AND INTERPRETATION)

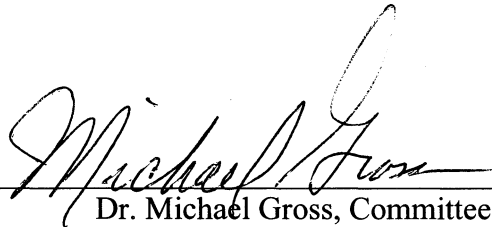
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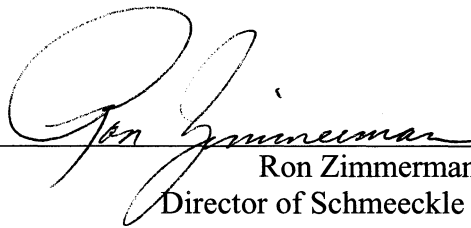
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May 2002

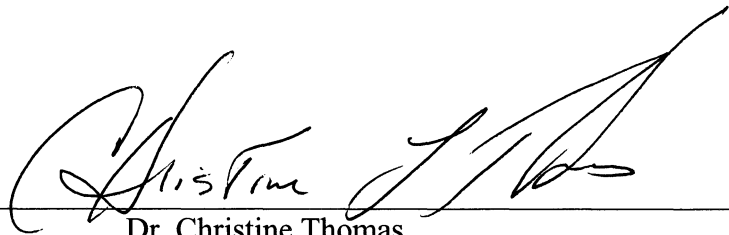
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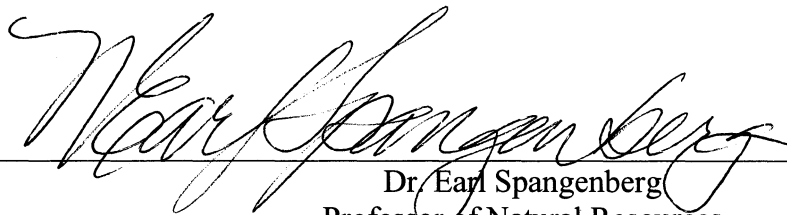
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Abstract

Computer technology has become infused with many aspects of our society, and the interpretation profession is no exception. The University of Wisconsin-Stevens Point is one of the top training institutions for environmental education and interpretation. However, since no technology training is currently required for this program, many students are graduating without the technology skills they need if they are to succeed in the field.

The goal of this project is to develop technology facilities and course modules that will improve a student's interpretive technique and enhance the efficiency of their work. To achieve this goal, several objectives were designed to guide the project.

1. Technology skills important to the field of interpretation were identified for training course modules.
2. The researcher oversaw the construction of a modern computer lab in the Schmeeckle Reserve Visitor Center.
3. Interpretive technology was taught as two training modules. For the "digital presentation" module, students completed a series of take-home tutorials and assignments to learn PowerPoint skills. A lab session was developed for the "desktop publishing" module, which involved tutorials and personal instruction covering page layout and graphic editing basics.
4. Five focus group sessions were conducted with students to analyze the effectiveness of the technology training in both modules.

5. Finally, e-mail surveys were sent to professional interpreters and supervisors to determine how computers were being used in the field, and which technology skills they believed to be most important.

The results of the focus group confirmed that the tutorials were effective teaching tools in both modules. Students that received the training felt more comfortable and empowered using technology skills. However, students in the digital presentation module recommended a more comprehensive training in graphics, sound, and traditional slideshow methods. Students in the desktop publishing module liked the combination of tutorials and personal instruction, but believed that more training sessions were necessary to reinforce the skills. Specific to the interpretation computer lab, students recommended the addition of more computers and longer hours to accommodate their schedules.

The results of the interpreter surveys have revealed a definite need to concentrate more teaching effort on desktop publishing, the most valuable skill to future employers. In addition, students should be required to have competencies in basic computer skills before taking the interpretive technology training. Website design skills are becoming more important in the field and should be incorporated into future training. Finally, students must understand that technology is only a means to an end, and not the end in itself.

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Acknowledgements

Twenty years from now you will be more disappointed by the things you didn't do than by the ones you did do. So throw off the bowlines. Sail away from the safe harbor. Catch the trade winds in your sails. Explore. Dream. Discover.

- Mark Twain, *Autobiography*

The past two years have truly been times of discovery for me. Through the graduate program at Stevens Point, I have been able to explore new and intriguing facets of environmental education and interpretation. Many people have supported me both intellectually and emotionally during my program. Without their guidance, assistance, and encouragement, this project could never have been completed.

I would first and foremost like to thank my graduate committee of Dr. Michael Gross, Ron Zimmerman, Dr. Christine Thomas, and Dr. Earl Spangenberg. Although my original project changed drastically over the years, the members of my committee always understood and accepted the new directions that the project took. I worked closely with Dr. Gross and Ron Zimmerman, and I especially appreciate their friendship, expertise, and guidance through all stages of the project. They genuinely serve as role models; not only for myself, but also for all of the students they teach and care about. I hope that they can use the results of this study to improve the already high-quality interpretive training that they provide.

I would also like to acknowledge my family, whose emotional support always lifted me up when I needed it most. I especially thank my parents, Jim and Kathy Buchholz, who have always been and continue to be an inspiration for my life. They taught me at an early age to appreciate the natural world and the value of teaching, two concepts that I will always hold dear to my heart. In addition, I thank my sister Krissy, who also attended UWSP and kept me company, and my "little" brother Joey, who always serves as a source of entertainment.

I would particularly like to acknowledge the students who participated in the technology training. Their dedication and positive attitudes made this project a pleasure to work on. By providing me with feedback about their experiences, they truly will be helping to shape the interpretive courses of the future.

Finally, I would like to thank the graduate students and professors that greatly assisted me in my graduate program. A huge thank you goes out to Dr. Rick Wilke, who read and made suggestions on three different research proposals that I submitted. I appreciate all of the time and effort that he put into my thesis. In addition, I thank all of my fellow graduate students who supported me throughout my program, especially Deb White, who served as my "big sister" at Schmeckle Reserve, Kelli English, a good friend with whom I shared both an office and an apartment, and Beth Lesure, a fellow computer wiz who investigated technology use in environmental education.

Chapter I

The Goal and Its Setting

Introduction and Importance of the Study

Computers have been integrated into many different aspects of our lives. At home, people can stay connected with family and friends throughout the world using e-mail. They can log on to the World Wide Web, a networking of computers that spans the planet, and order tickets for a game, check their current bank accounts, look up information about a multitude of topics, or listen to music on an Internet radio station. On simple home computers, people can create their own CDs, scan pictures, balance their checkbooks, write letters, and design cards. Computers are also interwoven into the work place, from the daily routine of budgeting, e-mailing, and word processing, to the more complex processes of sharing ideas through a digital interface, network conferencing, and manipulating graphics.

The profession of interpretation is no exception to the increasing use of computers. Once thought to have use only in a business field, modern computers open up an incredible number of options to interpreters. According to the current definition, interpretation is a “communication process that forges emotional and intellectual connections between the interests of the audience and the inherent meanings in the resource” (NAI Board of Directors, 2000). Through the use of computers, interpreters have a greater ability to create these connections. In visitor centers and nature centers, computers have been integrated as interactive exhibits, revealing places and times to the visitor like no other media can. Computer technology controls unique sound devices and

emotional object/multimedia theaters. They serve as convenient information stations, providing answers to a wide array of visitor questions, while keeping interpreters free to do other work.

Interpreters use the power of computers to quickly design and fabricate colorful posters and brochures that advertise programs, describe rules, or provide natural and cultural history information. Through the use of professional page layout software, scanners, and digital cameras, they can design interpretive panels for trails and exhibits. By designing the panels themselves, expensive pre-production costs in sign fabrication can be virtually eliminated. Instead of giving slide programs, more and more interpreters are transferring the slides to digital pictures and using Microsoft PowerPoint. Digital pictures never fade or get scratched over time, and PowerPoint offers a diversity of choices to enhance programs.

The sudden incorporation of computers into the interpretation field has the potential for increasing both the efficiency and effectiveness of interpretation in the future. However, the rapid emergence of computers in the field has left many interpreters without sufficient training. Frustration using computer technology can lead to greater inefficiency in the field. For an inexperienced computer user, programs designed to save time can take much longer than traditional methods. Interpreters are often left to train themselves on using computers, taking precious time from already tight schedules.

The University of Wisconsin-Stevens Point is one of the leading institutions in the country for training environmental educators and interpreters. Currently, five core courses create the foundation for interpretive training: Oral Interpretation Methods/Park Interpretation (NR 368/568/367/567), Interpretive Centers (NR 365/565), Signs, Trails,

and Waysides (NR 363/563), Environmental Publications (NR 364/564), and Interpretation Practicum (NR 374). In the past few years, attempts have been made to teach some computer skills, including one class devoted to Microsoft PowerPoint basics and another class devoted to QuarkXpress. However, without reinforcement of technology skills, the training is insufficient in preparing students to use computers in the field.

To enhance the success of students after graduation, it is imperative that students receive basic computer training relating to its use in interpretation. The goal of this project is to design and create lessons that encourage students to explore and develop computer technology skills. This “skills training” will become an integral component of the current interpretive curriculum, and as they change in the future, will be extended to fit the newly designed courses.

The importance of this project is revealed by the reality of the world outside of the classroom walls. Although few people choose to become interpreters to work with computers, the extension of computer technology into the interpretive field requires the program at UWSP to change. It is hoped that students receiving the integrated computer training will be more efficient and effective as interpreters in the field. The addition of related computer skills to a student’s repertoire can enhance their employability after graduation.

Statement of the Goal

The goal of this project is to develop computer training facilities and course modules for environmental education/interpretation students at the University of Wisconsin-Stevens Point, which will improve the students' interpretive techniques and enhance the efficiency of their work.

Objectives

- Objective 1 is to define which computing skills should be taught in the interpretive courses.
- Objective 2 is to create thematic lesson plans that incorporate computer skills training into the current and future interpretive courses at UWSP.
- Objective 3 is to design and oversee the construction of an "Interpretation Computer Lab" in the basement of the Schmeckle Reserve Visitor Center, where students can practice computing skills using modern equipment and programs.
- Objective 4 is to evaluate the effectiveness of the computer technology training.
- Objective 5 is to determine which computing skills are currently most used and valued by professional interpreters and their supervisors.

Assumptions

1. Computer use in the interpretive profession will continue to grow and become more important in the future.

2. Students taking interpretive courses already have a basic understanding of computer skills, including opening programs, logging in and out of the computer, word processing, e-mailing, and using the Internet.
3. Students entering the interpretive profession should have a basic understanding of computer skills, which include page layout, graphic design, and digital presentation skills.
4. By providing students with opportunities to use computer technology skills through guided training, they will obtain a more solid and realistic understanding of the skills.
5. Students in the interpretation courses have a will and desire to learn professional skills that will assist them in their future careers.

Delimitations

1. The study will be specifically focused on undergraduate and graduate students taking environmental interpretation courses at UWSP. The results may not be applicable to a broader audience.
2. The study will not test the acquisition of specific computer training knowledge or skills. Rather, it will qualitatively analyze the students' attitudes toward computers and their confidence using interpretive computing skills.

3. The study will not include all basic computing skills important to interpretation. Concepts such as e-mailing, word processing, and Internet use will be left to self-discovery or other classes. This study will focus on computing abilities that are more unique to the interpretive field, including page layout, graphic design, and digital presentation skills.

Definitions

Computer technology skills: In this project, computer technology skills refer to the operation of different types of equipment (scanners, digital camera, computers, projectors) and the use of different types of software (page layout, graphic editing, presentation) that would most often be used in an interpretation career.

Course instructors: Unless stated otherwise, the course instructors for this project are Dr. Michael Gross, professor of environmental interpretation, Ron Zimmerman, director of Schmeckle Reserve, and James Buchholz, graduate assistant and author of this thesis.

Desktop publishing: Desktop publishing is the process of combining page layout skills, graphic editing skills, and knowledge of hardware to create newsletters, sign panels, posters, brochures, or other publications on a computer.

Graphic design software: Graphic design software allows users to manipulate images in a variety of ways. Users can create their own images from scratch, or resize, rotate, recolor, and add special effects to images from other sources (scanners, digital cameras,

clipart). Graphic design software ranges from simple and inexpensive programs, like Microsoft Photodraw and Jasc Paint Shop Pro, to more complex programs that offer a wider range of options, like Adobe Photoshop and Illustrator.

Hardware: Hardware represents the physical components of a computer and other technological devices. These can include disk drives, monitors, speakers, scanners, printers, mice, and keyboards.

Interpretation: According to the most current and widely accepted definition, interpretation is a “communication process that forges emotional and intellectual connections between the interests of the audience and the inherent meanings in the resource” (NAI Board of Directors, 2000). Interpreters can work in visitor centers, nature centers, zoos, aquariums, museums, exhibit design companies, and many other locations.

Interpretive Product: In this project, an interpretive product is the final result of a comprehensive design and planning process that strives to connect the interests of visitors with the meanings of a resource. These products would include PowerPoint presentations, sign panels, brochures, newsletters, exhibits, or conceptual plans.

Page layout software: Page layout software allows the user to combine graphics, text, and other elements on a page of their choice. These programs are primarily used to create signs, brochures, wayside panels, newsletters, and other publications. Types of page layout software range from simple and inexpensive programs, like Microsoft Word

and Publisher, to more complex programs that offer a wider variety of options, like QuarkXpress and Adobe PageMaker.

Digital Presentation software: Digital presentation software provides a digital means for presenting information to groups. Users create “slides” by adding graphics, text, sounds, and movies, and then organize their slides into a logical order. Through the use of a digital projector, users can share their presentations with large groups. Although a variety of presentation software exists, the most commonly used is Microsoft PowerPoint.

Software: Unlike the physical hardware equipment, the term “software” represents computer programs made up of electronic instructions that tell the computer what to do. Software includes word processor, database, spreadsheet, graphic, Internet, and music programs. They are stored on disks (hard drive, CD-Rom, floppy disks).

Training module: A training module refers to a specific set of lessons that are integrated into an already existing university course. These lessons enhance and update the course by introducing new relevant skills and information. In this project, the training modules are designed to teach students particular skills related to technology in the interpretive field.

Abbreviations

CNR: College of Natural Resources, part of the University of Wisconsin-Stevens Point

Interpretive Technology Project: This study: “Incorporating computer technology skills into interpretation courses at the University of Wisconsin-Stevens Point”

NAI: National Association for Interpretation

NR #: Natural Resources course number #

Paint Shop Pro: Jasc Paint Shop Pro 5.0 “graphic editing” software

Photoshop: Adobe Photoshop 5.5 “graphic editing” software

PowerPoint: Microsoft PowerPoint 2000 “digital presentation” software

Publisher: Microsoft Publisher 2000 “page layout” software

Quark: QuarkXpress Passport 4.1 “page layout” software

UWSP: University of Wisconsin-Stevens Point

Windows: Microsoft Windows 98, Second Edition, “operating system”

Chapter II

The Literature Review

Computers and interpretation: can two concepts that are based in dichotomous realities truly be blended together into a single project? On one hand, interpretation is based entirely on the meanings of cultural and natural resources, often intentionally disconnected from fast-paced modern civilization. Visitors attend interpretive programs as part of their recreational experience, a chance to escape from society's rushed lifestyle. They can witness the utter beauty and power of nature, and immerse themselves in the culture of another place and time. On the other hand, computer technology is completely based in the rigors of modern civilization. As we push forward in the Information Age, these machines are becoming more and more important parts of our lives. Computers provide us with mountains of information, but at the same time can isolate us from real experiences in a natural or cultural environment.

The marriage of computer technology and interpretation may be difficult to understand. Yet, the ultimate goal of this project is to integrate these two fields. Through an analysis of existing literature, it becomes clear that interpretation and computer technology are related, and can provide immense benefits to students participating in the program at the University of Wisconsin-Stevens Point (UWSP).

The following sections introduce various works that are related to the Interpretive Computer Skills project. Information that has been selected from these sources is pertinent to achieving the objectives of the project. The literature review will describe four of the project's primary foundations: environmental and cultural interpretation,

computer technology, the use of computers in interpretation, and evaluation tools. These four topics are intricately linked together, and a background in each is essential for understanding the ultimate goal of the project.

Interpretation: “More inspirational than informational”

What is Interpretation?

Interpretation is not an easily defined concept. Many definitions have been proposed, but no single definition has been universally accepted by all interpreters in the field. A simple definition comes from *Interpretation of Cultural and Natural Resources*: “[Interpreters are] translators of the natural and cultural environment” that help their audiences to better understand and enjoy the resources being interpreted (Knudson, 1995). From the same book, the purpose of interpretation is described as helping people to gain a sense of place, to respond to the beauty of the environment, or to the significance of their surroundings.

Enos Mills is considered the “Father of Professional Interpretation.” His book, *Adventures of a Nature Guide*, contains the foundations of modern-day interpretation (1990). In 1884, at the age of 14, Mills began to build a cabin at the foot of Long’s Peak in Colorado. Mills had a passion for the outdoors, and would spend most of his time climbing mountains, observing natural phenomena, and attempting to understand the mysterious workings of nature. He trained himself to guide visitors up Long’s Peak. According to *Adventures of a Nature Guide*, Mills distinguished between trail guides and nature guides (1990). Trail guides are those individuals that safely lead visitors to a point of interest and back again. In contrast, “a nature guide is a naturalist who can guide

others to the secrets of nature...Touched by a nature guide the wilderness of the outdoors becomes a wonderland.” In addition, “A nature guide is not a guide in the ordinary sense of the word, he is a teacher. At all times however, he has been rightfully associated with information and some form of education. But nature guiding, as we see it, is more inspirational than informational” (Mills, 1990). By making this distinction, Enos Mills created a field that would later be known as interpretation. Before his death in 1922, he had developed interpretive principles and techniques that would guide the profession of interpretation in the future.

Freeman Tilden introduced another widely accepted definition of interpretation. In 1953, Tilden, an experienced author, playwright, newspaper reporter, and observer, was invited to analyze the interpretation occurring in the national parks. After four years of study, he published a landmark book called *Interpreting Our Heritage*, which was the first book to define the interpretation profession. His book defines interpretation as “an educational activity which aims to reveal meanings and relationships through the use of original objects, by firsthand experience, or by illustrative media, rather than simply to communicate factual information” (Tilden, 1977). He admits that definitions are too limiting when trying to describe interpretation, and so offers two concepts that expand upon the overall definition. The first is that “interpretation is the revelation of a larger truth that lies behind any statement of fact.” The second is that “interpretation should capitalize on mere curiosity for the enrichment of the human mind and spirit” (Tilden, 1977).

To further overcome the limitations of a single definition, Tilden introduced six principles that have become the guiding foundations of the interpretive profession. The principles are:

1. Any interpretation that does not somehow relate what is being displayed or described to something within the personality or experience of the visitor will be sterile.
2. Information, as such, is not Interpretation. Interpretation is revelation based upon information. But they are entirely different things. However, all interpretation includes information.
3. Interpretation is an art, which combines many arts, whether the materials presented are scientific, historical, or architectural. Any art is in some degree teachable.
4. The chief aim of Interpretation is not instruction, but provocation.
5. Interpretation should aim to present a whole rather than a part, and must address itself to the whole man rather than any phase.
6. Interpretation addressed to children (say, up to the age of twelve) should not be a dilution of the presentation to adults, but should follow a fundamentally different approach. To be at its best it will require a separate program.

What are the common threads that wind through the writings of Enos Mills and Freeman Tilden? Both had different perspectives about interpretation. Mills was the creator of the profession, while Tilden assessed the profession when it was already 30

years old. However, both described the primary foundations of interpretation that distinguish it from any other profession. Interpretation exists to inspire and provoke, not to teach information. Leading visitors on a hike through the forest and teaching them the scientific name of every plant is not interpretation. Factual information alone is not interpretation, although it is the foundation upon which true interpretation is built. Interpretation is revealing the meaning behind the factual information. When a naturalist states the scientific name of a plant, and then explains or shows why it received that name, interpretation begins to occur. Interpretation involves not just the informational parts of the brain, but also the emotional and sensory aspects.

Building from resources produced by the National Park Service's Interpretive Development Program (IDP), the National Association for Interpretation (NAI) created a new definition for interpretation in 2000. Based on the fundamentals of Tilden and Mills, this definition has been widely accepted within the interpretive profession. It states that interpretation "is a communication process that forges emotional and intellectual connections between the interests of the audience and the inherent meanings in the resource" (NAI, 2000).

Stevens Point: A tradition of training interpreters

Today, the College of Natural Resources at UWSP is one of the leading undergraduate training institutions for environmental education and interpretation. The primary purpose of this project is to improve the interpretive courses by incorporating technology training. Over the years, the interpretive program at Stevens Point has grown from a single 3-credit course to a Major option composed of five courses and 13 credits.

To understand the current situation, a brief history of the interpretative program at Stevens Point will be presented. The following information comes from interviews with Dr. Michael Gross (2002), Ron Zimmerman (2002), Dr. Rick Wilke (2002), and archived UWSP course catalogs.

In 1970, Dr. Margaret Baumgartner developed the first courses that touched on interpretive principles. A biologist by training, Baumgartner taught Interpretation in Central Wisconsin (NR 390), Nature Interpretation Agencies, Areas, and Issues (NR 391), and Nature Interpretation Activities (NR 392). Although the classes used interpretation to teach the topics, they were not created to provide training in interpretation itself. In 1974, Dr. Gabe Cherem developed and taught the first interpretive training courses at UWSP. The 3-credit undergraduate course was called Environmental Interpretation Methods (NR 374), and the graduate level course was entitled Principles and Practices of Environmental Interpretation (NR 793). Both courses covered a diversity of topics including verbal and nonverbal methods, exhibits, trails, signs, and visitor centers. Cherem had received interpretive training from the University of Michigan-Ann Arbor. When Cherem left in 1975, Dr. Jim Newman, who had three years of interpretive experience as a seasonal ranger, took over the course in the interim. In 1976, Dr. Joe Roggenbuck was hired to teach interpretation and forest recreation in the College of Natural Resources. He guided the program at Stevens Point for two years before moving to Virginia Polytechnic Institute in Blacksburg, Virginia.

By the time Cherem arrived at UWSP, an Outdoor Education minor had already been available through the College of Professional Studies (CPS) for six years. The minor was administered by the CNR under the general degree requirements of the CPS.

In 1975, an education professor named Dr. Robert Schmatz became the first half-time director of the Central Wisconsin Environmental Center (CWES), which had previously been a Boy Scout camp. That same year, Rick Wilke, a recent graduate of the CNR masters program, was hired as an assistant director at CWES on a federal CETA (Comprehensive Employment and Training Act) grant, and was primarily responsible for taking care of the site and developing the education program. Schmatz and Wilke developed an Outdoor Education Practicum at CWES for teachers to gain real-life experience. In 1976, the university hired Wilke as the full-time director of CWES, who in turn hired Ron Zimmerman, a graduate student who had been helping with programming, as the assistant director on another CETA grant.

To strengthen the ties between CWES and the College of Natural Resources, Wilke and Zimmerman requested that a professor be hired not only to teach the interpretation courses, but also to be the education coordinator at CWES. In spring of 1977, Dr. Michael Gross was hired to fill the position. On campus, Gross was responsible for teaching the interpretation course originally developed by Cherem. Zimmerman, who obtained training in interpretation from Dr. Newman and assisted Dr. Roggenbuck, volunteered to help teach the course. In addition, Gross taught graduate seminar, Environmental Issues (which was developed by Wilke), and other natural resources courses. At CWES, Gross was responsible for mentoring and supervising the outdoor education practicum students.

In the fall of 1977, Wilke left Stevens Point to work on his doctorate degree and Zimmerman became the acting director of CWES. The first Outdoor Education Practicum (NR 376) was to be taught at CWES during that season. According to the

1977-1978 Course Catalog, the purpose of the course was to provide “practical experience at an Environmental Center, including teaching, scheduling, food service, maintenance, and organization.” Unfortunately, few students signed up. The entire CWES teaching staff consisted of Gross, Zimmerman, three interns, and two graduate assistants. To keep up with the numerous school groups that had been scheduled, the staff set up a creative booth in the concourse of the Union Center on campus to advertise the CWES program. By the end of this campaign, 26 students had signed up to help teach the next semester.

Wilke returned to the director position in 1978, and Zimmerman again became the assistant director. To secure full-time funding for the assistant director position, Gross and Zimmerman wrote a CESA (Cooperative Education Service Agency) grant to teach Project Learning Tree workshops half-time. In 1979, Zimmerman was hired as the full-time director of the newly established Schmeckle Reserve. Gross and Zimmerman began to team-teach the Environmental Interpretation course. At the same time, Gross, Zimmerman, and Wilke began to push for an Environmental Education and Interpretation minor through the CNR that would replace the Outdoor Education minor.

In the fall of 1979, the Environmental Education and Interpretation minor was created, which spawned a flurry of changes in the interpretive program. Gross developed and taught a new course called Foundations of Environmental Education. The former Outdoor Education Practicum was renamed Environmental Education and Interpretation Practicum. Cherem’s single interpretation course (NR 374) was split into two 3-credit courses: Environmental Interpretation I (NR 368) that covered principles and verbal techniques, and Environmental Interpretation II (NR 369) that covered nonverbal

techniques. The interpretation graduate course (NR 793) was dropped from the curriculum.

To better prepare students for community interpretive programming and to strengthen the ties between Schmeckle Reserve and the CNR, Zimmerman and Gross created a new practicum in 1987. Environmental Education Practicum (NR 376) would still be taught at CWES, but the new 3-credit Interpretation Practicum (NR 374) would be taught at Schmeckle. According to the course catalog, the purpose of the course was for students to gain “practical experience in environmental programming for nature centers and park visitors.” That same year, another interpretation course was added for students in the Forest Recreation program. This 4-credit course, called Park Interpretation (NR 367), taught both personal and non-personal skills for interpreting a park or recreation site to visitors.

In 1989, Gross and Zimmerman made the last major changes to the interpretive courses. Environmental Interpretation II (NR 369), which taught nonverbal techniques, was split into four different 1-credit courses: Interpretive Signs, Trails, and Waysides (NR 363), Interpretive Publications (NR 364), Interpretation for Visitor Centers (NR 365), and Planning for Interpretation (NR 366). The Park Interpretation course (NR 367) was cut down to two-credits, and only covered verbal techniques. Forest Recreation students could now take any of the newly created 1-credit courses. In addition, Environmental Interpretation I (NR 368) was renamed Oral Interpretation Methods.

Minor changes have occurred in the years following 1989. Planning for Interpretation (NR 366) was dropped in 1993 due to lack of enrollment and overlap with other new courses. That same year, Interpretation for Visitor Centers (NR 365) was

increased to 2 credits. In 1995, the Visitor Centers course was increased again to 3 credits. Finally, in 1997 the Signs, Trails, and Waysides course (NR 363) and the Environmental Publications course (NR 364) were increased to 2 credits for interpretation students.

The interpretation program at UWSP has changed dramatically over the years in response to student needs. In the fall of 2003, major changes will again remold the program. The environmental education and interpretation practicums will be united into a single semester-long experience, similar to the School of Education's block framework. The different nonverbal interpretation technique courses will once again be combined into a single 5-credit (three hours lecture and four hours lab) course called Interpretive Media (NR 369). This Interpretive Technology Project is timely, as it will provide recommendations for incorporating technology training into the evolving courses.

Computer Technology: A growing necessity

History and expanding use

Today, computers are an integral part of our society. Grocery stores, banks, businesses, space rockets, hospitals, police, cars and hundreds of other services all require computers to operate. This was especially evident in the year 2000 when a widespread fear swept through the world that the "Y2K bug" would shut down computers. How did computers become such an important part of our lives?

According to LaMorte (1999) in his article entitled "Computers: History and Development," the first computer can be considered the abacus, originating about 5,000 years ago in Asia. The abacus allowed people to make calculations by sliding various

beads along a rod. Charles Babbage invented the first *mechanical* computer in 1822. Babbage was disgusted with gross errors he had found in calculations by the Royal Astronomical Society. Perceiving a link between the perfect repetitions of steam-powered machines and simple repetitions required for calculations, Babbage created the “Difference Engine.” The computer, a giant machine as large as a locomotive, could perform simple calculations and print the results automatically. Later, Babbage also drew up plans for the first general-purpose computer, called the “Analytical Engine.”

Herman Hollerith was an American inventor who wanted to find a faster way to compute the U.S. census. By 1890, he had developed a machine that could read punched cards. Different combinations of punches on the cards represented letters and numbers. In the previous census, it had taken almost seven years to count the country’s population. The Hollerith machine reduced that time to six weeks in the 1890 census. Hollerith founded the Tabulating Machine Company in 1896 through which he marketed his machine. In 1924, the company became International Business Machines (IBM).

During World War II, countries began to fund further computer research to increase their strategic importance. By 1944, Howard Aiken working with IBM developed the first all-electronic calculator for the U.S. Navy. The machine was “half as long as a football field and contained about 500 miles of wiring” (LaMorte, 1999). By 1956, the invention of the transistor replaced large, bulky components that had previously been used in computers. The size of computers began to shrink. In 1964, electronic components were attached to a single chip made from the mineral quartz, which eliminated overheating. The “computer chip” allowed computers to shrink at an even faster rate (LaMorte, 1999).

By 1971, millions of electronic components were included on a single chip. An entire computer, called a microprocessor, could be condensed to an area half the size of a dime. Computers found their way into microwaves, cars, garage doors, and televisions. This condensing of components made computers available to everyone. In 1981, IBM introduced its first personal computer (PC). Clones of this computer design caused prices to drop dramatically and purchases to soar. In 1981, 2 million personal computers were in use. By 1982, the number had more than doubled to 5.5 million. Ten years later, the number had risen dramatically to 65 million (LaMorte, 1999).

Today, computers continue to get smaller, faster, and more efficient. The World Wide Web, or Internet, is an immense store of constantly increasing information. A networking of computers worldwide, the Internet can be accessed from every continent. According to Moore and Murray (2000), the Internet has over 2.1 *billion* publicly accessible pages. Almost 7.2 million unique pages are added each day. In addition, nearly 550 billion pages can be found in the “deep Web,” which is information stored in topic-specific databases (Bergma, 2000). According to one estimate, 3% to 4% of all human knowledge is available in digital form on the Internet (Seavey, 1998).

A simple device invented to help with mathematical problems has evolved into a machine that is a necessity in the modern world. The Information Revolution has impacted every aspect of society and the interpretation field is no exception.

For Better or Worse: The Marriage of Interpretation and Computers

Interpretation has its foundations in natural and cultural resources, often found in places where people go to escape modern civilization. Computers are man-made machines that have become essential tools of our society both at home and work. Although the fusion of computers and interpretation at first seems incompatible, the integration of technology into the interpretive profession opens new doors in the quest to connect people to the meanings of resources. However, computer technology also presents a host of challenges.

Due to the dramatic increase in computer use over a relatively short period of time, very little direct research has been conducted to study the incorporation of computers into the interpretive field. The literature that does exist often discusses the effectiveness of computers in an exhibit, not the computer skills an interpreter needs to be successful. One part of this study is to gather information about computer skills from interpretive professionals in the field. The following documents provide a glimpse of computers and interpretation working together.

A Historical View

A few modern-day resources give insight into the use of computers in interpretation. However, even a traditional source helps to shed light on the subject. Back in 1957, Freeman Tilden had the foresight to describe modern “gadgetry” in regards to interpretation. He writes, “So, whether one likes it or not, we are going to have more—and I should hope, better—mechanical devices aimed at multiplying the interpretive effort” (1977). Tilden believed that nothing could replace direct human

contact, but with funding limitations, interpretation would rely more and more on non-personal means. Though he probably had no idea of the computer revolution, that pictures, photographs, movies, and sounds could be inexpensively incorporated into a single machine, he provided important insights into the gadgets of his time, namely tape players and slide shows.

Tilden maintained that a good device is better than no contact at all. Similarly, good interpretation from a device is better than a poor performance from an actual person. However, devices are acceptable only if the interpretation is truly good. Poor interpretation from a device is much worse than poor interpretation from a person. In fact, poor interpretation from a device may be worse than no interpretation at all. Tilden ends the chapter with a simple warning; “Gadgets do not supplant the personal contact, we accept them as valuable alternatives and supplements” (1977).

Computer Exhibits for Visitors

Though Tilden may not have had computers in mind when writing about “gadgets,” his insights definitely hold true today. Coming back to modern times, Larry Beck and Ted Cable in their book *Interpretation for the 21st Century* provide guiding principles for including computer exhibits in visitor and nature centers (1998). The advantages of using computers in centers are that computers respond to stimuli, they create new experiences, and they bring people to places and events they cannot go to in real life. Disadvantages of computer systems include being impersonal and often too complicated. Older generations, who may not be comfortable with computers, might find such displays intimidating. Beck and Cable (1998) also describe three attributes of a successful interpretive computer exhibit.

- Should be engaging (fun and rewarding) but also must be educational
- Must be dependable (easy maintenance and replacement)
- Must reveal something to the visitor (allow people to go beyond their senses)

According to research done at various institutions, interactive computers strongly attract visitors, hold their attention, and promote learning. *Fun* seems to be the key to the interactive computer's success, and most visitors enjoy them much more than static exhibits (Beck & Cable, 1998). In addition, computer interactives promote non-sequential learning. Slides and videos are embedded in the linear learning process; the visitor must watch from the beginning to the end to understand the true meaning of the exhibit. With computers, the visitor can choose which topics interest him or her the most, and how detailed information he or she might want. In essence, the visitor chooses the path and pace of learning, and diverse audiences are served (Beck & Cable, 1998).

One aspect of interpretive computer technology that has been researched in-depth is the use of computers in exhibits. This research is accomplished primarily through visitor studies at museums. By reviewing the impact computers have on a visitor's interpretive experience, we can glimpse both the strengths and weaknesses of interpretive technology. Do computers truly enhance the overall experience of visitors, or do they separate them from the real natural and cultural experience of the site?

Positive Effects on Visitor Experience

Some research reveals that computers can enhance the interpretive experience of museum visitors. The positive aspects of computers seem endless: providing in-depth

and layered information on almost any environmental or cultural topic, maps for traveling, efficient purchasing of items and tickets, and details about sites. Interpretation is based in factual information. With this wealth of information available, do computers actually increase people's understanding of the information? Many studies have been conducted to determine how well people can learn from computers.

In an article entitled "The impact of interactive computer software on visitor's experiences: A case study," Hilke, Hennings, and Springuel (1988) describe an experiment involving computers in a museum setting. The Smithsonian created a traveling exhibition called "Laser at 25," which included a large variety of interpretive components, one of which was an interactive computer. When the exhibition moved from one museum to another, the computers were turned on for certain periods of time and were "out of order" for other intervals. This allowed researchers to assess the effect of computers on different aspects of the visitor's experience.

The researchers discovered that significant changes did occur in the museum experience when computers were included in the exhibition. Computers increased the visitor's recognition of themes and content areas within the exhibition (Hilke, 1988). Researchers expected that people would remember the topics presented in the computer program, but they were surprised to see that visitors who used computers could much more easily recognize themes from other exhibit components as well. The interactive computer exhibit seems to have sensitized visitors to other themes in the exhibition as a whole. In addition, the researchers found that the interactive computers did not detract from other exhibits in the hall. The computers seemed to be an effective supplement to the exhibition.

This research supports the notion that computers enhance a person's knowledge of interpretive concepts. Recognition of themes and content areas can be an important component of learning. Themes provide a person with broad overviews of the topic, and lead to the foundations of organized thought. An individual that reads a website about water pollution, for example, could go out to the local city river and recognize the pollution theme, making a link between the information he or she obtained digitally and the actual, real object. The study takes it even one step further, however. The same individual could see a factory in the industrial park, and recognize a completely different theme—air pollution. The computer has created a mental framework for the individual to conceptualize the environment in terms of broad themes. This can lead to an enhanced understanding of the natural and cultural world as a whole.

In addition to the recognition of broad themes, the research identifies another significant contribution. Previous to this study, many museum professionals believed that computers drew people away from other exhibits. The attraction and interactiveness of a computer do cause visitors to spend more time using them. However, these same visitors spend just as much time at other exhibits as they would without the computer exhibit (Hilke, 1988). People may not be using computers at the expense of real-life natural and cultural experiences, but to supplement their actual experiences instead.

In the book *Interpretation for the 21st Century*, Beck and Cable support the idea that computers enhance understanding (1998). Interactive computers promote non-sequential learning, by providing visitors with different paths. Unlike videos, slide shows, or talks, computer programs do not have a solid beginning, middle, or end. Visitors can choose which direction they want to move and how much information they

would like to learn. Since every person has a different learning style, these choices can enhance learning for a very diverse audience.

Studies and other resources show that computers can enhance learning, and thus lead to a greater understanding about the natural and cultural resources of a site. However, “understanding” is only one aspect of an individual’s experience in the natural world. Interpretation strives not only to enhance understanding, but also to facilitate a meaningful experience for the visitor. Can computers enhance those intangible feelings about a natural or cultural site? A few studies have focused more on the total experience, instead of the learning aspect.

Douglas Worts believes that computers can enhance experiences at art galleries (1990). Traditionally, art galleries have been very cautious incorporating computer technology into the exhibition. Art gallery curators often believe that computers compete with art to attract the visitor’s attention. However, art gallery professionals also deal with the issue of connecting people with the art. Visitors that have not made this connection will have a less positive experience, thereby reducing the possibility of a return visit. To provide visitors with important information about art, interactive computers were constructed at the Art Gallery of Ontario in 1987 (Worts, 1990).

The effect of these computers on the visitor’s experience was astounding. During phase 1 (without the computers), people were more quiet and subdued. In phase 2 (with computers) the entire social atmosphere of the gallery changed. Visitors talked more with each other, asked questions, and pointed at different parts of the artworks. The overall attitudes were obtained from visitors through a series of interviews. In phase 1,

only 23% of the visitors rated their experience as “above average.” In phase 2, 70% rated their experience as “above average” (Worts, 1990).

The research indicates that computers greatly enhanced the experience for most visitors to the art gallery. Worts concludes his article by saying, “...relevant educational material [from computer exhibits] is beginning to dispel some of the aura of ineffable ‘greatness’ often associated with museum objects. In its place, many visitors appear to be developing greater confidence in their ability to relate to cultural objects in a personal way” (1990). This quote epitomizes the notion that computers can enhance interpretation, creating connections between the visitors and the natural and cultural resources of a site.

According to David Dean in his book entitled *Museum Exhibition*, the role of museums will be expanded in the future as technology continues to evolve (1996). Computers will be included in exhibitions, information will be placed on the Internet, and virtual museums will be created to provide access to everyone. However, the founding premise of the museum will not change. “The basic appeal of the actual object, the ‘real thing,’ will not diminish, but the intellectual curiosity engendered by exhibitions will find sustenance in information technology” (Dean, 1996). Like a museum, people visit natural and cultural sites to see “real things.” According to Dean’s hypothesis, the appeal of the natural and cultural world, the attraction to the “real things” like scenery, fresh air, and wildlife, will not be reduced, but computers will provide information to satisfy the visitor’s curiosity.

Negative Effects on Visitor Experience

Whereas the previous studies tend to support the positive aspects of computers on a person's experience in an interpretive setting, other research reveals the detrimental effects of computers. This opposite view states that people spend many more hours staring into a computer screen, reducing the number of real, first-hand natural and cultural experiences. The computer, in effect, replaces recreation and activities that might otherwise be pursued in the natural world. Computers act as barriers to separate human beings from the natural and cultural experience; the virtual takes precedence over the real.

Time consumption is a major concern when combining computers and interpretation. In museums, visitors spend much longer periods of time using interactive computers than any other type of exhibit. Again referring to the Hilke et al. study, which focused on the computer component aspect of the "Laser at 25" exhibition, computers held the participants' attention longer than other exhibits. "Visitors who stopped generally stayed for some time—four or even six minutes was not uncommon. Such prolonged attention to a single station was never observed at other stations" (Hilke, 1988). Although four to six minutes might seem insignificant, in museums where hundreds of exhibits are vying for people's attention, four to six minutes is a considerable time period.

The Worts study at the Art Gallery of Ontario yielded similar results in regards to the time visitors spent on the computer (1990). During phase 1 (without the computer), people spent about 5.4 minutes in the gallery. After phase 2 was completed (with the computer), that time rose to 16.3 minutes. Almost 96% of the visitors used the computer

exhibits in the gallery (Worts, 1990). Again, the computer exhibits were extremely popular, and held the audience's attention much longer than other exhibits.

People may be spending long periods of time on computers, but this does not necessarily affect their experience of the real natural and cultural world. Using computers, people can travel to natural sites throughout the world. In seconds, an individual can be crawling over crumbling rocks on the Galapagos Islands, swimming in the Great Barrier Reef of Australia, or climbing to the top of Mount Everest. Even local nature centers have included virtual tours of replanted prairies, wetland boardwalks, or forest trails. Are these valuable "natural" experiences?

According to David Sobel in his book *Beyond Ecophobia*, the most valuable experiences are those that are real and first-hand (1996). Sobel claims that current environmental education in many schools fails to make the link between the abstract (virtual) and the concrete (real). For instance, students are taught about the destruction of the rainforest and the threatened animals that depend on tropical forests for survival. To the vast majority of students, these concepts are abstract—rainforests are too far away to be real. If a business is threatening to destroy a local meadow, students are unable to connect the similar "rainforest issue" with this real issue. According to Sobel, "Children are disconnected from the world outside their doors and connected with endangered animals and ecosystems around the globe through electronic media" (1996).

Sobel (1996) encourages teachers to bring their students outside so they can bond with the natural world. Only then, he claims, will students develop attitudes that will protect nature. The concrete experiences are the ones that count. Virtual experiences, no matter where they take people, tend to be quite abstract if they are not coupled with real

experiences. Humans have difficulty connecting purely abstract situations with reality. In essence, people that view natural and cultural resources through abstract means like the computer, have a vision of the world that is not based in reality. Their view is skewed by technology, detracting from their experience in the real natural and cultural world.

Ann Mintz, in her book *The Virtual and the Real: Media in Museums*, more directly explores the differences between computer technology and the real objects (Thomas, 1998). The heart of a museum experience is reality. She cites several characteristics that make a computer experience artificial. Computers tend to enlarge or shrink pictures of real objects to similar sizes. Colors are not reproduced well from reality. Three-dimensions are flattened into two dimensions. The object has no texture. Mintz claims that experiences with real objects are much more powerful than experiences with computers (Thomas, 1998).

Research has been conducted to study the overall “real” experience of visitors at museums. In 1994, an organization called Science Learning, Inc. brought together a group of museum professionals to discuss learning in museums. Participants were asked to share any “peak experiences” they might have encountered within a museum setting. “Peak experiences” are those that create a sense of awe, amazement, and in many cases are life-changing. All 50 participants chose an experience that occurred with a real object; not a single person chose an experience with technology. Another similar study led by Michael Spock came up with the same results. Pivotal learning experiences in museums were based on real objects, visitors, and staff, not information technology (Thomas, 1998).

Powerful, life-changing experiences seem to occur in reality, not in the virtual world. People that explore natural and cultural resources at a site, like those that experience the real objects in museums, tend to have much stronger and more personal experiences. These experiences shape an individual's understanding of and attitude toward the world. Computers tend to limit the natural experience a person might have by condensing reality onto a flat monitor. These studies support the notion that computers may detract from a person's interpretive experience.

Computer Skills for Interpreters

Although computer exhibits are a crucial part of interpretive technology, most students will not have the ability or time to create a computer program. This project focuses on computer skills that students will most likely use in their interpretive professions, including presentation, page layout, and graphic software and equipment.

Digital Presentations

From the early days of interpretation, one type of standard program presented at natural and cultural sites was the illustrated talk. Interpreters understand the power of pictures. Visual cues often evoke emotions that words could never create. The old cliché, "A picture is worth a thousand words," holds true for illustrated talks. Thirty-five millimeter slides have traditionally been used as an effective visual medium for showing images to groups of all sizes. According to Regnier, Gross, and Zimmerman (1994), this "old" technology originated in the 1930's.

Although interpretive sites are still using slides to successfully communicate, many are transforming their presentations to a digital medium. Microsoft PowerPoint is one of the most popular and user-friendly presentation programs on the market today. Interpretive sites, like Grand Canyon National Park, are scanning slides into a digital format and storing them on computers.

Ralph Jones, in an article written for the 2000 NAI Conference in Tucson, Arizona, describes the conversion of transferring evening slide programs into PowerPoint presentations at the Grand Canyon. According to Jones (2000), traditional 35-millimeter slides have several limitations that make the conversion worth the effort.

- Two large cabinets hold the 7,300 slides at the Grand Canyon, which takes up room.
- Only one person can use a slide file at a time.
- It can take days to look through and find enough slides for a presentation.
- Over time, slides degrade in quality. Many become faded, scratched, or blurred.
- Slides cannot be altered or edited in any way (crop, add text, add borders)
- Stock slides can be extremely expensive, \$10 to \$75 each (Jones, 2000)

Converting slides to a digital format at the Grand Canyon has been advantageous in many ways.

- Digital slides are stored on a network. All interpreters in the park have access to the images at the same time, any time.

- The slides are coded with keywords, which makes searching for and finding the correct image simple and convenient.
- A single CD-Rom can hold nearly 1,000 images, enhancing the ability to transfer pictures to computers not on the network.
- Digital photos never degrade in quality.
- Image editing, such as cropping, adding text, and re-coloring, can easily be accomplished on the computer.
- Stock digital images are considerably less expensive than 35-millimeter slides: only \$30 for 30,000 photographs (Jones, 2000).

Converting traditional slides into a digital format can definitely prolong the longevity of images and simplify many tasks for interpreters. The true power of digital images to enhance an interpretive experience, however, can only be revealed through presentation software. The Grand Canyon is using Microsoft PowerPoint to create and revise illustrated talks. According to Jones (2000), "PowerPoint is a highly versatile multimedia tool that can dramatically increase the professional look and interpretive effectiveness of your presentations." It is possible to completely replicate a traditional 35-millimeter slide program with PowerPoint. However, many interpreters use the available tools in PowerPoint to enhance the traditional programs, adding unique transitions, text, colored backgrounds, mysterious animations, sound effects, music, and even video clips.

Microsoft PowerPoint and other presentation programs can reduce the staff time needed to accomplish traditional illustrated talk duties, and can contribute to the professionalism and effectiveness of interpretive programs at a site (Jones, 2000).

Page Layout and Graphic Editing

Whereas PowerPoint is used to assist with the illustrated talk duties of an interpreter, page layout and graphic software can enhance the quality and increase the efficiency of creating interpretive panels, posters, brochures, newsletters, and other publications. Page layout, or desktop publishing, programs provide interpreters with a blank virtual easel on the computer screen. Just as an artist adds elements to create a whole picture, the interpreter adds elements to design an effective publication. Through a simple click of the mouse, the interpreter can insert text of any shape or color, add different styles of borders, change the background color of any object, insert images from a scanner, digital camera, or disk, and have full control over where each element is positioned. Graphic design software, on the other hand, provides interpreters with a myriad of tools for creating and manipulating images.

According to Charles Milliken and Krista Kovach from the New Jersey Coastal Heritage Trail Route (1999), the increasing speed and graphic capabilities of modern computers have provided interpreters with the means to plan and prepare small museum and wayside exhibits in-house. Most desktop computers and page layout programs are well within the reach of an interpretive site's budget. By providing interpreters with these tools, projects that may have been contracted out to design firms in the past can now be efficiently planned and prepared.

Milliken and Kovach (1999) also list the computer technology equipment required to create exhibit labels and sign panels. This information is vital for the creation of a successful student Interpretive Computer Lab, which is one of the objectives of this project. The list of equipment that Milliken and Kovach (1999) recommend includes:

- Computers (Pentium II processors running at 350 to 450 MHz, 128 Mb RAM Memory)
- High-resolution monitors (17-21")
- Large hard drives (greater than 10 Gb)
- Zip drives
- Color slide scanner
- Flatbed scanner
- Postscript printer with 16 Mb of memory or more
- Good set of graphic, illustration, and layout software applications

Although the authors do not recommend any specific software applications, they do mention that Adobe PageMaker and QuarkXpress are appropriate desktop publishing programs. The total cost of software and hardware can be purchased for about \$5,000 to \$6,000 (Milliken, 1999). Computer technology is growing at an incredible rate and even the Milliken and Kovach article from three years ago is somewhat outdated. For example, the Pentium 4 processor has replaced both the Pentium II and III in this short period of time. The article does, however, demonstrate the basic elements needed for a successful interpretive lab.

Guidelines for Computer Education

Throughout the nation, educators and school officials are realizing the need to integrate computer training into the curriculum. The development of computer education standards for schools is becoming widespread. Computers are an integral component of society and in many professions proficient computer skills are essential for success. Since the widespread appearance of computer standards is a recent phenomenon, many college and university students do not have the skills that their younger counterparts are learning in school. A review of the current local, state, and national computer education standards will provide valuable guidance in designing interpretive technology courses.

The beginnings

The computer revolution truly started in 1976 when Steve Jobs and Steve Wozniak, two college undergraduates, built the first Apple computer (Poole, 1995). Although large companies and researchers used computers before this time, the Apple computer was the first affordable machine that families, schools, and small businesses could purchase. One year after its creation, a second generation of Apple computers, the Apple II, was born. Demand for the computers skyrocketed in 1978 when a software application was created to help businesses simplify their financial records and reports. From the onset, Apple marketed its computers to schools. Realizing the value of computers in the classroom, the Apple Computer Corporation provided grants for the purchase of equipment. In the early to mid-eighties, schools around the country purchased Apple II computers to help teach their students (Poole, 1995).

Few people in 1980 (at the very beginning of the revolution) believed that computers skills should be taught in the schools. In 1983, just three years later, the National Commission on Excellence in Education created a report entitled “A Nation at Risk.” The report focused on shortcomings of the education system in America. These deficiencies were considered especially serious due to the increasing use of technology in the workplace. The following list from the report describes the status in 1983:

- “Computers and computer-controlled equipment are penetrating every aspect of our lives--homes, factories, and offices.
- One estimate indicates that by the turn of the century millions of jobs will involve laser technology and robotics.
- Technology is radically transforming a host of other occupations. They include health care, medical science, energy production, food processing, construction, and the building, repair, and maintenance of sophisticated scientific, educational, military, and industrial equipment” (NCEE, 1983).

To overcome the inadequacy of computer skills training, the commission recommended that high school graduation requirements be strengthened to include the “Five New Basics:” English, mathematics, science, social studies, and computer science. Whereas three years prior computer training was seen as non-essential, this report elevated computer skills to the same level as the traditional skills of reading, writing, and arithmetic. The first guidelines for teaching computers in schools were introduced by this report. “The teaching of *computer science* in high school should equip graduates to:

(a) understand the computer as an information, computation, and communication device; (b) use the computer in the study of the other Basics and for personal and work-related purposes; and (c) understand the world of computers, electronics, and related technologies” (NCEE, 1983).

Partially due to the National Commission on Excellence in Education report, the U.S. Department of Education was concerned about assessing the potential learning from the new technology being incorporated into schools. In 1986, the National Assessment of Educational Progress (NAEP) published a booklet entitled, *A Framework for Assessing Computer Competence: Defining Objectives*. The objectives were to be used as a guide for accomplishing the first national assessment of computer competence. By working with professionals, teachers, school staff, parents, and concerned citizens, NAEP hoped to “reflect accurately the national expectations for students’ ability to use computers” (NAEP, 1986).

The NAEP booklet defines *computer competence* as “exposure to computing that enables them [students] both to experience the power of computing and to use that power to solve significant and interesting problems” (1986). The objectives for computer learning were split into three different categories (NAEP, 1986):

1. Computer applications

- Assess students’ ability to use programs that other people have written.
- Applications in word processing, database management, lab instrumentation, telecommunications, graphics, music generation, spreadsheets, models and simulations.

2. Computer science: Programming

- Provides a framework for expressing ideas about processes and methodology. Assess students' ability to understand and use a programming language.
- Languages include BASIC, Logo, and Pascal.

3. Knowledge and attitudes

- Assess student's understanding of how a computer operates and what the functions of major components are.
- Assess student's understanding of the ways in which modern technology is transforming society.
- Assess students' attitudes toward computers and computing (may have a link to variations in performance).

These objectives were the first attempt at a national standardization for computer skills education and serve as a foundation for modern-day thinking.

Modern Objectives and Standards

Interestingly, despite computer skills being elevated to one of the "New Basic Skills," NAEP has not assessed computer competence since the report in 1986 (NAEP, 2001). Literature addressing modern computer skills training reveals a wide range of methodology, standards, and objectives. Organizations such as the International Society for Technology in Education (ISTE) are working with teachers and specialists to formulate standardized teaching objectives. Through the National Educational

Technology Standards (NETS) Project, ISTE is working to “define standards for students, integrating curriculum technology, technology support, and standards for student assessment and evaluation of technology use” (ISTE, 2002).

Whereas NAEP separated computer learning into three categories, the NETS project has identified six categories of standards:

1. “Basic operations and concepts”
 - Demonstrate a sound understanding of the nature and operation of technology systems.
 - Proficient in the use of technology.
2. “Social, ethical, and human issues”
 - Understand the ethical, cultural, and societal issues related to technology.
 - Practice responsible use of technology systems, information, and software.
 - Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.
3. “Technology productivity tools”
 - Use technology tools to enhance learning, increase productivity, and promote creativity.
 - Use productivity tools to collaborate in constructing technology-enhanced models, prepare publications, and produce other creative works.

4. “Technology communications tools

- Use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences.
- Use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

5. “Technology research tools

- Use technology to locate, evaluate, and collect information from a variety of sources.
- Use technology tools to process data and report results.
- Evaluate and select new information resources and technological innovations based on the appropriateness for specific tasks.

6. “Technology problem-solving and decision-making tools

- Use technology resources for solving problems and making informed decisions.
- Employ technology in the development of strategies for solving problems in the real world” (ISTE, 2002).

These six categories of standards represent the most current attempt to develop national guidelines for teaching computer skills. The Interpretive Technology Project will strive to follow these standards when developing technology lesson plans and courses. To facilitate the incorporation of these standards into the classroom, the

Delaware Center for Educational Technology created a “Computer Skills Growth Chart” based on the NETS project, Delaware Content Standards and Performance Indicators, and the Delaware computer skills graduation requirement (DCET, 2000/2001). The easy-to-understand table lists specific skill requirements divided into grade levels and categories (see Table 1).

The table represents basic skills that students should possess before entering a college program. Unfortunately, the creation of these national standards is a recent phenomenon and many schools have yet to accept or integrate them into their curriculum. The majority of college students have never received training in even the elementary computer skills. The Interpretive Technology Project will focus primarily on the “Graphics and Presentation” category of the skills standards. Realizing the lack of training, the interpretation course modules will begin with very simple skills such as drawing and manipulating a picture, and progress to more advanced skills like capturing and utilizing digitized video.

Table 1: Computer Skills Growth Chart
(The Delaware Center for Educational Technology, 2000/2001)

	E-mail & Internet	Network & Computing Skills	Word Processing	Graphics & Presentation	Spreadsheets & Databases
12					
11				Capture and utilized digitized video	
10				Save, export and import graphics in a variety of formats	
9	Select and use appropriate search tools to find information	Install and remove programs, such as Acrobat Reader		Create a self-running presentation. Capture and utilize digitized sound.	Understands that databases consist of records and fields.
8	Manage an address book including individuals and groups. Save email and organize into folders. Organize bookmarks.	Basic troubleshooting.		Resize or crop graphics.	Can use absolute and relative addressing in spreadsheets. Can use Boolean techniques to search. (AND, OR)
7	Send and read attachments. Search for information using teacher-selected tools.	Navigate file system (local and network)	Use outline tools.	Capture a picture to the computer using a digital camera or scanner.	Can format and print a worksheet (page setup).
6	Create bookmarks and use them as navigation tools.	Manage directories. Use search or find to locate a file or program.	Add headers, footers, and page numbers to documents. Flow text around an image or table. Use grammar check. Find and replace.		Can replicate formulas across a row or down a column. Can create graphs and charts from data.
5	Send, reply, forward and cc an email independently.	Multitask by switching among open windows. Log on to the network using a student name according to local policy. Copy, cut and paste between windows or documents.	Format page layout (margins, tabs, orientation, page breaks). Create a table. Use a thesaurus.	Create a multimedia presentation using a blank document. Use animation and transitions to enhance a presentation.	Can create simple formulas. Can format data (decimal places, percentage). Can search a database by specifying the value of particular fields.
4	Enter a URL to reach a site. Search for information using teacher-selected sites.	Minimize, maximize and restore windows. Make folders.	Edit text (cut, copy, paste, move). Create bulleted or numbered list.		Can use a spreadsheet to do simple calculations (sum, average, etc.). Can insert and delete rows and columns.
3		Launch a program using a menu. Create, open and close a file. Save to and retrieve a file.	Format text (size, font, style, color, alignment). Use spell check and dictionary.	Insert clipart or a graphic into a document. Reorder slides in a presentation.	Can perform arithmetic calculations in a spreadsheet. Can sort data.
2	Use bookmarks to reach teacher-selected sites.	Print from within a program.	Edit by inserting and deleting. Key in a paragraph with word wrap, capital letters, and punctuation	Draw and manipulate a picture using a graphics program.	Can locate a spreadsheet cell by its row and column address. Can adjust sizes of rows and columns.
1	Use the browser navigation tools (back, forward, refresh, stop).	Handle CDs, discs, and other media appropriately.	Understand cursor placement. Key in phrases or sentences with proper spacing.		Can enter and edit text and numeric data.
K	Follow a link.	Use a mouse. Start up and shut down a computer properly. Launch a program from an icon.	Key in letters to form words.		

National standards are seldom discussed within a university curriculum.

However, computers have become such an integral part of society, students graduating from a university should have the technological skills necessary to succeed in their chosen professions. By reviewing the current status of computer skills standards, the interpretive course modules can be tailored to include important skills that students are currently or will be expected to know.

Students in a Digital Age

Students that have grown up in the Digital Age are different from students in the past. Not only do these students learn about the fundamentals of computers at an early age, but they are also bombarded socially and mentally by a flurry of technological “necessities.” Commercials advertise the need to stay in touch at all times through cell phones, e-mail, and pagers. Complex and visually stimulating video games keep many young people glued to television and computer screens. The World Wide Web has transformed research and learning. Instead of finding a few pages on a topic in an encyclopedia, students search the Internet to discover hundreds or thousands of articles on a topic that are dressed up with pictures, sounds, and videos. Digital Video Discs (DVD’s) are replacing videotapes, and digital cameras are replacing traditional film. This “Digital Generation” of students has an entirely different set of expectations and personalities that can make teaching a challenge.

John Seely Brown, the chief scientist of Xerox and director of its Palo Alto Research Center, believes that the Internet is as fundamental to society as the discovery of electricity (2000). According to his article, “Growing Up Digital,” the World Wide

Web is only in its early forms and major advances in the future will change every aspect of our lives. Through his work at the research center, Brown has identified several dimensional shifts that are having a major impact on the lives of youth.

First, students are acquiring a different type of literacy. Traditionally, literacy refers to the ability to read words. Literacy in the Digital Age involves not only words, but also image and screen literacy. The ability to comfortably navigate through confusing and complex information may take precedence over traditional literacy (Brown, 2000). The second dimension shift is one towards discovery-based learning, instead of the traditional formal and authority-based teaching. The Internet provides endless opportunities for personal growth and learning (Brown, 2000).

The third shift is an emphasis on concrete reasoning. Traditionally, reasoning has dealt with deduction and the abstract. However, students working with digital media tend to have logic that is more concrete; they need to start with something real (an object, document, or code) and use that tangible to build values and importance. This type of reasoning is called *Bricolage* (Brown, 2000). The final shift that Brown reports is a bias toward action. Students that grow up in the Digital Age tend to have fewer inhibitions about trying new things. Other individuals might shy away from unfamiliar applications or machines, but students of the Digital Age watch others and try it for themselves (Brown, 2000).

In the next few years, more students that grew up in the Digital Age will be attending universities. With different learning styles and reasoning, courses will need to change to meet the needs of this new group of students. The Interpretive Technology Project will consider these differences and apply them where appropriate. Self-discovery

learning, for example, is an effective way to learn computer skills and will be built directly into the core of the course modules. For those students that have little experience with computers, the navigation literacy will be an important and essential ability to foster. The bias toward action is a very positive shift for teaching computer skills; students that are uncomfortable trying new programs could have a difficult time succeeding in the courses. One of the proposed outcomes of the project is to help students feel comfortable using computers and a variety of programs.

Evaluation Methods

Evaluation is the process of collecting data, analyzing the results, and then making recommendations based on the findings. This process will be vital to the success of the Interpretive Technology Project. First, interpretive professionals will be asked to provide information about their use of computers in the field, and to identify technology skills they believe interpreters should possess. Second, students that participate in the pilot interpretive technology course modules will be encouraged to give feedback about the strengths and weaknesses of the sessions. The data that is collected from professionals and students will be used to improve and change the integration of technology into the interpretive courses. Several evaluation methods in the social sciences will be explored as tools for the Interpretive Technology Project.

Focus Groups

A focus group is really an interview with several people simultaneously. In the traditional focus group, the researcher becomes a moderator, posing a question and

allowing different members in the group to respond. Based in group interaction, the focus group evaluation method can secure greater insight into the opinions and attitudes of participants, and provide more substantial information (Morgan, 1988).

The beginnings of the Focus Group

The first group interviews can be traced back to Emory Bogardus in 1926, who was involved in testing a social distance scale (Frey, 1991). However, Robert Merton and Patricia Kendall wrote the earliest published record of the “focus group” methodology in 1946. The article, entitled “The Focused Interview,” was published in *The American Journal of Sociology*. During World War II, Merton and Dr. Herta Herzog were assigned by war agencies to study the psychological effects of war propaganda. To overcome limitations of interpreting statistically significant effects of the mass communication, Merton and Herzog designed and standardized a new type of analysis tool. This tool, called the “Focused Interview,” was different from all other interviews in many ways. Merton and Kendall listed four unique characteristics (1946):

1. Participants have been involved in a **particular concrete situation**. Each person saw the same film, read the same book, or listened to the same radio broadcast.
2. Through **content analysis**, the researcher already has an intimate understanding of the situation and the significant elements of the study.
3. The researcher uses knowledge gained in the content analysis to develop an **interview guide**. This list of questions will guide the researcher in obtaining data that are pertinent to the study.

4. The interview is focused on the **subjective experiences** of the participants (Merton, 1946).

With the development of this unique type of group interview, Merton became the “Father of Focus Groups.” Through their research, Merton and Kendall also established four criteria that must be followed in order for a focus group to be successful (1946).

1. **Nondirection.** The researcher must keep questions or comments that might guide a participant to a minimum.
2. **Specificity.** The researcher needs to discover the specific reason that a participant feels one way or another.
3. **Range.** The researcher should try to maximize the range of responses from participants.
4. **Depth and personal context.** The researcher must understand the personal context of each participant and how his or her responses fit into that context (Merton, 1946).

This early journal article and a book authored by Merton, Kendall, and Majorie Fiske in 1956 (called *The Focused Interview*) became the foundation for future focus group research. However, according to Andrea Fontana and James Frey, this new type of evaluation was not well accepted. Since the focus group was a method for collecting “qualitative data,” professionals in the social sciences deemed it as “unscientific.” In fact, between the 1940’s and 1970’s, market researchers conducted the majority of focus groups to determine the needs and wants of the general public. Not until the 1980’s did an interest in using focus groups resurface within the social sciences. Today, a variety of

social issue professionals use focus groups as a primary tool for gathering data (Fontana, 2000).

Advantages and Disadvantages of Focus Groups

Richard Krueger was one of the people responsible for bringing focus groups back to the social sciences. In 1988, he published the first edition of his book, *Focus Groups: A Practical Guide for Applied Research* (Morgan, 1998). The book provides rationale for and steps on conducting focus groups, which is the approach used by many agencies and organizations today. Krueger discusses the advantages and disadvantages of focus groups in his book.

Advantages:

- Socially oriented research procedure. Participants are placed in natural, real-life situations where they can interact with each other.
- Moderator can probe. If a response is not clear, the researcher can ask more specific questions.
- High face validity. The methodology of focus groups is easily understood by anyone, and the results seem believable.
- Can be relatively inexpensive. Interviewing several participants simultaneously saves time and money.
- Can provide speedy results. Perceived problems revealed in a focus group study can be immediately remedied.

- Enables the researcher to increase the sample size of qualitative studies.

Interviewing several participants simultaneously increases the sample size, but does not significantly impact the time requirements of the researcher.

Disadvantages:

- Less control in a group interview. The interaction between group members often influences the course of the discussion.
- Data is more difficult to analyze. As Merton stated, the results must be analyzed in terms of the social context (1946).
- Requires carefully trained interviewers. Moderators need to be able to use open-ended questions, ask probing questions, and move into new topic areas at appropriate times.
- Every group has its own characteristics. One group might offer a wealth of insights, while another offers nothing worthwhile.
- Groups may be difficult to assemble. Focus groups require participants to give up time and share personal thoughts and perceptions. The groups for the Interpretive Technology Project will be assembled based on students that take the technology modules
- Must be at a location conducive to conversation. This might cause logistical problems. For the Interpretive Technology Project, the Schmeckle Reserve Visitor Center has several meeting rooms that would overcome this limitation.

In addition to the advantages and disadvantages presented by Krueger, a video produced by the National Park Service entitled *Focus Groups—Tool for Evaluating Interpretation* offers these additional advantages (Medlin, 1991). First, a great deal of information can be gathered from a relatively few focus groups. Overall, participants are happy to share their attitudes and opinions about an interpretive experience. Second, focus groups are a flexible evaluation method that can be used to study a variety of situations. Whether a researcher wants to study the impact of an interpretive talk, the feelings toward an exhibition, or whether basic needs are being met at a visitor center, focus groups can be used to effectively gather the information. However, focus groups cannot be used to evaluate the overall program; it must focus on something more specific (a talk, a visitor center, an exhibition). In addition, since focus groups do concentrate on specifics, the results cannot be generalized to a broader audience (Medlin, 1991).

Planning and Conducting a Focus Group

Different resources suggest various steps in the preparation and facilitation of a focus group session, although the fundamental procedure seems to be the same. The National Park Service video has the most logical breakdown of steps (Medlin, 1991), and so will partially be used as the basis for planning and conducting focus groups for the Interpretive Technology Project. Other sources are also referenced in each step to fill in gaps.

Focus Group Steps

Step 1: Planning

1. **Determine the purpose.** Before more advanced stages of planning occur, the researcher should ask the fundamental question, “Why am I conducting this study?” If the problem is not clarified, an investment of time and resources could be wasted. The researcher needs to accurately describe the goal of the study and the types of information needed to achieve the goal (Krueger, 1994).
2. **Review any budget or time constraints** (Morgan, 1988).
3. **Determine the number of groups.** In most situations, 3 or 4 focus group sessions will be necessary to gain effective insight into the problem (Medlin, 1991). According to Morgan, when the moderator can clearly anticipate what will be said next in a group, the data gathering is completed (1988).
4. **Determine the size of the group.** The size of a group can influence both social dynamics and time required by the researcher to conduct. Most researchers agree that a “moderate-sized” group, between 6 to 10 people, is best for focus group studies (Morgan, 1988).
5. **Determine the source of participants.** Due to the small size of focus groups, results can never be generalized to a broader audience. Researchers choose participants from a subgroup of the total population that have a common experience (for example, a subgroup might be the people that visit a specific nature center) (Morgan, 1988).
6. **Determine the level of moderator involvement.** A low level of involvement means the moderator has a small role in the overall discussion. His or her

comments and questions are nondirective, allowing the group to explore topics on their own. Although the low level fosters a more disorganized group discussion, the insights of participants are often more meaningful and in-depth than a more organized structure. A high level of involvement allows the moderator to control the set of topics discussed and the dynamics of the group. This type of involvement is appropriate for a strong, externally generated agenda. Due to the higher level of control, some important insights that the researcher overlooked may not be brought to the table (Morgan, 1988).

7. **Select the focus group location.** Sites should be easy to find and conducive to conversation. However, to reduce the location's influence on responses, the environment for the focus group should be neutral. Windows and doors should be shut to reduce visual and audio distractions. The location should have a large table for participants to sit around and face each other (Krueger, 1994).
8. **Develop a question guide.** According to Morgan, the researcher should start with a list of questions addressing the needs of the study, and then organize the list into categories (1988). He advises researchers to limit how rigidly they follow the guide. Focus groups are useful because they allow participants to interact with one another. The group should influence the direction of questioning (Morgan, 1988). Krueger offers several suggestions when creating questions for a focus group. First, focus groups use open-ended questions. These allow the participant to structure an answer in several dimensions. Dichotomous questions, or questions that can be answered with a "yes" or "no" are not conducive to successful focus group sessions. "Why" questions are rarely used in focus

groups, because they imply a rational answer developed by thought and reflection, and may set off defensive barriers. The questions should also be clear and concise (Krueger, 1994).

Step 2: Recruiting and Preparing the Meeting Place

1. **Invite potential participants to join the group discussion.** A “group discussion” is usually clearer and better received than a “focus group.” In some situations, the researcher will ask random visitors to join an immediate group discussion to talk about a certain aspect of the site or program. This is often done when evaluating interpretation at parks and forests (Medlin, 1991). Usually, however, participants are chosen before the focus group session will take place. A letter is written inviting the subjects to take part in a group discussion. The invitation must be personalized to make each participant feel that they are needed in the discussion. A follow-up on the invitations must also be done, which includes calling each person the day before the focus group as a reminder. The importance of the study must be conveyed to the participants (Krueger, 1994).
2. **Offer an incentive to participants.** Besides conveying the importance of your participants’ responses to the study, it is also important to offer them a token of appreciation. A small gift will encourage people to participate in the discussion, foster good impressions about your study, and is a physical way of showing appreciation for their comments (Medlin, 1991). Incentives are especially important in focus groups, due to the level of time and effort required by the participant (Krueger, 1994).

3. **Prepare the meeting place.** Researchers should set up recording equipment and test it before participants arrive for the focus group. Refreshments can also be served to make participants feel more comfortable (Medlin, 1991).

Step 3: Conducting the Focus Group

1. **Pre-session.** Before the focus group session begins, allow the group to be comfortable. Pass out refreshments and make small talk.
2. **Introduction.** The researcher should introduce him/herself and thank the group for coming. Reiterate the purpose of the focus group, and how the responses from participants will be used (Medlin, 1991).
3. **Ground Rules.** Certain rules will enhance the quality of responses and the ability to transcribe data after the sessions. Only one person should speak at a time. There should be no side conversations that could be picked up by the recorders. Everyone should feel free to participate, but no one person should dominate the discussion (Morgan, 1988).
4. **Question Routes.**
 - a. **First question.** Always start with an easy, general question to break the ice. “What is your name and where are you from?” is an appropriate beginning question. The first question should strive to make people comfortable talking in a group setting (Medlin, 1991).
 - b. **Main questions.** After the initial question, the researcher can start asking more important questions using the guide. Questions should start broad to accommodate many different perspectives (some of

which the researcher may not have thought about), and then be narrowed down to obtain specific information significant to the study (Krueger, 1994).

- c. **Moderator response.** As participants answer, the researcher should respond very carefully. Avoiding head nodding and responses that imply judgment (“Good,” “Excellent”) is an important part of moderating the discussion (Krueger, 1994).
- d. **Group dynamics.** In addition, the moderator is responsible for watching and modifying the group dynamics. Merton cites three things the moderator must watch for: keep one person or group of people from dominating the discussion, encourage everyone (especially shy members) to participate, and obtain responses from the entire group (1956).
- e. **Probing questions.** The researcher should use probing questions to get more specific information from group participants.
- f. **Final question.** The final question should be one that allows participants to say something they did not have a chance to in earlier questions. For example, “Is there anything else anyone would like to say?” is an appropriate closing question (Medlin, 1991).

- 5. **Conclusion.** Two different methods exist for concluding a focus group session. The National Park Service suggests thanking the participants for their time and handing out the gifts (Medlin, 1991). This is a common procedure used in most focus groups. A more effective conclusion, but one that requires much more

effort, is to briefly summarize the main points of the focus group and ask if the perception is accurate. After the participants respond to the accuracy, they are thanked and given gifts (Krueger, 1994).

6. **Summary.** Immediately after the focus group, the researcher should write down a summary of the main points of the discussion.

Analyzing the Results of a Focus Group

The analysis of focus group results is often the most time-consuming part of the study. Unlike quantitative data that can easily be grouped together and plugged into statistical formulas, qualitative data must be analyzed with techniques that require a great deal of time and effort by the researcher. Many different methods are available for analyzing and reporting the qualitative data from focus groups. Only those methods that are most appropriate for the Interpretive Technology Project will be included in the following section. The “Focus Group Steps” will be continued into the analysis section as well.

Step 4: Transcribe and Analyze the Data

1. **Transcribing the recorded sessions.** Systematic data gathering helps to minimize human error when analyzing focus group discussions. “Capturing and handling data” is one of the major concerns, and a recording device of some sort is highly recommended for focus groups. A lack of notes or recordings will seriously impede the ability of the researcher to remember certain aspects of the discussion. Ideally, the researcher should also transcribe the discussion, since he

or she understands the context and meaning of the spoken words. Unfortunately, complete transcripts take enormous amounts of time and effort. Between 30-48 hours will be taken to transcribe three focus groups, and will result in 50-70 pages of information. The transcription step can be combined with the analysis to reduce the time and energy required (Krueger, 1994).

2. **Analyze the data.**

- a. **Coding the data.** Coding is the primary tool used to analyze data gathered from a focus group. When a researcher comes across a unique idea or suggestion on a transcript, it is assigned an identifiable label. This label, or code, is written in the margin of the transcript (or in the case of computers, directly on the file). If the same idea reappears later in the discussion, it is also given that same label. This process, called axial coding, allows the researcher to organize and categorize ideas in different ways (Krueger, 1994).
- b. **Choose an analysis option.** According to Krueger (1994), there are four different methods for analyzing the focus group responses.
 - i. **Transcript-Based Analysis.** The recorded tapes are listened to and typed word-for-word on a computer. When the transcripts are completed, the researcher looks for common themes and develops a coding system. The data are sorted into coding categories. This method requires the greatest amount of time. A researcher can expect to spend 30-48 hours preparing the transcript, and another 30-48 hours analyzing the data.

- ii. **Tape-Based Analysis.** In a tape-based analysis, the transcription and analysis phases are combined. The researcher carefully listens to the tape, and types an abridged transcript that only includes comments directly related to the study. As the researcher is transcribing, he or she identifies the emerging themes, develops a coding system, and types data directly to different categories. This transcript may be only 3-10 pages long, and 12-18 hours will be spent in the transcription and analysis.
- iii. **Note-Based Analysis.** This type of analysis is based on field notes, the debriefing session, and the summary comments at the end of the focus group. The session is still recorded, but the tape is only used to verify the notes. A researcher can expect to spend 8-12 hours analyzing the data.
- iv. **Memory-Based Analysis.** The researcher presents an oral report to the clients soon after the focus group is completed. Although a researcher might consult field notes, most of the analysis is done from memory. Only a highly skilled researcher should attempt this type of analysis.

Step 5: Report and use the results

1. **Choose a reporting option.** The type of report that is written after the study depends heavily on the client and the audience that will be reading the report. Krueger (1994) identifies at least three types of reports.

- a. **Raw data model.** All of the comments in a focus group are divided into categories and included in the report. It provides the reader with the entire range of comments, but the length may discourage careful reading. This is the fastest and easiest of all reports to produce.
 - b. **Descriptive summary.** This report starts with a summary paragraph, and then lists representative comments that support the summary. The comments illustrate how participants responded.
 - c. **Interpretive report.** This report expands on the descriptive summary by incorporating a section on what the data mean. This takes the most time and energy to produce, but provides the greatest depth in analysis.
2. **Use the results.** This will obviously vary depending on the client.

Focus groups will be the primary method used to analyze the attitudes and opinions of students that participate in the interpretive technology course modules.

Surveys

A survey will be sent to professional interpreters in the field and supervisors that hire interpreters for the Interpretive Technology Project. The goal of the survey is to obtain general information about the current use of computers at interpretive sites, and what professionals believe students need in terms of computer skills. The surveys will attempt to provide a realistic view of the interpretive field in regards to technology.

Questionnaires: Advantages and Disadvantages

A survey poses subjective questions to people in an attempt to gain a clearer understanding of the subject. Some interviews, for example, can be considered a type of survey. A questionnaire is basically a written survey. The questions appear in written form, and participants are asked to respond in written form. Questionnaires are an effective tool for discovering factual information or a participant's opinion about nearly any aspect of a program (Malcarne, 1982).

Questionnaires have a variety of advantages and disadvantages.

Advantages:

- Provide insight into the perceptions that people have of the program, which can lead to positive changes within individual programs and the organization as a whole.
- Can cover a broad range of areas in a relatively short period of time. In fact, questionnaires can fill in the gaps where direct measurement might be too costly in terms of money and time.
- Individuals taking the traditional questionnaires feel that their opinions really count, which empowers them with a sense of importance.
- Can be used to survey less accessible individuals (NMU 1996).

Disadvantages:

- The quality of results is variable. Responses to traditional questionnaires are often highly dependent on the wording of the questions. Therefore, traditional questionnaires take a lot of initial effort to construct.
- Forced response questions (multiple-choice) do not allow participants to express their true feelings, but open-ended questions are much more difficult to interpret and compare. Before the traditional questionnaire is given, possible answers must be considered and criteria established for scoring purposes.
- Reflect only what participants are willing to report about their opinions of the program. Therefore, the results must be considered carefully since they may not represent a comprehensive view.
- Questions must have a limited scope. If questions are too broad or if they are too numerous, people will provide superficial answers at best (NMU 1996).
- Expertise is needed to write effective questions and interpret the results.

Overall, questionnaires can be used to collect factual and opinion information about a broad range of topics. They provide clients with an in-depth look into their programs. By mixing open-ended and forced response questions, participants are able to provide honest feedback about the program in a non-threatening way.

Creating a Questionnaire

According to Robert Peterson (2000) in his book *Constructing Effective Questionnaires*, questioning strategies are characterized along two dimensions: the

amount of structure and the degree of directness. In a completely structured strategy, all participants are asked the same questions in the same order. The questions are closed-ended (answers are pre-determined). This strategy, often used in later stages of research, provides the ability to generalize answers to a broader population. On the other hand, in a completely unstructured survey, every question that follows the first depends on a previous answer. The questions are open-ended, which allows for a multitude of answers. This strategy will most likely be used during the early exploratory stages of research and cannot be generalized beyond the participants. Many questionnaires fall between these two extremes.

The degree of directness refers to how much information is given to participants about the purpose of the research project. In a full disclosure study, everything about the project is provided including the purpose and sponsors. Questions are transparent and directly relate to the purpose of the study. Projective questioning, on the other hand, uses indirect questions. The participants are told little or nothing about the true nature of the project (Peterson, 2000).

Peterson (2000) also introduces seven steps for creating an effective questionnaire, which are similar to other sources (Salant, 1994 and Creative Research System, 2001). Based on Peterson and these other sources, the researcher expanded the guide into ten steps. The following steps are from Peterson's book (2000) unless noted otherwise.

Questionnaire Steps

Step 1: Information and Goals Analysis

Initially, the information requirements that necessitate a questionnaire must be reviewed. The researcher should decide what information is needed and how it will be used. In addition, the researcher and the clients should clarify the goals of the study, the detail and depth of information to be gathered, and any timing issues.

Step 2: Determine Sample (Salant, 1994)

A sample is a group of participants that accurately represent diversity found in a larger population. According to Salant (1994), sampling involves three steps. First, define the survey population. If the population is small enough, a survey could be sent to everyone. This is called a census. However, if the population is too large, a smaller group that represents the larger population will be sent surveys. Second, the researcher needs to obtain an adequate population list. Third, a sample is selected from the population list (if a census is not being conducted).

Selecting a sample from the population, called sampling, can be done in a variety of ways. All sampling methods, however, fit into two broad categories: probability and non-probability sampling. In probability sampling, every person in the population has a known probability of being selected (StatPac 2002). This includes random sampling, which is the purest form of probability sampling. Members of the population are randomly selected from a list by the use of a random number generator or table. Every member has an equal chance of being selected for the sample (StatPac 2002).

In non-probability sampling, on the other hand, members of the population are selected by a non-random method. This includes convenience sampling, where people are selected for the sample because they are convenient. The people might live close by, might know the researcher personally, or have something in common which makes reaching them easier. This method is often used in exploratory research for an inexpensive approximation of the truth. It could also be used during preliminary research efforts to get a gross estimate of the results, before the actual probability sampling is conducted (StatPac, 2002). Since non-random methods are used to select the sample, the results cannot be generalized to the broader population.

Step 3: Research Questions

Next, the researcher should develop and prioritize a list of potential research questions that will achieve the goals of the project. These questions should be as specific as possible, making it easier to create readable questions at a later stage. During this process, the questions should go through an initial screening. How will the answers be analyzed? What is the anticipated information? How will the information be used? Questions that provide information not pertaining to the research goals should be dropped.

Step 4: Assess Research Questions

In this step, the research questions that survived the first screening process are screened more carefully a second time. Will the participants understand each question? Can they answer each question? Will they answer each question? If the answer is no to

any of these queries, the potential research question must be dropped. The list should also be submitted to a panel of experts for their opinions.

Step 5: Determine Types of Questions

Questions fall into two broader categories: open-ended and close-ended. Open-ended questions are written with no possible answers or categories listed. These are often used if the researcher does not know how respondents will answer, or to probe deeper by jogging the memory (Is there anything else?). The variability of answers to these questions can be quite high. These types of questions take less time and effort to initially construct, but take much more time to analyze.

Close-ended questions incorporate answers or response categories, which limit the participant's response to predetermined answers. To effectively create these types of questions, the researcher must have an intimate knowledge of the participants, the research subject, and the use of the answers. Therefore, these types of questions take much more time and effort to construct. However, these questions are easier for the participant to answer since they require less physical and mental effort. In addition, they are much easier to analyze.

A ranking continuum is one type of close-ended question that can be particularly effective in a questionnaire. With a built-in scoring system, it is easy to quickly and efficiently quantify data for comparisons. Ranking continuums are scales that represent both extremes of an attitude or opinion (strongly disagree to strongly agree). Instead of simply asking yes or no, the scales allow participants to choose from an array of options, which hopefully represents their true feelings more accurately. The scales are divided

into equal intervals and participants choose where their opinions fit on the scale. Each end of an interval is assigned a number. The data is therefore easy to quantify and provides quick results. One type of ranking continuum is the interval scale, which includes the classic Likert scale (a 5-point scale ranging from “strongly agree” to “strongly disagree”). A variety of statements are split into equal intervals along the scale. Each of the statements is given a certain score. The participant chooses the statement that most accurately reflects what he or she is feeling (Jenson, 1965 and Heimlich, 1996).

Example: Microsoft PowerPoint should be taught in the interpretive technology training sessions.

Strongly agree ---- Agree ---- Neutral ---- Disagree ---- Strongly disagree

Step 6: Specific Wording

The specific wording of questions can have a tremendous effect on the visitor responses. A slight difference in wording can lead to major differences in the answers. Peterson (2000) suggests using common sense, a knowledge of communication, and experience to develop readable questions that are understood by the majority of participants. The questions should meet five primary criteria: be brief, relevant, unambiguous, specific, and objective (BRUSO).

Step 7: Determine the Structure of the Questionnaire

Be sure the questionnaire is easy to read, has solid instructions, has appropriate space for answers, appears professional, and facilitates analysis. The following sections should be included:

- **Introductory section:** The first part of the questionnaire is communication between the researcher and participant. Stress the importance of the project, provide information about the study, request their help, and assure them that it will not be time consuming. Also include any special instructions for filling out the questionnaire.
- **Substantive question section:** This section includes the primary questions important to the research project. The questions should be logically ordered, but the order should not influence the answers.
- **Classification quota section:** This section is designed to obtain demographic information. Participants are usually willing to fill out these questions.
- **Conclusion section:** Words of appreciation for filling out the survey and instructions for returning the survey should be included.

Step 8: Evaluate the Questionnaire

Pre-test the questionnaire with participants who are similar to those that will be receiving the actual questionnaire. Poorly written questions, misunderstood instructions, and any other common confusion will be identified through this evaluation process. The questionnaire should also be submitted to an external panel for evaluation and approval.

Step 9: Send out the Questionnaires and Enter Data (Creative Research Systems, 2001)

The next step is determining which method is best for distributing the questionnaires. For the Interpretive Technology Project, surveys will be sent via e-mail. According to Creative Research Systems (2001), e-mail surveys have several advantages and disadvantages.

Advantages:

- **Speed:** With e-mail, many responses can be gathered in a just a few days.
- **Inexpensive:** After the initial questionnaire has been set up, there is no cost associated with sending or receiving the surveys.
- **Attachments:** Pictures, movies, and sound can be attached to e-mail messages if they are important to the study.
- **High Response Rate:** The novelty of using e-mail for surveys often leads to higher response rates than mail.

Disadvantages:

- **Availability of Lists:** The researcher must have a list that includes e-mail addresses.
- **Repeat Responses:** Participants could submit answers more than once.
- **Negative Feelings:** People dislike unsolicited e-mail messages
- **No Ability to Generalize:** E-mail is growing rapidly, but it is by no means universal. Therefore, people that have e-mail do not accurately represent the

population as a whole. E-mail surveys are best used in a corporate environment where e-mail is common.

Overall, e-mail surveys are the fastest and cheapest of all survey methods.

Although the sample is somewhat limited, more people have e-mail access than have Internet access. An e-mail survey can effectively be used in the exploratory stages of research.

Step 10: Analyze the Data and Produce Reports (Creative Research Systems, 2001)

The final step is analyzing the data gathered from the surveys and making sense out of the numbers. Analyzing close-ended questions is a simple process. The scoring system is often built into the question itself. For example, in a ranking continuum question with five categories, each category would be given a numbered score. The average of all the participant's scores would be included in the final report. For multiple-choice questions, the percentage of participants that selected each of the choices would be the final analysis for the report.

Analyzing open-ended questions takes much more effort and time. A coding process, like that used in focus groups, needs to be developed. According to Peterson (2000), this content analysis consists of three stages.

- **Stage 1:** The answers are received and grouped together based on some broad characteristic (same word, same theme, same attitude).
- **Stage 2:** Answers are combined into sub-groups within the first-level group, based on more specific characteristics.

- **Stage 3:** A coding system is developed so all answers can be categorized. An effective coding system is represented by there being “one and only one code for every answer, and every answer can be coded” (Peterson, 2000)

For both close-ended and open-ended questions, the analysis can be completed at different levels. Less sophisticated analyses include simple frequency diagrams that illustrate how many times a particular theme occurs. More sophisticated analyses seek to discover motivations and inference patterns (Peterson, 2000). A more detailed analysis requires a greater investment of time and money. Often, the less sophisticated analysis can successfully achieve the goals of the research project.

Summary

The University of Wisconsin-Stevens Point has a long tradition of training environmental educators and interpreters with the skills they need to be successful. To continue this proud tradition, and to provide students with new opportunities to connect the interests of visitors with the meanings inherent in the resources, computer skills training should be incorporated into the curriculum. As computers continue to become ever more prominent in society, the importance of learning technology skills takes on a much greater precedence. The purpose of this Interpretive Technology Project is to integrate computer skills into the interpretation courses at UWSP.

It is imperative that students receive high quality training in computer skills that will assist them in becoming more effective and efficient interpreters. Interpretation strives to connect the meanings of natural and cultural resources with the interests of visitors. The College of Natural Resources at UWSP has taught interpretation courses for

over 30 years. Through the dedication and talent of instructors over the years, Stevens Point has become one of the leading training intuitions in the country for environmental education and interpretation.

In the early 1980's, very few businesses, schools, or homes owned a personal computer. Today, just 20 years later, computers have revolutionized the way people work and play. They have become intertwined with all facets of life, and the interpretation profession is no exception. Interpreters are using computers to create multimedia exhibits, present illustrated talks, design sign panels, posters, and other presentations, and manipulate graphics, sound, and videos. These tools provide interpreters with opportunities to be more effective in their profession, as long as they can overcome the limitations that are part of any new technology.

Since the beginning of the Computer Revolution, educators have been trying to standardize computer skills training in the schools. Unfortunately, national standards have yet to be accepted, and students are entering college without the basic computing skills necessary to succeed. The Interpretive Technology Project will strive to fill in this gap of knowledge, focusing on skills directly related to the interpretive profession. At the same time, it will encourage alternative types of learning for students that have grown up in the Digital Age. To analyze the success of the technology course modules, focus groups will be used to determine students' attitudes and perceptions toward the training. Surveys will be sent out to professional interpreters and supervisors to determine which computing skills they deem to be most important. The results of these analyses will be used to modify and improve the interpretive technology modules in the future.

Chapter III

Methodology

A solid plan is required to successfully achieve the objectives and goals of this project. The following section details methods that have been used to achieve the primary goal, which is to develop computer training facilities and course modules for the environmental education and interpretation curriculum at UWSP. To make this process more efficient, the goal was broken down into four specific objectives. Each objective has been further broken down into a series of specific steps. Ideally, these steps guide the researcher to successfully complete each individual objective. The culmination of all objectives being accomplished leads to the ultimate achievement of the primary goal.

Objective 1:

Define which computing skills should be taught in the interpretive courses.

Initially, the technology course modules were developed on the basis of skills that have been taught previously as requirements of the interpretative course. For example, students in Oral Interpretation Methods (NR 368/568) and Park Interpretation (NR 367/567) are required to present an illustrated talk. Over the past three years, Microsoft PowerPoint has steadily overtaken the traditional 35-millimeter slide presentations. Digital presentations save the students both time (no wait for slides to be developed) and money (no cost for the slides). In response to this major shift, a single session of PowerPoint training was taught in the 2000-2001 school year. However, the marginal

quality of the resulting student presentations has stimulated the development of a more intense and detailed training.

Students in the 2-credit Environmental Publications (NR 364/564) and Signs, Trails, and Waysides (NR 363/563) courses are required to design and produce several examples of posters, sign panels, and other publications. When these courses were established in the early 1990's, Gross and Zimmerman decided that students should be using desktop publishing software to create their publications. QuarkXpress, a professional page layout program utilized by nationally syndicated newspapers, magazines, and advertising companies, was chosen as the software students should learn. Gross and Zimmerman contracted with University Printing and Design to instruct the course. Two discussion sessions (4 hours) were devoted to QuarkXpress training each year. The frustration expressed by students using the software has prompted the need for more comprehensive training in QuarkXpress and graphic editing programs.

In addition to the past incorporation of computer skills and requirements in the courses, discussions with former students will form the initial basis of the technology course modules. Zimmerman has received a few phone calls from former students who request QuarkXpress for their agency. After developing skills in using QuarkXpress, the students would like to use the software to produce publications for their interpretive site. Unfortunately, QuarkXpress requires a large investment, nearly \$1,800 at the time of this writing, and few interpretive agencies or organizations can afford to spend this much on software purchases. Therefore, another need has arisen to teach students about more affordable page layout solutions.

The past incorporation of computer skills into the courses did not happen by chance. Dr. Gross and Ron Zimmerman have a comprehensive understanding of the field through networking with professional interpreters. These connections have provided them with insight into the needs and desires of computer skills in the interpretation field. Therefore, the initial training modules expanded and built upon skills currently taught in the interpretive courses.

By reviewing popular software and talking with people who use the programs, the researcher determined specific skills to teach in the interpretive courses. The available applications represent an enormous spectrum of possibilities in terms of skill development. This project identified only the necessary program components that could be used to enhance an interpretive product, whether the product is a publication, sign panel, or presentation. Although technology is an essential aspect of the interpretive program, it is by no means the most important to a student's training. The time spent on technology skills must be balanced with the other training.

Objective 2:

Create thematic lesson plans that incorporate computer skills training into the current and future interpretive courses at UWSP.

The foundation of computer skills training has already been set by past requirements of the course (page layout software to design posters and sign panels), shifts in presentation styles both on campus and in the field (PowerPoint software), and concerns from past students (agencies cannot afford QuarkXpress). In previous courses, very little time and energy were devoted to these technology skills and students were

required to learn computer software and hardware on their own or in other classes.

Overall, students reported that they felt limited by their knowledge of the technology, which led to interpretive products that were less than ideal. Technology tools were available to students to create an effective interpretive product, they had a vision of the final result, but they did not have the skills to move from vision to actual product.

Step 1: Design and produce tutorials that provide students with step-by-step instructions on how to use computer hardware and software.

Through many years of helping people to learn and use computers, the researcher has found that simple step-by-step instruction guides are the best means for teaching and reinforcing technology skills. After the specific skills were determined in Objective 1, tutorials were written for each individual software program and piece of equipment that would be taught in the courses. These tutorials did not only include the step-by-step instructions that enhance skill building, but also had a discovery component that encouraged students to further their own learning.

The tutorials were written for a beginner audience. Although organizations are currently pushing to incorporate computer skills training at the elementary and high school levels, many students entering a college program have no formal technology training. Writing the tutorials for beginners ensured that regardless of past training, all students in the interpretive courses would be given an equal chance to create interpretive products using the same skills. If the tutorials are completely successful, a person that has virtually no computer experience could pick up a tutorial, follow the instructions, and develop a solid interpretive product.

With these ideas in mind, the tutorials were written simply and concisely, avoiding technical language wherever possible. The number of pages was limited to no more than ten to avoid overwhelming the students. If a particular software application was more complex, several tutorials were written to cover different aspects of the program. The organization was kept clear and distinct with bullets or numbers separating the various steps. Since computers are a visual medium, images were used to enhance the reader's understanding of concepts. When possible, actual screen shots were incorporated to strengthen the ties between the tutorial and the software, as well as increasing the comfort level for students who see something familiar. Since color is an important aspect of many programs (especially graphic design), the tutorials were printed in color. Color can contribute to the organization (colored sub-headings, labels, arrows), strengthen the ties between the tutorials and actual computer screen, and increase the readability of the tutorials by enhancing their aesthetic qualities.

In some cases, the tutorials would be used alone as a training tool for students without further instruction. In the Oral Interpretation Methods/Park Interpretation course (NR 368/568/367/567) for instance, PowerPoint tutorials were created to assist students in developing basic digital presentation skills. No class time was devoted to the tutorials specifically; students completed them on their own time. Assignments were added to the tutorials, which provide proof to the instructors that students actually completed them. The assignments required students to utilize the skills and knowledge taught by the tutorials.

In other cases, the tutorials were used to supplement actual course instruction. For the Environmental Publications (NR 364/564) and Signs, Trails, and Waysides (NR

363/563) courses, additional class time was devoted to the technology skills training in the form of a laboratory session (see Step 2). Students used the tutorials as a reinforcement of the personal instruction. In the lab session, an instructor directly observed the skills being demonstrated by the students. Assignments were given at the end of the training, but were not included in the actual tutorials.

The tutorials served as the backbone for incorporating technology skills into the interpretive curriculum. They can be powerful tools for teaching and reinforcing skills, and are physical guides that students can refer back to in the years to come.

Step 2: Develop a technology lab session where students can learn and practice computer skills related to the interpretive profession.

Apart from the tutorials, instruction sessions were also developed to further increase the learning of technology skills. The written tutorials have definite limitations. For instance, the tutorials cannot answer specific questions a student might have. If students do not understand one of the steps, the tutorial does not provide any more detailed information. The students must figure out the answer for themselves before they can move to the next step. Similarly, for students that simply cannot comprehend a computer program or piece of equipment, the impersonal nature of the tutorials could lead to frustration.

A combined lab session was developed for students taking either the 2-credit Signs, Trails, and Waysides course (NR 363/563) or the Environmental Publications course (NR 364/564). The session was an intensive learning experience, taught by an instructor and supplemented by the step-by-step tutorials. An essential component of the

session was the availability of computers, software, and hardware for the students to use (see Objective 3). The session was a practical skills course designed to get students using the programs and equipment. The instructor guided them through a series of activities, incorporating the important skills they would be using to produce interpretive products.

Although written tutorials could accomplish the same goals, an instructor-led lab session has many advantages. First, the amount and depth of technology information in NR 363 and 364 could cause tutorials to be overwhelming. Both page layout and graphic design software will be taught in these courses. In some cases, it is much simpler to show students how to complete a step rather than writing the explanation in words or pictures. Second, since some of the concepts may be difficult to understand, the instructor is available to answer questions the students have while participating in the training. This enhances the quality of the learning for all students. Third, the entire training can be modified depending on the knowledge and expectations of the audience. If an advanced group of students comprehends the information quickly, more challenging techniques can be introduced. Fourth, limitations in the training can be virtually avoided. If a step in a tutorial is worded poorly, all students will probably fail to learn the skills of that step. However, if a certain explanation does not work during the lab session, the instructor can change positions and try explaining the information in a different way. Overall, the instructor-led lab session has the potential of enhancing the entire learning experience of the students.

Objective 3:

Design and oversee the construction of an “Interpretation Computer Lab” in the Schmeckle Reserve Visitor Center, where students can practice computing skills using modern equipment and programs.

Modern computer technology must be available for student use if the interpretive skills training is to be successful. In the past, students used computer labs located throughout campus to design and produce their final products. Although the proximity was convenient, students faced several obstacles using the labs. First, the equipment was not standardized. A scanner in one lab might be a completely different brand and model from one in another lab. Computers in one lab might be significantly faster than computers in another lab. Creating tutorials for all equipment on campus would be virtually impossible. Second, the software programs taught in the interpretive courses are only available in a few places. QuarkXpress, for example, is found only on computers in the CNR public lab and in the Fine Arts Building. Third, students had no guarantee that the lab would have available computers at any given time. During the last few weeks of the semester, the computer labs are congested with students. And finally, the proper equipment needed to complete interpretive products are difficult to find and expensive to use. For example, students need a large-format color printer to fabricate full-size sign panels. Only one is readily available in the CNR Advanced Computing Lab and students need special permission to use it.

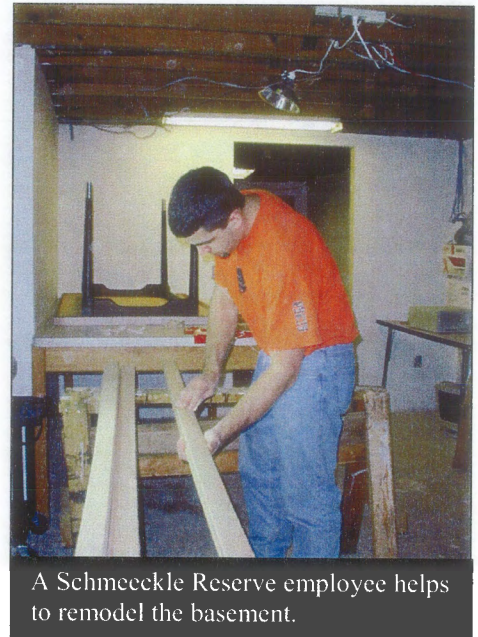
When the researcher started his graduate program at UWSP in the fall of 2000, a technology grant had already provided Schmeckle Reserve with necessary funds to purchase equipment for a computer lab. Much of the equipment, such as a tower network system, three computers, a large-format color printer, and a large-format laminator, had

already been ordered. A renovation of a downstairs storage area was underway where the Interpretation Computer Lab would be constructed. Dr. Michael Gross and Ron Zimmerman envisioned the computer lab as a dedicated place where environmental education and interpretation students could practice and use their technology skills. By developing a lab specifically for the interpretive courses at UWSP, many of the limitations of the public computing labs could be overcome.

The primary goal of this project is to develop a technology course module that teaches

interpretive computing skills. Through tutorials and instructor-led sessions, this goal could be accomplished without a specific interpretation computer lab. However, the lab at Schmeckle Reserve makes the incorporation of technology skills much more effective. By clustering all of the equipment and software into a single location, the instructors know exactly how the computers respond, which programs are available, what types of hardware can be used, and can answer any questions that interpretive students might have. Students learn on the exact equipment they will be using to produce their final interpretive products.

As the technology course module is developed, the researcher oversaw the construction of the interpretive computer lab to ensure that it would enhance the quality of the skills training. The physical layout of the equipment was considered to maximize the available space, reduce possible congestion points, and facilitate the instruction of the



A Schmeckle Reserve employee helps to remodel the basement.

courses. Possible furniture and accommodation options were discussed with Ron Zimmerman, director of Schmeeckle Reserve. Recommendations were also made for the purchase of equipment not yet ordered (scanner, laminator), for upgrading equipment, and for the purchase of appropriate software packages.

Once the computers and equipment were installed, the researcher worked closely with the UWSP Information Technology Office to ensure that the computers were networked correctly on the unique Schmeeckle system, that standard campus software was installed on the computers, and that other technology equipment was operating correctly. The researcher became the primary contact between Information Technology and Schmeeckle Reserve, as well as being the person responsible for keeping the technology working in the computer lab. This required a comprehensive understanding of the Schmeeckle network, the various pieces of technology equipment (scanners, printers, laminators), and the software taught in the course modules.

When the computers and equipment in the interpretive technology lab were operating successfully, the computers were standardized with identical menus and programs. A student that learns on one computer should be able to use any computer in the lab without a problem. As described in Step 1 of the second objective, step-by-step instruction tutorials were created for each piece of hardware available for student use. This significantly reduced the amount of personal instruction time required to teach every person who used the lab equipment.

With the completion of the Interpretation Computer Lab, students had a quiet and individualized place to practice their technology skills and complete interpretive projects. The lab sessions, as described in Step 2 of the second objective, were taught in the new

computer lab at Schmeeckle Reserve. Consequently, the development of the lab sessions was tied very closely with the creation of the computer lab. The combination of the technology course modules with the specialized Interpretation Computer Lab created a powerful tool for teaching computer skills in the interpretive courses.

Objective 4:

Evaluate the effectiveness of the computer technology training.

The next component of this study strove to evaluate the effectiveness of the tutorial and lab training through several group discussions. The “focus group” assessment technique was used to determine student perceptions and attitudes toward the computer skills training, which revealed the overall strengths and weaknesses of the initial course modules. The final data from the focus groups assisted in the development of recommendations for future incorporation of technology training.

The focus groups did not address the specific skills development or knowledge acquisition of participants in the course modules. In a meeting with Dr. Michael Gross and Ron Zimmerman, interpretation instructors who will ultimately use the recommendations from this study, it was decided that the group discussion should focus on the students’ attitudes. For instance, knowing that a student *believes* he or she improved by participating in the training is more important than proving that the student actually did acquire new skills and knowledge. Similarly, if a student believes that he or she gained nothing from the experience, it is more important than testing the skills he or she really may have learned. Students’ perceptions of the training can reveal how comfortable they will be using computers after graduation, their acceptance of technology

in the interpretive field, and their willingness to learn new programs and equipment as technology continues to advance. The focus groups explored these possibilities through an analysis of student attitudes. The actual acquisition of technology knowledge and skills, on the other hand, were demonstrated through assignments and by the quality of major course projects.

The steps for completing this objective were compiled from a variety of focus group resources (Medlin, 1991, Krueger, 1994, Morgan, 1988, and Merton, 1956). Descriptions of each step were introduced in the Evaluation Methods section of the Literature Review. Two similar but separate focus group sessions were developed: one for students that worked on PowerPoint tutorials (NR 367/567/368/568), and one for students that participated in the technology lab sessions (NR 363/563/364/564).

Focus Group Steps

Step 1: Planning

1. **Determine the purpose.** As stated in the paragraphs above, the purpose of the focus groups was to obtain feedback about the effectiveness of the technology training through an analysis of the students' attitudes and perceptions.
2. **Review any budget or time constraints.** The cost of the focus groups was minimal. The incentive gifts and meeting room were available free of charge at the Schmeckle Reserve Visitor Center. Fifty dollars was budgeted for refreshments and recording equipment. An initial analysis of the focus group results needed to be completed by April 25, when the researcher presented his

second graduate seminar. The final analysis was to be completed by mid-May.

3. **Determine the number of groups.** Three focus groups were conducted for the technology lab sessions, and four focus groups were conducted for the PowerPoint tutorials. This provided students with a variety of time options, but still limited the number of groups to maximize the number of participants in each.
4. **Determine the size of the group and the length of time.** The variability of student schedules and conflicts also created variable-sized groups. Ideally, each group would consist of 5-8 participants. However, a wider range of 3-10 was permissible for this study. Each focus group session lasted between 45 minutes to an hour.
5. **Determine the source of participants.** The participants were students that either took the PowerPoint tutorials in NR 367/368, the Interpretive Technology Lab session in NR 363/364, or both. All 46 students were invited and encouraged to participate in the focus group sessions.
6. **Determine the level of moderator involvement.** The level of moderator involvement in this group discussion was medium to high. The moderator, who was also the researcher, looked for answers to specific research questions. Due to a limited amount of time for conducting the focus groups, the moderator needed a higher level of control over the topics discussed. If the discussion veered too far off course, the moderator brought the focus back to the stated purpose.

7. **Select the focus group location.** The focus groups were held at the Schmeckle Reserve Visitor Center, either in the main classroom or a smaller office meeting room. Each room had a large table with comfortable chairs around it, allowing participants to see and talk with each other.
8. **Develop a question guide.** Initially, a brainstorming list of all pertinent questions was created. The list was then condensed and revised to focus specifically on students' perceptions and attitudes. The wording of the questions was modified to enhance understanding among focus group participants. This revised list was sent to several individuals for review, including Dr. Rick Wilke, Dr. Dan Sivek, Dr. Michael Gross, and Ron Zimmerman. The question guide was revised a second time incorporating suggestions and feedback from the reviewers, and was submitted to the graduate committee for approval.

Since the study will be using human subjects, a research protocol that included the focus group questions was written and submitted to the IRB committee at UWSP. The protocol was approved on March 18, 2002. The completed protocol is included in Appendix C. Figures 1 and 3 represent the revised question guides for the PowerPoint and Interpretive Technology focus groups. Figures 2 and 4 are brief questionnaires that the students filled out before each of the focus group sessions to provide subjective individual feedback on the skills gained from the training. Originally, these questions

were going to be asked during the focus group session, but to save time they were distributed as a survey instead.

Figure 1: Focus Group Question Guide for *PowerPoint Tutorials*

Introduction / Ice breaker

- Introduce yourself. What would be your dream job after you graduate?
- How do you think you may be using computers in your future career?

Overall Attitudes and Suggestions about the Tutorials

- What did you like about the PowerPoint tutorials?
- What didn't you like about the tutorials?
- What specific skills did you acquire by participating in the PowerPoint tutorials that you found helpful?
- Were the step-by-step instructions effective for your learning, or are there other methods that should be incorporated?

Opinions and Suggestions about the Assignments:

- Do you think that the assignments were an effective way of practicing your PowerPoint presentation skills and evaluating your use of those skills? Did you find the assignments helpful?
- Which assignments did you find particularly effective? Why?
- Which assignments did you find less effective? Why?
- Was the scoring of assignments fair? Or should it be changed in the future?

Final Opinions and Suggestions about the Tutorials:

- Are there additional skills you would have liked to have learned about using PowerPoint?
- Should the PowerPoint tutorials be integrated into future interpretation classes?
- After participating in these sessions, how comfortable do you feel using PowerPoint after you graduate?

Figure 2: Focus Group Skills Development Questionnaire for *PowerPoint Tutorials*

On a scale from 1-10, how would you rate your skill in using Microsoft PowerPoint before participating in the technology lab?

1 ----- 2 ----- 3 ----- 4 ----- 5 ----- 6 ----- 7 ----- 8 ----- 9 ----- 10

Never had used
PowerPoint and
didn't know
how to start.

Completely
understood
PowerPoint and
could easily create
a complex
presentation

How would you rate yourself after participating?

1 ----- 2 ----- 3 ----- 4 ----- 5 ----- 6 ----- 7 ----- 8 ----- 9 ----- 10

Never use
PowerPoint and
don't know how
to start.

Completely
understand
PowerPoint and
can easily create
a complex
presentation

Figure 3: Focus Group Question Guide for *Interpretive Technology Lab*

Introduction / Ice breaker

- Introduce yourself. What would be your dream job after you graduate?
- How do you think you may be using computers in your future career?

Overall Attitudes and Suggestions about the Lab

- What did you like about the computer technology lab sessions (skills development, group interaction, knowledge about computer basics, real world applications)?
- What didn't you like about the lab sessions?
- What specific skills did you acquire by participating in the computer technology lab that you believe will be important in your future career?

Opinions and Suggestions about the Assignments

- Do you think that the assignments were an effective way of practicing your computer technology skills and evaluating your use of those skills? Did you find the assignments helpful?
- Which assignments did you find particularly effective? Why?
- Which assignments did you find less effective? Why?
- Should assignments be counted as points for a grade? What percentage of the final grade?

Logistical Opinions and Suggestions about the Lab

- This semester, your lab session met once a week for 1 ½ hours. We had a total of five instruction sessions. Is this an appropriate schedule, or should it be changed? How?
- Should the computer technology lab be counted as part of your final grade in the class? What percentage of the final grade?
- Do you believe that the computer technology lab as a whole should be an integral part of interpretive classes in the future?

Final Opinions and Suggestions about the Lab

- How can the computer technology lab be improved for future classes?
- Are there any additional skills you would like to have learned in the technology lab?
- After participating in these sessions, how comfortable do you feel using these skills after you graduate?

Figure 4: Focus Group Skills Development Questionnaire:
Interpretive Technology Lab

On a scale from 1-10, how would you rate your skill in using page layout software (Quark and Publisher) before participating in the technology lab?

1 ----- 2 ----- 3 ----- 4 ----- 5 ----- 6 ----- 7 ----- 8 ----- 9 ----- 10

Never had done any page layout work and wouldn't know how to start.

Completely understand page layout and could easily put something together.

How would you rate yourself after participating?

1 ----- 2 ----- 3 ----- 4 ----- 5 ----- 6 ----- 7 ----- 8 ----- 9 ----- 10

On a scale from 1-10, how would you rate your skill in using graphic design software (Paint Shop Pro and Photoshop) before participating in the technology lab?

1 ----- 2 ----- 3 ----- 4 ----- 5 ----- 6 ----- 7 ----- 8 ----- 9 ----- 10

Never had done any graphic editing and wouldn't know how to start.

Completely understand graphic editing and could easily use most of the tools.

How would you rate yourself after participating?

1 ----- 2 ----- 3 ----- 4 ----- 5 ----- 6 ----- 7 ----- 8 ----- 9 ----- 10

Figure 4 (continued):

On a scale from 1-10, how would you rate your skill in using scanners and digital cameras before participating in the technology lab?

1 ----- 2 ----- 3 ----- 4 ----- 5 ----- 6 ----- 7 ----- 8 ----- 9 ----- 10

Never had used a digital camera or scanner and wouldn't know where to start.

Frequently use scanners and digital cameras and understand most of their functions.

How would you rate yourself after participating?

1 ----- 2 ----- 3 ----- 4 ----- 5 ----- 6 ----- 7 ----- 8 ----- 9 ----- 10

The number of questions may seem overwhelming for a 45-minute to 1-hour focus group session, especially if the participants respond frequently and for longer periods of time. The goal of the question guide was not to ask all of the listed questions, but to offer a framework of potential topics the discussion could cover. Many of the listed questions were used as follow-up or probing questions to gain more information. It was hoped that students would bring up some of the more specific topic areas on their own (like assignments, meeting times, and instruction methods) through the general questions listed at the beginning and end of the guide. However, if students did not touch upon these topics, the moderator used the question guide to help focus the discussion.

Step 2: Recruiting and Preparing the Meeting Place

1. **Invite potential participants to join the group discussion.** Three weeks before the focus group sessions were planned, an invitation was sent out by e-mail to all of the potential participants. The invitation clearly stated the purpose of the study and the importance of each participant's opinions. Due to busy schedules, students that participated in the PowerPoint tutorials were given four options for joining a focus group, while students that had taken part in the technology lab session were given three options. Figure 5 represents the first invitation:



Figure 5: First Invitation to Attend Focus Group Session E-mail

You're invited to help us make the interpretive courses better!

The Environmental Education and Interpretation courses are currently undergoing some major changes. One of these changes, as you already know, is the incorporation of computer training into the classes. You were part of the first class to participate in the Interpretive Technology Lab, and we're interested in what you thought.

You are invited to join us for a group discussion about the Technology Lab sessions. **Your comments and suggestions are important to us.** Help us to modify and improve the interpretation courses for future students.

For participating in the group discussion, you will not only be helping to shape the interpretation courses, but you will also **receive a free gift from the Browse Shop at Schmeckle Reserve.**

The discussions will be held at the Schmeckle Reserve Visitor Center and last about 45 minutes. **Beverages and snacks will be served.**

Note that the discussion sessions are scheduled during your normal lab times, so you should hopefully be able to make at least one of the discussions. If you participated in both the PowerPoint tutorials and the Interpretive Lab, I encourage you to attend both discussion sessions (yes, you will receive two gifts!). The sessions are scheduled so that a PowerPoint discussion is immediately followed by an Interpretive Lab discussion, and vice versa.

Please press the "Reply" button and check all options that apply:

- I can attend the discussion on Wednesday, April 3 at 1 p.m.
- I can attend the discussion on Wednesday, April 3 at 5:00 p.m.
- I can attend the discussion on Friday, April 5 at Noon.
- I can not attend any of the discussions listed above, but could attend one on (list dates and times available) _____
- I do not wish to participate in the discussions.

Thank you for the opportunity to hear your comments and suggestions. When you reply, I will verify your meeting time and send you a list of topics that we will be discussing. If you have any questions concerning the group discussion, feel free to contact me by e-mail or phone (346-4992). I hope that everyone has a chance to share their ideas with us.

Sincerely,

Jim Buchholz

Students that responded were recorded on a list. A week after the potential participants were invited to join a group discussion, a second reminder invitation was sent to students that had not yet responded. The second invitation is reproduced in Figure 6.

Figure 6: Second Invitation to Attend Focus Group Session E-mail

Hello,

If you are receiving this e-mail, then I haven't heard back from you yet about joining an Interpretive Lab group discussion. Your opinions are **very** important to us. Your comments will help to shape future classes for students in your discipline. For giving us just 45 minutes of your time, not only will you be assisting us in improving the interpretation courses, but you will also receive free snacks, refreshments, and a gift. Please reply to this e-mail by checking one of the options below.

- I can attend the discussion on Wednesday, April 3 at 1:00 p.m.**
- I can attend the discussion on Wednesday, April 3 at 5:00 p.m.**
- I can attend the discussion on Friday, April 5 at Noon.**
- I can not attend any of the discussions listed above, but could attend one on (list dates and times available) _____**
- I do not wish to participate in the discussions.**

Thank you for the opportunity to hear your comments and suggestions. When you reply, I will verify your meeting time and send you a list of topics that we will be discussing. If you have any questions concerning the group discussion, feel free to contact me by e-mail or phone (346-4992). I hope that everyone has a chance to share their ideas with us.

Sincerely,

Jim Buchholz

The various times that students marked on the invitations were compiled to create appropriately sized focus groups. An e-mail message was sent to all the participants a week before the actual focus group sessions, which listed the group

discussion they had been assigned to. The e-mail schedule is included in Figure 7.

Figure 7: Scheduled Focus Group Session E-mail

Hello,

Thank you very much for accepting our invitation to join a PowerPoint Tutorial group discussion! I have compiled all of your responses and created a schedule below. Please find your name under one of the time slots, and let me know right away if you won't be able to participate in your scheduled discussion.

April 2 at 5:00 p.m.

[Names]

April 3 at 4:00 p.m.

[Names]

April 4 at 5:00 p.m.

[Names]

April 5 at 1:00 p.m.

[Names]

Place: Meet at the Schmeckle Reserve Visitor Center promptly at your scheduled time. Refreshments will be served.

What to bring: Just yourself!

What will be discussed: Here is a list of topics we will be discussing to help you start thinking: what you liked about the tutorials, what you disliked, what you thought about the assignments, what skills you learned from the tutorials, how comfortable you feel creating PowerPoint presentations.

Thanks again for the opportunity to hear your thoughts. I look forward to seeing you at the group discussion. Let me know if you have any questions or concerns.

Jim

Finally, two days before a student's scheduled focus group session, a last reminder was sent to the student through e-mail. Figure 8 represents the final reminder e-mail.

Figure 8: Final Reminder Focus Group Session E-mail

Hello [Names],

This is a quick reminder that your PowerPoint group discussion will be held on **Wednesday, April 3 at 4:00 p.m.** Please meet at the Schmeckle Reserve Visitor Center. Refreshments will be served, and the discussion should take about 45 minutes.

Thank you for the opportunity to hear your thoughts. I'm looking forward to seeing everyone again. If you have any questions or concerns, just let me know.

Sincerely,
Jim Buchholz

2. **Offer an incentive to participants.** The Browse Shop at Schmeckle Reserve was currently undergoing major renovations in the type and quality of merchandise being sold. Consequently, the Reserve discounted a large number of items that did not sell well in the past or did not fit within the mission of the Browse Shop. Schmeckle Reserve donated these items as gifts for participants in the focus group sessions. In addition, beverages and snacks purchased by the researcher were served at each focus group session.
3. **Prepare the meeting place.** The meeting rooms were set up with a single table (or multiple tables pushed together as one) large enough for all participants to comfortably sit around. A tape recorder was placed in the middle of the table. A cart with the refreshments was set up before the session. Each participant signed a consent form and filled out a skills development questionnaire before the focus group session began. These were located near the entrance of the meeting room.

Step 3: Conducting the Focus Group

1. **Pre-session.** Before the focus group session began, refreshments were served and participants were encouraged to socialize for approximately five minutes. During this time, each participant signed a human research consent form and completed the brief skills development questionnaire. This provided adequate time for all participants to arrive.
2. **Introduction.** The researcher introduced himself and thanked the group for coming. The purpose of the focus group, to gain feedback about the PowerPoint tutorials or technology lab sessions, was reiterated.
3. **Ground Rules.** A few rules were positively stated to make the group discussion flow more smoothly. Only one person should speak at a time. There should be no side conversations that could be picked up by the recorders. Everyone should feel free to participate, but no one person should dominate the discussion.
4. **Question Routes.** The researcher followed the question guide developed in the first step. The first two questions were designed to comfortably initiate discussion. The initial study questions began quite broad (“What did you like?” “What did you dislike?”), and were narrowed into more specific research questions as the discussion progressed. If the specific topics were addressed in the general questions, the researcher then used the guide for probing questions to gain more information. The final question was a general one that asked for additional comments about any aspect of the computer technology training.

5. **Conclusion.** Due to the time restraints, a longer summary of the main points was not possible in these focus groups. Instead, the participants were thanked for their time and given the incentive gifts.
6. **Summary.** Immediately after the focus group, the researcher wrote down a summary of the main points of the discussion. The tape recorder was checked to ensure it has operated correctly. If it had not, the researcher spent extra time after the focus group to remember what had been discussed.

Step 4: Transcribe and Analyze the Data

1. **Transcribing the recorded sessions.** The researcher was responsible for accurately transcribing the recorded tapes. To make the process more efficient, transcription was combined with the analysis step.
2. **Analyze the data.** This study used the **tape-based analysis** to obtain and code data. The researcher carefully listened to each tape, typing an abridged transcript that only included comments directly related to the study. As the tapes were being transcribed, the researcher identified certain themes or patterns, developed a coding system, and moved data directly to different categories. No individual participant was identified during the coding process.

Step 5: Report and use the results

1. **Choose a reporting option.** In this study, an **interpretive report** was written that summarized the data, using supporting quotes from the participants. The

results were analyzed and interpreted by the researcher, to develop a list of recommendations for improving future technology training (see Objective 4 of the Results and Discussion Section).

Objective 5:

Determine which computing skills are currently most used and valued by professional interpreters and their supervisors.

One purpose of a university course is to provide students with the knowledge and skills required to be successful in their chosen professions. Consequently, course designers must have an intimate and current understanding of the profession beyond the university setting if students are to graduate with the training they need. To integrate future computer training into the courses at UWSP, the researcher must obtain accurate insight into the current uses of computers in the interpretive field.

With the rapid changes being made with modern technology, it is difficult to clearly understand the specific needs and desires of professional interpreters in regards to computer skills. The course modules were constructed from general concepts that have been developed in the interpretive courses over a number of years. To gain insight into more specific skills that are important to the interpretive profession, however, a survey was designed to gather data from interpreters currently working in the field and supervisors that hire interpreters. The results of this survey were used to make recommendations for the future incorporation of technology into the interpretive courses.

The purpose of the survey was to gain background information about how interpreters currently use computers and to determine which skills they believe are most

important. It was hoped that the data would represent the interpretive profession as a whole. The interpretive courses at UWSP are not designed to train students for a specific segment of the environmental education/interpretation field, but rather to provide them with essential background knowledge and skills to assist them wherever they decide to work. Therefore, the survey was sent to many different interpreters and supervisors working in a variety of settings (zoos, exhibit firms, parks, forests, historical sites, museums, visitor centers).

To successfully complete this questionnaire method, a series of steps were developed from a variety of survey resources (Peterson, 2000, Salant, 1994, and Creative Research System, 2001). Descriptions of each step were introduced in the Evaluation Methods section of the Literature Review.

Questionnaire Steps

Step 1: Information and Goals Analysis

The purpose of the questionnaire was twofold. First, it would provide a snapshot to reveal how interpreters are currently using computer technology in the field. What programs are interpreters using? What equipment do they have access to? Second, the questionnaire would highlight those computer skills that would make an interpreter successful and effective. Since the questionnaire was used in conjunction with exploratory study methods, the depth of information was general. The questionnaire was developed, submitted, and analyzed within a two-month time period.

Step 2: Determine Sample

The next step was to identify a group of potential participants who would receive the survey. As identified in the purpose, this study was developed to gain general insight into the current use and importance of computer technology in the interpretive profession. Therefore, the survey population included all people who are in an interpreter-related field (naturalists, rangers, museum docents, zoo educators, environmental center educators, interpretive sign and exhibit designers) and supervisors that ultimately hire interpreters at a site. As defined, the population was quite broad, which could potentially provide general results applicable to the interpretive profession as a whole. On the other hand, no accurate population list existed that included all interpreter-related professions, making inexpensive probability sampling nearly impossible.

Since the results would not be used for statistical or experimental analysis and due to the lack of an accurate population list, a random selection method was not used for the study. The survey strove to gain general background information from a variety of interpreters and hopefully highlight some patterns that are occurring within the profession. Using a non-probability convenience sampling method, the surveys were sent to interpreters and supervisors that the researcher personally knew, that were recommended by the graduate committee, and that were listed on the Internet (NAI distribution list, National Park Service interpreters, Wisconsin State Parks and Forests naturalists). A complete listing of the different study groups is included in Table 2.

Table 2: Interpretation Technology Survey Recipient Groups

Group Names	Number of Surveys	Positions
National Association of Interpretation	314	Online directory: Various agencies and job titles
National Park Service	94	National Park and Monument Interpreters
Wisconsin Department of Natural Resources	47	Managers of state parks, forests, wildlife areas, and recreation areas
Minnesota Association of Environmental Education and Minnesota Naturalist Association	30	Organization officers
Environmental Education Association of Illinois	22	Organization officers
U.S. Forest Service	20	Interpreters
North American Association for Environmental Education	20	Organization officers
Miscellaneous nature centers, museums, and zoos	19	Education directors and interpreters found online
Wisconsin Department of Natural Resources	18	Outdoor educators
Wisconsin Association of Environmental Education	16	Organization officers
University of Wisconsin-Stevens Point	16	Professors and graduate students
Interpretation Canada	16	Organization officers
Interpretation Australia Association	15	Organization officers
National Association of Interpretation	5	Organization officers
Others	4	Interpreters
Missouri Department of Natural Resources	1	Head of interpretation
Total	657	

Step 3: Research Questions

After determining the sample group, the next step was to list all of the questions that could provide significant insight into the uses and needs of computers. By concentrating on the purposes of the study, broad questions were developed that would help to further the research. Through several brainstorming sessions, a long list of questions and study topics was created.

Step 4: Assess Research Questions

The list of questions and topics was submitted to Dr. Michael Gross and Ron Zimmerman, the instructors ultimately responsible for making changes in the interpretive courses. Gross and Zimmerman selected the questions that they felt were most important to the objectives of the study. These questions were reviewed and reworded to be more concise. A first draft of the survey was written.

Step 5: Determine Types of Questions

Both close-ended (ranking continuum) and open-ended questions were incorporated into the questionnaire, to provide well-rounded responses from the participants.

Step 6: Specific Wording

The questions on the survey were revised several times to be brief, relevant, unambiguous, specific, and objective. The researcher worked closely with Gross and Zimmerman to design the original questions.

Step 7: Determine the Structure of the Questionnaire

- **Introductory section:** The first part of the questionnaire introduced the researcher and supporting institution. It explained the purpose of the study, and how the results would be used. In addition, participants were informed how long it would take to complete the survey and given special instructions for sending the survey back to the researcher, especially important with an e-mail survey.
- **Substantive question section:** The questions were logically ordered, from simple current use inquiries to the more complex attitude and opinion questions.
- **Classification quota section:** The classification section was not included for this survey. The survey needed to be as short and concise as possible.
- **Conclusion section:** The conclusion was actually included in the introductory paragraphs, which seemed to keep the e-mail survey better organized.

Step 8: Evaluate the Questionnaire

Before being submitted to the entire study group, the survey was checked for accuracy by the interpretive course instructors (Ron Zimmerman, Dr. Michael Gross), selected interpreters (Scott Johnson, outdoor educator at Wyalusing State Park, Deb Beringer, chief naturalist of Wisconsin) and selected supervisors currently working in the field (James Buchholz, Sr., superintendent of Kohler-Andrae State Park). Their

suggestions and comments were used to revise the questionnaire into its final form.

Figure 9 represents the final revised survey.

Figure 9: Professional Interpreters and Supervisors Survey

Dear Sir or Madam:

I am a research assistant working with Dr. Michael Gross and Ron Zimmerman at the University of Wisconsin-Stevens Point (UWSP), a leading institution for training environmental educators and interpreters/naturalists. We are expanding our teaching of "computer skills" in the interpretation courses.

As a professional interpreter/naturalist or someone who hires interpreters, your opinion about what students should be learning is invaluable to us. Please take 5 minutes to comment on the computer skills needed as an interpreter.

Your responses will help us to shape the evolving courses in ways that benefit both students and the field of interpretation. Thank you very much for contributing to this study. Feel free to send this survey to other supervisors or interpreters that would be interested in providing feedback.

Sincerely,

Jim Buchholz
Schmeeckle Reserve
(715) 346-4992

Please press the "Reply" button and fill out the survey. When you are done, press the "Send" button to return the survey to Jim Buchholz at jbuch209@uwsp.edu.

Please return this survey by April 18.

Figure 9 (continued):

1. How do interpreters currently use computers at your site? On a scale of 1 to 5, please indicate how often each of these skills is used on the job (1 = rarely used, 5 = used all the time).

- E-mail
- Internet research
- Word processing
- Databases
- Spreadsheets, charts, graphs
- Mailing Labels
- Creating brochures, posters, newsletters, and other publications
- Creating trail and wayside exhibit sign panels
- Creating labels, images, and interpretation for exhibits
- Educational multimedia software
- Interactive multimedia exhibits
- PowerPoint presentations
- Graphic editing
- Recording and editing sound
- Scanning pictures or documents
- Digital cameras
- Web page development
- Other (please list)_____

2. From the choices above, list the top 3 that are the most important for an interpreter at your site to be successful?

3. What type of computer technology equipment do you currently have access to at your site?

- High speed computer
- Laptop computer
- Internet access

Figure 9 (continued):

- ___ Flatbed scanner
- ___ Slide scanner
- ___ Digital camera
- ___ Black-and-white printer
- ___ Color printer
- ___ Digital projector (for PowerPoint presentations)
- ___ CD-Burners
- ___ Clipart CD's
- ___ Sound editing on computer
- ___ Video editing on computer
- ___ Other (please list) _____

4. Listed below are computer skills that we are currently teaching in our interpretive courses. On a scale of 1 to 5, please rank these skills based on their importance to an interpretation job (1 = rarely needed in the job, 5 = essential to the job).

- ___ Understanding the role that computers play in the field of interpretation.
- ___ Identifying the basic parts of a computer, and understanding basic computer terms
- ___ Navigating and working in the Microsoft Windows environment
- ___ Creating and presenting PowerPoint programs
- ___ Using flatbed and slide scanners
- ___ Using digital cameras
- ___ Learning page layout software to create posters, brochures, and other publications.
- ___ Learning graphic editing software to create and manipulate images
- ___ Learning to use large-format printers and laminators in the sign fabrication process.

5. From the choices above, list the top 1 or 2 skills that would make an interpretive student most employable in the interpretive profession?

Figure 9 (continued):

6. Are there other advanced computer skills that students should be learning in a college program not included on the list?

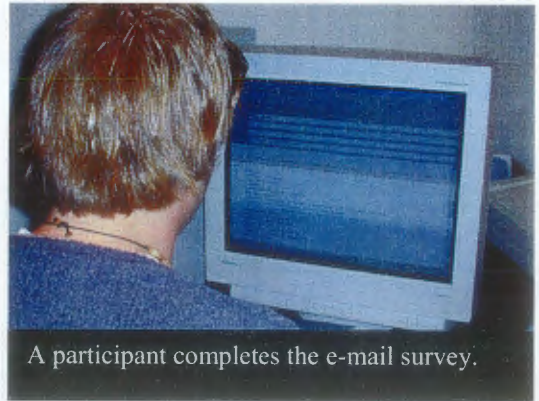
7. Do you have any other suggestions for teaching interpreters/naturalists about using computers and other technology?

Step 9: Send out the Questionnaires and Enter Data

As stated previously, the questionnaires were sent via e-mail. Due to time and budget restraints, an inexpensive and quick survey method was preferred for gathering results. E-mail is one of the quickest and most cost effective options for sending questionnaires. A major disadvantage to using e-mail is the inability to generalize the results to a broader population, since usually not everyone in the population will have access to e-mail. However, this project was an exploratory study that used non-probability sampling, which already limited the generalization of the data. Therefore, the e-mail survey was an appropriate choice.

A variety of e-mail questionnaire formats could have been chosen, from electronic forms with a graphic interface, to a rich text format that includes bullets, italicized words, and color. However, agencies and organizations often use very different e-mail systems. Forms, although easier for participants to complete, require the use of a specific e-mail

program like Microsoft Outlook. Formatted e-mails with bullets and color enhance the organization and professional quality of the questionnaire, but “simple text” e-mail systems cannot display the messages correctly. Therefore, a “simple text” e-mail questionnaire was designed, which could be accurately reproduced on every e-mail system regardless of the program used.



A participant completes the e-mail survey.

Data gathered from the close-ended survey questions was entered into Microsoft Excel, a spreadsheet program that simplifies calculations and can generate graphs and charts. The program was used to assist in the analysis step. Comments found within the open-ended questions were initially written down, and later entered into categories on Microsoft Excel.

Step 10: Analyze the Data and Produce Reports

Close-ended questions were directly analyzed through the spreadsheet program. Ranking continuum questions based on a 1 to 5 scale (questions #1 and #4) were averaged together to reveal the overall importance of each item on the list. The equipment available question (#3) was calculated in terms of percentage of the total sample. The specific importance questions (#2 and #5) were also analyzed in terms of percentage of the total respondents.

A coding system was used to interpret the open-ended survey questions (#6 and #7). Each comment provided in the questions was written down on a piece of paper. If a

comment was identical to a previous one, a tally mark was placed next to the comment. After all of the comments were recorded, they were grouped into major categories based on broad characteristics. More specific characteristics were used to group comments into sub-categories. The response rate within certain categories guided the researcher to issues and suggestions that were most important to the interpretive field.

Summary

The methodology of the project is the systematic plan that drives the work of the researcher. Each objective was achieved by following a series of steps and procedures. By accomplishing each small step, the researcher climbed closer and closer to the ultimate goal of the project. The Interpretive Technology project required an understanding of computer skills that professional interpreters value, the creation of an interpretive technology lab where students can practice their skills, the development of technology course modules that incorporate skills into the interpretation classes, and an evaluation of student's attitudes and comfort levels. Completing the steps for each objective lead to a successful and effective computer skills training for interpretive students.

Chapter IV

Results and Discussion

The systematic completion of the methodology has produced a variety of results that will help to strengthen interpretive technology training in the future. These results range from physical teaching tools (like tutorials and an interpretive lab) that enhance the learning experience of students, to experiences and suggestions (from focus groups and surveys) that provide direct recommendations for incorporating technology skills. The results of this study form the foundation for developing a list of recommendations to improve technology training in the interpretive courses at UWSP.

Objective 1:

Define which computing skills should be taught in the interpretive courses.

By reviewing the past incorporation of technology into the interpretation program and the current needs of students, the researcher and graduate committee agreed that the study should focus on four interpretation courses. The in-depth technology training would be integrated into these courses based on current requirements of the classes.

- 1. Oral Interpretation Methods (NR 368/568)**
- 2. Park Interpretation (NR 367/567)**

In the Oral Interpretation course, environmental education and interpretation students are required to present three interpretive programs: a talk, a walk, and an illustrated talk. Forest Recreation students in the Park Interpretation class receive the same training, but only present two of the programs. Since the two courses are taught

together, a single *Digital Presentation* training module will be developed to serve both classes. Although slideshows were traditionally used for illustrated talks in the past, Microsoft PowerPoint is now the predominant choice among students. Therefore, students need to have solid skills in how to design and create PowerPoint programs, basic graphic skills for scanning or taking digital pictures, and a working knowledge of how to use PowerPoint-related equipment, including projectors, cordless mice, Zip drives, and scanners. In addition, interpretive skills in presenting a PowerPoint program need to be specifically addressed. The ease of incorporating text and animation presents new challenges to creating a high-impact and visually appealing presentation.

3. Signs, Trails, and Waysides (NR 363/563)

4. Environmental Publications (NR 364/564)

Environmental education and interpretation students are encouraged to take both the Signs, Trails, and Waysides class and the Environmental Publications class simultaneously. Many principles and projects overlap between the two courses. Since desktop publishing skills are essential in these courses, a single *Desktop Publishing* training module will serve students in both classes. Two primary skills within desktop publishing need to be emphasized. First, students should understand *page layout*. Students will be taught how to use two common page layout programs: QuarkXpress, the higher-end industry standard, and Microsoft Publisher, an inexpensive alternative often bundled with other Microsoft products. Second, students should understand the basic concepts of *graphic editing*. Again, the course will focus on two graphic programs: the higher-end Adobe Photoshop and the less

expensive Paint Shop Pro. Within page layout and graphic editing, students will be taught basic skills that allow them to create an effective interpretive product. In addition, students need to have a working knowledge of technology equipment related to desktop publishing, which include flatbed scanners, slide scanners, digital cameras, CD-burners, and Zip drives.

The following figure summarizes the two training modules that will teach technology skills in each of the interpretation courses.

Figure 10: Interpretive Technology Training Modules and Skills

1. Digital Presentation Module

Oral Interpretation Methods (NR 368/568) / Park Interpretation (NR 367/567)

- Digital presentation skills (Microsoft PowerPoint)
- Digital presentation equipment (scanners, projectors, cordless mouse)
- Interpretive skills with digital presentations

2. Desktop Publishing Module

Signs, Trails, and Waysides (NR 363/563) / Environmental Publications (NR 364/564)

- Page layout skills
 - QuarkXpress
 - Microsoft Publisher
- Graphic editing skills
 - Paint Shop Pro
 - Adobe Photoshop
- Desktop publishing equipment (flatbed scanners, slide scanners, printers, CD-burners, Zip drives, digital cameras)

Objective 2:

Create thematic lesson plans that incorporate computer skills training into the current and future interpretive courses at UWSP

Step 1: Design and produce tutorials that provide students with step-by-step instructions on how to use computer hardware and software.

Step 2: Develop a technology lab session where students can learn and practice computer skills related to the interpretive profession.

The two training modules that were developed through the completion of Objective #1 require varying styles of instruction. The first module focuses on a single program called Microsoft PowerPoint, whereas the second module will teach four different programs and a variety of technology equipment. Tutorials were developed for both training modules, but they differed in detail and coverage. The PowerPoint tutorials, for instance, contained very specific and concise instructions that built off of previous tutorials. Instructor-led sessions were also a part of both modules, but again differed in importance. The sessions were an integral part of the desktop publishing module, but played only a minor role in the digital presentation training.

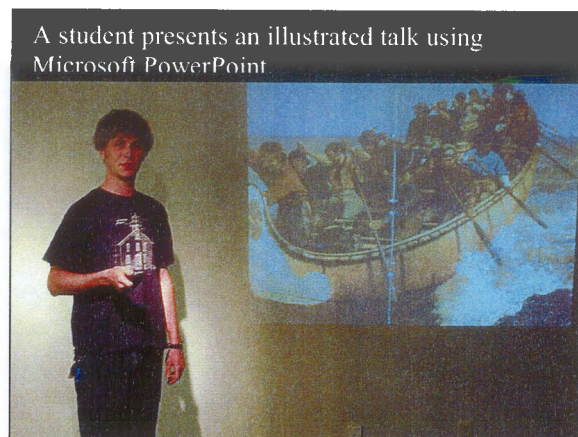
1. Digital Presentation Module: Oral Interpretation Methods (NR 368/568) / Park Interpretation (NR 367/567)

Tutorials: In the Oral Interpretation/Park Interpretation course, the tutorials would focus on teaching students how to effectively use Microsoft PowerPoint.

Discussions with Dr. Michael Gross and Ron Zimmerman, instructors of the interpretation courses, led to the general agreement that reinforcement of the PowerPoint

skills would benefit student learning. However, between the traditional interpretive principles instruction and the student presentations, time was already very limited in the course. Incorporating comprehensive instructor-led technology training would have been very difficult within the time restraints.

Therefore, the PowerPoint tutorials were designed as take-home assignments that students would complete on their own time. It was essential that the tutorials be written very specifically with concise step-by-step instructions to guide students in their learning. No instructor would be available to provide immediate feedback, although students were encouraged to e-mail the instructor with any questions they had while completing the tutorial.



Overall, four PowerPoint tutorials and one scanning tutorial were developed for the technology training. Copies of each tutorial can be found in Appendix A. During the first semester of the 2001-02 school year, students in NR 367/368 were given one tutorial each week. The four PowerPoint tutorials were designed to chronologically develop skills, from very basic concepts to more advanced abilities. To incorporate reinforcement, each new tutorial built off of skills introduced in previous ones. At the end of each tutorial, students were required to create a small presentation based on the skills they had just learned. In addition, they answered questions that were applicable to the interpretive profession. These assignments were sent to the instructor via e-mail and graded. The assignments proved that students had actually completed the tutorials and

comprehended the concepts and skills, while identifying potential weaknesses within the training itself.

The following list describes the themes and topics that were incorporated into each tutorial:

- **PowerPoint Tutorial #1:** The first tutorial covered very basic concepts at a beginner level. These included how to start PowerPoint, create a blank presentation, identify the different working areas of the screen, insert and resize graphics, and save the presentation.
- **PowerPoint Tutorial #2:** The second tutorial built upon the first by including more basic concepts like inserting more slides, moving slides, deleting slides, inserting and changing text, working with color options, and changing the background.
- **PowerPoint Tutorial #3:** The next tutorial begins to introduce more advanced skills, including layering elements, inserting pictures from the Internet, inserting pictures from a scanner, cropping pictures, editing the brightness and contrast of pictures, viewing the slideshow, and adding transitions.
- **Scanner Tutorial:** One of the requirements of PowerPoint Tutorial #3 was inserting a picture from a scanner. A separate scanner tutorial was provided to the students with step-by-step instructions on how to successfully scan pictures for a PowerPoint presentation. The tutorial provided general steps for scanning pictures on any scanner, but covered Hewlett-Packard scanners (available in the university library) in more detail.

- **PowerPoint Tutorial #4:** The final tutorial provided training in advanced PowerPoint skills, including the use of custom animation, sound effects, music CDs, and movies.

Interpretive Techniques Lecture: Besides the take-home tutorials, one 50-minute class lecture was devoted to interpretive techniques using PowerPoint. Although learning to create a PowerPoint presentation is a basic component of the course, developing an *interpretive* presentation, one that connects the interests of the audience to the meanings of the resource, is truly the overlying goal of the illustrated talks. Many of these interpretive techniques were also included in the tutorials when introducing a new skill. However, the instructors of the course decided that the actual demonstration of these techniques would result in a much more effective learning experience for the students.

The demonstration included topics such as telling the story through full-screen images, using high-quality pictures, creating unified and thematic backgrounds, adding appropriate transitions, limiting the amount of text to titles, captions, and quotes, choosing an effective font type and size, adding animation for mystery and surprise, and incorporating sound and video to elicit an emotional response.

2. Desktop Publishing Module: Signs, Trails, and Waysides (NR 363/563) /
Environmental Publications (NR 364/564)

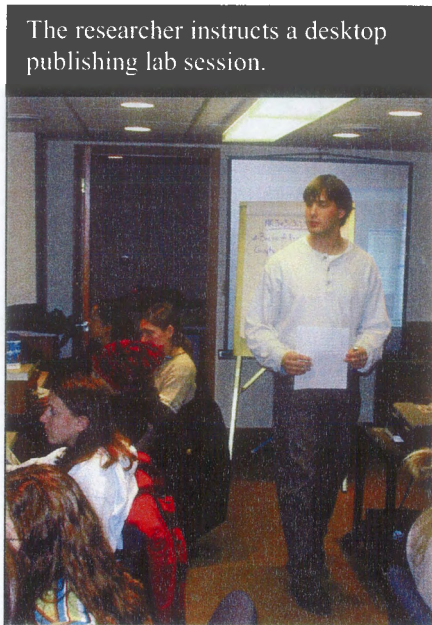
A different teaching method was essential to successfully integrate the desktop publishing module into the interpretive courses. Unlike the digital presentation module

that focused on a single program, the desktop publishing module would teach four different programs and a greater variety of equipment. The take-home tutorial teaching method would be ineffective for this module for two main reasons: time commitment and program complexity. Many more in-depth tutorials would need to be developed for each program and piece of equipment. This would not only take an enormous time commitment for the tutorial designer, but also for students completing the tutorials and for instructors grading the assignments. In addition, the page layout and graphic editing programs are much more complex than Microsoft PowerPoint, causing a dilemma to novice computer users.

Due to the challenges presented by this teaching module, a separate laboratory session was added to the interpretation course to specifically address the technology training needs of the students. The lab session was held in the Schmeckle Reserve “Interpretation Computer Lab” (see Objective 3). A combination of less detailed tutorials and more in-depth class instruction was chosen as the most appropriate teaching method for the lab session.

The Signs, Trails, and Waysides (NR 363/563) and Environmental Publications (NR 364/564) courses can be taken for either 1 or 2 credits. Environmental education and interpretation students are required to take the 2-credit version, which includes a final interpretive project for a real-world organization. Forest recreation students, on the other hand, normally take the courses for 1 credit, and are not required to complete the final project. During the second semester of the 2001-2002 school year, 26 students were enrolled in the Signs, Trails, and Waysides course, the Environmental Publications course, or both.

The limited number of computers in the Interpretation Computer Lab was one of the major challenges to integrating technology into the course. When the desktop publishing module was taught, the lab had a total of 7 computers available for student use. The instructors of the course decided to provide the technology lab experience only



to students taking the 2-credit version. Seventeen out of the original 26 students would receive the training. To increase the hands-on experience working with computers, the remaining 2-credit students were split into two lab session groups based on available time slots in their schedules. Eight students joined the Monday lab session, while nine students joined the Friday session. Each lab session was scheduled for an hour-and-a-half time slot.

Overall, 5 lab sessions were developed for the desktop publishing training module that incorporated both tutorials and personal instruction. In each session, the instructor guided students through the tutorial, describing steps in detail and making sure that every student was at the same stage. The instructor was available to immediately answer questions and troubleshoot any problems that arose. A digital projector hooked up to a computer was used to show the entire class how to complete a step. At the end of each session, the students were given an assignment that was due before the next week's lab. The assignments were designed to test skills that had been taught in the lab session.

For the benefit of the entire class, an additional 50-minute lecture was devoted to Microsoft Publisher, which was a program that every student used to create an

interpretive poster. Copies of the lab tutorials, the Microsoft Publisher outline, and other worksheets are located in Appendix B. The following list describes the themes and topics that were incorporated into each lab session:

- **Lab Session #1- Introduction:** The first lab session was an introduction to using computer technology in interpretation. The students established rules for using the lab, which included no food or beverages, respecting the equipment, and limiting the amount of time on e-mail. The instructor presented a PowerPoint program that described current applications of technology in the interpretive field, including exhibits, educational software, digital presentations, desktop publishing, and other daily tasks. In addition, students were taught basic computer terminology and skills using the Microsoft Windows environment. A definition sheet was provided for students to fill out (see Appendix B). At the end of class, the students were given a tour of the computer lab and encouraged to explore several educational multimedia CD-ROMs.
- **Lab Session #2- QuarkXpress Basics:** The first real computer program training was an introduction to QuarkXpress, the industry standard in page layout. The session included topics like creating a new document, learning the tool palette, creating and formatting text boxes, adding frames, working with color, inserting and formatting images, changing the clipping and runaround of pictures, and layering objects. For an assignment, the instructor created an interpretive sign panel using

QuarkXpress. Students were required to mimic this poster as closely as possible, using many of the skills they had learned during the lab session.

- **Lab Session #3- QuarkXpress Design Fundamentals:** The second training session built upon the basic skills taught in the first QuarkXpress lab. These more advanced skills included creating new colors, blending colors in a box, forcing text to follow a curved line, drawing arrows, transforming text into a graphic box, inserting different shapes, and working with pages. In addition, students followed instruction sheets to scan an image using the flatbed scanners and take pictures using the digital cameras. For an assignment, students were required to create their own posters using many of these advanced design elements, and incorporating scanned and digital camera pictures.
- **Microsoft Publisher Lecture:** Every student, including those taking the course for one credit, was required to create an interpretive poster using Microsoft Publisher. Since only the 2-credit students were participating in the lab sessions, the course instructors decided that one 50-minute lecture period should be devoted to Microsoft Publisher. Instead of creating a detailed tutorial, the instructor designed a simple outline that students could use to take notes on during the lecture. Topics included creating a new properly sized document, inserting and modifying text, using Word Art for special effects, inserting and modifying graphics, and layering.
- **Lab Session #4- Paint Shop Pro Basics:** The third training session switched the focus of the lab to graphic editing. Paint Shop Pro is an

affordable graphic editing program that can be accessed from any computer on campus. The session provided comprehensive skills development in such topics as cropping images, resizing pictures, mirroring and rotating images, adjusting the brightness and contrast, sharpening and blurring, cloning areas of an image, replacing colors, cutting out pictures, and using special effects. For an assignment, the instructor cut out parts of already existing images, and combined them into a new graphic. Students were required to mimic the new graphic as closely as possible, using the skills they had learned in class.

- **Lab Session #5- Adobe Photoshop Essentials:** The last training session continued to integrate graphic editing skills by introducing Adobe Photoshop. This program is a complex professional system for working with graphics. Due to the time limitations of the class, only a few important skills were taught. These included adjusting the brightness and darkness levels of a picture, using special artistic filters, and working with transparency blends to create a faded background. A poster and sign panel had already been assigned in lecture during this final lab session, so the students were not given a lab assignment.

Objective 3:

Design and oversee the construction of an “Interpretation Computer Lab” in the Schmeckle Reserve Visitor Center, where students can practice computing skills using modern equipment and programs.

Layout of the Interpretation Computer Lab

As stated previously, the construction of the Interpretation Computer Lab was well underway when the researcher started his graduate program. A former storage area in the basement of the Schmeckle Reserve Visitor Center was being renovated into a modern computer lab. Figure 11 shows the layout of the basement storage areas before 1999. The original proposed layout of the computer lab is reproduced in Figure 12.

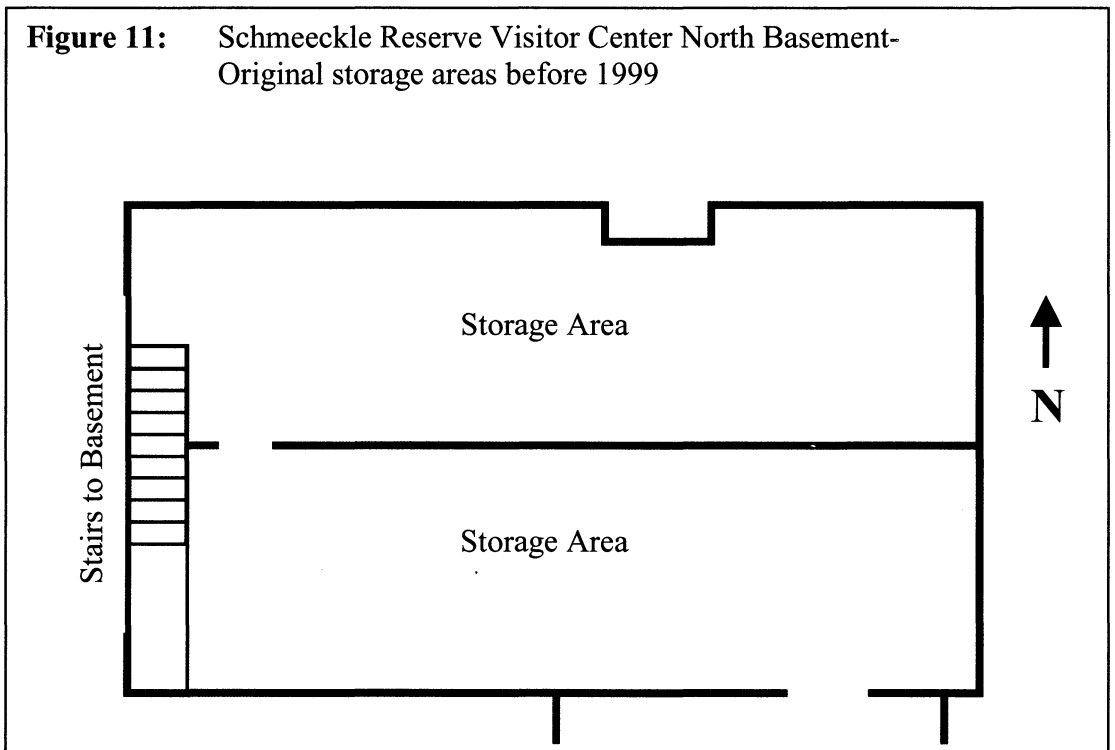
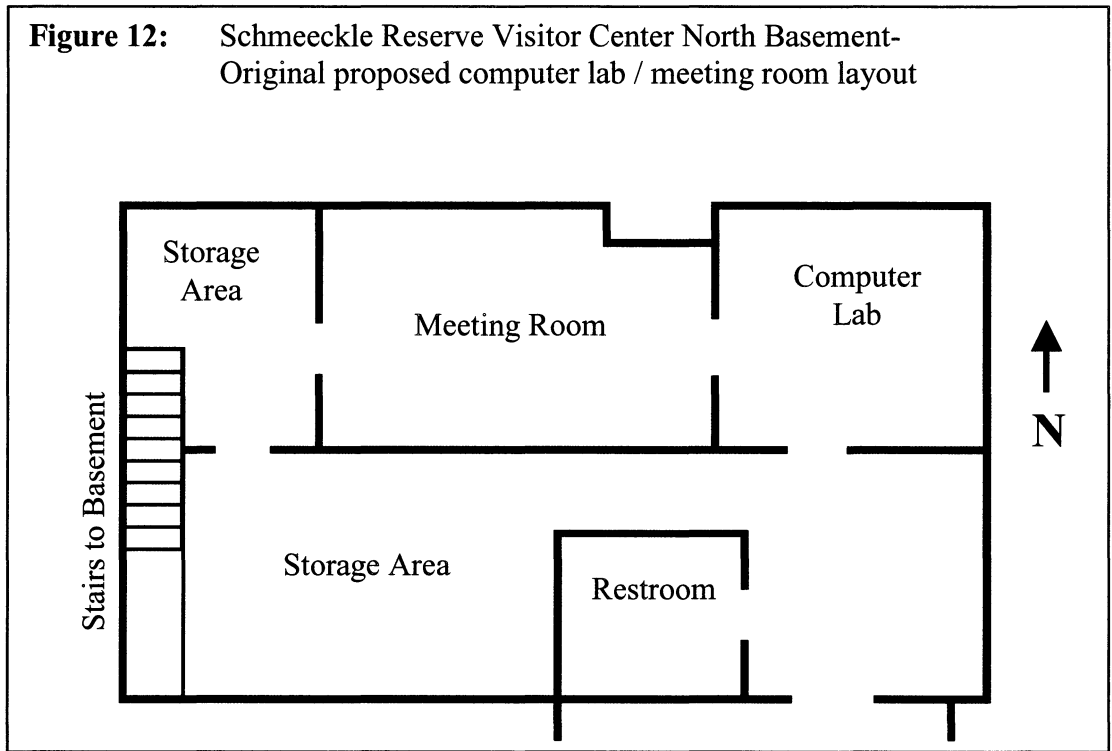


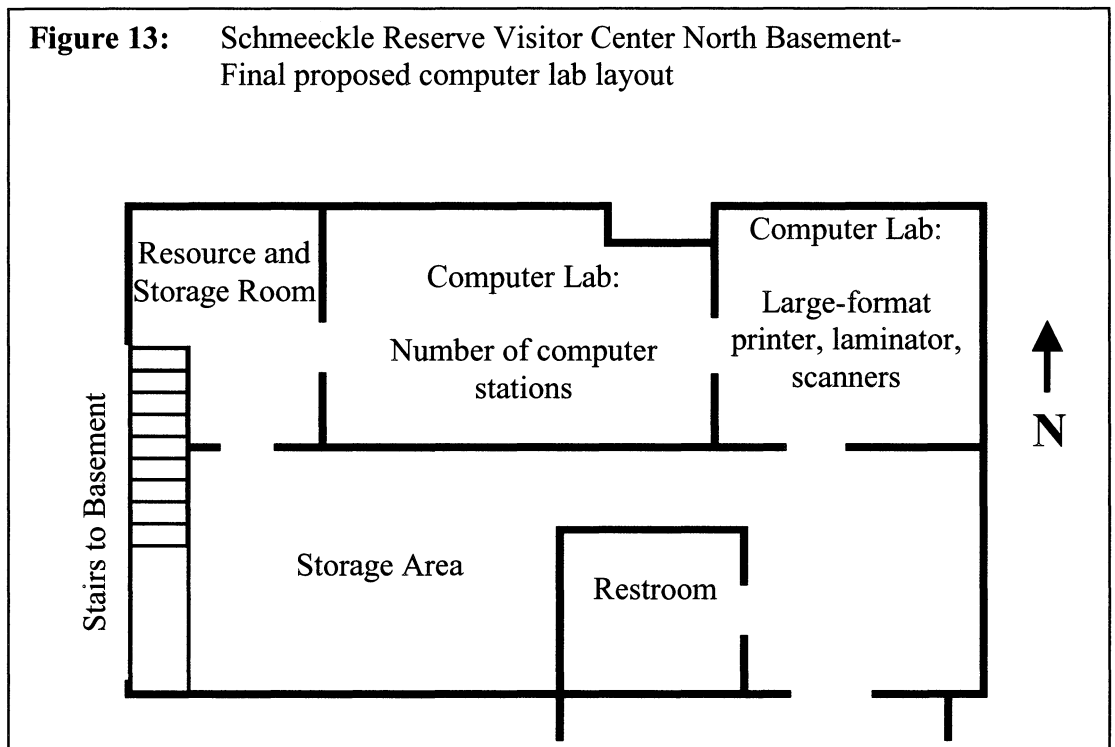
Figure 12: Schmeckle Reserve Visitor Center North Basement-
Original proposed computer lab / meeting room layout



According to the original proposal, the northern-most storage area would be divided into three separate rooms. The small west room located at the end of the stairs would remain a storage area. The middle space would become a meeting room appropriate for smaller groups of people. Meetings could then be scheduled in the large classroom upstairs and the smaller meeting room downstairs. The east room would become the interpretive computer lab, complete with computers, scanners, and a large format printer and laminator.

In the early stages of this project, it became apparent that the space proposed for the computer lab was inadequate. The bulky large-format printer and laminator consumed nearly all of the space in the original computer lab. Regardless of the arrangement, only two or three computers would fit in the east room, drastically limiting

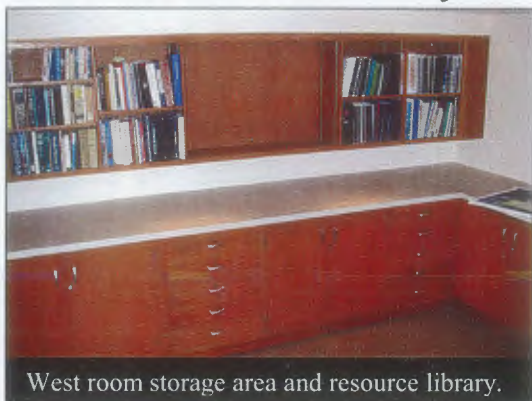
the teaching opportunities. Ron Zimmerman, director of Schmeeckle Reserve, and the researcher determined that both the middle and east rooms would need to be dedicated as computer lab space. The second meeting room proposal was dropped, and the final layout for the renovated storage areas can be seen in Figure 13.



Since the wall between the east and middle rooms had already been constructed, the computer lab would be divided into two separate spaces. The primary teaching area would be in the middle room, where a number of student computer stations would be installed. The east room, on the other hand, would house equipment devoted to the actual fabrication of interpretive products, including the large-format printer, the laminator, and a computer station for high-resolution scanning and publication layout. The west room would serve both as a finished storage area and as a resource library for the interpretation students.

Renovation Basement Storage Areas

Between May of 2000 and January of 2002, the basement storage areas were under constant renovation. Through the help of University students and staff, walls were built, electric outlets and network jacks were installed, lighting was put in, a ceiling was



West room storage area and resource library.

hung, carpet was laid, and doors were installed. To make the downstairs lab accessible to people with physical disabilities, a gently sloping road was shaped and paved to the basement workshop door. A hallway was

constructed that separated visitors from the workshop and painting areas, and connected the workshop door to the computer lab. In addition, an accessible restroom was constructed in part of the south storage area near the computer lab, which can be seen in Figure 13.

During December and January of 2001-2002, student employees at Schmeckle Reserve transformed old oak cabinets and drawers from the College of Science into usable, high-quality computer stations. Heavy-duty tabletops were cut and refinished with white countertop lamination. The furniture and tabletops were custom designed to create four computer stations on the south side of the middle room, and three stations on the north side. A corner desk was purchased for the layout station in the east room. Two wooden folding tables

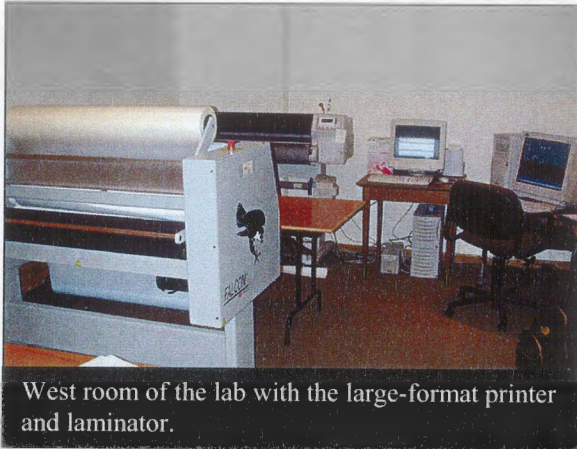
Middle room of the lab with seven computer stations.



were also cut to a proper size and placed in the east room to aid in the lamination process.

Installation of Computer Technology Equipment

When the computer stations were completed, the actual computers were installed in the downstairs lab. Each computer was networked to the University system through a network box in the east room, which allowed access to the Internet, e-mail, and other campus software. Because the Schmeckle Reserve Visitor Center is on a wireless network system (a tower on the roof sends and receives signals from the library on



West room of the lab with the large-format printer and laminator.

campus), computers in the lab needed to be specially configured to work on the network. Some equipment, such as the two flatbed scanners, the slide scanner, and a sound recording device, were hooked up to individual computers. Other

equipment needed to be installed to all computers, including the color laser printer, color inkjet printer, large-format printer, and digital camera card reader.

Software for the technology training modules was also installed on every computer. Some programs, like the Microsoft products, were already installed on the computers by the University Information Technology office. Other more unique programs, however, needed to be installed directly, including QuarkXpress, Adobe Photoshop, Adobe Illustrator, Adobe Acrobat, Paint Shop Pro, sound editing and conversion programs, and graphic viewing programs. The “start menu” and “desktop” of

each computer were standardized so a student would have an identical computing experience regardless of which computer he or she chooses.

When the desktop publishing module was taught the second semester of the 2001-02 school year, five high-speed desktop computers were available for student use, although one of those computers was located in the east room and thus inaccessible for group teaching. Two slower touch-screen computers, which had been previously purchased for an exhibit in the Wisconsin Conservation Hall of Fame, were also available for student use. In March of 2002, two more high-speed computers and another color laser printer were acquired for the lab.

The current equipment that has been installed in the Interpretation Computer Lab is listed in Figure 14.

Figure 14: Current Equipment in the Interpretation Computer Lab

- 6 high-speed (over 500 Mhz processor) computers
 - 4 have large 21" monitors
 - All have 250 Mb Zip drives
 - All have DVD/CD-Rom drives
 - 3 have CD-burners
- 2 lower-speed (less than 500 Mhz processor) computers
- 1 portable 250 Mb Zip disk drive
- 1 digital projector
- 1 cordless mouse
- 2 flatbed scanners (1 older and slow model)
- 1 slide scanner
- 2 color laser printers (1 up to 8.5" x 11", 1 up to 11" x 17")
- 1 color inkjet printer (up to 11" x 17")
- 1 large-format inkjet printer (up to 36" x any length) and network computer
- 1 large-format laminator (up to 36" x any length)
- 2 digital cameras
- 1 digital camera reader
- 1 network box (with multiple connections)

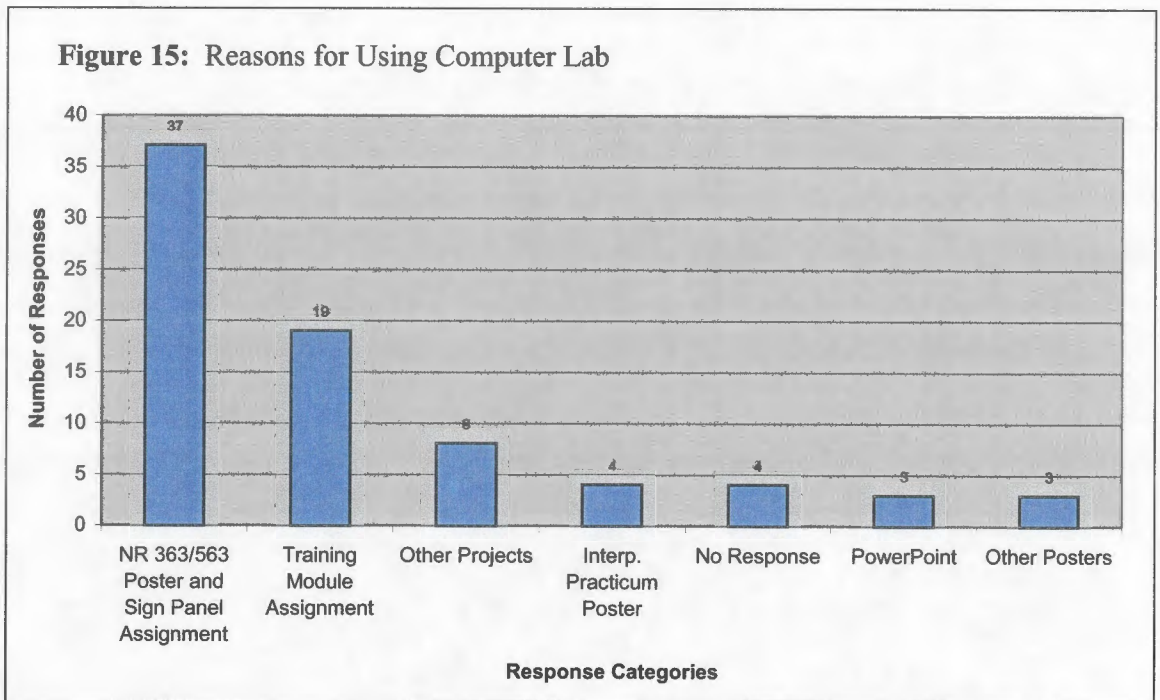
Current Use of the Lab

Sign-in sheets were located outside the entrance of the middle computer lab, requesting the student's name, purpose for using the lab, and time spent in the lab. On April 7, 2002, after the desktop publishing training module had been completed, this data was collected and analyzed to reveal current use patterns. Students did not sign the sheets during the training module sessions, but the instructor kept an attendance sheet for further use information.

Overall, 22 different students used the lab between the end of January and the beginning of April. A total of all the time values on the sign-in sheets indicates that 115 hours were logged in the lab outside of class. Without incorporating any class time, each student spent an average of 5.23 hours in the computer lab. Fourteen out of the 22 students also participated in the desktop publishing training module that was taught in the computer lab. Each of these students spent an extra hour-and-a-half in the lab each week for 5 weeks. For these students, the average time spent in the lab was an additional 7.5 hours, making the total about 12.73 hours per person. Through class and non-class use, nearly 220 student hours were spent in the interpretation computer lab.

Figure 15 illustrates the various reasons that students were using the lab. The majority of students used the lab to complete assignments for the Signs, Trails, and Waysides course. The second largest category was the completion of assignments for the desktop publishing training module. As would be suspected, students are primarily using the lab to complete assignments for their interpretation courses. However, very few students are using the lab to work on other projects. During those periods when no

assignment was due in the interpretive courses, the computer lab remained virtually empty.



Recommendations for Interpretation Computer Lab

Through teaching the desktop publishing module and working with students in the lab, several improvements and additions to the computer lab could provide a more effective learning experience in the future.

- 1. More computers:** Students learn best through direct hands-on manipulation of computers. Even with the small groups taught during the desktop publishing module, several students in each lab session were forced to share a computer. Watching someone else use a program often limits the learning experience. To be most effective, every student in the technology training module should have an individual computer to work with.

The small size of the computer lab is a major limitation to incorporating more computers in the future. Currently, 5 high-speed computers are located in the middle room where all of the instruction takes place. Two slower-speed computers occupy the other stations. In the very least, these two computers should be replaced with high-speed models. An additional flat-screen computer could potentially be installed in the northeast corner of the middle room. This would bring the number of usable computers up to 8 in the middle room, appropriate for teaching small lab groups.

2. **More Flatbed Scanners:** When designing interpretive products, students almost always require the use of a scanner for capturing colorful photographs and drawings. Currently, two flatbed scanners are located in the interpretation computer lab. One of the scanners is an older model that can take a significant amount of time to scan high-resolution images. In regard to efficiency, only the higher-speed scanner is usable by the interpretive students. During high-use periods, the single scanner can create a major bottleneck for students attempting to finish their projects. In addition, the scanner ties up one of the lab computers, which are already limited by the space.

Purchasing more scanners for the lab would help to resolve some of these congestion problems. The budget is obviously a major limitation, but

students do not need expensive, high-resolution scanners to complete their projects. Inexpensive scanners, which can be purchased for about \$200, could effectively accomplish their tasks. In addition, by purchasing scanners with a USB (universal serial bus) connection, the scanners could be easily moved from one computer to another. Whereas the current flatbed scanners require a special card to be installed in the computer, all of the computers in the lab have USB ports. Two less expensive USB flatbed scanners could drastically increase the efficiency of scanning in the lab.

3. **Purchase video editing hardware:** One extraordinary feature of Microsoft PowerPoint is the ability to include movies in a presentation. Currently, all of the computers in the University library are connected to VCRs (videocassette recorders) and have the capability of capturing and editing video. In order to effectively train students to incorporate movies in the presentations, at least one computer in the interpretation lab should be upgraded with video editing hardware. Again the budget is a limitation, but inexpensive video capture cards start at about \$250. A VCR, which can be hooked up to the digital projector for large-screen viewing, is already located in the lab. The incorporation of video editing skills could enhance the quality of interpretive digital presentations that students create.

4. **Encourage more student use:** As revealed through the current use analysis, few students are using the computer lab to work on projects other than assignments for the interpretation courses. The lab was designed as a comfortable place where environmental education and interpretation students could use technology to complete projects for any class or extracurricular activity. Students should be assured that the lab is available for their use at all times, and encouraged to utilize the technology for other classes and projects.

Objective 4:

Evaluate the effectiveness of the computer technology training.

Participants and sessions

Focus groups were chosen to analyze students' attitudes and impressions toward the technology training. Since the instruction methods were so different between the training modules, two separate focus groups were planned: one for the desktop publishing module, and one for the digital presentation module. All 46 students that had participated in either module were invited to attend a focus group session. Seventeen students from the desktop publishing training and 15 students from the PowerPoint training agreed to take part in a discussion. Seven of those students received both training modules, and agreed to participate in both focus group sessions. Therefore, 25 of the 46 students, or about 54%, contributed to the effectiveness analysis of the technology training. Two

other students, that could not join a focus group due to scheduling conflicts, agreed to fill out a questionnaire with their thoughts and suggestions.

Originally, 4 digital presentation focus groups and 3 desktop publishing focus groups were planned during the week of April 1 to April 5. Due to scheduling conflicts with other classes and activities, the Friday sessions were cancelled. Ultimately, 3 digital presentation and 2 desktop publishing focus groups were conducted with group sizes ranging from 4 to 13 participants. Only the one focus group with 13 participants went outside of the original acceptable range of 3 to 10. This was necessary, however, to overcome the limitations of student schedules and obtain the maximum amount of participation. The complete listing of participants and focus group dates is included in Appendix C.

Coding of Transcripts and Importance

The focus group discussions were recorded, and the researcher transcribed the tapes during the week of April 8-12. To analyze these comments more effectively, the statements were grouped according to similar content. Forty coding categories were identified for the desktop publishing module, while 30 were identified for the digital presentation module. The coded transcripts for both modules are listed in Appendix C.

To make appropriate recommendations for the technology training, the categories needed to be organized by importance. In essence, the most important comments or suggestions would be given more weight when creating the recommendation list. The importance of a category was designated through two primary criteria. First, the researcher had identified important research questions before the focus groups were

conducted, as witnessed in the question guides (Figure 1 and 3). The researcher was searching for answers to these specific questions, which seemed to be essential components of the effectiveness analysis. However, one of the major advantages of a focus group is the ability of participants to identify topics that the researcher had not considered. The second criterion of importance was the amount of discussion about a central topic or theme. The more participants talked about a certain subject, the more likely that the topic was something very important to them.

Results and Recommendations

The various categories that were developed from the transcripts can be broadly divided into two main sections. First, many of the categories related to some sort of **positive feedback** about the technology training, which encourages similar incorporation into future courses. Second, the other categories were **suggestions for improvement**, representing ideas for changing the training to enhance the student's learning experience. Based on the criteria set above, the most important positive feedback and suggestion categories will be listed with recommendations for the technology training. The number of related participant responses follows each category.

Digital Presentation Module: Positive Feedback

1. The written step-by-step tutorials are an effective teaching method (33 responses):

By far, the most discussed topics in the digital presentation focus groups related to an overall appreciation of the written tutorials. These specific step-by-step instructions guided students in their discovery of Microsoft PowerPoint and scanning images. Many students responded positively to the concise and detailed information built into each tutorial, while other students referred to the ease of using the step-by-step instructions. Students especially liked the visual nature of the tutorials, complete with screen images, arrows, and color to help organize and clarify the skills being taught. Individual comments from students in the digital presentation focus groups can provide additional meaning to this theme.



Digital presentation projector and laptop.

These [PowerPoint tutorials] have helped me so much. I came into the project like, "Oh great, I have to learn this," and it wasn't that hard even for me, because you had it so specific.

They [PowerPoint tutorials] were very concise. They had all of the steps you needed to do in them. Didn't take very long to do it.

I liked that they were really step-by-step. You couldn't really miss something.

I thought they were very user-friendly. Very easy to essentially teach yourself.

You showed pictures. [You] could always refer back to the pictures when you were doing it for real. I am a very visual person.

The pictures are good because otherwise it is real difficult to find things.

I really like where you point to the buttons and describe them. I thought that was very helpful because that was one of the harder things to figure out.

Although the comments about the specificity and visual representation of the tutorials were positive, students had mixed emotions about the use of color. The tutorials were originally printed in color to enhance the organization of information, and to increase the comprehension of skills by matching the computer screen with the paper tutorials. Students overall liked the color, but had concerns about the financial and environmental repercussions of printing in color. The following comments reveal these issues in more detail.

The color is helpful to see things, [but] I wonder how much that's costing [the course]. The color was really helpful though. I don't know how you could really do this without putting it in color, because you really need to see the details. Maybe looking into cheaper printing or something.

I liked having them in color, but I don't think I needed them in color necessarily.

I really liked the color. I know it costs more to print them in color. It made it more inviting to come in and take a look, and the fact that what was on the page mimicked the screen in every way including color really helped me to understand better.

I think it could be done in black-and-white. The color adds but I don't think it's critical.

The focus group responses justify the continuing incorporation of specific, detailed tutorials into future technology training. These tutorials are not only well liked by the students, but serve as effective PowerPoint teaching tools. As demonstrated by other comments, students feel comfortable using the skills they learned outside of class. Graphics, screen images, and arrows are essential components of the tutorials. Although the use of color resulted in mixed emotions, overall the benefits of using color to enhance comprehension seem to outweigh the costs involved with the printing. The tutorials

should continue to be printed in color for future courses. To offset the printing costs, the course fee should be increased, or the tutorials should be purchased separately as a lab manual (see item #2 in the digital presentation suggestions section).

2. Students use the tutorials and skills from the training module for other classes and presentations (16 responses):

An interesting theme discussed by the focus group participants was the use of PowerPoint skills for other classes and projects. This was a particularly important concept not included on the original question guide. By using their skills in other situations, students demonstrate an acceptance and understanding of digital presentations development that goes beyond a single course. This also supports the relatively high comfort levels reported by the students. Many students responded that by using skills acquired through this training module, they had presented an effective PowerPoint program for another class or organization meeting. A few students applied skills from this training, like scanning images, to other types of computer programs. The following comments will demonstrate the breadth of this feedback.

I'm definitely glad I learned [PowerPoint]. I'm using it a lot this semester in a bunch of other classes I have.

These skills that we are learning carry over to other classes. You could definitely tell the difference between the people that had the tutorials, and those that just put [PowerPoint presentations] together based on what they had done before.

I kind of looked forward to doing these [tutorials], because I knew this is something I will use after school all the time. I know I'll use it after school. I kind of looked forward to learning more about it.

Since we are required to do PowerPoint [programs] and presentations, it's nice to actually have a class that teaches it.

I use different skills from [the training], like... taking pictures [and] scanning pictures, not necessarily putting together a whole PowerPoint [presentation]. I have used various skills, like the sound option... for other things I've done.

One of the primary goals of this project is for students to be comfortable using technology skills in their professions after graduation. The fact that so many students are already using these skills for other projects is very encouraging. Students seem to comprehend and feel comfortable using digital presentations, and in this regard the training module is working successfully. The training should definitely be an essential component of interpretation courses in the future.

3. The take-home tutorial teaching method is preferred over an instructor-led course (16 responses):

A core question of the focus groups was whether or not students believed that the chosen teaching method was effective for their learning. In the digital presentation training module, the teaching method was a take-home tutorial that students completed as an assignment. Besides a single 50-minute interpretive techniques lecture, no personal instruction was included in the training. All participants unanimously agreed that the take-home tutorial method was the most appropriate way to teach the class. Students believed that the detailed steps were easy to follow on their own, and that devoting more class time to the training would have been a waste. Some students that had participated in both training modules contrasted the types of programs taught in each. They agreed that PowerPoint was much more simple than the graphic editing and page layout

programs taught in the desktop publishing module. The following comments reiterate the preference of take-home tutorials.

I like the tutorials better than having someone go through it with you. It was easy enough for me to do without having an instructor there.

It would have been overkill to have an entire lab devoted to PowerPoint. You were still available to help me [through e-mail].

I don't think you really need a teacher there to tell you how to do it. It's pretty well said on paper for you.

The other applications [in the desktop publishing module] are much more complicated and necessitate having an instructor. PowerPoint is not as complex and I think you can save time, energy, and goodwill among more experienced PowerPoint people.

All focus group participants agreed that the take-home tutorials are superior to an instructor-led lab session for learning PowerPoint. The tutorial teaching method should continue to be integrated into future training sessions.

4. Students are comfortable using PowerPoint and enjoy using it (14 responses):

Another core question that the researcher hoped the focus groups would answer was how comfortable students felt using digital presentation skills. Students who are comfortable and confident using technology skills are more likely to use those skills after graduation, and are more capable of learning other computer applications and equipment. Overall, students reported that they would feel very comfortable using digital presentation skills in the future. Some appreciated the additional skills that could be added to their resumes. A few comments illustrate this high sense of confidence.

I feel very comfortable. It's a great skill to have.

Thanks for giving me more things... to put on my resume. It really made me comfortable using applications that I never used before.

A couple of students reported that they were comfortable using the skills, but the tone and wording of their answers seemed less confident than the others. They stated:

I feel much more confident than I [did] coming in, that's for sure.

[I would be comfortable] as long as I had the tutorials.

As it is currently designed, the digital presentation training module seems to effectively boost student confidence levels. Students feel comfortable using these skills in other classes, which reflects how students may use the training after graduation. When asked whether the PowerPoint training should be incorporated into future interpretation courses, all students believed that it should. Like the other positive feedback categories confirm, the digital presentation lessons are essential components of the interpretive technology training.

Digital Presentation Module: Suggestions

1. Many students do not understand basic graphic concepts, like size and resolution. The scanning tutorial should be rewritten (21 responses):

Students feel comfortable using most of the digital presentation skills included in the training module. However, many students reported difficulties working with images. In a traditional 35-mm slideshow, every image has the same resolution and size, though the clarity depends on how well the camera was focused. In PowerPoint, resolution and size are critical factors of an image's clarity beyond the original focusing. Despite being

addressed in the scanning tutorial and during the techniques lecture, these concepts seem to be difficult for students to grasp.

Students reported that the tutorials taught them *what* pictures were at the correct size and resolution, but not *why* they needed to be these specific dimensions. Others reported difficulties in understanding terminology, especially with the different types of graphics. Apart from the general graphic concepts, the scanning tutorial specifically was an issue with most students. Many were confused by the complex steps of the tutorial, and again wanted to know the reasons for scanning a certain way. The following comments provide insight into this issue.

With the DPI's (dots per inch) and the resolution, I don't even still understand any of that, so maybe more explanation. [The tutorial] tells you how to change [images] and everything, but I just don't understand it at all.

I had big pictures and small pictures and I put the same things in all of those, and I was questioning if I was doing that right [and] if it was going to look right when it came up [on the screen].

I had difficulty later on doing my final presentation when scanning my pictures. Resizing was confusing to me. I knew I had to do it, and I knew what to put the measurements in, but I had no idea really what I was doing, or why I was doing it, or how it was changing my presentation.

I remember that the way [the tutorial] said to use the scanner seemed to me quite round-about. It didn't work for me for some reason the first time. It was a different way than I had used a scanner.

The difficulties encountered using and manipulating images is a serious one, especially since Microsoft PowerPoint is first and foremost a visual presentation.

Students need to be provided with the rationale behind resolution and size, and how those parameters affect the overall quality of an image. More time needs to be devoted to these important concepts within the training module itself. First, an "Image Tutorial" should

be written to replace the ineffective scanning tutorial. The image tutorial would introduce concepts of size and resolution in an easily understandable context. These concepts can be applied to any graphic, whether it is scanned, taken with a digital camera, or saved from the Internet. The tutorial would also include more specific instructions for using various scanners on campus and in the interpretation computer lab. Second, a half-hour lecture session should also be devoted to digital images. By using several different teaching methods, such as models, drawings, and relationships to other familiar things, an instructor could ensure that the majority of students in class comprehend the basic concepts of images.

2. Students feel that the tutorials should be available in a lab manual for purchase. However, the tutorials should also be on reserve in the library and available online (19 responses):

Due to the expense involved with printing the numerous tutorials, either the cost must be built into the course or another alternative must be decided upon. Students in the focus group discussed this topic in great detail. The issue of using color played into this category frequently. Most students believed that the colored tutorials should be sold as a lab manual, available for easy reference in the future. However, students also identified potential conflicts with experienced computer users that might see the lab manual as a waste of money.

A potential solution offered by the students was to put the tutorials into public folders (an e-mail networking system that is available to all students in a specific course), allowing students to print out the guides with their own time and money. This causes

other problems, however. Inexperienced computer users who would benefit from colored tutorials, for instance, might print off the tutorials in black-and-white from public folders since this alternative is much cheaper. An additional alternative would be to keep the tutorials on reserve at the university library. The following array of comments demonstrates this confusing issue.

Public folders. They are there for you to reference, but I will only print it off if I feel I need the information a lot. You pay for a certain number of pages to print, and I know I haven't used mine at all, so I might as well use it.

Maybe you could keep a hard copy available at the circulation desk for someone who is having a hard time with computers.

Public folders is a good idea and it saves a lot of paper. But maybe the support of being able to get somebody hard copies if they need them.

If it is a matter of fee, make it an option to purchase your tutorial manual for however much. If you don't want to purchase the already printed out copy, it is on public folders.

Just sell them in a binder. You don't have to deal with the bookstores. You have the option to get them or not get them.

Through the jumble of comments and suggestions, a common theme seems to emerge. Students would like the option of purchasing the colored tutorials as a lab manual, but they definitely want to keep it an option. Raising the fees for the course may not be a viable alternative. The use of public folders is another common thread that runs through the comments. The tutorials are already available online through the researcher's university website. By placing them in the public folders, only students in the course would have access to them.

For future training, the digital presentation tutorials (and possibly the desktop publishing tutorials) should be secured in a binder and sold to students as lab manuals.

The tutorials should also be placed into the university public folders as an alternative to the lab manual, or kept on the Internet for anyone to download. However, students should be strongly encouraged to purchase the colored tutorials, which have the potential of increasing comprehension through more succinct organization and by closely linking the paper images with the computer screen.

3. Many students had problems incorporating sound into their presentations (13 responses):

Beyond the problems associated with image concepts, students also had difficulty with some digital sound basics. Students were encouraged to use sound effects and music in their presentations to enhance the emotional connections with the audience. After viewing the final presentations, however, it became apparent that working with sound was a major issue, and the focus groups confirmed this assumption. For many students, the sound simply did not work during their presentations causing frustration and undue worry. Overall, students did not understand that the sound file needed to be saved along with the PowerPoint file, even though this information was included in the tutorial.

Student comments included:

A lot of people had trouble with sound... I know a lot of people that tried to put sound in their final project, and it either didn't work or the computer wasn't fast enough to make it go when they needed it to.

I had some problems with sound. There were quite a few times when we had the icon and we pushed it, but we just didn't hear anything.

Maybe like a whole one-time sound/video lab session, since those tend to be more complicated. A lot of people forgot to put the sound file on the same zip disk as their presentation.

Sound provides a unique opportunity for adding emotion and surprise to an interpretive program. In order for students to effectively use sound, more time should be devoted to this topic in the training modules. The last suggestion listed above seems to be the most appropriate solution to this problem. After students complete the series of take-home tutorials, a follow-up lab session that focuses on incorporating sound and video would provide reinforcement of these more advanced skills (see #5 below).

4. Students would prefer 35-millimeter slide instruction (12 responses):

The focus group method is powerful, because it allows open discussion among participants that can result in a variety of sometimes-unexpected results. One of the most interesting suggestions that arose from the focus groups was in reference to training that the researcher had not even considered: learning the traditional 35-millimeter slide methods. In previous years, traditional slide programs were taught in great detail. The class took a fieldtrip to the Instructional Media lab in the university library, where they learned how to take pictures of flat images using a specially designed camera, how to send in film for developing, how to burn words or line art into the image, and how to use slide projectors and dissolve units. Since the emphasis has shifted so heavily to Microsoft PowerPoint in the past few years, the detailed 35-millimeter slide instruction was dropped from the course.

Students responded in the focus groups that they would still like to receive the 35-millimeter slide instruction. They referred to the fact that many agencies and interpretive sites in the real world do not have access to digital presentation technology. Slides are still commonly used for illustrated talks in the interpretive profession. They suggested

that training in using this traditional method be incorporated into the Oral Interpretation course. The following comments illustrate this insightful recommendation.

There was a lot of emphasis on PowerPoint in my section. PowerPoint doesn't exist everywhere, and you might be better off bringing your own slides and actually stuff that makes your presentation run.

It's good that you brought it up, because PowerPoint isn't everywhere, and is expensive for small non-profit places to have it.

I was even going to do slides, but [an instructor said] you should do PowerPoint.

It would be neat to take a day and go through how they produce the slides, instead of having each person do their own [program].

I think using slides will always be used. I don't think it will be terminated too soon in the future with technology.

Students were correct that traditional slideshows are still a major interpretive tool in many sites throughout the country. Ironically, so much emphasis has been placed on the more advanced computer techniques, that students now lack knowledge in using traditional technology, like slide projectors. The efficiency, in terms of money and time, and the additional features, like sound and animation, still make PowerPoint a more appropriate interpretive medium for illustrated talks. However, the 35-millimeter slide training should be reincorporated into future interpretation courses, so students at least have a basic understanding of traditional slideshow concepts.

5. Some students would like to learn more about incorporating video into their presentations (8 responses):

A final suggestion tied closely to using sound (see #3 above) is a more detailed training about digital video. The final PowerPoint tutorial briefly touched upon the

incorporation of movies into a presentation. Students downloaded a movie from the Internet and inserted it into their program. However, a few students wanted to digitize their own videos for use in PowerPoint, which was not covered in the tutorials or class.

The comments about this suggestion included:

In high school we learned how to take movies and put it into our PowerPoint. In yours, you already had it and we just had to click on it. That would be helpful to know how to do that, so you can put it all in one media.

One part that was difficult that might be nice to go through with the class, would be converting video over and installing that. I had to go figure it out myself through someone in the library, which took hours and the quality was horrible, so I didn't end up using it. I think several other students in the class wanted to use video, but didn't really know how.

One solution to this issue has already been identified in the digital sound recommendations (see #3 above). After the students have completed the PowerPoint tutorials, a one-and-a-half to two-hour lab session should be held, training students how to incorporate and work with digital sound and video. These advanced concepts are very difficult to explain with written tutorials. The lab session could be held in the Interpretation Computer Lab at Schmeckle Reserve, but the lab would need to be upgraded with video and sound editing equipment. This lab session would be a hands-on opportunity to work with video and sound files, and would reinforce skills acquired from the PowerPoint tutorials. Overall, a working knowledge of digital sound and video could enhance the interpretive quality of the final illustrated presentations.

Digital Presentation Module: Subjective Skills Development Analysis

Before each focus group, participants were encouraged to fill out a "Skills Development Questionnaire." For each particular piece of software and hardware,

students indicated their perceived skill level before participating in the technology training and after participating in the training. The skill level was based on a 10-point interval scale, with 1 indicating no skill at all and 10 indicating a mastery of the technology. Since students subjectively interpret what each level between 1 and 10 represents, comparisons between absolute skill levels will not be useful (two students with the exact same skills, for instance, would still likely choose different skill levels). However, the difference between the before-training and after-training skill levels yields some interesting information. This represents subjectively on a scale from 1 to 10 how much a participant believes his or her skills improved from the technology training. Table 3 includes the averaged results of the digital presentation training module.

Table 3: Results of Digital Presentation Skills Development Questionnaire

	Average skill rating	Highest individual skill rating	Lowest individual skill rating	Total number of responses
PowerPoint: Before training	3.5	9	1	14
PowerPoint: After training	9	10	7	
PowerPoint: Total change	5.5			

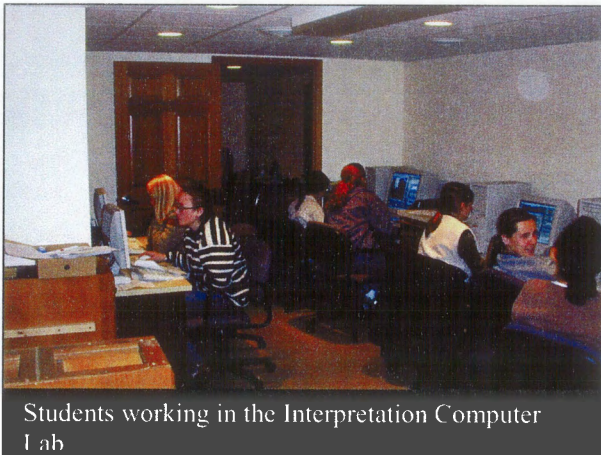
Students believed that they had improved their skills by on average over 5 ranking points, which is half of the entire continuum. Although this cannot be linked with the actual acquisition of knowledge and skills, students obviously felt that they had learned many of the skills taught in the training module. Perhaps more than anything, these

results confirm that students are comfortable and confident using digital presentation skills.

Desktop Publishing Module: Positive Feedback

1. Students liked the overall interpretive lab training experience and found it helpful for real-world applications (14 comments):

The most discussed category in the desktop publishing focus groups was a general appreciation of the training. Despite some frustration, students not only enjoyed the lab



experience, but also found the skills to be beneficial for their future. A few students contrasted this experience with more negative computer training experiences. Others acknowledged the large amount of information and skills they learned. All were in general agreement that the desktop

publishing module was a positive experience. A few comments will highlight some of the main points.

I've always had troubles with computers, and these [sessions] just amazed me. Going through the labs made me really excited about going into this field. I guess I never realized how much creativity you get to put into it. The labs were so well put together that even I could understand it, because I was really nervous about the computer aspects.

I really liked how much I learned. I think that it's probably the most applicable lab I've had so far. Applicable to everything: other classes, my jobs, anything I'm going to need to do...

I'm just thinking about those of us who took [Introduction to Soil and Water Resources] here and had to do the GIS thing and I'm just comparing. Like, I

don't remember anything of how to do ArcView or GIS with their tutorials, nothing at all. And I know I can do [desktop publishing] now with the tutorials and how it was taught.

It was fun. Sometimes frustrating. Always fun, even sometimes when it was frustrating.

Overall, the students both enjoyed and respected the skills they learned from the desktop publishing module. When asked if these training sessions should be incorporated into future interpretation courses, the students unanimously agreed that they should. The training is deemed as important not only by the instructors, but also by the students themselves.

2. The tutorials were specific and enhanced learning (12 responses):

Like the digital presentation module, students in the desktop publishing focus group frequently responded positively to the step-by-step tutorials. Although these guides were written in less detail than the PowerPoint tutorials, the students still believed that they were essential components of their learning. Students commented on the tutorials' ease of use, the specific detailed instructions, the ability to learn on their own, and having something to refer back to in the future. The following are select comments that illustrate this category.

I liked how you could basically pick up the direction sheet here and learn everything yourself. It was really easy for me to get into the program. It was good reference too when I forgot what to do.

I liked how much effort you put into [the tutorials], because it's so specific that it's easy to follow. The directions are well written.

The tutorials we went through as a group I think were excellent. You put them in such easy-to-learn formats, going right through all the basics.

Apart from the numerous positive comments, one student did identify the more general nature of these tutorials as being a barrier to learning.

Although I do have one complaint. A couple of these guides were hard to follow because they weren't as specific as the ones last semester [PowerPoint tutorials].

Like the PowerPoint training, the tutorials for the desktop publishing module seem to be effective tools for teaching. Overall, students like the step-by-step instructions and benefit from their use. Due to the encouraging comments from both focus groups sessions, tutorials should definitely be incorporated into future technology training in the interpretive courses. Current tutorials should be revised based on student comments and suggestions. In addition, new tutorials should be written when newer versions of software are purchased or when different pieces of equipment are added to the training.

3. Students believed that an instructor-led lab was essential to teach the more complex programs (7 responses):

Another concept important to the study was whether the combination of tutorials and personal instruction was effective for teaching desktop publishing skills. Could this training module have been taught without a personal instructor, like the take-home tutorial methods of the digital presentation module? All of the participants agreed that an instructor-led lab was an essential component of their learning. Many referred to the fact that the page layout and graphic editing programs were more complex than PowerPoint. Others responded that it was important to have someone there to answer questions. A few comments will provide more insight.

I personally liked that you were around and that you went through it like that, because I thought that these were a lot harder than the PowerPoint ones. Not the tutorials, but the technology itself was harder to understand how to do.

I enjoyed having the labs for this. I think they were helpful. For this, there were so many different options that you had that you needed to be shown what they were. Having someone there to answer questions when you were at the screen instead of trying to e-mail.

I thought Quark and Photoshop were much more technical than PowerPoint, so I thought it was good that you took us through that.

Like the PowerPoint training, students overall agreed that the selected instruction method was appropriate and effective for their learning. Due to the number and complexities of the programs, a personal instructor was necessary for teaching desktop publishing skills. An instructor-led lab session should be an integral part of future interpretive courses.

4. Students generally feel comfortable using the skills they learned, but lack confidence (7 responses):

When asked how comfortable the students felt using skills they had learned in the desktop publishing module, the majority of students responded positively. However, the general feeling of the group as revealed through comments and discussion was much less confident than the PowerPoint focus groups. A few responded that they were truly comfortable with the skills and willing to use them after graduation. As one student commented:

I would be comfortable with it. Not only is it a comfort thing, these labs kind of fanned the flames. I can make [interpretive products] look a lot better and it's not that hard to do.

More students, however, were less sure of their comfort level using desktop publishing skills. The following comments reveal a certain lack of confidence among the participants.

I'd feel pretty comfortable, I think. I know the programs enough where I can make the box and put the text in and pictures. It would just be more of an art of fine-tuning.

I also feel comfortable enough where I could definitely put something together. It might take me some time. I feel comfortable enough where I could have a nice product.

I'd have to bring the tutorials along. To be honest, I couldn't do half of the stuff without the tutorials. ...I have to refer back to my tutorials constantly. But I feel like I'm definitely more prepared than I thought I would have been.

The comfort level of students was one of the core concepts that the researcher attempted to identify. Regardless of the specific skills and knowledge they gained, if students are comfortable participating in these modules, they will be more likely to succeed using technology in their careers after graduation. The more students use and become familiar with computers, the easier it will be for them to learn new programs and equipment in the future. Overall, students that participated in the desktop publishing module are comfortable using skills on a very basic level, but are much less confident than students who participated in the PowerPoint training.

Many factors might contribute to this lack of confidence. First, whereas the digital presentation module focused on a single program, the desktop publishing module covered four rather complicated programs. The time and sessions devoted to each program may not have been sufficient to boost confidence levels. As revealed in the next section, there was very little reinforcement of skills, which may have significantly

decreased retention. Finally, students were simply not required to practice their desktop publishing skills after each session beyond a single assignment.

To increase confidence levels in the future, more time should be spent on each program in the lab. During the study, only QuarkXpress had more than one training session devoted to it. At least two or three sessions per program are needed to effectively train students. The sessions should build upon skills taught in previous sessions to encourage reinforcement. Although the tutorials are effective teaching methods, they also have a major downfall; in some cases, the tutorials become a substitute for learning the skills. Tutorials should still be integrated into the training, but students must be encouraged to practice skills without the instruction guides. As students encounter new programs and equipment, the specifically written tutorials will be useless if students do not have the general technology skills they need to be effective.

Desktop Publishing Module: Suggestions

1. It was difficult for students to find time to come to Schmeckle Reserve and complete their assignments (26 responses):

During the desktop publishing module, the interpretation computer lab was open to students during the normal visitor center hours of 8 a.m. to 5 p.m. The visitor center itself is located about two miles from campus. One of the major challenges identified by the focus group participants was simply the physical act of getting to the computer lab. Many students reported scheduling conflicts with the normal lab hours. Whereas the students' days were scheduled solid with classes and work, their evenings were set aside for homework when the lab was not open. Other students without transportation

discussed the significant time periods required for walking to the labs. The following comments illustrate this important challenge.

A lot of times I felt it was a real hassle to come over here. I found that a real big hassle.

I always had to walk and I have class late every day. So I would have to get up super early in the morning if I wanted to get here.

The only thing I didn't like on some of the programs like Quark, I actually had to come to Schmeckle to work on it. That kind of irritated me a little bit. I had to come all the way to Schmeckle to work on the assignment.

My frustration was having to work on stuff between 8 and 5. I do all my homework at night. Having that [training module assignments] be part of my homework, I had to try to schedule that into my school day and workday and not into my homework time.

To overcome this limitation, the students discussed a few alternatives that might improve the situation. First, most of the participants agreed that the Schmeckle Reserve computer lab should be open for extended hours, perhaps even just a two-hour time slot in the evening. These additional hours would alleviate some of the scheduling conflicts but require more time from Schmeckle employees. The following comments describe the recommendation.

It would have been nice if it could have been open even to 7 [p.m.].

7-9 [p.m.] would be awesome. Meetings and stuff get done around 7-8.

And that's not necessarily something you have to do every day [extended lab hours]. That might entail another personal to be here. Even if it were three days a week, that would be so much more helpful

If you are looking at extending the hours, you could probably consider hiring someone who already took the class.

Other participants would like the option of completing assignments and projects on campus. Certain software programs, like QuarkXpress and Adobe Photoshop, have been purchased specifically for the Schmeckle Reserve computer lab and are rarely available in other University labs. As some students stated:

It would be nice if there was a lab in the CNR that has the exact same stuff as here.

If there's a way to have similar programs in other labs on campus, that may solve some of the problems and you may not need to expand hours necessarily.

The instructors have very little control over which software programs or pieces of equipment are available in other computer labs on campus. One of the major benefits of having a technology lab in the Schmeckle Reserve Visitor Center is that the instructors have complete control over programs and equipment installed on the computers. By having a small centralized lab, the instructors can make sure that technology is up-to-date and functioning correctly within the budget constraints of the program. This would be much more difficult to accomplish in a larger computer lab on campus, which is open to all university students.

A more appropriate solution to the problem is extending the hours of the Schmeckle Reserve lab, as many students suggested. The major limitation to this solution is the cost involved with hiring an employee to keep the building open for extended hours. Interpretation students could be provided with a key and security pass code to the visitor center, but the training involved with using the security system and the potential security issues make this option undesirable. To maintain security and fit into the budget while still providing for student needs, the extended hours of the lab must be

limited. The lab should be open for extended hours during those time periods when an assignment or project is due for the interpretive courses. This should eliminate many of the students' time issues by providing a place to work during the evening. During off-times, the lab will be open between the normal visitor center hours of 8 a.m. to 5 p.m.

2. Students would like more computers available in the lab for hands-on learning (16 responses):

The second most discussed challenge was the inadequate number of computers in the lab. As described in the recommendations of Objective #3, the size of the middle room in the basement is one of the major limitations. During the desktop publishing module, 6 computers were available for student learning. However, only three of those were higher-end computers appropriate for page layout and graphic editing. Though the lower-end computers worked, they physically slowed down the training sessions. Since 8 or 9 students were scheduled for each lab session, 2 to 3 students were always required to share a computer with someone else. Students who were sharing were encouraged to switch places throughout the training session, but the lack of hands-on experience was a source of concern.

This concern was confirmed through the focus groups. Many students responded that the number of computers was inadequate in the interpretation lab. Some were frustrated during busy periods when they were forced to wait for an open computer or scanner. Others reported that the hands-on use of computers was essential for learning, and that watching someone else was not effective. The following comments demonstrate these issues in more detail.

One thing that might be important is to make sure you limit the class size so each person can be on a computer doing it hands-on. That's a factor in how much you'll remember doing it. If you're just sitting and watching, you can follow along but you won't remember it as well.

I do [think there should be more computers], because I am a hands-on learner, so I have to be that person that's doing everything.

The major seems like its getting more popular, so you might have trouble with lab space and the number of computers, too.

The only thing that bothered me besides having to come to Schmeackle all the time, is when I would come to Schmeackle outside of the actual lab, and there were a lot of people working. I guess maybe there aren't enough computers, or something has to be done with scheduling.

As was recommended in Objective #3, more computers need to be included in the lab. Currently, five high-speed computers and two lower-end computers are available for student use. The lower-end computers should be replaced with faster models, and at least one more computer should be purchased for a table in the northeast corner of the middle room. Nine computers would then be available for the training modules, which would allow every student in the lab group to work on a computer. Obviously, lab group sizes must be kept small for individualized hands-on training. If future interpretation class sizes are increased, the class may have to be divided into three or even four lab sections.

To resolve the crowding issues encountered when an assignment or project is due, a few students recommended a scheduling system. Students in each lab section would be given a specific time to come in and complete their projects.

3. Microsoft Publisher should not be taught as a 50-minute lecture (11 responses):

The Microsoft Publisher lecture was another important challenge identified by focus group participants. For the benefit of both 1-credit and 2-credit students in the

Signs, Trails, and Waysides course, Microsoft Publisher was taught in a 50-minute lecture session. An outline of the lecture was given to students before class for note-taking, which has been included in Appendix B. Every student in class was required to create an interpretive poster using Microsoft Publisher. Overall, students felt that the lecture was an ineffective teaching method. They did not acquire or understand the presented skills. Many felt that a more specific tutorial and lab session would have been much more helpful. The following comments again shed light on this issue.

I didn't really care for [the Microsoft Publisher lecture]. Because I didn't think it was very effective. It's hard to teach stuff like that in a lecture format. And I think that's why I didn't like my poster. We were told we had to do it in Publisher.

I didn't think that one [Microsoft Publisher lecture] was helpful at all. That was one of the most difficult ones that I had a hard time with. The steps weren't as defined and was hard to follow.

I didn't enjoy having the Microsoft Publisher thing in class instead of lab. Because I don't have a long attention span about that stuff. When we got it done, I didn't even know what Microsoft Publisher was, so we should have just had a tutorial for that. Especially since that's what our poster was done on.

In the future, Microsoft Publisher should definitely not be taught in a lecture format. Like other page layout and graphic editing programs, a specific step-by-step tutorial should be written for Publisher. In addition, for the best learning experience, the program should be taught in a lab setting where students have hands-on access to computers, and an instructor guides the progress and answers questions. This lab session should be provided to both 1-credit and 2-credit students.

4. Students would prefer to have more lab sessions to reinforce the training and teach more skills (10 responses):

Students also believed that more lab sessions would increase their retention and use of desktop publishing skills. This ties into the fact that students generally feel comfortable using the skills they learned, but lack confidence (see #4 under positive feedback). Again, the desktop publishing module taught four separate programs and various pieces of equipment. Two sessions focused on QuarkXpress, but only a single session was devoted to each of the other programs. Students expressed the desire to learn more skills and to review the skills they had previously acquired. Comments included:

I would have liked a few more [lab sessions]. It would have been nice to have a review. When I go down to work on a computer now, I have to get all of these things [tutorials] out and go through it again. I just have not retained a lot of that.

I definitely always have the tutorials to look back to, but I almost needed more reinforcement of ideas. Maybe just more labs. We definitely want to be able to do really interesting things if we are going to be making panels.

I would like to have had more of them, not necessarily to review, but to learn [more] features of the programs.

I think once a week is a good amount of time, but I think that there could be more weeks of it [the lab sessions] then. Because there were some things that I would have liked the full class period for you to explain.

Overall, students agreed that more lab sessions should be provided to teach and review skills. The desktop publishing lab sessions did not provide adequate reinforcement of skills. More time should be committed to each program and piece of equipment. The lab sessions should build off of one another, similar to the PowerPoint tutorials. A more integrated and comprehensive desktop publishing training will enhance the learning opportunities for students in the future.

5. Most students prefer to have the lab times set before they sign up for class (9 responses):

During the second semester of the 2001-2002 school year, a lab session was not scheduled in the UWSP timetable for the Signs, Trails, and Waysides or the Environmental Publications courses. Instead, the labs were scheduled during the first week of classes. This resulted in conflicts with work schedules and a pressure-filled discussion to find an hour-and-a-half time block when the students were free. Ultimately, the group was divided in half based on the time they could meet for lab. Most students agreed that the lab should be scheduled before classes begin, so work and other conflicts can be dealt with in advance. According to one student:

I thought that was really frustrating in the beginning of the year when we had to wait to come to class to find out when we have lab. That to me was the dumbest thing. There are so many people that have jobs, and I need to know the schedule. It took longer than it should have. I think it can be done when we sign up for classes.

To ease the scheduling in the future, the technology labs should be included in the timetables. Dividing the lab into two or three sessions would hopefully provide enough options for students signing up for classes.

6. Students want to learn how to create brochures and pamphlets (8 responses).

One of the more insightful suggestions from the focus groups was to incorporate the creation of brochures and pamphlets into the training. The researcher completely overlooked these basic skills when developing the desktop training modules. Yet, the vast majority of students who end up in the interpretive field will be required to create

some sort of brochure for their site. Students identified the importance of these skills, strongly suggesting that they be taught in future sessions.

I think brochures would be very helpful, because anywhere we go for a job, they always want brochures and people always use brochures. It's a lot different than making a sign panel.

The poster was fun to make, but it was something that we were definitely all capable of and we didn't need to prove it. I had a few job interviews and every single person asked me if I knew how to make a pamphlet.

Brochures and pamphlets definitely should be incorporated into future desktop publishing training. These skills would help a student be a more successful interpreter after graduation. After the basic page layout and graphic editing training, a lab session should be taught that is devoted just to creating brochures. This would help students acquire the unique formatting skills they need to develop a successful brochure, while allowing them to review previous skills.

Desktop Publishing Module: Subjective Skills Development Analysis

Like the digital presentation module, students were given a “Skills Development Questionnaire” before each focus group, where they indicated their perceived skill level before participating in the technology training and after participating in the training. The skill level was based on a 10-point interval scale, with 1 indicating no skill at all and 10 indicating a mastery of the technology. The results of this survey are reproduced in Table 4.

Table 4: Results of Desktop Publishing Skills Development Questionnaire

	Average skill rating	Highest individual skill rating	Lowest individual skill rating	Total number of responses
Page layout: Before training	2.5	7	1	17
Page layout: After training	8	10	6	
Page layout : Total change	5.5			
Graphic editing: Before training	2.5	7	1	17
Graphic editing: After training	7.5	10	5	
Graphic editing : Total change	5			
Scanners and digital cameras: Before training	4	9	1	14
Scanners and digital cameras: After training	8	10	6	
Scanners and digital cameras : Total change	4			

With page layout software, which included programs such as QuarkXpress and Microsoft Publisher, students believed that they had improved their skills by on average 5.5 ranking points. With graphic editing software, like Paint Shop Pro and Adobe Photoshop, students believed their skills had improved by an average of 5 ranking points. Both of these categories represented a subjective gain in skills of at least half of the entire continuum. Skills using scanners and digital cameras, which were not emphasized to a great degree in the modules, still improved by a subjective 4 ranking points.

Again, these subjective improvements cannot be compared to what students actually gained. However, it is apparent that participants believe they have acquired a significant number of skills from the training module. This reveals the importance of the desktop training module to interpretation students. It also possibly indicates a relatively high comfort level using the skills, although the average skill rating for each category after the training (8 for page layout, 7.5 for graphic editing, and 8 for scanners and digital cameras) is somewhat lower than the PowerPoint questionnaire result of 9.

Objective 5:

Determine which computing skills are currently most used and valued by professional interpreters and their supervisors.

To enhance the quality of training in the future, the instructors must possess a realistic and current view of how computer technology is being used in the interpretive profession. The final objective of the Interpretive Technology Project guided the development of an e-mail survey that was sent to professional interpreters and supervisors responsible for hiring interpreters. The survey consisted of two primary sections. First, participants were asked how technology is currently being used at their sites in terms of specific skills and access to certain hardware. Second, participants were asked to rate specific technology skills on their importance to the interpretation job. Based on the results from these two categories, the training modules will be reshaped to better fit the expectations and desires of interpreters and supervisors who ultimately hire students after graduation.

Survey size and response rate

In total, 657 e-mail questionnaires were sent out to potential participants in interpretation-related organizations and agencies identified in Table 2. A major limitation encountered in e-mail surveys is the reliability of the e-mail address lists available. People change their e-mail addresses so often that the lists are frequently outdated. Due to this challenge, 224 of the original questionnaires were either undeliverable or indefinitely delayed. The actual initial sample size for the study, therefore, was 433 potential participants.

However, this number does not accurately reflect the final sample size. To obtain a general view of the interpretive profession as a whole, the researcher strove to distribute the survey to as broad of an interpretive audience as possible. In the introduction of the survey, participants were encouraged to send the questionnaire to other people that might be interested in the study. Since the additional number of sent surveys is unknown, the sample size is truly amorphous.

By the deadline date of April 18, 2002, 232 questionnaires had been returned. If compared to the initial sample size, the response rate was nearly 54%. However, the actual sample size is larger than the initial by an unknown amount, which means the actual response rate is lower than 54%. Due to time constraints, a follow-up message to encourage more responses was not sent out.

The absolute response rate was not a critical factor in the survey. The survey was designed as an exploratory analysis to obtain an inexpensive approximation of the truth. Biases introduced through non-probability sampling and the e-mail survey method already limits the ability to generalize this data to the entire population. As an

exploratory study, the survey produced viable results from a variety of interpretation professionals. This provides a general view of technology in interpretation, although the specific percentages may not exactly represent the entire profession.

Results and Recommendations

Close-ended Survey Question Results

Both closed-ended and open-ended questions were incorporated into the e-mail questionnaire, which required different methods for analysis. The results of the close-ended questions were much simpler to quantify since scoring had been built into each question. The following section lists the results of each close-ended question on the survey.

Question #1: How do interpreters currently use computers at your site?

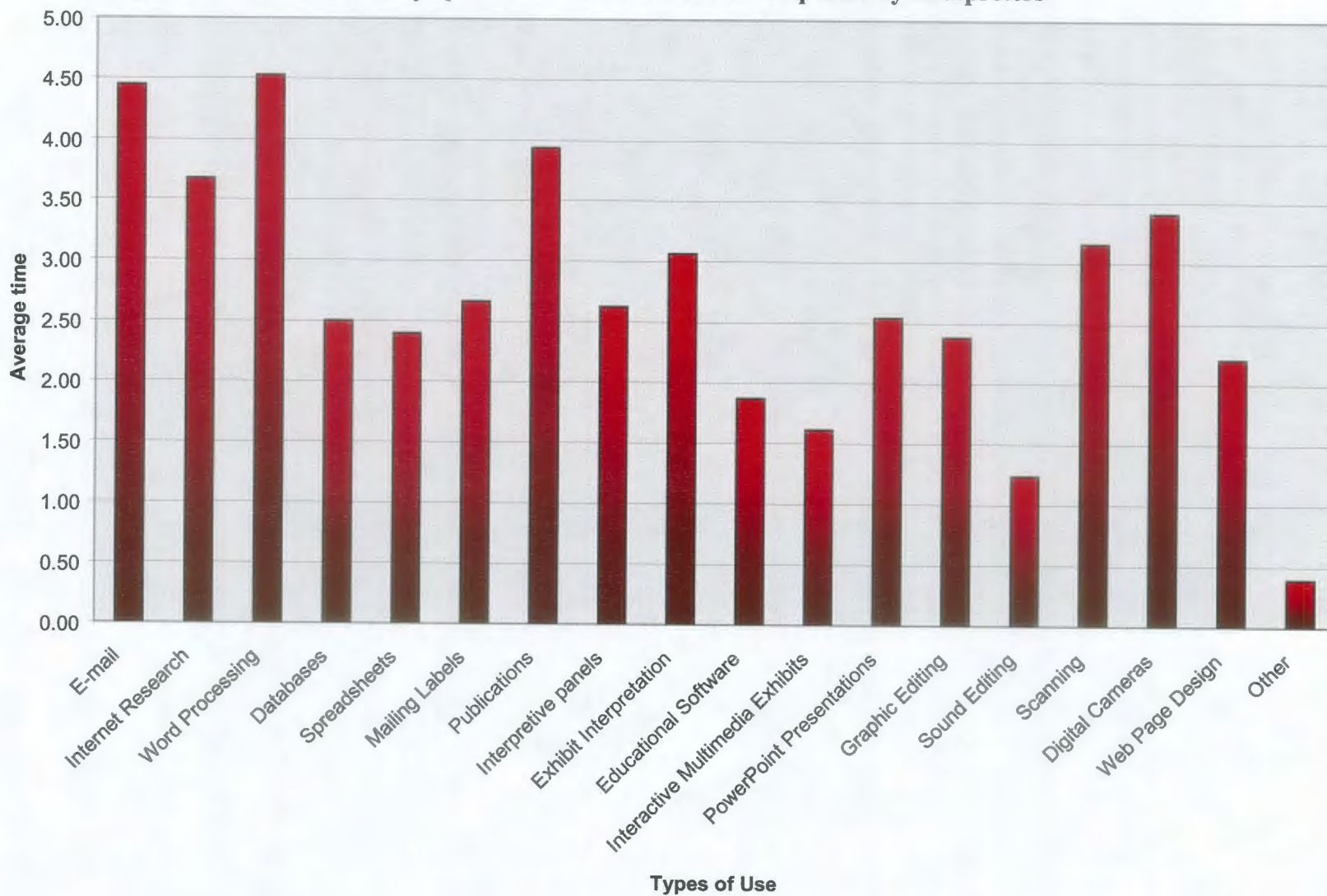
The first question asked participants to rate their use of computers based on how much time interpreters spent doing specific tasks. The question included a list of tasks that ranged from e-mailing to creating brochures to using digital cameras. Participants rated each task using a 5-point ranking continuum. A rating of 1 meant that very little time was spent on the task, while a 5 indicated that a great deal of time was devoted to task. For each task, the average of all responses was calculated. The results of this question are included in Figure 16.

What do these results indicate about the use of computer technology by interpreters? Confirming previous assumptions, e-mail and word processing are the most

common uses of computers, both scoring about 4.5 on the ranking continuum. With few exceptions, an e-mail survey sent to a professional in nearly any field would likely result in the same uses. Following closely in third place, however, are tasks more unique to the interpretation profession. "Creating brochures, posters, newsletters, and other publications" had a score of almost 4 on the ranking scale, indicating that a relatively large amount of time was spent on these activities. Both page layout and graphic editing skills are essential components of designing publications.

Other tasks that interpreters spend an over-average amount of time doing (categories that ranked over 3) include Internet research (3.7), digital camera use (3.4), scanning pictures or documents (3.2), and designing interpretation for exhibits (3.1). According to the survey, interpreters spend the least amount of time editing digital sound (1.2), designing interactive multimedia exhibits (1.6), and working with educational multimedia software (1.9).

Figure 16: Results of Survey Question #1 - Current use of computers by interpreters



Question #2: From the choices above, list the top 3 that are the most important for an interpreter at your site to be successful?

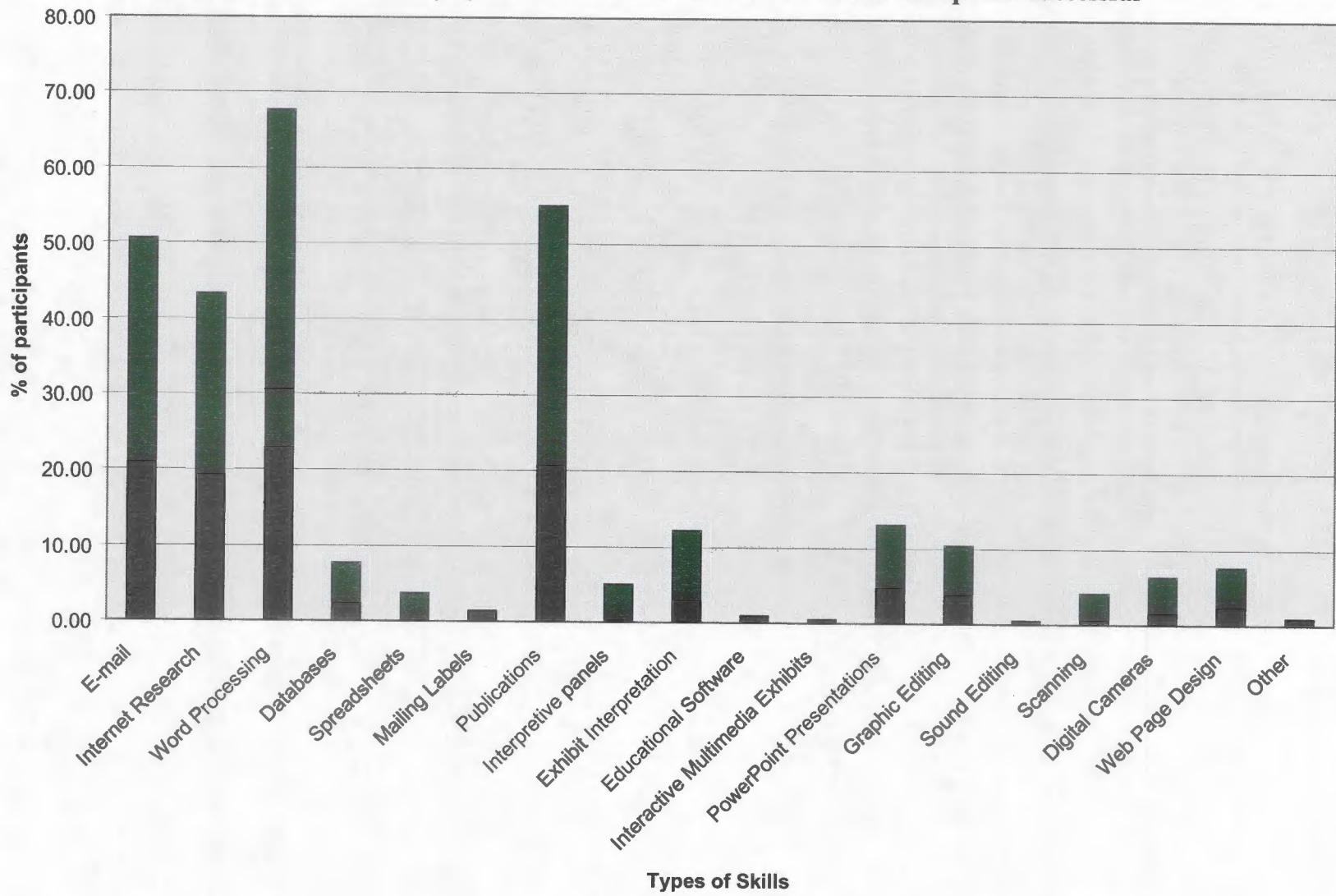
Whereas the first question attempted to obtain factual information about current use, the second question was designed to measure the participants' attitudes. Although the amount of use is important information in itself, it does not necessarily reflect value. For instance, even if e-mail is used a great deal at an interpretive site, it may not be considered an essential skill for success. The interpreters and supervisors were asked which of the skills from question #1 would be most indicative of a successful employee. Participants identified the top three most important skills.

To analyze this information, the responses for each category were summed together and reported as a percentage of the total participant number. The results from this question are included in Figure 17.

Similar to question #1, word processing skills were by far the most important for the success of an interpreter, indicated by nearly 70% of the participants. The second highest rated category was publication design, included by 55% of the participants. E-mail skills at 50% dropped down to the third highest level, followed closely by Internet research at 43%. Although e-mail seems to be used more by interpreters according to question #1, the ability to design publications is a more important skill in regards to success on the job.

A significant gap is evident between the top four success skills and the rest. From the highest to the lowest response rate, the next skill after Internet research (43%) was creating PowerPoint presentations, though only 13% of the participants believed this was important. Exhibit interpretation (12%) and graphic editing (10%) shared similar

Figure 17: Results of Survey Question #2 - Skills that would make an interpreter successful



response rates. Again, sound editing (.5%) and interactive multimedia exhibits (.5%) were considered to be the least important skills.

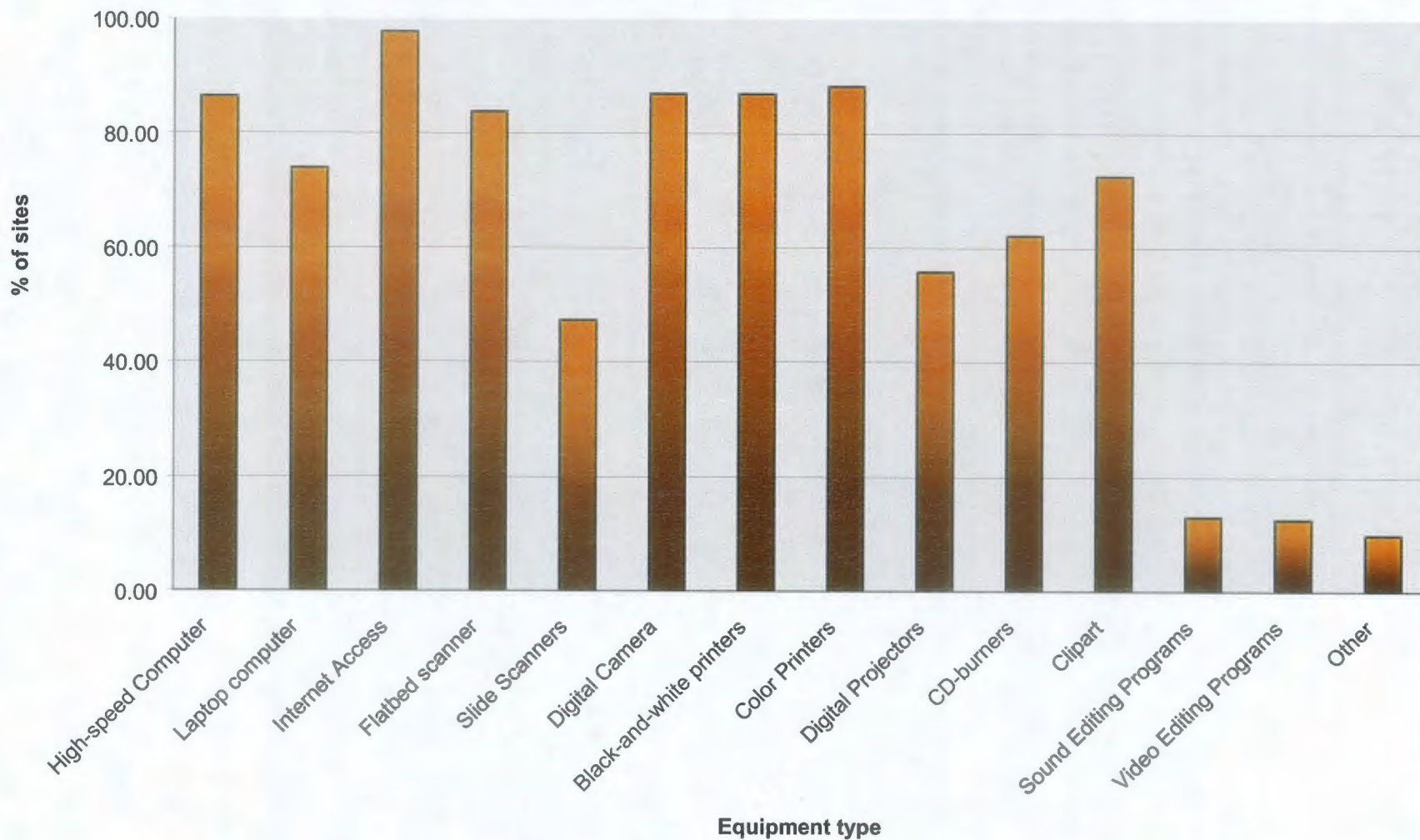
Question #3: What type of computer technology equipment do you currently have access to at your site?

The next question moved away from attitudinal inquiry and back to the factual information, which hopefully required less thought. The researcher wanted to find out what technology equipment interpretive sites have access to. In a university setting, advanced, high-quality technology is often readily available to students. As part of this project, for example, an interpretive technology lab was constructed with scanners, digital cameras, colored printers, and other advanced computing hardware. However, this type of setting may not accurately represent the technology available at real interpretive sites.

Participants were again provided with a list of options that ranged from high-speed computers, to Internet access, to scanners. Instead of a ranking continuum, the answers were dichotomous—either the site had access to the technology or it did not. For each option, the sites that had the equipment were summed together and the results were reported as a percentage of the total number of participants. These results have been included in Figure 18.

Surprisingly, the percentage of sites that had access to technology equipment was much higher than had been previously assumed. In fact, over 80% of the surveyed sites had access to high-speed computers (86%), Internet (98%), flatbed scanners (84%), digital cameras (87%), black-and-white printers (87%), and color printers (88%).

Figure 18: Results of Survey Question #3 - Current access to computer equipment



Over 50% of the sites had additional access to laptop computers (74%), digital projectors (56%), CD-burners (62%), and clipart disks (73%). Only sound editing programs (13%) and video editing programs (13%) were in less than 25% of the sites.

Before the survey was sent out, it was assumed that the percentages for all categories (besides Internet access which is usually coupled with e-mail) would be much lower. These peculiar results could be explained by at least two possibilities. First, the results might be biased toward more technically inclined interpretive sites. Since an e-mail survey method was used, in the very least the site needed to have a computer and network access. Sites without any computers were not represented, unless an employee had e-mail access at home. In addition, people working at sites that had technology equipment may have had more of an interest and been more inclined to send back the survey. Although bias is a definite possibility, it was not apparent in any of the other questions.

On the other side of the spectrum, perhaps interpretive sites really do have more access to technology equipment. The computer revolution has transformed the way people work. As technology continues to grow and become more important to people's lives, businesses and other professions invest in these new "essential" components. The interpretative profession has also been following this trend for many years. Although the percentages may be a bit higher than the actual profession in general, it is likely that many interpretive sites now have access to a wider variety of technology than they may have had even a few years ago.

Question #4: Listed below are computer skills that we are currently teaching in our interpretive courses. On a scale of 1 to 5, please rank these skills based on their importance to an interpretation job.

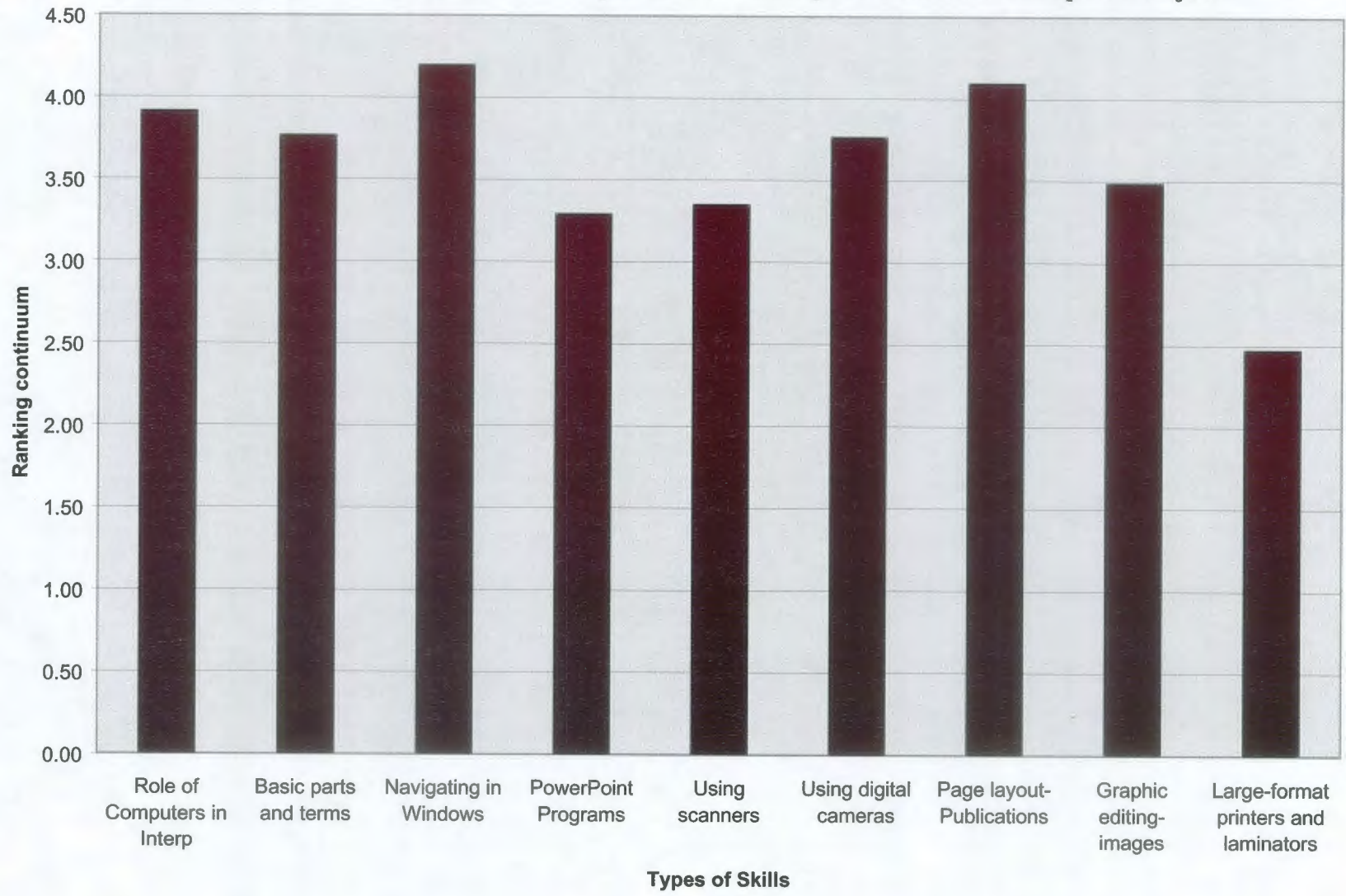
The fourth question again asks participants to make a value decision. The participants were provided with a list of skills taught in the two technology training modules. They were then asked to rate each skill based on how important it would be to an interpretation job. In essence, the instructors wanted to determine if professional interpreters and supervisors valued the skills being taught in the training modules. The results would provide a general overview of skills that the participants believed were most important.

Each skill was rated on a ranking continuum, with 5 being skills that were essential to an interpretive job and 1 being skills rarely needed on the job. All of the responses for each skill were averaged together and reported. The results are included in Figure 19.

The results from this question were very encouraging. An importance rating of 3 would have been about average, where half of the participants believed it was a more important skill and half believed it was a less important skill. Overall, every skill was rated as having an above average importance (higher than 3) except for large-format printing and laminating (2.5), which was not actually covered in any great detail within the training modules.

Skills with the highest importance ratings included “navigating and working in the Windows environment” (4.2) and “learning page layout software to create posters, brochures, and other publications” (4.0). Other skills that were rated as higher than 3.5

Figure 19: Results of Survey Question #4 - Importance of training module skills to interpretation jobs



included understanding the role of computers in interpretation (3.9), knowing the basic parts and terminology of computers (3.8), using digital cameras (3.8), and learning graphic editing (3.5). Using scanners (3.4) and creating PowerPoint presentations (3.3) were considered less important skills than the others.

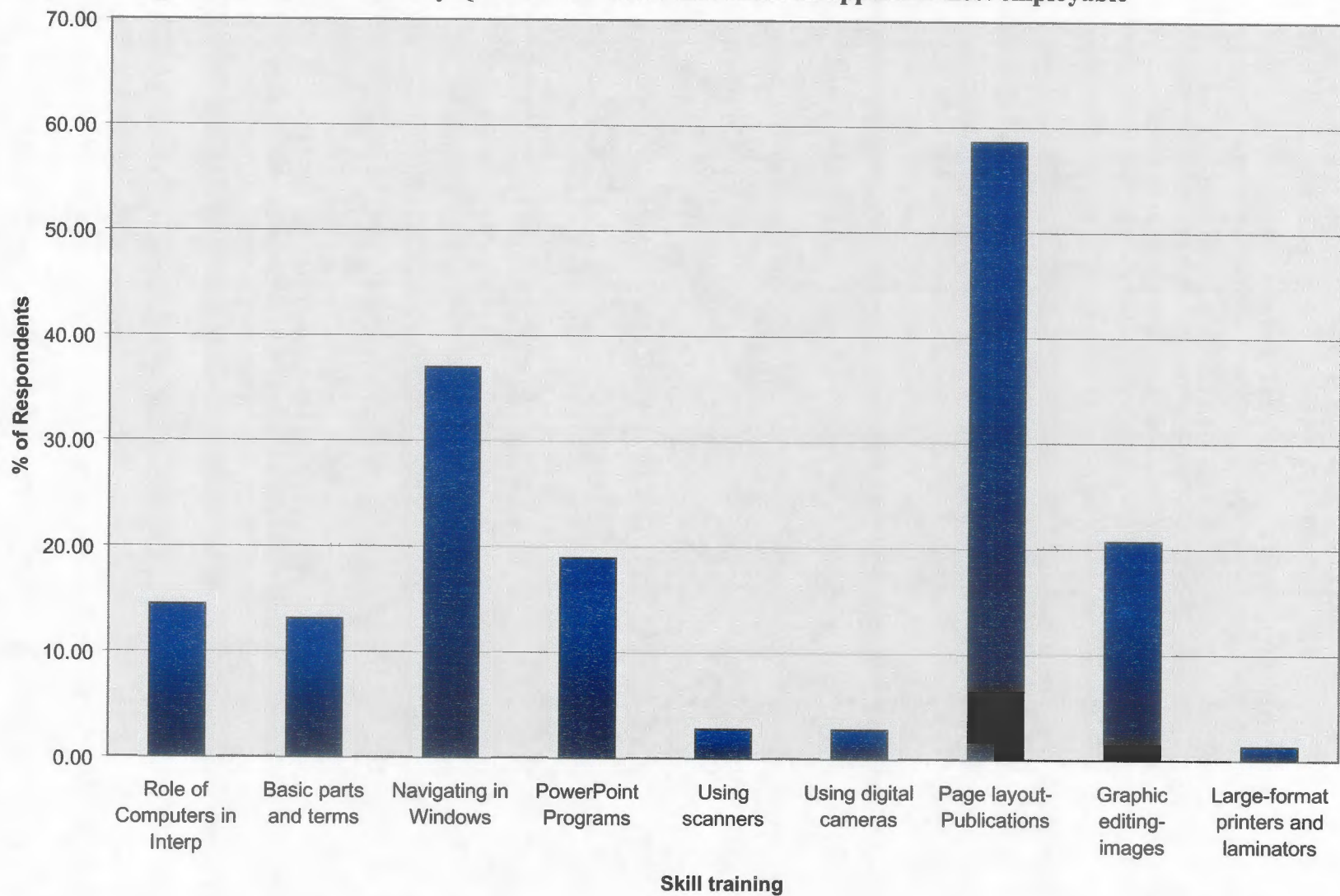
Question #5: From the choices above, list the top 1 or 2 skills that would make an interpretive student most employable in the interpretive profession?

Participants were asked to choose the most important skills from the list provided in question #4. In some cases, it was very easy to see which skills the participants valued the most. The top two highest rated skills in terms of importance were identified from the previous question. However, other participants may have rated every skill with the same importance, which are viable responses. The researcher wanted to know which skill or skills were particularly important to an interpretive job. Therefore, the question was phrased as which skills would make a student most employable after graduation. The results of this question would be vital to shaping the training modules of the future. Students should be taught the skills that employers in the field are specifically looking for.

The number of responses for each skill was summed together. These summations were reported as percentages of the total participant number. The results are included in Figure 20.

After reviewing the results of the other questions, it was no surprise that page layout skills were by far the most important to make an individual more employable. Nearly 60% of the participants included page layout in their top two skills. In addition,

Figure 20: Results of Survey Question #5 - Skills that make an applicant most employable



although only 20% chose graphic editing as one of the top skills, many participants insightfully responded that both page layout and graphic editing skills are needed to successfully create publications. A limitation of the questionnaire was the separation of these categories. If they had been combined, it is likely that both page layout and graphic editing would have been chosen by well over 50% of the participants.

The next skill rated as highly important was working and navigating in Windows, selected by nearly 40% of the participants. Although this might seem like a rather basic concept, a surprising number of college students do not understand functions such as opening programs, creating new folders, organizing information, or working with disk drives. Since there are no national standards defined for computer science, students of varying technological abilities are entering university courses. According to this survey, professional interpreters and supervisors feel that these basic skills should be an essential component of the training.

If graphic editing and page layout are combined, another gap exists between the highest-rated skills and the rest. The third most important skill is creating PowerPoint programs, though only about 21% of the participants chose it. Understanding the role of computers in interpretation (14%) and knowing the basic terminology and parts of a computer (13%) were selected just slightly less than PowerPoint. Using scanners (3%), using digital cameras (3%), and learning about large-format printers and laminators (1%) were the least important for being hired in an interpretive position.

Close-ended Survey Question Recommendations

Based on the results of the close-ended questions, recommendations will be made to revise the technology training modules in future interpretation courses. These revisions will make the training more applicable to the actual interpretive profession by providing students with the skills that will make them better and more efficient interpreters, and more employable after graduation.

1. Incorporate technology training modules into future courses:

In general, professional interpreters and supervisors believe the skills being taught in the training modules are important to the interpretive profession. When asked how important these skills were, participants rated each category above average, except for learning about large-format printers and laminators. According to these results, the teachable skills identified in objective #1 seem to reflect what people in the interpretive profession deem to be important. Therefore, the initial training module skills were chosen well.

In response to these results, technology training in the future should continue to incorporate the original skills, which include page layout design, graphic editing, Microsoft PowerPoint, scanning, digital cameras, file management in Windows, and computer basics. Since most sites do not have access to large-format printers and laminators, training should be limited for this equipment.

2. More comprehensive training in desktop publishing:

A common thread that ran through nearly every close-ended question on the survey was the importance of solid page layout and graphic editing skills to create publications. According to the results, creating publications was the third most common use of computers at interpretive sites, topped only by word processing and e-mail. Participants ranked publications as the second most important skill that makes interpreters successful at their sites. Page layout was ranked as one of the top two most important skills being taught in the training modules, and was by far the top skill that would make an interpreter more employable.

The most important skills to professional interpreters and supervisors in the field are those needed for designing and creating publications. As many identified on their questionnaires, a successful publication depends on both page layout and graphic editing skills. A greater emphasis should be placed on desktop publishing skills in the future. More time should be devoted to specific software programs that students will likely encounter on the job, including QuarkXpress, Microsoft Publisher, Adobe PageMaker, Adobe InDesign, Paint Shop Pro, Adobe Photoshop, and Microsoft PhotoDraw. However, since developing solid skills in every individual program would be impossible in the course, students should be taught the general page layout and graphic editing concepts that the programs share. General skills would be more applicable to the wide variety of software found within the profession.

3. Continue training in using technology equipment:

If students do not have access to technology after graduation, the time spent in the training modules would have been wasted. This was one of the major concerns of incorporating more technology training into interpretation courses. Should students be taught about technology that they would likely not have access to in the real world? According to the results of this survey, however, the majority of interpretive sites do have access to the technology taught in the training modules. Skills in using scanners, digital cameras, printers, and other equipment should continue to be incorporated into future training.

4. Require students to know computer basics:

Besides desktop publishing skills, another concept was common to nearly every question: computer basics. The most common uses of computers at interpretive sites were word processing and e-mailing, which are both considered to be basic computer skills. Word processing topped the list for skills that would make an interpreter most successful at the site, while e-mail and Internet research took the third and fourth positions. All three of these skills fall under the basic computer skills category. Working and navigating in the Windows environment, another basic skill, was the most important concept being taught in the training module, while understanding the basic parts and terminology of computers followed closely behind as the fourth most important concept. Finally, working and navigating in Windows was only second to publications as the skills that made applicants most employable at an interpretive site.

Interpreters and supervisors truly value basic computer skills and view them as essential components of the profession. On one hand, these results might reflect the type of people responding to the survey. Most participants would be part of generations that did not grow up with computers. With the rapid rise of technology in the workplace, perhaps the participants would like to have received this basic computer training themselves. Most students graduating today have never known a time without computers. Since technology has become so interwoven into society, students likely already have an understanding of basic computer skills.

On the other hand, computer basics training is still a major concern even with the technologically inclined generation of today. As explained in previous sections, without national standards governing the teaching of computer science, students entering the university are at a variety of skill levels. Some received an integrated training in word processing, databases, Internet, e-mail, and even PowerPoint, while others have received little or no training at all. This makes teaching advanced skills, like the digital presentation and desktop publishing modules, very difficult.

Students need to have a working knowledge of computer basics if they are going to succeed in the interpretive profession or nearly any other career. However, incorporating this basic training into the interpretive courses can not only take time away from the more advanced and unique skills, but also take time from their primary purpose of teaching interpretive skills, a detriment to both students and the program alike. One solution to this problem is to utilize other courses already offered by the Information Technology (IT) program. Students may be required to take certain basic computing courses before enrolling in the interpretive courses.

However, as more students enter the university at higher skills levels, the time devoted to these basic computer courses might be better spent elsewhere. A unique solution is already in place at Northern Michigan University (NMU). Dr. Jean Kinnear (2002) instructs two interpretation courses at NMU, which require students to produce publications and a PowerPoint presentation. As a prerequisite of the course, certain competencies are required instead of actual computer courses. Students need to have competency in computer presentation and desktop publishing skills. According to Kinnear (2002), students can gain these competencies through self-learning, using tutorials or the Help screens, or by taking NMU computer courses.

Desktop publishing and digital presentation skills training should still be integrated into the interpretive courses at UWSP. Many of these skills need to be honed for their unique use in an interpretive setting. However, students need an understanding of basic computer skills, such as word processing, e-mail, and Internet, before they participate in the training modules. Future interpretive courses should include a basic computing competency requirement that students can achieve through other courses or self-learning. Overall, this requirement would provide students with the basic technology skills they will need after graduation, while allowing the training modules to run more smoothly.

5. Less concentration on digital presentations:

Finally, although professionals believed that digital presentation skills were important for an interpretation job, only a few thought that these skills were among the most vital. Participants ranked the current use of PowerPoint presentations as below

average, and only one in ten professionals believed digital presentation skills were necessary for an interpreter to be successful. Just over 50% of the interpretive sites had access to digital projectors, a necessity for presenting PowerPoint programs. Less than a quarter of the participants listed PowerPoint skills as making an applicant more employable.

Participants did not value digital presentation skills as highly as the other choices. The current trend seems to indicate that digital presentations are replacing the traditional 35-millimeter slideshows. However, this change seems to be occurring much slower than was previously assumed. The high cost of digital projection technology and the complexity of working with the equipment may be limiting the use of PowerPoint at many interpretive sites. The lower resolution of digitally projected images may also be a factor. Digital presentation skills are important to sites that have access to the technology, and as indicated by many participants, these skills will probably be even more important in the future.

Microsoft PowerPoint should continue to be taught in the technology training modules. However, since these skills are less valued by future employers, less emphasis should be placed on PowerPoint skills as compared to other skills, like desktop publishing.

Open-ended Survey Question Results

The last two questions on the survey were open-ended, allowing participants to provide a variety of suggestion and opinion responses. Because of the highly variable responses, the results of the open-ended questions were difficult to quantify. A coding

method, similar to the one used for the focus group results, provided a means for grouping similar responses into broad categories. These broad categories were then subdivided into more specific categories. The importance of a category was rated on the number of responses that related to that topic. The most important categories were used to formulate recommendations for the technology training modules. The following section lists the results of the open-ended questions on the survey.

Question #6: Are there other advanced computer skills that students should be learning in a college program not included on the list?

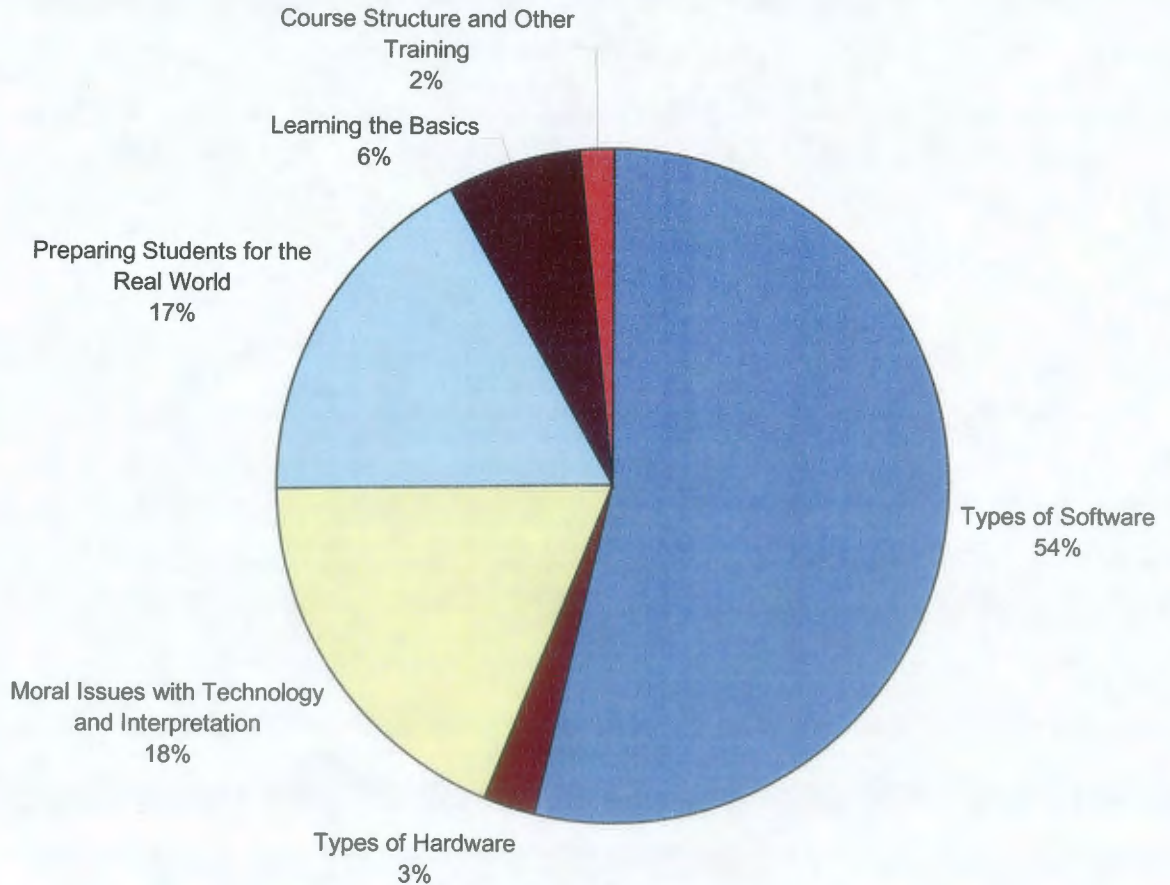
Question #7: Do you have any other suggestions for teaching interpreters/naturalists about using computers and other technology?

Many participants interpreted the last two open-ended questions on the survey as being essentially the same. Initially, question #6 was designed to determine additional skills that students should be learning in the training modules. Question #7 would allow participants to write opinions about issues and concerns related to technology training. In reality, participants included opinion responses and additional skill training in both of the questions. Therefore, the responses from both questions were pooled together and categories were developed for all comments as a whole. The complete listing of broad and specific categories is included in Appendix D.

Six broad categories were identified through the coding process. These categories were comments and suggestions related to types of software, types of hardware, moral

issues with technology and interpretation, preparing students for the real world, teaching the basics, and course structure/other training. Overall, 395 unique responses were recorded from the open-ended questions. If an individual listed several different suggestions under a question, each was counted as a unique response. Figure 21 visually shows the percentage of response related to each of the major categories.

Figure 21: Other Skills and Issues Identified by Interpretive Professionals: Major Categories (395 responses)

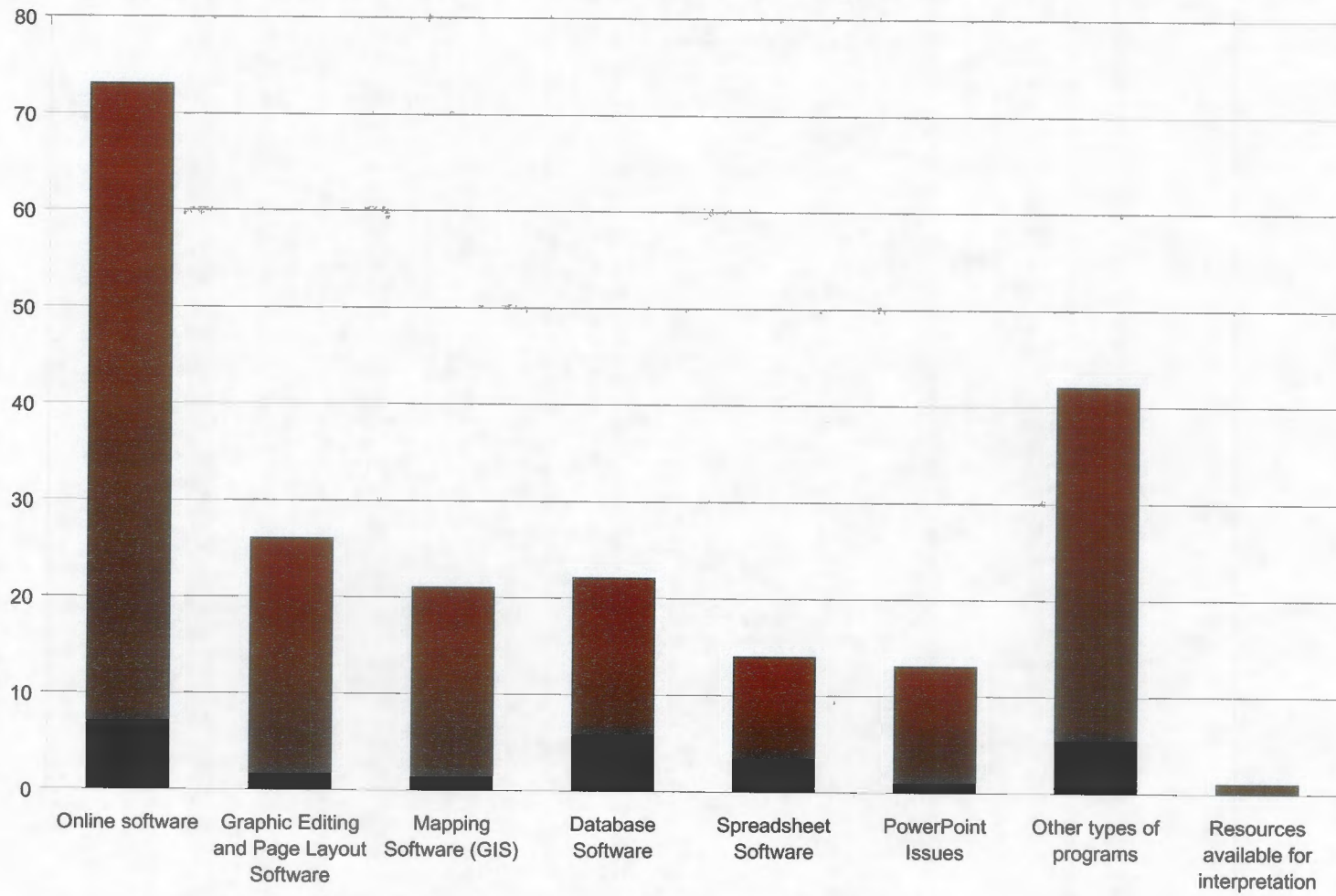


As demonstrated by this chart, over half of the responses were related to the “Types of Software” category (212 responses), indicating software applications that should be incorporated into the training. The next largest category, “Moral Issues with Technology and Interpretation” (73 responses), included comments about some overlying concerns, ideas, and ethics with teaching interpreters about technology. The “Preparing Students for the Real World” category (68 responses) had nearly the same number of responses as the moral issues, but involved specific changes and additions that would better prepare students for entering the interpretive profession. Some of the categories that had fewer responses included “Learning the Basics” (25 responses), “Types of Hardware” (10 responses), and “Course Structure and Other Training” (7 responses). The following section analyzes each category in more detail.

Category #1: Types of Software (212 responses)

The category with the highest number of responses dealt with the general topic of software. In most cases, participants suggested that specific types of programs should be incorporated into the technology training. Other comments were directly related to specific programs being taught in the current modules. This broad category was divided into more specific components, which can be seen in Figure 22.

Figure 22: Subdivided categories of “Types of Software” (212 responses)



The largest subdivision by far was the “Online software” category with 73 responses. This category included topics such as Internet navigation and research, e-mail, and distance learning. However, over half of the responses (42) within the online software referred to the incorporation of web site design and maintenance training. Although only about 8% of the participants believed that web site design was essential for an interpreter to be successful (see results from question #2), many would still like students to have this training.

The second largest subdivision was “Other types of programs” (26 responses), which was really just a miscellaneous category for software that only a few people responded to. For example, word processing (6 responses), multimedia programming (4 responses), and Adobe Acrobat (4 responses) were included among various other applications.

The “Graphic editing and page layout” category (26 responses) was further divided into specific skills and specific programs. Skills included working with digital images, fonts, and brochure design. Specific programs included QuarkXpress, Microsoft Publisher, and Adobe Photoshop. Suggestions to incorporate “database software” (22 responses) and “mapping software” (21 responses) were nearly equal in number.

Although the “PowerPoint issues” category had a rather small response rate (13), it revealed an interesting and dichotomous view of an issue within the interpretive field worthy of further investigation. Responses about PowerPoint were often quite passionate, being either very positive or very negative with little middle ground. Nine of the participants responded that PowerPoint was an important and growing tool for the future. A few positive comments about PowerPoint include:

PowerPoint has almost made slide programs obsolete in many venues. Often times a manager will not know how to put a PowerPoint presentation together and seek someone out who does. The cost of [digital presentations] are still expensive, but once the price decreases, PowerPoint will most likely be used more frequently.

[As the second most important skill], I would choose creating PowerPoint programs, which are becoming more important here as we phase out the traditional NPS [National Park Service] slide show.

Four of the participants represented the other side of the issue. They believed that PowerPoint was an ineffective interpretive tool, and should not be a focus of the technology training. One participant responded:

I personally think the sun is setting on PowerPoint and you shouldn't spend too much time teaching that to people. It has been shown to be a rather ineffective means of communication that generally puts the audience to sleep rather than engaging them. I would not allow my interpreter working for me to use a PowerPoint presentation in a program unless the circumstances were very unusual.

Another participant who also disagreed with the use of PowerPoint offered further insight into the reasoning of this side of the issue.

[PowerPoint] has replaced illustrated talks when interpreters communicate with each other, and in some instances in public presentations. The problem is that the skills that went with the illustrated talks have not been applied. It is a device for reading bullet lists, and no matter how many bells and whistles you attach to it, it's often just a script for the speaker... taking away from rather than enhancing the overall presentation, and standing between information and true interpretation.

This category was not significant in terms of response numbers, but opens up an entirely different area of study. What do interpreters think about using digital presentations? Even with the small number of responses, the apparent dichotomous view is intriguing and warrants future research.

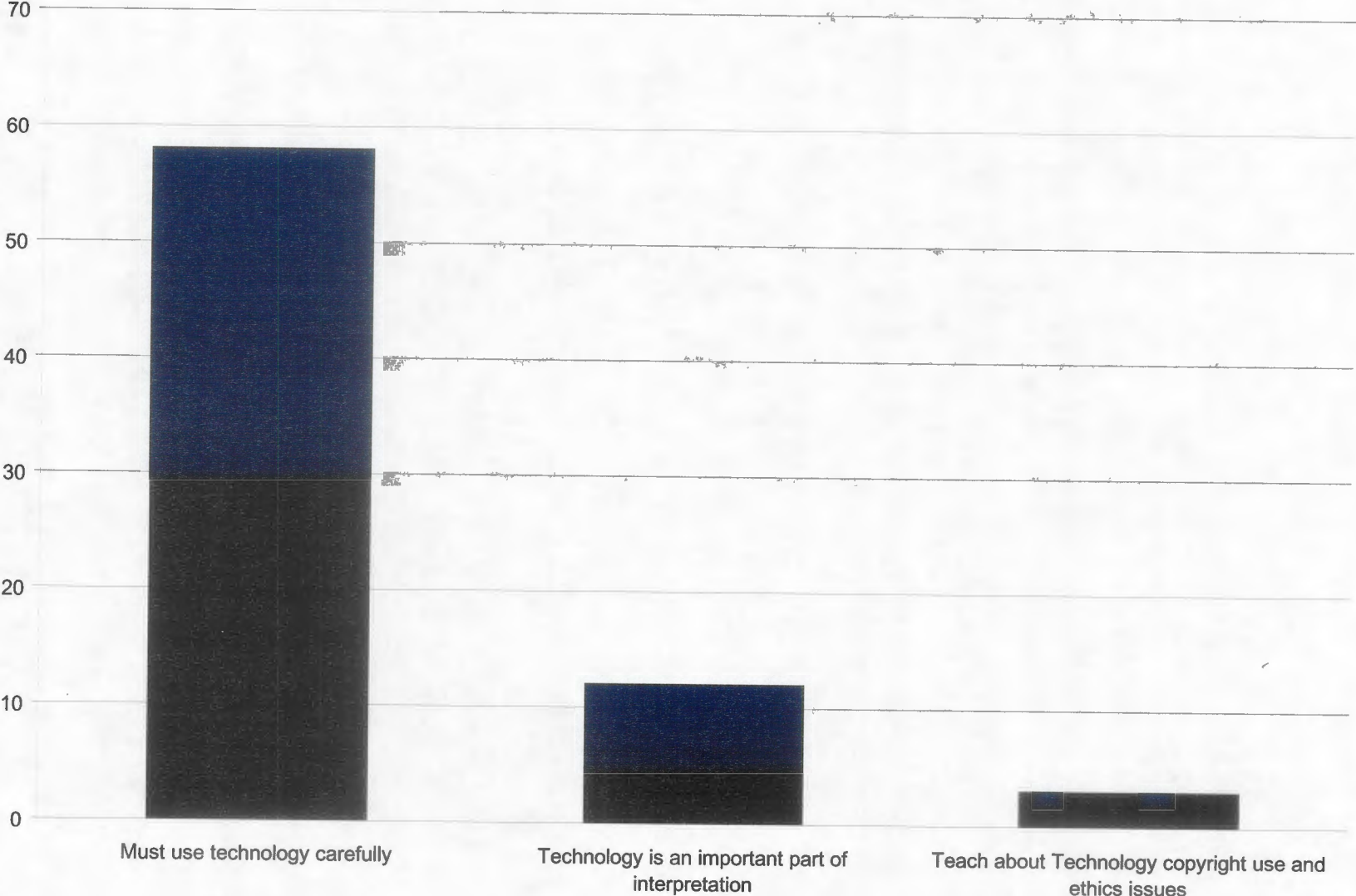
Category #2: Moral Issues with Technology and Interpretation (73 responses)

Some of the most interesting comments and suggestions were placed into the moral issues category. These responses dealt with higher-level concepts that involved the entire technology training experience as a whole. Instead of listing specifically *what* should be taught to enhance the training, these responses dealt with *how* the training should be taught, or even if it should be taught at all. The category was again subdivided into more specific components, which have been included in Figure 23.

Many professionals were very concerned that the technology training could replace the “essential components” of interpretation, like communication, people skills, and knowledge of the audience, hands-on activities, and learning styles. These comments were placed under the “Interpreters must use technology carefully” subdivision, which is the largest specific subdivision within all the major categories (58 unique responses).

Overall, the participants’ comments in this subdivision were related to four primary themes. First, solid interpretive skills are more important than technology. These skills include working with people, communicating effectively, knowing the resource, and being creative. Technology cannot take the place of any of these skills. Second, technology is just one tool of the interpreter. Technology must be used appropriately. Interpreters must understand that it is a means to an end, not an end in itself. Third, technology cannot take the place of real interaction with the site. And fourth, interpreters must balance the amount of time they spend on computers and in the field.

Figure 23: Subdivided categories of “Moral Issues” (73 responses)



A few comments from these participants will illustrate this important subdivision.

Computers are only a tool for interpreters. It's much more important for them to have proper training in interpretation so they can apply the knowledge to their work, whether it requires the use of a computer or not.

Interpreters should not be focusing on computers. They should be trying to get better at communicating with people "live." There is a great savings in the government if all these other necessary jobs can be done in-house, but in my opinion the interpreter should not be sitting at a desk... We are losing human touch with the visitor and the skills that need to be taught are other people skills. I am sitting in a chair right now because I'm on a computer and there are people out in the visitor center that would like to talk to a ranger.

[There] seems to be a steady, gradual shift of younger employees spending enormous amounts of time on the Internet, e-mailing co-workers, or just surfing the computer. If no control is exercised by employees themselves, the computer ceases to be a "tool" and a naturalist's entire day can be lost staring into a computer monitor out of sight and out of contact with nature center or park visitors.

In contrast, responses in the "Technology is an important part of interpretation" subdivision were positive aspects of using computers in the interpretive field (12 responses). Participants who responded in the previous category do not necessarily believe that computers are unimportant, so these two categories are not dichotomous views. Rather, comments in this subdivision specifically referred to the importance of technology. A couple of comments can provide insight into the subdivision.

An applicant's computer skills are of critical importance. In fact, I often have to go outside the agencies to hire/contract work that requires significant computer skills.

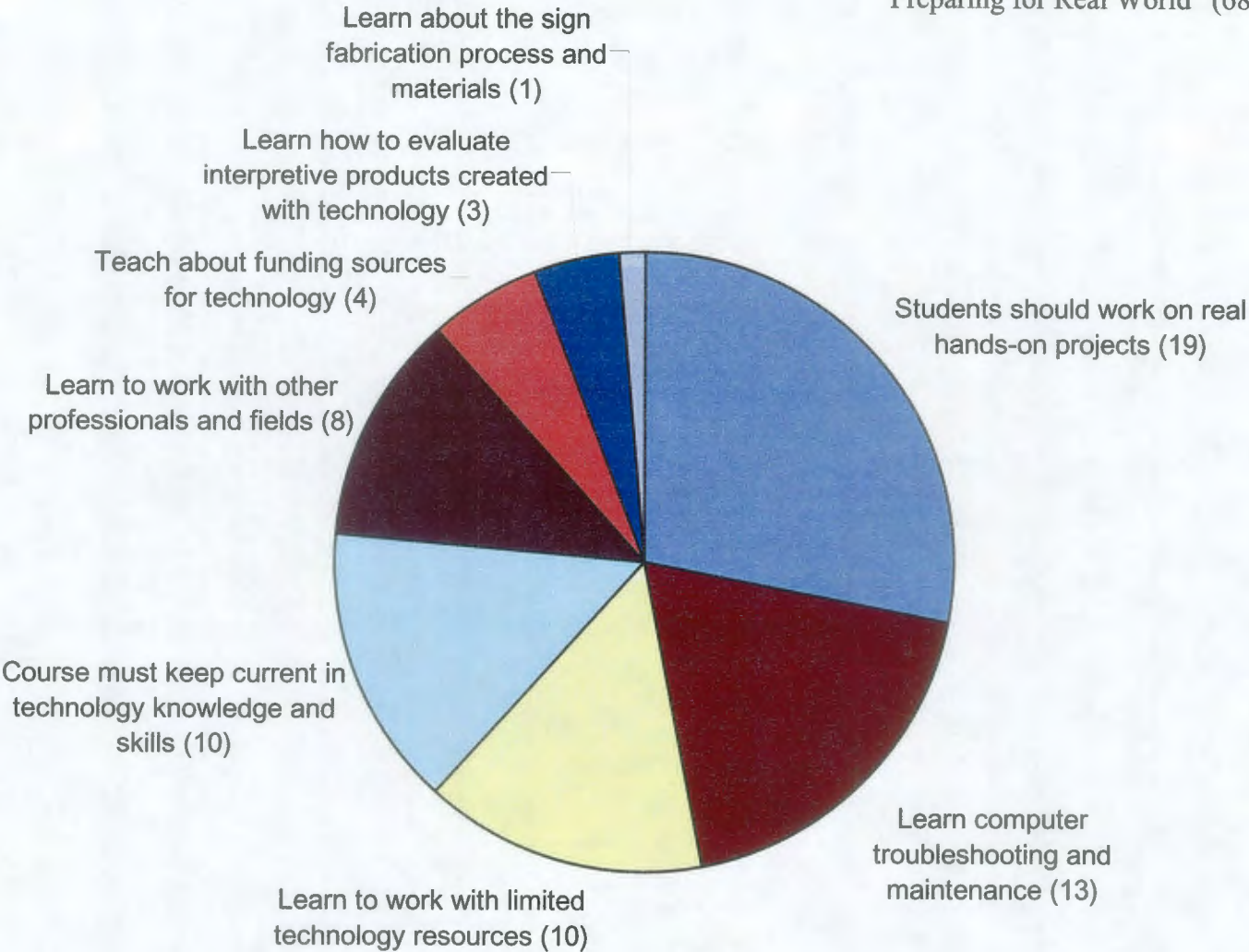
Know your way around a computer---knowing only the flora, fauna, history, and how to tell a story is not enough anymore. All of the information you need, and increasingly the methods of delivery, revolve around computers.

Many more interpreters and supervisors responded with concerns over using technology in the profession than those who commented on the importance of these skills. The comments reveal a unique insight into the topic of technology that might not be such a large issue in other types of professions. As discussed earlier in the document, at first glance, interpretation and technology seem to be rooted in two very different types of worlds. Whereas interpretation is grounded in cultural and natural resources, technology is grounded in fast-paced modern civilization. The participants had a real concern that technology has the potential of taking over rather than enhancing interpretation in the future.

Category #3: Preparing Students for the Real World (68 responses)

Although this category has nearly the same response rate as the moral issues, it is actually divided into many more subcategories that artificially enlarge the general category. Suggestions in this category were not related to specific software or hardware, nor were they comments about how technology should be taught. Instead, these comments included additions and changes to the training that would better prepare students for the real world. The subcategories are included in Figure 24.

Figure 24: Subdivided categories of “Preparing for Real World” (68 responses)



The subdivision with the highest number of responses was the suggestion that students work on real hands-on projects to develop their technology skills (19 responses). According to these responses, students should create some sort of real interpretive product, be allowed to explore the various technology options, and listen to guest speakers. Other participants would like students to learn basic computer troubleshooting and maintenance (13 responses). They reported that many interpretive facilities do not have an Information Technology division, and that interpreters with troubleshooting skills would be invaluable members of the team.

Some interpreters and supervisors responded that students should learn to work with limited technology resources (10 responses). Despite the rather high percentage of access to technology identified by this study (see results of question #3), many interpretive sites still have limited technology resources. Students must be taught traditional methods along with the advanced technology training. The same number of participants believed that the interpretation courses should keep current in technology knowledge and skills (10 responses). They responded that although keeping the classes up-to-date is an important concept, the fast rate of change in modern society could make this very challenging. In addition, a similar number of participants suggested that students learn to work with other technology professionals, like they would probably be doing in the real world (8 responses). The list included vendors, graphic designers, fabricators, marketers, and educators. Only four participants responded that students should learn about technology funding sources, though this is an especially important topic for sites with limited budgets.

Category #4: Learning the Basics (25 responses)

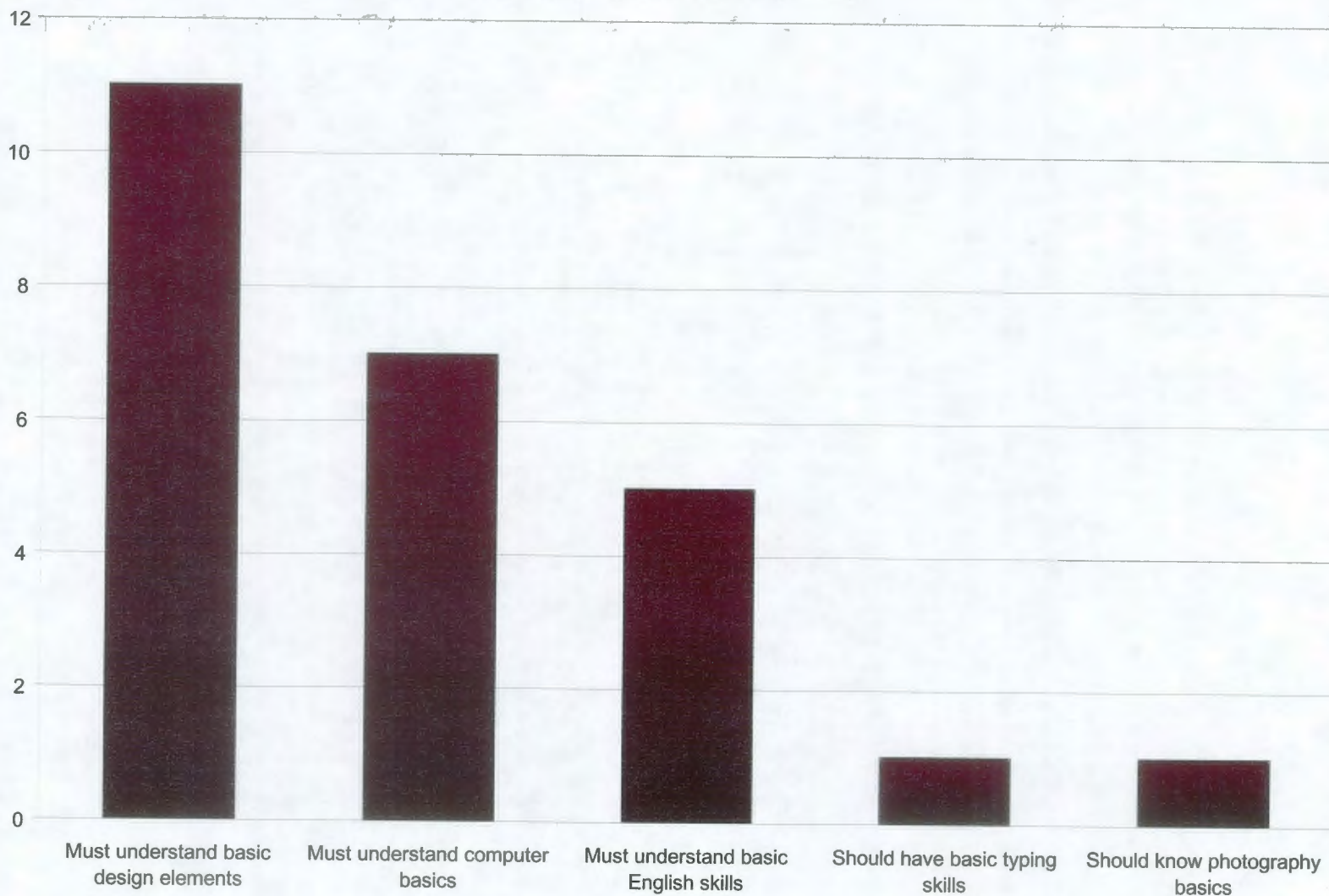
The last three categories represented only about 11% of the total responses, so the results will be described in less detail. The “Learning the Basics” category included suggestions about teaching basic skills instead of the more advanced computing skills. The types of basic skills were diverse, ranging from basic design elements to general English skills. The subdivisions of the category are included in Figure 25.

The largest subdivision included suggestions that students learn basic design elements, such as image use, colors, and fonts (11 responses). Although these elements are currently being taught in the interpretive courses, participants did not have knowledge of other course topics besides the technology training. Participants also indicated that students should understand computer basics (7 responses), which has already been discussed in the recommendations section of the close-ended questions. A few participants responded that students should first and foremost have a solid understanding of the English language (5 responses), which they believe is severely lacking in recent graduates of university programs.

Category #5: Types of Hardware (10 responses)

In contrast to the large response rate of the software category, only a few participants responded that specific types of hardware training should be integrated into the courses. The category was divided into three components: Using networks (5 responses), being familiar with multiple operating systems, like Macintosh and Linux (4 responses), and using digital cameras (1 response). It is apparent that software training is a much higher priority for the participants.

Figure 25: Subdivided categories of “Learning the Basics” (25 responses)



Category #6: Course structure and other training (7 responses)

The final category with only 7 responses included suggestions about the course structure itself, as well as extending technology training beyond university students. The category was divided into five different topic areas. First, workshops should be offered for professional interpreters at NAI conferences or within the agency (2 responses). In addition, a separate course should be dedicated to just the subject of interpretive technology training (2 responses). Finally, training should be required for all permanent interpreters (1 response), training sessions should be an appropriate length (1 response), and the instructor must make computers accessible (1 response).

Open-ended Survey Question Recommendations

By reviewing the comments and suggestions made within the open-ended questions, and by especially focusing on the categories and subdivisions with the highest number of responses, recommendations will be made to revise the technology training at UWSP. Again, these revisions will make the training more applicable to the interpretive profession, by providing students with skills that will make them better and more efficient interpreters.

1. Emphasize that technology is just a tool in interpretation:

The highest number of responses related to a specific topic was an idea that technology would somehow replace the more fundamental interpretative skills. Interpretation is first and foremost a communication process, to reveal the meanings of natural and cultural resources in a way that inspires and educates an audience.

Technology training should never overshadow essential interpretive concepts, such as understanding the audience, communicating effectively, and knowing the resource. As they are currently designed, the technology modules are just one small piece of the entire interpretive training. They are designed to enhance the essential interpretive concepts, not detract from them. As important as it becomes in the future, the technology training must never grow to dominate the other basic skills of interpretation.

Interpretive technology training should never take place in isolation as it sometimes does. It should always be related back to the primary interpretation skills. Students, especially those that have grown up in the digital age, must be consistently reminded that computers are only tools, which can be used to help them achieve their interpretive goals. The foundations of interpretation are the real natural and cultural resources, not virtual computer screens. Although the instructors intuitively understand this concept, perhaps discussing technology issues should be consciously added to the classroom curriculum.

2. Incorporate web site design skills:

As indicated by the results, the specific subcategory with the second highest response rate was website design and maintenance. More and more interpretive facilities are marketing their programs and interpreting information online. The Internet opens up a vast worldwide audience, connecting people in ways that were never even considered a few years ago. The interpretive profession is already realizing the value of this new medium of communication.

According to the high number of responses, interpreters with web site design skills are highly valued by agencies and organizations. In the near future, web site design training should be incorporated into the interpretive courses at UWSP. Effective web sites have the same basic design elements as other interpretive products students are currently required to create, including posters, sign panels, brochures, and illustrated presentations. These elements can easily be incorporated into web page design using a “digital page layout” program like Microsoft FrontPage. Certain components unique to web pages, like links, scroll bars, and layout tables, could be taught in a lab session. In a digital age, students should be learning the newest interpretive medium.

3. Consider the possible incorporation of database and mapping software skills:

A significant number of responses also suggested that database and mapping software skills be integrated into the technology training. These are lower priorities according to the response rate, but may be important considerations in the future. Interpretive facilities utilize databases to organize budgets, store the addresses of members, create mailing labels, keep natural and cultural history inventories, and organize a variety of other information. Mapping software, like GIS (geographic information system) and ArcView, as well as mapping equipment, like GPS (global positioning system) units, are frequently used by interpreters for creating trail maps, analyzing biological or historical data, and designing interpretive media that accurately reflects the site. These skills could be integrated into the interpretation courses, but would probably be better taught in separate courses.

4. Continue to provide students with real hands-on projects:

The highest response category within “Preparing Students for the Real World” was to provide students with real hands-on projects. Currently, students in the Signs, Trails, and Waysides and Environmental Publications courses are required to complete a final project for a real agency or organization. This encourages students to use their technology skills on a project that will be reviewed by a real client. Another suggestion within “Preparing Students for the Real World” is that students work with other professionals. By doing these projects, students need to communicate with their clients (often professional interpreters or supervisors), with scientists or historians that know about the resource, and with fabrication companies to obtain price quotes on various materials. For students to get this important real world experience, these types of projects should continue to be incorporated into future courses.

5. Continue to teach basic design elements:

Within the “Learning the Basics” category, the highest response category was that students must understand basic design elements. Again, these skills are already being taught in the Signs, Trails, and Waysides and Environmental Publications courses. Design elements form the foundation of an effective interpretive product. The technology training modules should strive to emphasize not only learning computing skills, but also using those skills to create a balanced, unified, and visually appealing product. Essential design skills should continue to be taught in future interpretive courses.

6. Require students to know computer basics:

This recommendation is shared with the one already identified in the previous recommendation list (see close-ended question recommendation #4). Overall, a solid understanding of computer basics would achieve some of the suggestions that received a higher number of responses. For example, the second highest response division in the “Learning the Basics” category was that students needed to understand computer basics. In addition, the second highest category in “Preparing Students for the Real World” was learning computer troubleshooting and maintenance. A solid understanding of computer basics would allow students to troubleshoot many of the simple problems encountered when using computers.

7. Teach students to use traditional methods:

Although this suggestion is represented by fewer responses than the others, it is still an important concept for the technology training. Ten participants in the “Preparing Students for the Real World” category suggested that students should learn to work with limited resources. The university setting, which provides access to a wide variety of high-quality technology, may produce a false assumption that all interpretive sites have these options. Many facilities simply do not have access to even the basic technology equipment (like a scanner) that students currently use routinely to complete projects.

In some cases, traditional methods of page layout, graphic editing, or illustrated talks might be more appropriate. In situations where an employer believes that PowerPoint is an ineffective medium, for instance, students may be required to present a 35-millimeter slide show, regardless of the technology available. Due to these

challenges, students should be taught traditional methods along with the more advanced computer skills. As identified in the focus group results, the reincarnation of the 35-millimeter slideshow training would be a valuable asset to students. Today, nearly all interpretive sites have or at least can get access to a computer. However, not all sites will have access to the more powerful page layout programs like QuarkXpress, Adobe Pagemaker, or Microsoft Publisher. Students should be encouraged to create posters, newsletters, and sign panels using more simple programs like Microsoft Word, Microsoft PowerPoint, or WordPerfect. These programs can be used to create effective and successful publications.

Conclusion

After overseeing the construction of an Interpretation Computer Lab, developing two comprehensive technology training modules, conducting focus groups with students to determine the effectiveness of the training, and sending out a survey to professionals in the field to discover the most important technology skills, the researcher is left with a final question; did this project reach the goals it had set out to accomplish? The primary goal of this project, as stated in the beginning of the document, was to develop computer training facilities and course modules for environmental education/interpretation students at UWSP, which will improve the students' interpretive techniques and enhance the efficiency of their work.

Overall, this project has made major progress toward achieving the primary goal. In regards to training facilities, the computer lab in the Schmeckle Reserve Visitor Center is an incredible resource for students and instructors in the interpretive program.

The modern equipment and software provide direct hands-on learning opportunities. Students are able to use this technology to design, develop, and fabricate high-quality interpretive products all within the specialized computer lab. The training facility is a major asset not only to the environmental education and interpretation program, but also to the entire College of Natural Resources as a whole.

Beyond having facilities available for student use, training modules were developed to teach students technology skills that will be important to their future careers. The digital presentation and desktop publishing training sessions were well received by the students. As revealed through the focus group discussions, students enjoyed learning about technology, were comfortable using the skills they acquired, and sincerely believed that these skills would be important to their lives after graduation. Both Dr. Michael Gross and Ron Zimmerman agreed that for students who participated in the training modules, the visual quality of their interpretive products was much higher than in previous years. The positive attitudes of students and the high quality results of their work are very encouraging. It is likely that students will carry these technology skills past graduation and into their future professions.

Although training facilities and courses were developed as part of the primary goal, there are still many improvements that need to be made before students can realize the full potential of the technology training. A series of recommendations were developed from the results of focus group discussions with the students and surveys sent out to professional interpreters and supervisors in the field. Table 5 summarizes and prioritizes these recommendations (a priority level of 1 is the most important). The suggestions should be adopted as quickly as possible to improve the effectiveness of the

technology training, and to further progress toward achieving the primary goal of the project.

Table 5: Prioritized Recommendation List for Improving Technology Training.

Priority	Recommendation	Justification
1	Technology training should be incorporated into future interpretation courses.	Results of both focus groups and the professional survey. Students liked the training experience, and professionals believed the technology skills were important.
1	Purchase more computers for the interpretation computer lab.	Results of lab analysis and desktop publishing focus groups. Hands-on experiences are essential for effective training.
1	Continue to use tutorials as an instruction method.	Results of both focus groups. Students commented frequently about the effectiveness of the tutorials.
1	Digital presentation training should continue to be taught with take-home tutorials, and desktop publishing with instructor-led lab sessions.	Results of both focus groups. The chosen instruction methods were effective for student learning.
1	Develop a more comprehensive desktop publishing training, with more skill development and reinforcement.	Results of professional survey and desktop publishing focus group. Overwhelmingly, page layout and graphic design were the most important interpretive technology skills.
1	Require students to have competencies in basic computer skills.	Results of professional survey. Basic computing skills are essential for success in nearly any profession.
1	Emphasize to students that technology is only a tool.	Results of professional survey. This was the most discussed concern in the survey.
1	Teach students more traditional methods of technology, especially the use of 35mm slides.	Results of digital presentation focus group and professional surveys. Many interpretive sites still do not have access to more advanced technology.
1	Develop a more comprehensive training about digital images.	Students in both focus groups did not understand basic digital image concepts.
1	Incorporate brochure and pamphlet design into the technology training.	Results of desktop publishing focus group. This is an essential skill for interpreters.

2	Incorporate web site design skills into the technology training.	Results of professional surveys. A large percentage of participants believed that these are important skills to possess.
2	Create a colored tutorial lab manual for students to purchase.	Results of both focus groups. Also essential to offset the costs of printing.
2	Extend the hours of the Interpretation Computer Lab.	Results of desktop publishing focus group. Current hours do not fit well in student schedules.
2	Continue to provide students with real hands-on projects.	Results of professional survey.
2	Continue to teach basic design elements.	Results of professional survey.
2	Continue to train students in using technology equipment.	Results of professional survey. The majority of participating sites did have access to advanced technology.
3	Encourage more use of the Interpretation Computer Lab.	Results of lab analysis. Most students currently use the lab just for assignments in the interpretation courses.
3	Purchase more high-speed flatbed scanners for the Interpretation Computer Lab.	Results of lab analysis. Would reduce current bottlenecks with only one computer hooked up to a scanner.
3	Purchase video editing equipment and software.	Results of lab analysis and digital presentation focus group. Could be used to dramatically enhance programs.
3	Develop a more comprehensive training in digital video and sound.	Results of digital presentation focus group. Could be used to enhance programs, but students do not understand basic concepts.
3	Microsoft Publisher should be taught as a lab session, not as a lecture.	Results of desktop publishing focus group. Lecture was not conducive to learning.
3	Set the lab session times before classes begin to avoid schedule conflicts.	Results of desktop publishing focus group. This frustrated some students.
3	Incorporate database and mapping software skills.	Results of professional survey. Many interpreters believed these skills were important.
3	Concentrate less focus on digital presentations.	Results of professional survey. Still some disagreement about the future of illustrated talks.

Computer technology will continue to become more integral parts of our lives in the future. Interpretation is powerful, because it is based in the “real” natural and cultural resources of the planet rather than the “virtual” worlds that computers create. Still, the profession has found many ways of incorporating computers that increase the efficiency of work, and enhance the connections between the interests of visitors and the meanings of resources. Students graduating from a quality interpretive training program, like the one at UWSP, need to learn and use the essential technology skills that will help them be more successful in the field. This project has created a foundation for technology training in the interpretive program at UWSP. It is hoped that the training will continue to improve and expand in ways that will benefit student learning for years to come.

One student in the focus group discussions epitomized this hope when describing her experience.

I really liked these labs. You can have labs that get you through the semester, get you your grade at the end, and you'll forget about them and never go back to the stuff you learned. But I think that these are really something that will continue to be beneficial even after graduation.

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Appendix A
Digital Presentation Module

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Fundamentals of Microsoft PowerPoint



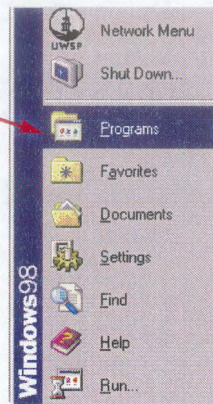
Tutorial #1

Step One: Opening the program

1. Click the “Start” button located at the bottom-left of your screen.



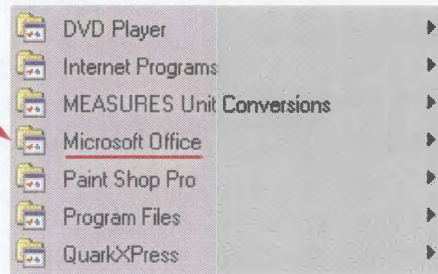
2. On the menu that appears, move the mouse cursor up to “Programs.”



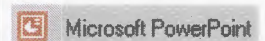
3. On the next menu that appears, look for the “Microsoft PowerPoint” program. If it’s there, click on it.



4. If you do not see the PowerPoint program, move the mouse cursor to the folder called “Microsoft Office”



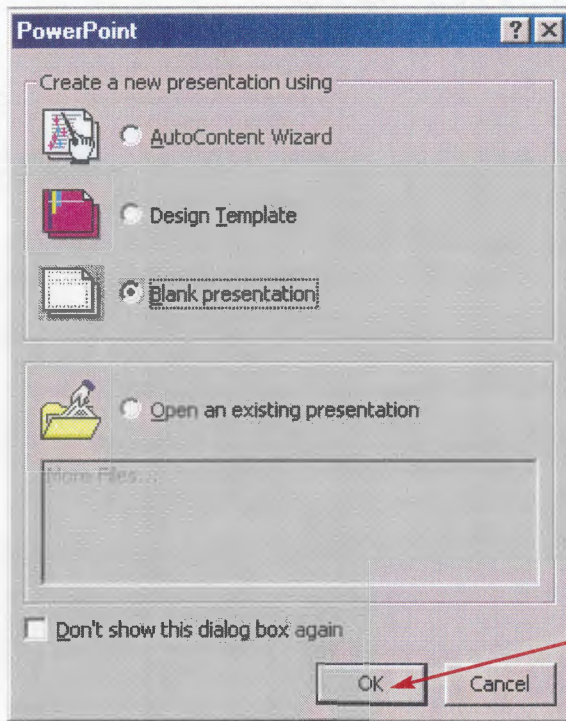
Then, on the next menu, look for the “Microsoft PowerPoint” program and click on it.



5. If you cannot find the “Microsoft PowerPoint” program or the “Microsoft Office” folder, please ask a computer lab assistant to help you.

Step Two: Starting a blank presentation

1. When PowerPoint first opens, a window like the one below will appear.



If you are creating a new presentation, click the "Blank presentation" option.

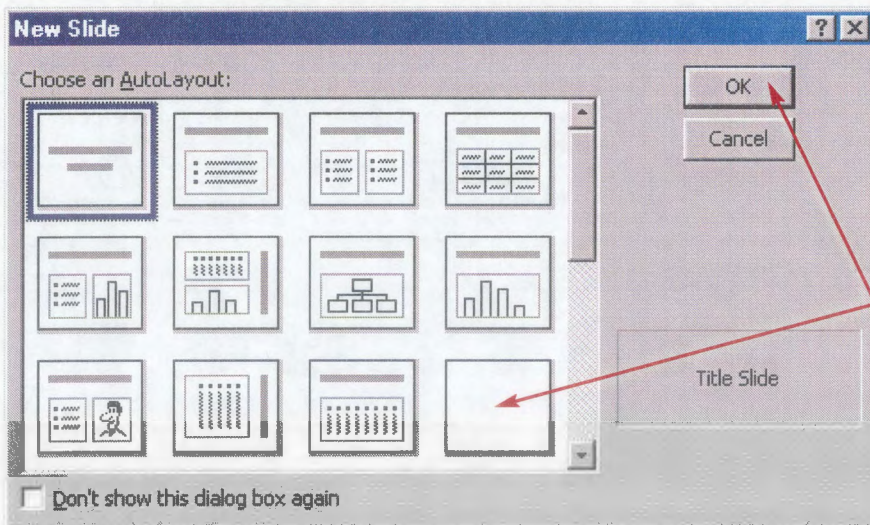
If you are loading a presentation that you already created, click the "Open an existing presentation" option.

We will be designing a new presentation. Click the circle next to "Blank presentation" if it isn't selected already.



Then click the "OK" button.

2. After you hit "OK," another window for New Slides appears like the one below.



This box lets you choose a template for your first slide. The program has lots of options, but you can make a much more effective and personalized program if you start from scratch.

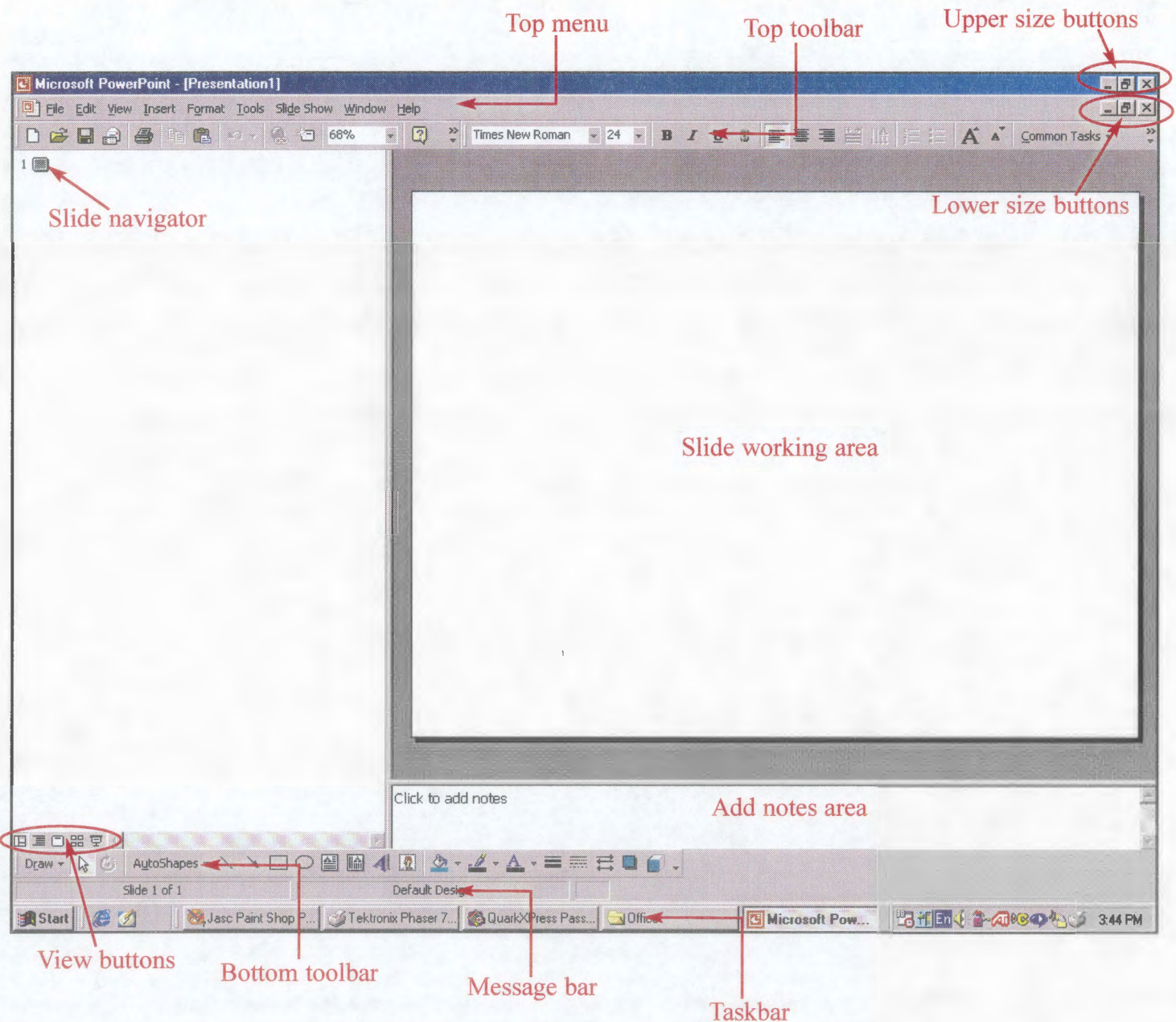
Click the blank slide.

Then click "OK."



3. Now you're ready to start creating the actual slides for your program.



Step Three: Understanding the terms


1. This is the first screen that loads after selecting a blank slide. Become familiar with the following terms in red. They will be used throughout the rest of the tutorial.



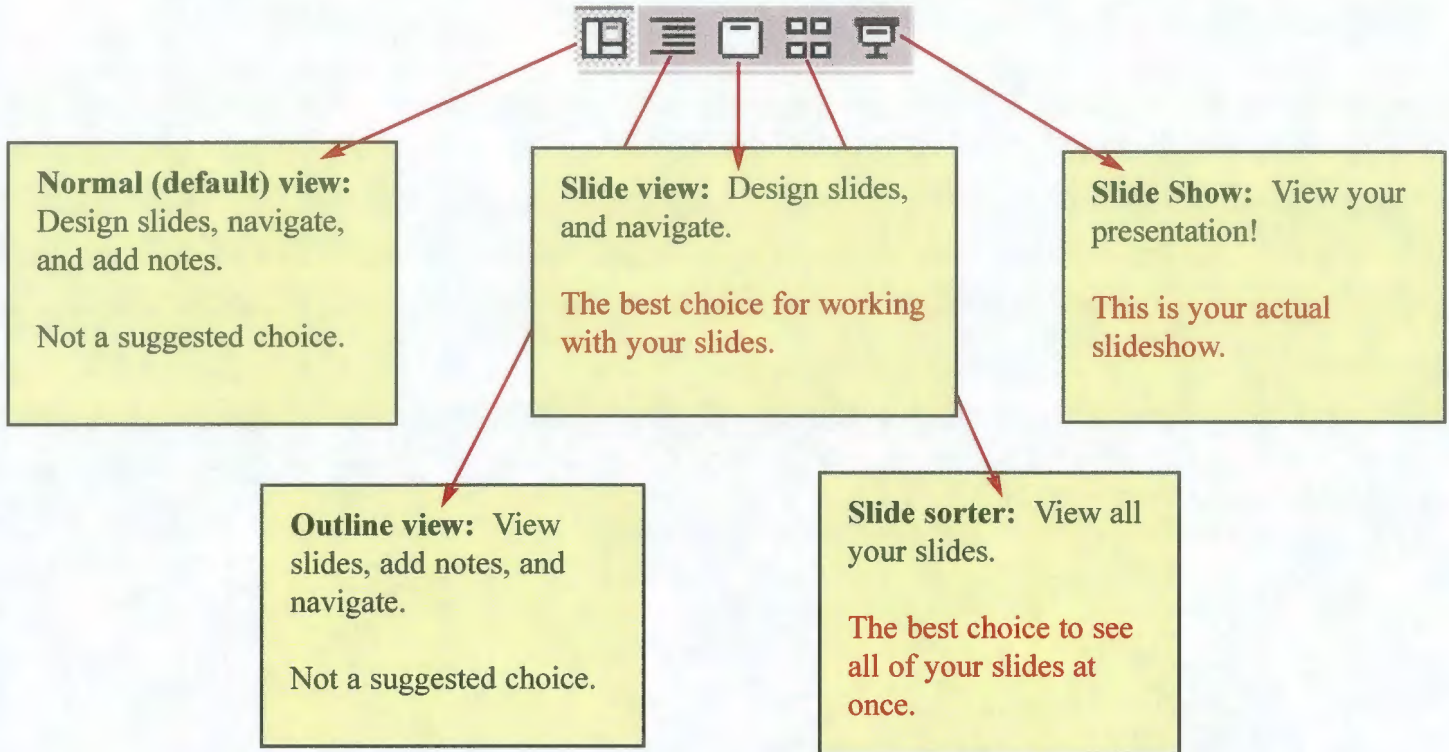
2. The "size buttons" in the upper right-hand corner do the same thing to every window that you see, regardless of the program you're using. The upper buttons manipulate the entire PowerPoint program. The lower ones manipulate the presentations within PowerPoint. We will only use the upper size buttons in the tutorials.

- The line  is the **minimize button**. Click it, and the window disappears. To make it appear again, click the program in the "Taskbar." → 

- The middle button can be one of two symbols. If the double-squares  are visible, click them and the window gets smaller, giving you the ability to move it. If the single-square  (**maximize button**) is visible, click it and the window fills up the entire screen.


• The X  (**close button**) closes the program that you are currently working on. Don't click this button just yet.

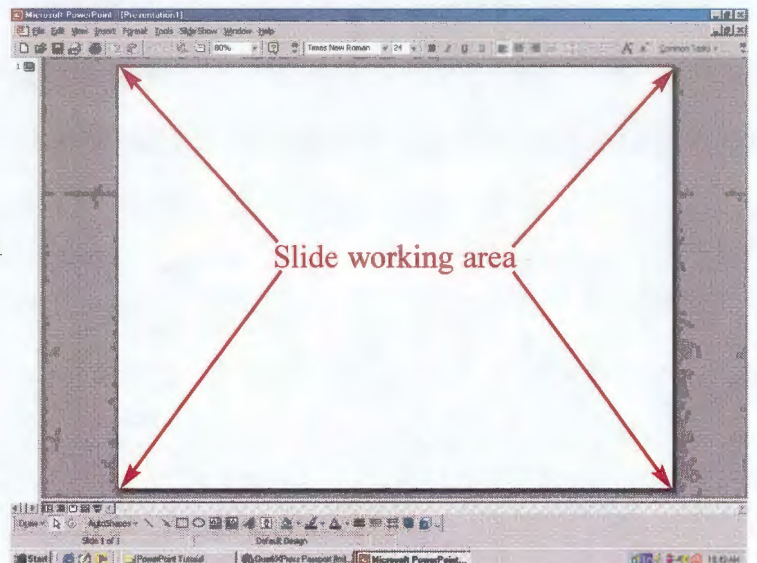
3. The “view buttons” near the bottom left-hand corner will also be important as you create your PowerPoint presentation. Click on each of the buttons to see how your view of the presentation changes.



4. Make sure you understand these terms and buttons before continuing. If you are confused by a term in the next steps, refer back to this section to see if it was explained.

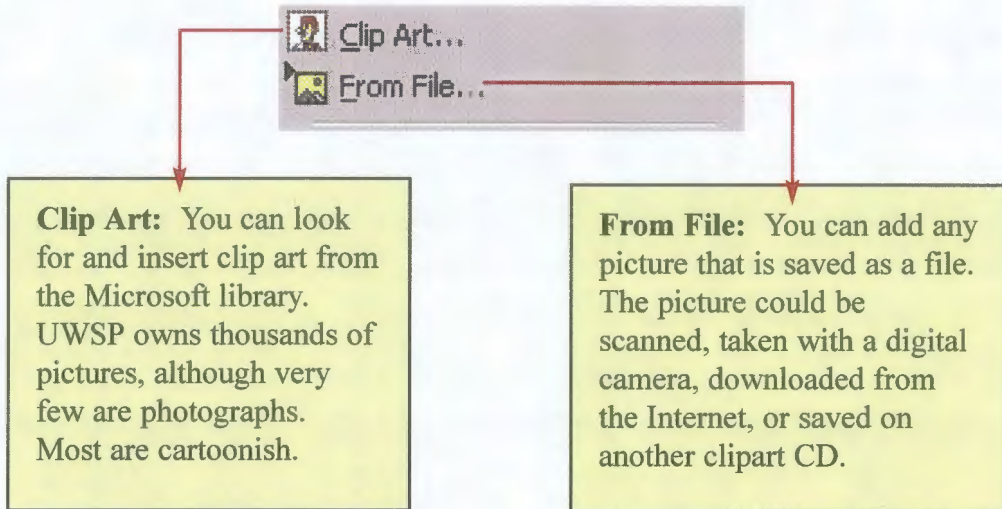
Step Four: Making your first slide

1. Make sure PowerPoint is maximized by clicking the upper “maximize button”  if it is visible.
2. Click the “slide view” button. This is usually the best choice to edit slides, since the slide working area is maximized.
3. The white box in the middle of the screen represents your slide. Anything placed outside of this box, will not be displayed when you view your presentation.



4. The most important elements you will be adding to your slides are graphics. Through the use of pictures, you will be telling a story. We will start by adding a graphic to your first slide.

- Click **Insert** on the top menu (refer back to Step Three for help with terminology).
- On the menu that appears, move the mouse cursor down to **Picture** ►
- On the menu that appears, the first two options are the most important:



- Let's try inserting clip art from the Microsoft library. Click on "Clip Art..."
- A window like the one below appears. You can either *search* for specific pictures, or *browse* through categories.

The screenshot shows the 'Insert ClipArt' window. Annotations include:

- Navigate Buttons:** Points to the left and right arrows at the top left of the window.
- Search:** Points to the search box at the top, with the instruction: 'Type a word to search for here and press "Enter" on the keyboard.'
- Browse Categories:** Points to a grid of category icons (Academic, Animals, Backgrounds, etc.), with the instruction: 'Click on a category to browse through related pictures.'
- Scroll Arrows:** Points to the vertical scroll bar on the right side of the category grid, with the instruction: 'Moves the screen of pictures up and down.'
- Close Button:** Points to the 'X' button in the top right corner of the window.

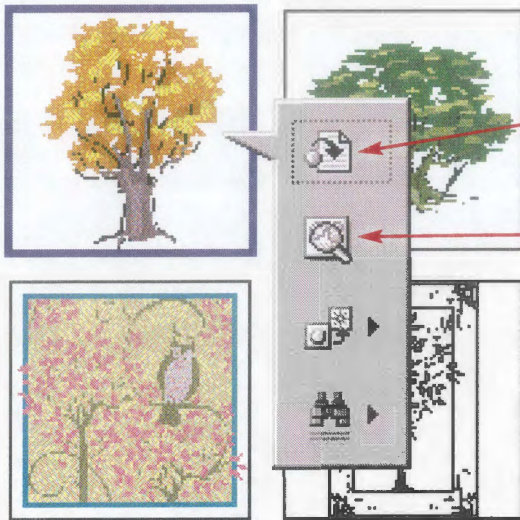
- We would like to insert a tree picture into the slide program. Type "tree" into the search box (see diagram above), and press the "Enter" key.
- After the binoculars stop moving, a variety of tree pictures will be displayed in the large white box. Click on the scroll arrows (see diagram above) to see all of the pictures.

- If you scroll to the bottom, you will see an icon labeled as “Keep Looking.” This means that there are more graphics to look at. Click on the icon to see more tree pictures.



[Keep Looking](#)

- Look for a tree picture that you would like to insert into your slide show. Click on the “Navigate arrows” (see diagram on previous page) to go back to a previous screen of pictures.
- When you’ve found a tree picture to insert, click on it once. A menu appears like the one below.



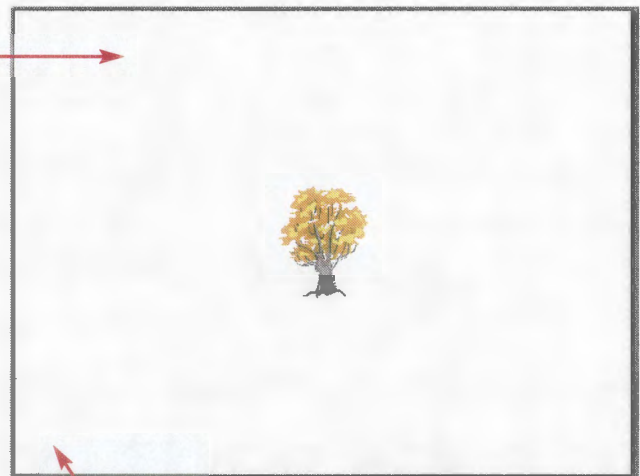
Click the first option (circle with an arrow) to insert the picture into your presentation.

If you’d like a closer look, click the second option (magnifying glass) to get a larger preview. Close the preview box (with the close button- See Step Three) before continuing.

- Close the window by clicking the close button (see diagram on previous page).


5. Your slide working area should now look like the picture to the right.

We would like to move the tree to the left side of the screen. Whenever you want to manipulate a picture, it needs to be selected. Click once on the picture.



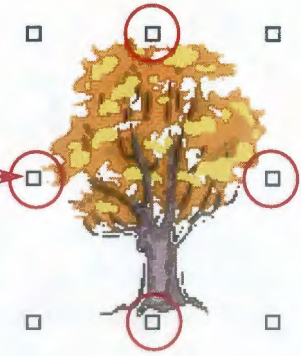
If the small squares weren’t already there, they will appear around the picture. The small squares are called “handles.”

The picture is selected and ready to be changed.

6. To move the picture, move the mouse cursor over the picture, but **not** over one of the handles. The mouse pointer will change to four arrows.  Click and hold the mouse button, and then move the mouse. The picture frame will move. Let go of the mouse button, and the picture appears again. **Move the picture to the bottom left side of the slide working area.**

7. Now let's make the picture larger. Be sure that your picture is selected (see item 5. above). To resize the picture, we will use the handles.

Narrow/Wide handles: These handles will change the size of the graphic disproportionately. For example, pulling the top handle will make the picture taller, but the width will stay the same.





Proportion handles: These handles will change the size of the graphic proportionately. By pulling the handle, both the height and the width of the graphic will grow.

Always use the "Proportion handles" to change the size of pictures, unless you have a reason to stretch or widen your graphic. Using the narrow/wide handles can have unintended effects, as seen in the photographs to the right.



On your tree picture, move the mouse pointer to the upper right handle.

The mouse cursor will change to a double-arrow. 
 Click and hold down the mouse button. The cursor changes to a plus. 
 Move the mouse to the upper-right. The picture frame will get larger.
 When you let go of the mouse button, the picture reappears much larger than it was before. Notice that the picture changed proportionately, so it is not distorted.

8. Practice resizing the picture with both the proportion handles and the narrow/wide handles. Notice how the picture changes. When projected onto a big screen, a slightly disproportionate image will be magnified and very noticeable.

Step Five: Saving your presentation

Saving your presentation is the most important step of all. Redoing hours of work after a power outage or computer failure can be very frustrating. A good rule of thumb is to save your presentation every time you finish a new slide.

1. Click **File** on the top menu.

On the menu that appears, click **Save**.



or

Click the disk button  on the top toolbar.

2. If this is the first time you are saving the presentation, a window will appear like the one below.

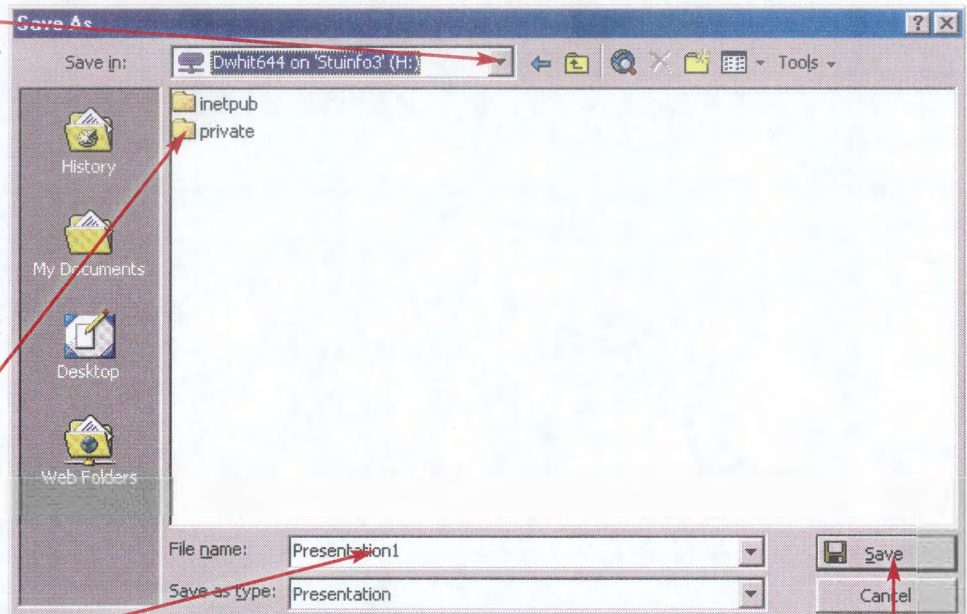
- Click the down arrow next to “Save in:” Look for a drive with your logon name and an (H:) after it.

 **jbuch209 on 'StuInfo3' (H:)**

This is your private drive (or H: drive), and is stored on the network. Click on it.

- Now, double-click the “Private folder” which appears in the large white box.

- Type a name for your presentation. Type in “Tree Show.”



- Click the “Save” button.

- Your file is now saved on your private drive (H:\Private), and can be accessed from any computer on campus.

3. To work on a non-campus computer, save your presentation on a Zip disk instead. Put your Zip disk in the computer. When you click the down arrow next to “Save in:” (see item 2. above) look for the “Removable Disk” drive, which is usually drive D:. Click on the drive. Type a name for your presentation. Click the “Save” button. Your presentation is now saved on your Zip disk, and can be opened on any computer with a Zip drive.
4. If your file has already been saved earlier, click **File** on the top menu and then click **Save** (or click the disk button on the top toolbar). The old version of the presentation is automatically replaced with the new version. The window above will not appear.
5. Close down the PowerPoint program by clicking the upper “close button” (see Step Three).

Assignment:

1. **Send your presentation to my e-mail mailbox: *jbuch209@uwsp.edu*.** Use the steps below for this and future tutorials.

a. Open your e-mail account. On campus, double-click “Microsoft Outlook” on the desktop.

b. Click the New Message button on the top toolbar.



c. Type “jbuch209” in the box next to the To: button.



d. Type “Tutorial #1” in the box next to Subject:



e. Click **Insert** on the top menu, then click **File** or just click the paper clip icon.



f. Click the down triangle next to Look in:



g. Click on the drive where you saved the presentation.

For private drive: Click “[Username] on ‘Stuinfo3’ (H:)”. Then double-click the “Private” folder.

For zip drive: Click “Removable Disk (D:)”

h. Double-click your presentation file. In this case, “Tree Show.ppt”.

i. A PowerPoint icon is now in your e-mail. The presentation has been inserted into the message. Don’t send the message yet. Answer the questions below first.

2. **Answer the following questions in your e-mail.**

1. What is the best “view button” to use when designing your slides? Why?
2. Why should you use the “proportion handles” when resizing pictures?
3. You have created a presentation and would like to work on it at home. Describe how you would save the presentation onto a zip disk.
4. Which sections of the tutorial did you have the most trouble with?

3. After you insert your Tree presentation and answer the questions, click the “Send” button on the “top toolbar.”



Congratulations! You have completed PowerPoint Tutorial #1.



Fundamentals of Microsoft PowerPoint



Tutorial #2

Step One: Opening a previously made presentation.

1. Start up Microsoft PowerPoint.
2. On the first window, click the “Open an existing presentation,” then click OK.
3. On the next window, change the “Look in:” box to the location where you saved your tree presentation from Tutorial #1 (see Step Five in Tutorial #1 for help).
4. Double-click your presentation.
5. You should see your slide in the “Slide View” mode. If not, click the “Slide View” button.

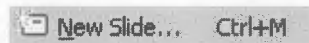
Step Two: Adding more slides.

So far, your presentation only has one slide. For most presentations, each slide should be on the screen for a maximum of 10 to 15 seconds. Therefore, a half-hour slideshow would contain anywhere from 120 to 180 slides. Let's add more slides to your presentation.

1. Click the “Slide Sorter View” button. You will see your first slide in the upper left corner with a “1” next to it. Recall that the “Slide Sorter View” shows you small versions of all the slides in your program.



2. On the top menu, click **Insert**. Then click **New Slide**.



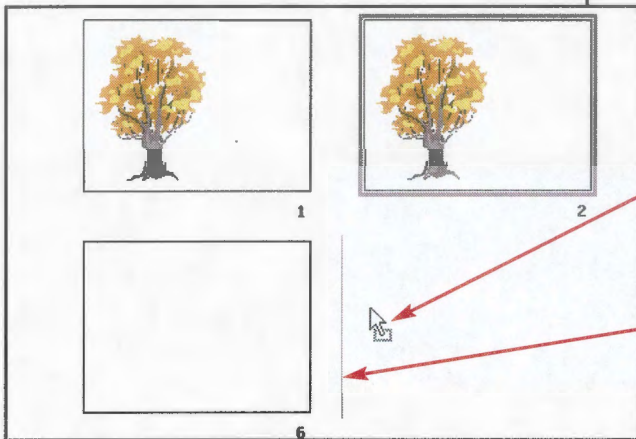
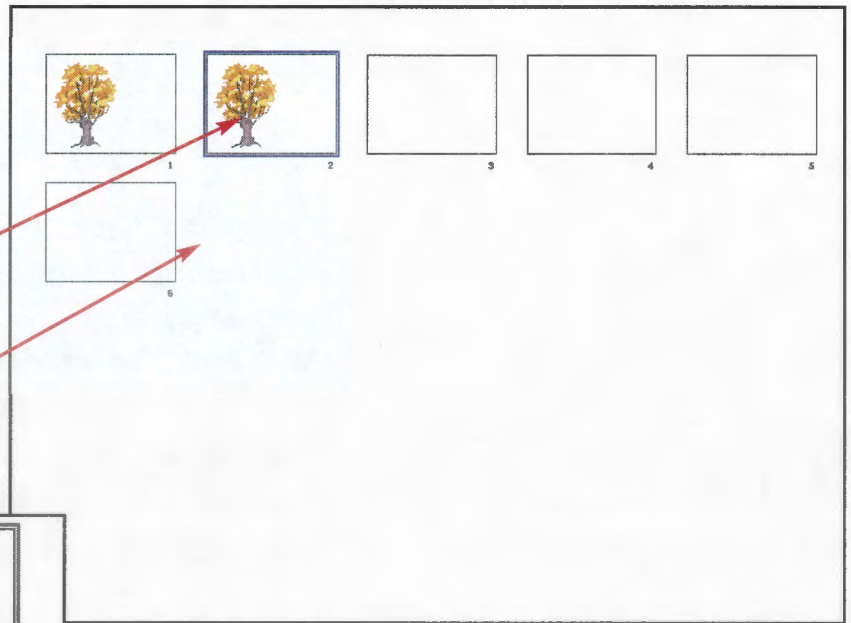
3. You've seen this window before. (See Step Two, Tutorial #1). Click on the blank slide, and click OK.
4. Now you see your inserted slide on the outline view labeled with a “2”. Follow items 2. and 3. above to insert three more slides.

Step Three: Adding duplicate slides.

1. A faster way to insert new slides, and one you can use to keep your program unified, is to add duplicate slides. Click on your first slide, which contains the tree picture.
2. On the top menu, click **Insert**. Then click **Duplicate Slide**. You added a copy of the selected slide. Now your first and second slides should be the same.

Step Four: Moving slides

1. Your screen should look like the picture to the right. We're going to move the second tree slide to the end of the presentation.
2. Click the second tree slide and hold down the mouse button.
3. Move the mouse cursor to a spot just after slide #6.



The cursor adds a box to show that you're moving the slide.

A vertical line indicates where the slide will be inserted.

4. Let go of the mouse button, and the second tree slide will be at the end of the presentation.

5. Using the previous steps, move the last tree slide (now slide #6) in between slides #3 and #4.

Step Five: Deleting slides

1. Your presentation should now look like the picture on the right.
2. We would like to delete slide #6. Click on slide #6.
3. Press the "Delete" or "Backspace" key on the keyboard. The "Delete" key is found right above the arrow keys.
4. The slide disappears. Your presentation has been cut down to five slides.



Step Six: Undoing mistakes

One of the most useful tools in PowerPoint is the ability to undo mistakes. Let's say you accidentally deleted the first tree slide in your presentation. A simple command can bring the tree slide back to life.

1. Click the first tree slide.
2. Hit the "delete" key on the keyboard. Woops! You wanted to keep that slide.
3. Click **Edit** on the top menu. Then click **Undo Delete Slide**. Your first tree slide reappears once again, and you can sigh in relief.
4. In the future, whenever you make a mistake (moving a picture the wrong way, resizing wrong, typing in the wrong text, deleting items), always remember to undo the mistake right away. In fact, you can undo multiple mistakes by repeating item 3, above.

Step Seven: Editing the slides in your presentation

When you're in the Slide Sorter View, you *cannot* edit your slides. This means that you will not be able to add or change pictures, text, and animation. To edit your slides, you need to be in Slide View.

1. Click on the first tree slide.
2. Click the "slide view" button (see Tutorial #1).
3. Now you can edit your slide.






For even a quicker way...

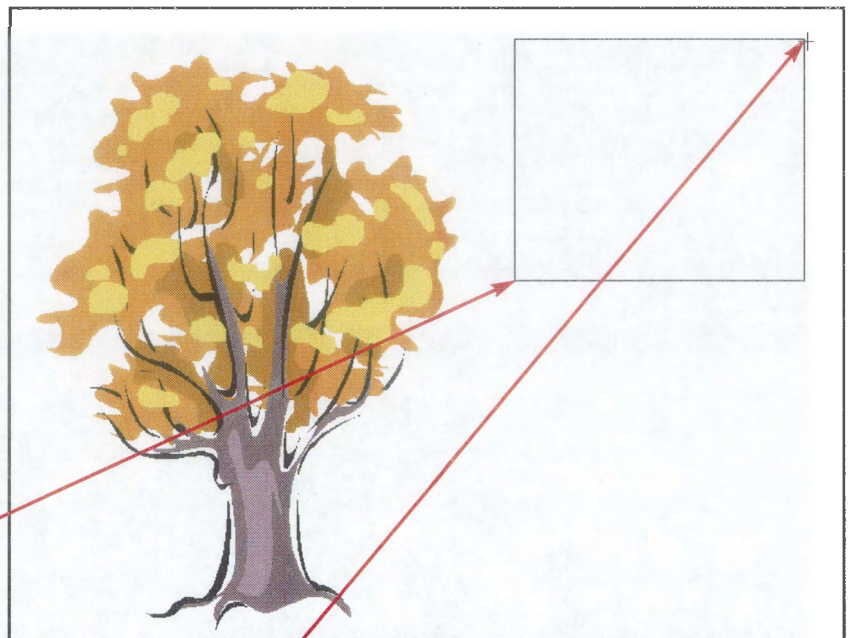
1. Click the "slide sorter view" button. You should be able to see all of your slides again.
2. Double-click the first tree slide.
3. You're back in the "slide view" again.

Using the Slide Sorter View you can quickly and easily navigate through all your slides.

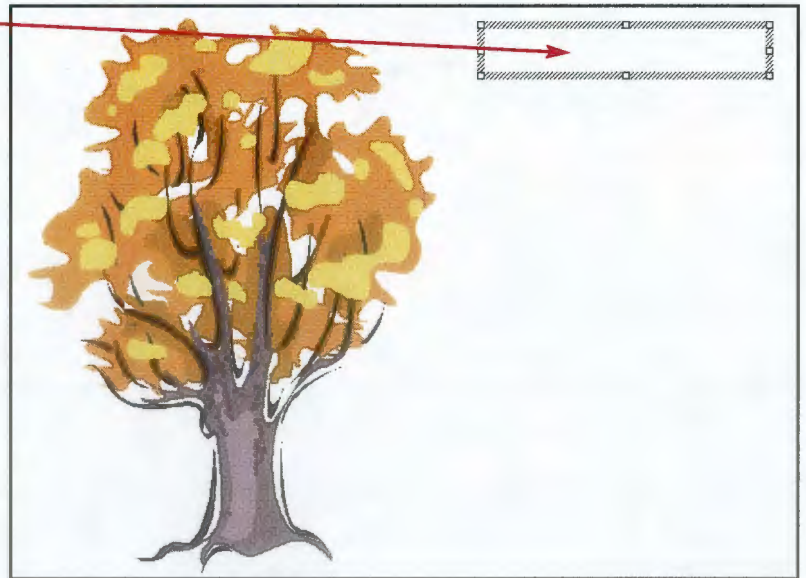
Step Eight: Adding text to the slide

We're going to add a title to your first slide. Text should be used sparingly in your presentation, but a few words can have a huge impact on the audience.

1. Click the "text box" button on the bottom toolbar. 
2. The mouse cursor changes to a downward arrow. 
3. Move the mouse button to this location. 
4. Click and hold down the mouse button. The mouse cursor changes to a plus. 
5. Move the mouse to the upper right area of the screen. 



6. Let go of the mouse button, and a text box appears.
7. You will see a flashing line inside the text box. This means whatever you type on the keyboard will end up in the text box.
8. Type any title for your presentation. We'll call our presentation "Trees of Fire."
9. Click anywhere off the text box.
10. The text box frame disappears. This is what the title will look like in your actual presentation.



Step Nine: Changing the text

The most important thing to remember when changing the shape, size, or color of text, is to highlight the text or part of text that you want to change.

1. Click on the title. A frame and 8 handles should appear around the title.
2. Move the mouse cursor just to the left of the title, but **not** on the frame of the text box. The cursor should look like an elongated I. I
3. Click and hold the mouse button. Move the mouse cursor to the right side of the text box. Your title will be highlighted.
4. Release the mouse button. Everything highlighted can now be changed. If you didn't get your entire title highlighted, click anywhere off the text box, and try these steps again.
5. Both the top toolbar and the bottom toolbar have options that can change the text. Become familiar with the following buttons and menus. Try them out to see how your text changes.

Top Toolbar

Bold:
Makes the text **darker**.

Italics:
Makes the text *slanted*.

Underline:
Puts a line under the text.

Shadow:
Adds a shadow to the text

Lists: Add bullets (dots) or numbers to your text.

Font type:
Changes the way the text looks.

Font size:
Changes the actual size of the letters.

Left justify:
Moves text to left side of box.

Center justify:
Moves text to center of box.

Right justify:
Moves text to right side of box

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Bottom Toolbar

Box fill:
Fill in your text box with color.

Font color:
Choose any color for your text.

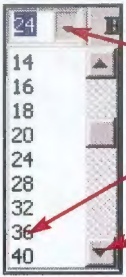
Box border:
Add a frame around your text box.

Box shadow:
Add a shadow behind the text box.

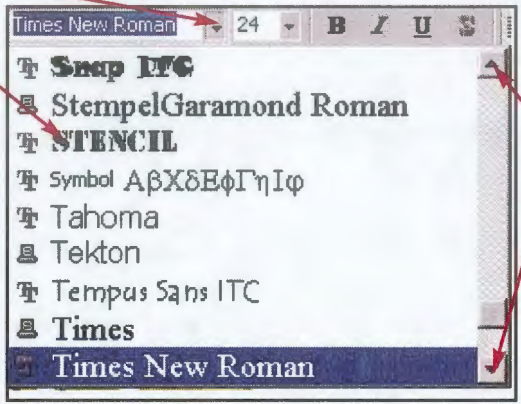
Border color:
Change the color of your frame.



6. Change the font type on your title to something more interesting. Make sure your title is highlighted. Then, click on the arrow next to the font name (top toolbar). On the menu that appears, click on another font.



7. Make the font size larger. Click the arrow next to the current font size (top toolbar). Then choose "36" from the menu that appears. You may need to scroll down to find the number.



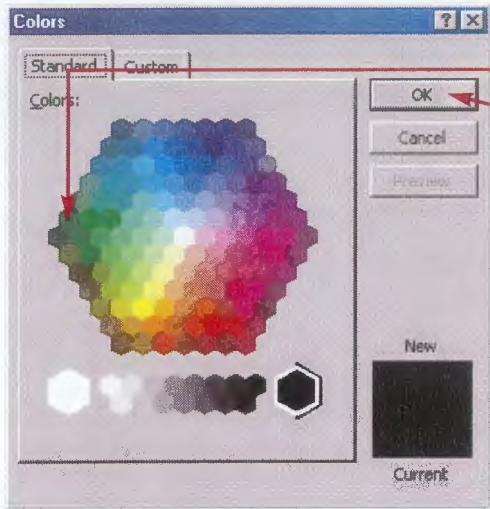
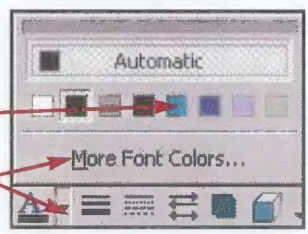
Use the **scroll buttons** to see more fonts. They are arranged alphabetically.

8. Center the title. Make sure the entire title is highlighted, and click the center button (top toolbar).



9. Make your text green. Make sure the entire title is highlighted, then click the triangle next to the current font color (bottom toolbar).

- If you click on one of the colored boxes, your text will change to that color.
- If you want more color options (the default ones are very limited), click on "More Font Colors..."
- After clicking on "More Font Colors..." a window like the one below appears.



- Click on any of the colored hexagons to select that color. A dark green would work well for the title.
- Click "OK" and your text will change to the selected color.
- You'll have to click anywhere off the text box to actually see the color change.

Advanced hint: For even more color choices, click the "Custom" tab on the Colors menu (picture at left). You can choose from thousands of colors.

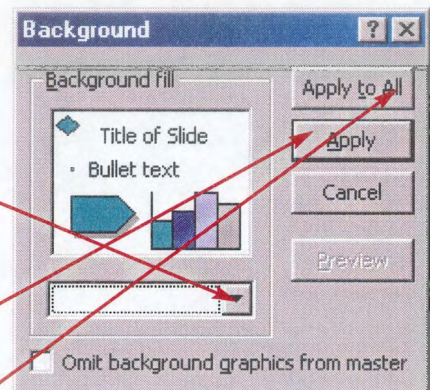
10. Your title should now be dark green. To practice changing colors, we will now make one of the words in the title orange.
- Highlight the word you want to change (see items 1.-4. above). In our sample, “Fire” will be highlighted.
 - Click the “Font color” button on the bottom toolbar (item 9.)
 - Choose “More font colors...” (item 9.)
 - Click an orange color, and click “OK” (item 9.)
 - Your title should similar to this..



Step Ten: The background

The background color of your PowerPoint presentation is a very important component of the experience. A brilliant background can cause headaches. Colors with low contrast can make pictures and words difficult to see. Changing the background color of one or all slides is easy.

1. Click “Format” on the top menu.
2. Click “Background...” on the menu that appears.
3. Click the arrow next to the current color. You’ve seen this menu before (see Step Nine).
4. Choose “More colors...” and select a sky blue color. Click “OK”
5. Click “Apply” to change the *current* slide’s background color.
or
 Click “Apply to All” to change *all* of your slides’ background colors.



Advanced hint: After clicking the arrow next to the current color, you’ll notice another choice on the menu: “Fill effects...” Use these effects to add gradients, color blends, patterns, and graphics to the background. These can be attractive and effective alternatives to solid colored background.

Step Eleven: Review

Use what you learned in this tutorial and the previous one to do the following. Use the “Slide Sorter View” to navigate between your slides.

1. Add an image of your choice to slide #2. Make it fill up the whole screen, but keep it proportional.
2. Add a poem of your choice to slide #3. Make it right-justified. Everything else is up to you.
3. Change the background of slide #4 to black. Move your tree image to the center of the slide.

4. On slide #5, add a large, centered “The End” in a text box. By using the buttons identified in Step Nine, change the **text color** to red, the **box color** to yellow, and add a “6 pt” **box border**. Make sure the text box is selected (has been clicked) before clicking on the buttons. The final text box should look something like this.



5. Switch to Slide Sorter View. Move your slide #4, in between slide #2 and #3. The slide sequence should be title, big picture, centered picture, poem, and end.
6. View your slide show. Click on your first slide and click the “Slide Show” button. Click the mouse to advance through the slides. To stop at any point, right-click the mouse, and choose “End Show.”
7. Save your presentation with a new name.
- Click “File” on the top menu, and choose “Save as...” (instead of Save).
 - Refer to Tutorial #1 for instructions on choosing where to save the file (Private drive or Zip drive).
 - Name this new file “Tree Show 2”.
 - Click the “Save” button.
-

Assignment:

1. **Create a new e-mail message** (see Tutorial #1)

Make sure to send it to my mailbox: jbuch209@uwsp.edu

2. **Answer the following questions in the e-mail.**

1. What is the “Slide Sorter View” used for?
2. What must be done to your text before it can be changed (size, color, type)?
3. List three ways the background color(s) or graphic(s) can influence your PowerPoint presentation. At least one of the ways should not be taken directly from the tutorial.
4. Which sections of this tutorial did you have the most trouble with?

3. **Insert your presentation in the e-mail.** (see Tutorial #1)

4. After you insert your Tree presentation and answer the questions, click the “Send” button on the “top toolbar.”

Congratulations! You have completed PowerPoint Tutorial #2.



Fundamentals of Microsoft PowerPoint

Tutorial #3



Step One: Starting a new presentation

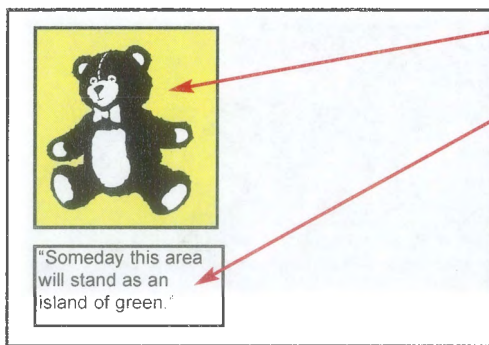
1. Open PowerPoint and create a blank presentation (Tutorial #1).
2. Go into the "Slide Sorter" view and add seven more blank slides (Tutorial #2).
3. You should have a PowerPoint presentation with eight blank slides.
4. Choose a solid color or color blend for the background of your first slide. Apply this background to all eight of your slides (Tutorial #2, Step Ten).

Step Two: Add a title

1. On your first slide, add a large title. The color, type, and size of the text is up to you. The rest of the slide show should be thematic based on the title.

Step Three: Moving a text box

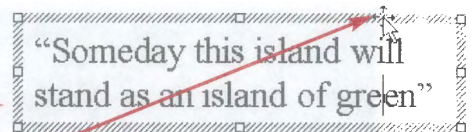
1. On slide #2, set up the slide working area as shown below.



Add a large graphic to the upper left of the slide.

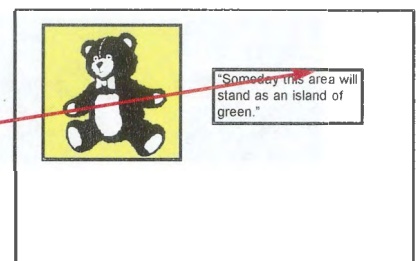
Add a text box right below the graphic. Type a quote into the text box.

2. We will now move the text box to the right side of the graphic. Make sure the text box is selected (the text box frame and handles are visible). If it is not selected, click on it.



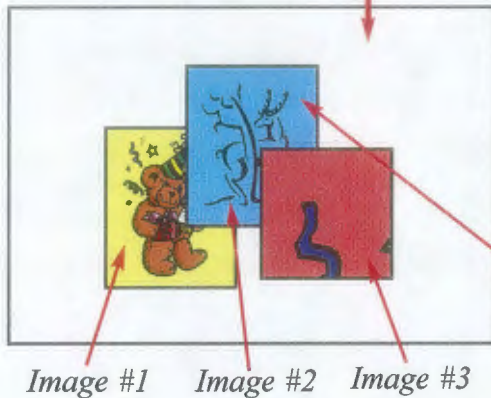
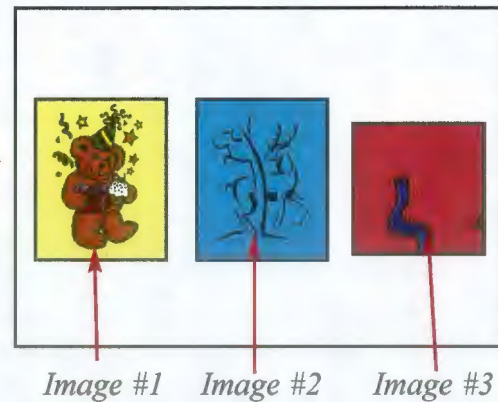
3. Move the mouse pointer to any place on the text box frame, *except for a handle*. The mouse cursor will change to "four arrows."

4. Click the mouse button and hold it down. Move the outline of the text box to an area just right of the graphic. Then release the mouse button. The text box has been moved.



Step Four: Arranging the layers of elements

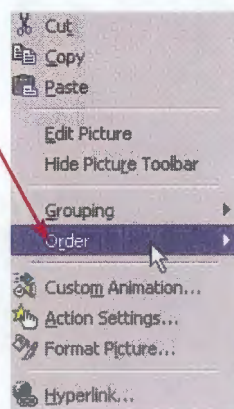
1. On slide #3, add three graphics of your choice. Arrange them into a row like those to the right. You may need to resize each graphic so it fits next to the others.
2. Now rearrange the images so they overlap each other like the ones below.



3. Notice the “layering” of the images. The first image you inserted is on the “bottom layer.” The second image is in the middle, and the third image is on top. We can change the order of the layers.

4. We would like to move image #2 to the top layer. Click on Image #2.

5. With the mouse, **right-click** on image #2. On the menu that appears, move the mouse cursor down to “Order.”



6. On the next menu that appears, you can choose between various layering options.

Brings the current object to the top layer (in front of all other objects).

Sends the current object to the bottom layer (in back of all other objects).

Brings the current object one layer towards the top.


Sends the current object one layer towards the bottom.

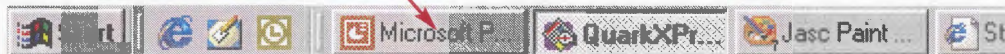
7. Click on the “Bring to Front” option. Your image #2 should now be in front of the other two graphics.
8. This method of ordering the layers can be used for any element in PowerPoint, including graphics and text boxes. Add a text box to this slide and experiment changing the order of the graphic and text layers.

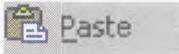
Step Five: Adding other types of pictures

In Tutorial #1, you learned how to add pictures to your presentation from Microsoft Clipart. Although the clipart contains a diversity of topics, they may not be specific or professional enough for your actual interpretive presentation. **Use clipart sparingly.** Pictures from books, slides, or the Internet will make up the core of your actual slide show.

Internet pictures

1. The World Wide Web is increasingly becoming an excellent source of images. Since your presentation will be a non-for-profit, educational, one-time showing, you may use images from the Internet. Keep in mind, however, that copyright laws do protect images (and sounds, music, videos, etc.) that are located online. Be careful that the images you download have a high enough resolution (they don't look fuzzy when blown up to size).
2. Minimize PowerPoint, and double-click the Internet Explorer icon on the desktop.
3. In the "Address box" on the top toolbar, type "<http://students.uwsp.edu/jbuch209>" and press Enter on the keyboard
4. On the web page that appears, click on the "Tutorial #3" link.
5. On the Tutorial #3 web page, you will see a large picture of a snake. Right-click on the picture, and on the menu that appears, click "Copy."  This stores the picture into the computer's memory.
6. Now, minimize Internet Explorer. Click the "Microsoft PowerPoint" button which should be on the taskbar. This maximizes PowerPoint.



7. Go to your slide #4. Make sure you are in "Slide View."
8. Right-click on the blank slide, and on the menu that appears, click "Paste." 
9. The picture has been copied into your presentation. Use the proportional handles to make the image as large as possible. Then, move the picture to the very center of your slide.
10. Since your slide has a single large graphic as its focus, your background is probably distracting to the audience. Make the background on this slide a solid black color. When the presentation is projected, there really is no background: the image takes precedence.

More internet pictures

1. Minimize PowerPoint. Click the "Internet Explorer" button on the taskbar, like you did in item 6. above.
2. Scroll down until you see four blue links. These are also stored graphic files, but are not visible on this web page.
3. If you find pictures like these on a web page, you have two options:

Option #1

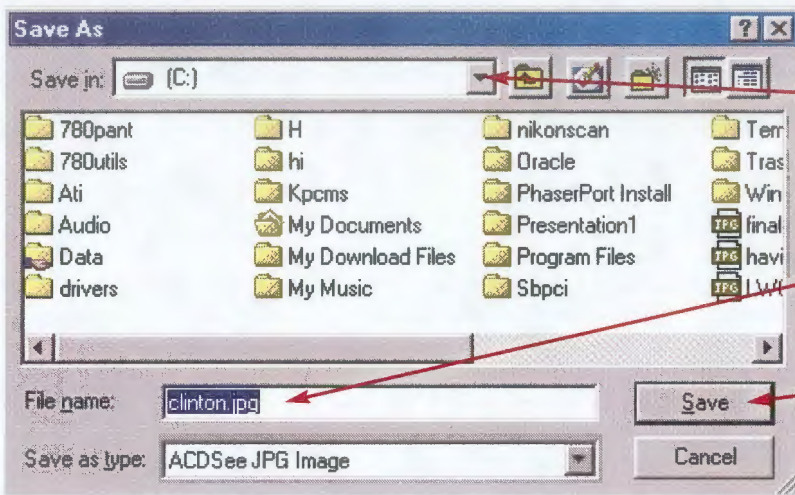
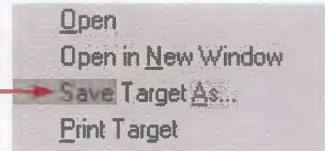
Click on the linked file (in blue). Internet Explorer will show you the picture. Then use the same steps as above to copy and paste the image.

Option #2

Save the linked file to your zip disk or private drive. Then insert it into PowerPoint.

4. We will be using Option #2, since this will be important later in the tutorial.

5. Right-click on [Clinton's Birthplace](#). On the menu that appears, select "Save target as..."



6. You've seen a window similar to this one before. Click the arrow and choose "Removable disk" if you're saving to a zip disk, or choose your private drive.

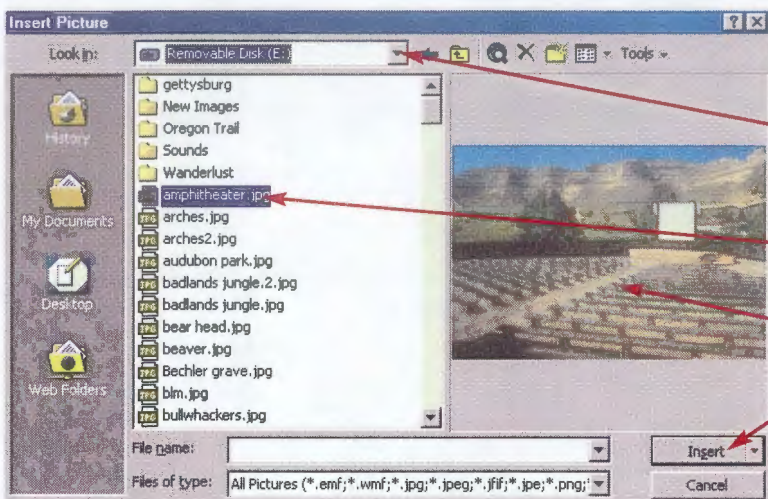
7. The filename is fine for this image. You can change it if you want.

8. Click save to copy the image onto your zip disk or private drive.

9. Minimize "Internet Explorer." Then maximize "Microsoft PowerPoint" by clicking it on the taskbar.

10. Go to slide #5. Make sure you are in "Slide View."

11. Click "Insert" on the top menu. Then choose "Picture >". Finally, click "From File..."



12. Although the window looks a bit different, the main elements are the same.

Click the arrow to choose your zip disk or private drive.

Click on the graphic file you just saved.

A preview appears to the right.

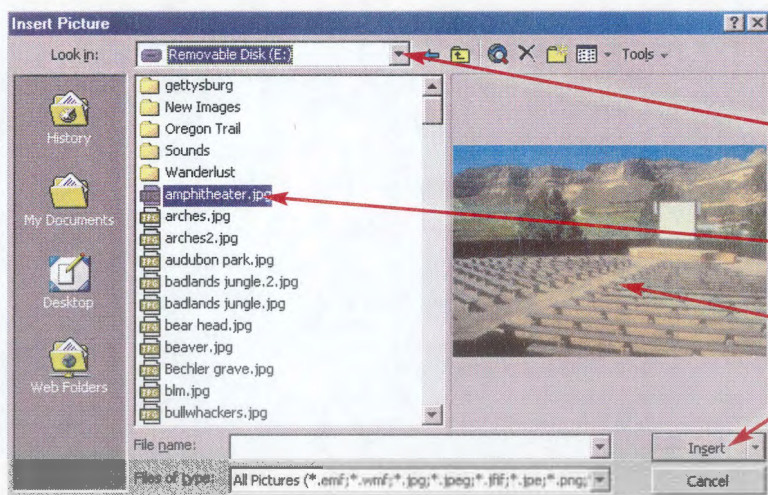
Click the "Insert" button to incorporate the picture into your presentation.

13. The picture has been inserted into your presentation. Use the proportion handles to make the picture fill your entire slide working area. It should cover your entire background.
14. Go to slide #6. Make sure you're in "Slide View."
15. Add another graphic from the web page that is listed in blue (**not** the Elvis picture yet). Use either of the two options listed in item 3.

For a challenge: Insert the [Crowley's Ridge State Park CCC building](#) picture. Notice that it is much larger than your slide! Use the proportion handles to shrink it down to the proper size.

Scanner pictures

1. Follow the instructions on the separate scanner sheets. Each scanner has a different program with different sets of options. At the end of these instructions, you should have a saved graphic on your zip disk or private drive.
2. Go to slide #7. Make sure you're in "Slide View."
4. Click "Insert" on the top menu. Then choose "Picture >". Finally, click "From File..."



5. These are the same steps you followed in item 11. above.

Click the arrow to choose your zip disk or private drive.

Click on the graphic file you scanned.

A preview appears to the right.

Click the "Insert" button to incorporate the picture into your presentation.

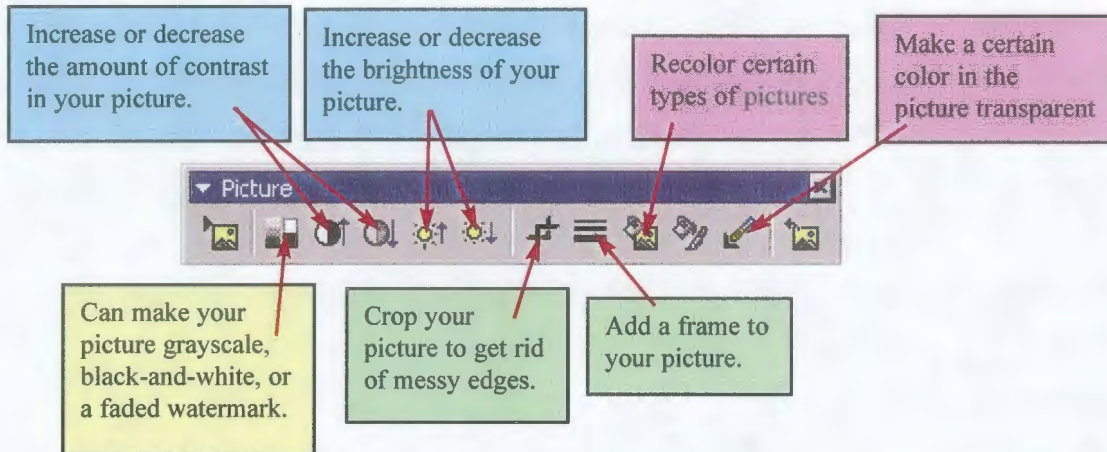
6. Resize your scanned picture using the proportion handles so it fills up the slide working area.
7. Make the background of this slide black.


Step Six: Cropping pictures and basic editing tools

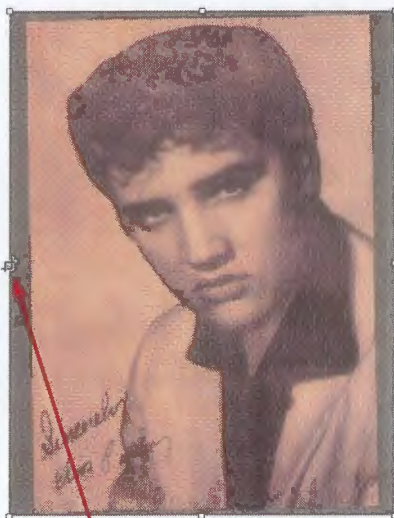
1. Go to slide #8. Make sure you're in "Slide View."
2. Insert the "Elvis Presley" picture from the web page, as you learned in the first part of Step Five.
3. Use the proportion handles to resize the picture. Make it fill more of the slide.
4. Notice the ugly dark gray border behind the picture. The photograph wasn't scanned very


accurately. Keeping a picture like this in your program is unprofessional. Fortunately, PowerPoint makes cropping pictures relatively easy.

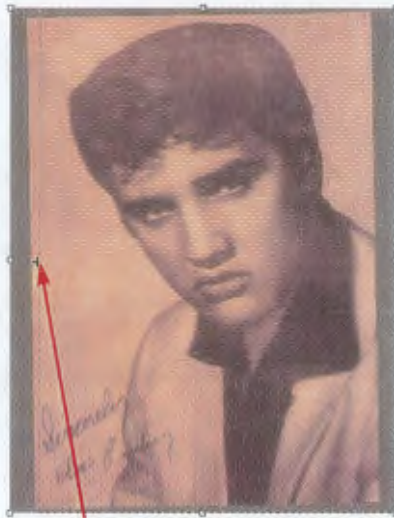
- Click on the Elvis picture. A "Picture Tools" window should appear like the one below (item 7.)
- If the window does not appear, click "View" in the top toolbar. Then choose "Toolbars >". Click "Picture." The window should appear. Look carefully. It may have been incorporated into the top or bottom toolbar.
- The Picture Tools contain many useful methods to edit your images.



- Make sure the Elvis image is selected before continuing. Click the "crop button"  on the Picture Tools.
- While the crop button is pushed in, you cannot resize the picture. The handles take on another very important function. They are used to create the crop.



10. Move the mouse cursor to the left handle. It changes to a crop picture. 

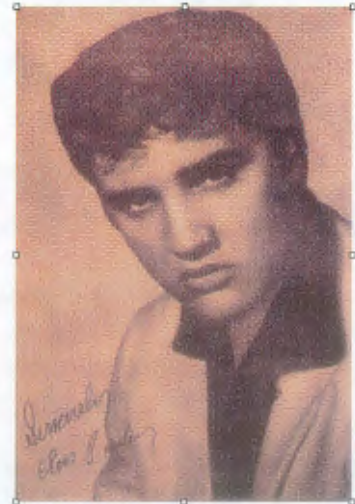


11. Click and hold the left mouse button. Move the mouse to the right so the dashed cropping line is just beyond the dark gray border.



12. Release the mouse button. Everything beyond the dashed cropping line is erased.


13. Repeat items 10. through 12. on the bottom handle, the right handle, and the top handle. When you're done, the image should be free from the uneven border, like the one on the right.
14. Now, click the "Cropping button" to turn off the cropping (button is out). You can also click off the picture, and then click on it again.
15. Using the proportion handles, resize the picture to fill the slide working area. Notice that the handles no longer crop the picture, but have gone back to their original purpose.
16. Experiment with the contrast and brightness buttons on the picture toolbar (see item 7.) How do they change the picture?



Important: Remember to crop your pictures for your actual interpretive PowerPoint presentation. Your presentation will be much professional and impressive to the audience.

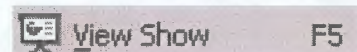
Step Seven: Viewing the slide show

We are going to view your actual presentation. You will use this same method when showing it on the day of your presentation.

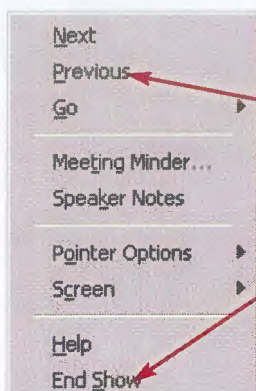
1. Every one of your eight slides should now have something on them.
2. Go to slide #1.
3. Click the "Slide Show" button on the View Buttons. 

or

Click "Slide Show" on the top menu, and choose "View Show"



4. Your first slide should appear and take up the full screen of your monitor. This is a great way to preview how your slides will actually appear when projected.
5. Click the left mouse button. The slide changes to slide #2. You advance through your slides by using the left mouse button.
6. Click the left mouse button again. You are on slide #3. What if you need to get back to slide #2? No problem. **Right**-click the mouse button. A menu appears.



You will probably be using two of these options the most:

Click "Previous" to go to the previous slide (or previous animation).

Click "End Show" to stop the presentation and go back to editing mode.

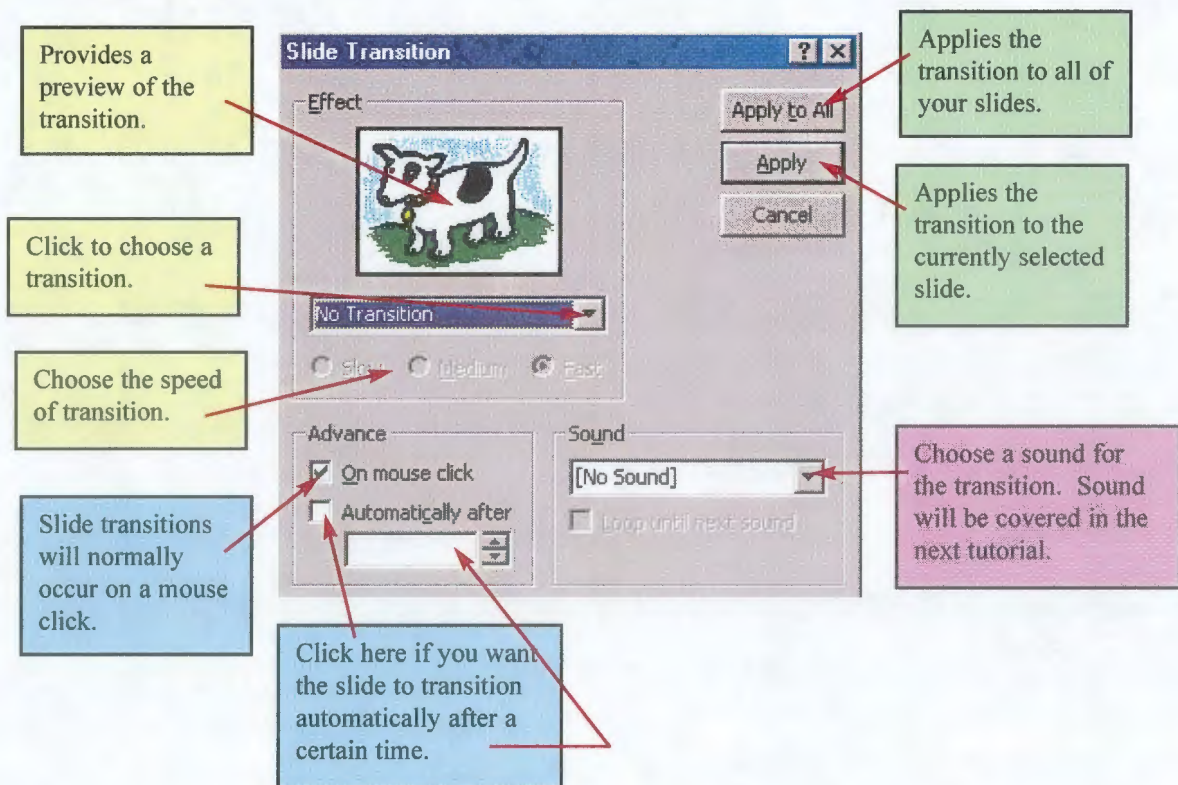
Feel free to try out the other options and see what they do.

- Click through all eight slides of your program.
- When you get to the end, a black slide will appear with the message “End of slide show, click to exit.” Click once more, and you will go back to the editing mode.

Step Eight: Slide transitions

When you viewed your slide show, you may have noticed how abrupt one slide follows another. In some cases, this abruptness may be desirable. In other cases, you may want some sort of transition between slides. Transitions can create an emotional response to the topic, link the program together thematically, and add a unique flair to the presentation. Be careful not to over-use transitions! A different transition after every slide can become distracting and weaken the impact of your program. Choose your transitions wisely... think about the purpose of the transitions and how they will influence the audience.

- Switch to the “Slide Sorter View.”
- Click on your first slide to select it.
- Right-click on the slide. On the menu that appears, click on “Slide Transition...”
- A window like the one below appears.



- Choose the “Dissolve” transition, keep the speed as fast, and click the “Apply to All” button.
- View your presentation as you did in Step Seven. Notice the new transition between every slide.

7. Switch to “Slide Sorter” view. Click slide #3. Change the transition to something else. Explore the various types of transitions by watching the preview box. When you find the transition you want to keep, click the “Apply” button (**not** the “Apply to All” button). View your show to see how it worked.
8. Add yet another transition to slide #6. Again, view your show to see how the transition looks.
9. Save your presentation.

Assignment:

1. **Create a new e-mail message** (see Tutorial #1)

Make sure to send it to my mailbox: *jbuch209@uwsp.edu*

2. **Answer the following questions in the e-mail.**

1. What is layering and why is it important?
2. What are some cautions to consider when importing graphics from the Internet?
3. When should you crop pictures in PowerPoint?
4. List one benefit of using transitions in your presentation, and one caution to consider.
5. Which sections of this tutorial did you have the most trouble with?

3. **Insert your presentation in the e-mail.** (see Tutorial #1)

Your presentation should be eight slides.

Slide 1: Title.

Slide 2: Image with quote on right.

Slide 3: 3 images and 1 text box layered

Slide 4: Snake picture.

Slide 5: Clinton’s birthplace picture.

Slide 6: Picture from Internet.

Slide 7: Picture from scanner.

Slide 8: Cropped picture of Elvis.

Your entire presentation should have the same background, except slides 4 and 7 (which are black).

Your entire presentation should have the “dissolve” transition, except slides 3 and 6.

4. After you insert your presentation and answer the questions, click the “Send” button on the “top toolbar.”

Congratulations! You have completed PowerPoint Tutorial #3.



Scanner Tutorial



Scanning images for PowerPoint

The university has a variety of scanners available for student use. Unfortunately, these scanners use different programs with different settings. This tutorial will introduce you to the basics of scanning, and a few specific programs that you will likely be using on campus.

Step One: Finding a scanner.

1. There are two primary locations that you will always find a scanner: the library and Schmeeckle Reserve Visitor Center. Other colleges and buildings may or may not have scanners. The CNR does **not** have a scanner in the public computer lab anymore, although they should have one in the Advanced Computing Lab.
2. In the library, there is one scanner in the lower floor lab, and one scanner in the main floor lab. Another older scanner is located in the IMC on the third floor of the library.
3. The scanner at Schmeeckle Reserve will be located in the interpretive technology lab in the basement. Call ahead to make sure it isn't being used (346-4992).

Step Two: Placing your image on the scanner

1. Almost any image can be scanned by a flatbed scanner: books, magazines, newspapers, photographs, charts, etc. For transparent images, like slides and transparencies, the scanners must be specially adjusted. Transparency scanning will not be covered in this tutorial. Ask for assistance if you need to scan transparent images. In the case of slides and film, a special slide scanner is available for use at Schmeeckle Reserve or the IMC. Choose an image to scan.
2. Make sure the scanner is on. If it is not, turn it on and reboot the computer. Lift the scanner cover. Place your image face-down on the glass, just like you would do on a copy machine. Make your image as perpendicular as possible with the sides of the scanner. This will save work later on.
3. Close the cover if your image is flat. If you are scanning from a thick book, you won't be able to close the cover. In this case, leave the cover open but find a heavy object to hold the book flat against the scanner.

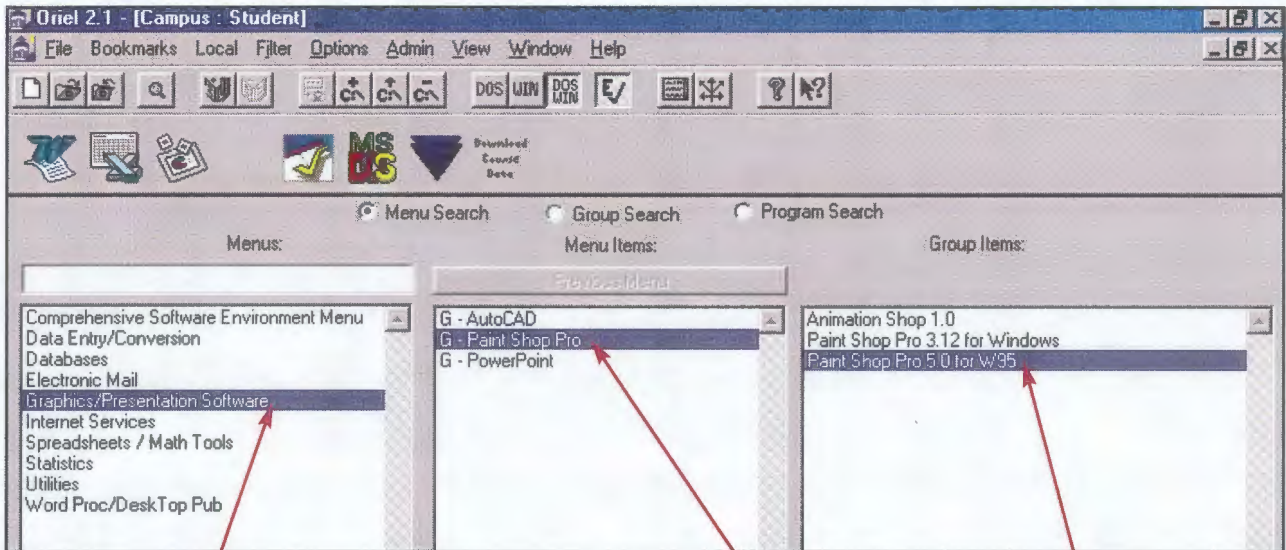
Step Three: Opening Paint Shop Pro

1. Although most scanners come with their own programs, we will be using a common graphic editor called Paint Shop Pro. This is available on all campus computers. Paint Shop Pro gives you the flexibility you need to edit your images before saving them for your presentation. **Always** start your scanning jobs by opening Paint Shop Pro.

2. If you are at Schmeeckle Reserve, skip to item 8. If you are on campus, follow these steps. After you log into the computer, double-click the “Oriel” icon on the desktop.



3. A window like the one below will appear...



4. Double-click “Graphics/Presentation Software” in the left menu box.

5. Double-click “G-Paint Shop Pro” in the middle menu box.

6. Double-click “Paint Shop Pro 5.0 for W95” in the right menu box.

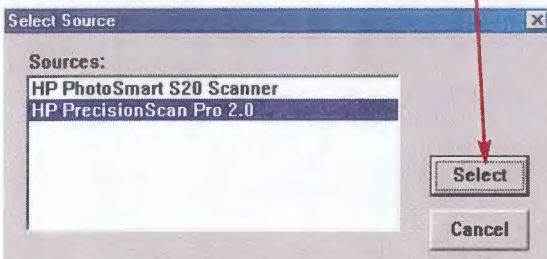
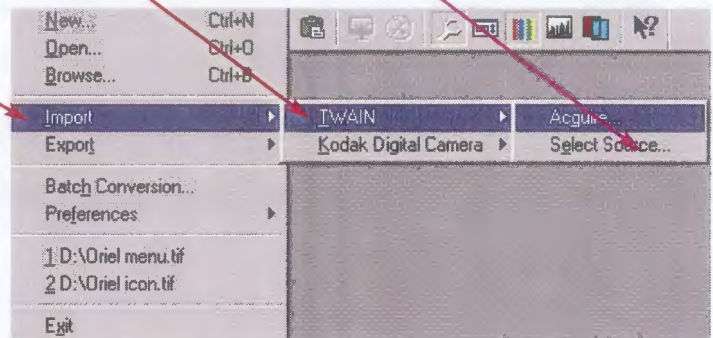
7. Wait for Paint Shop Pro to open.

8. If you’re at Schmeeckle Reserve, simply double-click the “Paint Shop Pro 5” icon on the desktop. Wait for Paint Shop Pro to open.



9. Now we need to transfer the image from the scanner into Paint Shop Pro. Click “File” on the top menu, move down to “Import >”, move right to “TWAIN >”, and click “Select Source.”

10. In the window that appears, you need to make sure the right scanner is selected. In the library, click on “HP Precision Scan Pro 2.0”. At Schmeeckle, click on “NewColor 4000”. Then click the “Select” button.



11. Again, click “File” on the top menu, move down to “Import>”, move right to “TWAIN >”, but this time select “Acquire.”

Step Four: Scanning the image

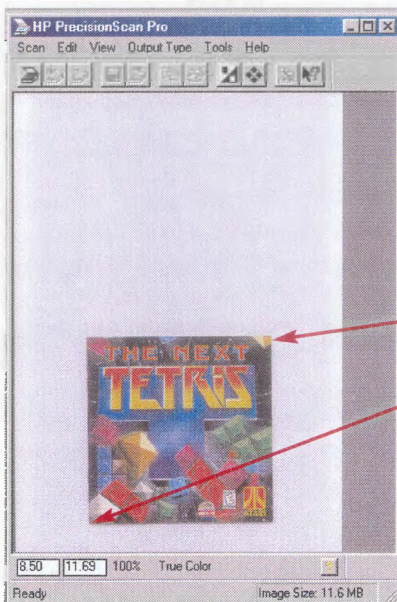
At this stage, the scanning program for the individual scanner will appear. Unfortunately, every scanning program is different. If you are using a scanner at the library or at Schmeeckle Reserve, specific instructions will be given in Step Five.

1. Follow these basic guidelines for all scanning programs. Ask for assistance if you cannot find where to change the settings (see Step Five for scanners at Schmeeckle or the library).
2. First, you need a **preview** of your image. Some programs do this automatically. You should see a picture of the scanner bed on your screen with your image.
3. Next, you need to **select your image** by drawing a box around it. Only the selected area will be scanned.
4. Then, you need to set the resolution. Resolution is measured in **DPI** (dots per inch). Most monitors and projectors can only display about 72 dpi. Set your resolution at **100 dpi** just to be safe.
5. You also need to set the size/dimensions. The size is measured in **pixels**, which is the number of dots your screen can display. Try to scan your images at about **800 pixels wide by 600 pixels height**, or as close as you can by still keeping the picture proportional.
6. Finally, you need to do a **final scan** of the image, and transfer it to Paint Shop Pro.


Step Five: Scanning at the library or Schmeeckle Reserve.

Library

The library uses Hewlett-Packard scanners. These instructions should work with almost any HP scanner.



1. After selecting "Acquire" in Paint Shop Pro, a window like the one to the left should have appeared.

2. If the preview doesn't appear automatically, hit the preview button on the top toolbar to see your image. 

3. Now we need to select your picture. Move the mouse cursor to one corner of the picture. The cursor should be a plus +. Click the mouse button and hold it down.

Move the mouse cursor to the opposite corner. A box is drawn around your image.

Release the mouse button, and the dashed box appears. Notice that the box has handles. You can easily resize the selection box to fit your picture.

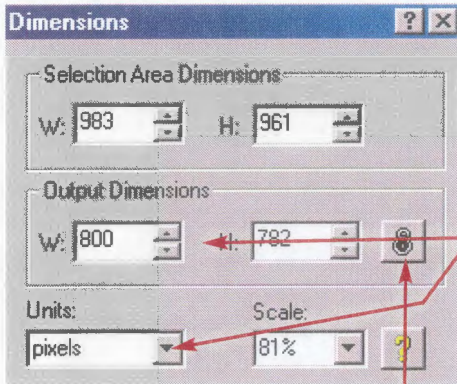
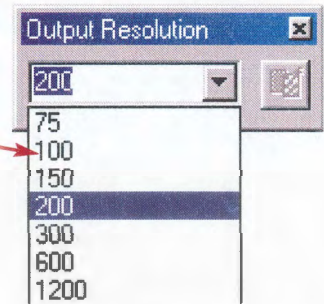


Remember, only the image inside the selection box will be scanned.

4. We need to change the resolution. Click “Tools” on the top menu, and then click “Output Resolution.”

On the box that pops up, change the number to 100 (for DPI).

Close the box.



5. We also need to change the size. Click “Tools” on the top menu, and click “Dimensions.”

We want to measure in pixels, so change the “Units” to pixels.

We also want our “Output Dimensions” to be close to 800 W by 600 H. On this example, when the width is changed to 800, the height automatically changes to 782. It’s larger than 600, but will work fine for PowerPoint. Try not to get any smaller than 800 x 600.

Make sure the padlock stays locked. This keeps the Output Dimensions in proportion.

Close the box.

6. Make sure you’re scanning the right kind of image. Click “Output Type” on the top menu, and make sure that “True Color” has a checkmark next to it.



7. Finally, we’re ready to scan. Click “Scan” in the top menu, and then click “Return to Paint Shop Pro.”

8. Wait for the scanner to complete the final scan. The program will automatically take you back to Paint Shop Pro.

9. Skip to Step Six to continue.

Schmeckle Reserve

The Schmeckle Reserve Visitor Center uses Heidelberg scanners.

1. Contact the reserve at 346-4992 and ask for Char or Jim. We will schedule a time to train you on using the scanner.

Step Six: Editing the scanned image.

Paint Shop Pro offers an endless diversity of tools for modifying your image. We will focus on the two most important ones: rotating and flipping an image. Feel free to explore Paint Shop Pro more on your own.

1. Rotating an image:

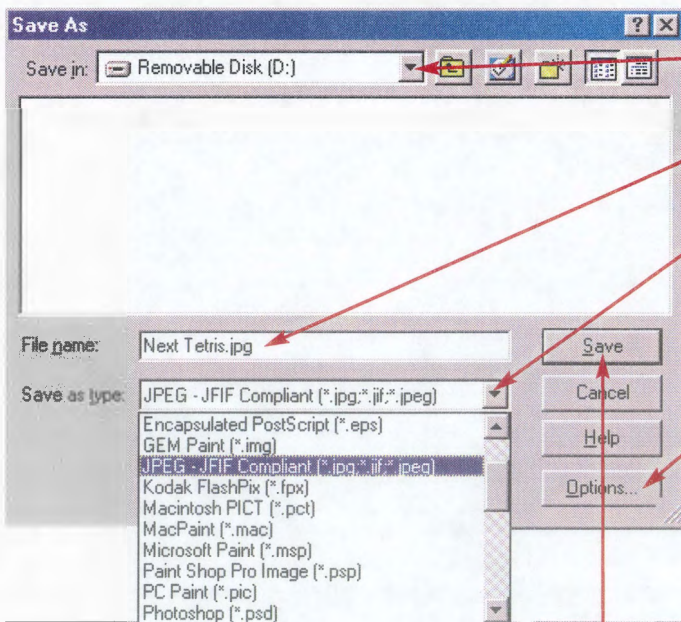
- Click “Image” on the top menu. Then click “Rotate.”
- Choose a direction (right: clockwise and left: counter-clockwise)
- Choose number of degrees. For the most part you will stick with 90 or 180 degrees. You can rotate any other degrees by selecting “Free” and typing in a number.
- Click the “OK” button to rotate your image.

2. Flipping an image:

- If your image is backwards, it may need to be flipped.
- To flip/mirror horizontally, click “Image” on the top menu, then click “Mirror.”
- To flip/mirror vertically, click “Image” on the top menu, then click “Flip.”

Step Seven: Saving the scanned image.

1. Click “File” on the top menu, then click “Save as...”

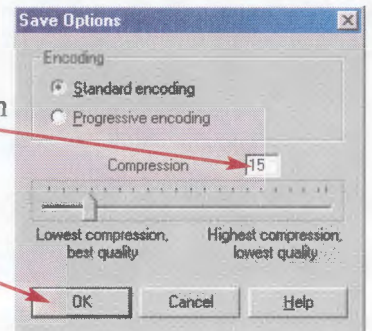


2. Choose “Removable Disk” to save on a zip disk, or choose your private drive.

3. Type a name for the scanned image.

4. Change the type to “JPEG-JFIF Compliant.” JPEG graphics work great for PowerPoint. They are small and look good on the screen. They are not appropriate for printing.

5. Click the “Options” button. Make sure the Compression is 15 or lower. Higher compression makes graphics look fuzzy. Click the “OK” button.



6. Click the “Save” button. Your scanned image has been saved on your Zip disk or Private drive.

Congratulations! You have completed the scanning tutorial. The image you scanned will be used in PowerPoint Tutorial #3.



Fundamentals of Microsoft PowerPoint

Tutorial #4



Step One: Starting a new presentation

1. Start Microsoft PowerPoint, and create a blank presentation.
2. Add seven more blank slides to the presentation, so you have a total of eight slides.
3. Make the background of all the slides black.
4. Make all of the slide transitions a fast “Fade Through Black.”

Step Two: Custom animation: Ordering and Timing

Besides being an easier alternative to actual slide presentations, PowerPoint offers a host of utilities that can enhance the impact of your program. **Animation** is used to reveal certain elements sequentially or to illicit an emotional response. Be very careful not to overuse animation in your presentation, or to degrade the professionalism of your program. Animation must have a solid purpose: will including animation enhance my program or contribute to the theme? If it doesn't, leave animation out.

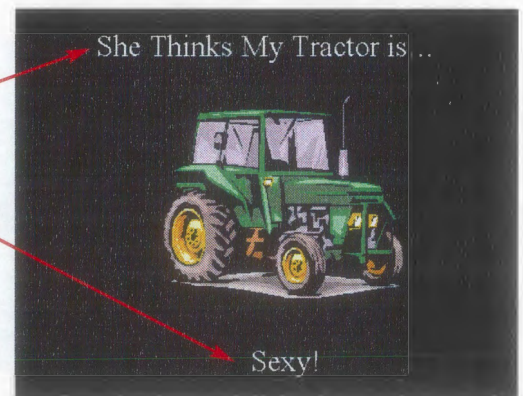
1. Go to slide #1.
2. Insert a graphic of your choice in the middle of the slide working area.
3. Think of a title that has at least two words.
4. Insert two text boxes: one above the graphic, and one below the graphic.

Put the first half of your title in the upper text box.

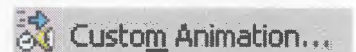
Put the second half in the lower text box.

Make sure the title is centered, and remember to change the color of your text to something other than black.

When we show this presentation, we would like the graphic to appear first, then the top text box, and lastly the bottom text box. That's where custom animation comes into play.



5. Click “Slide Show” on the top menu. Then click “Custom Animation.”



6. A window like the one on the next page appears.

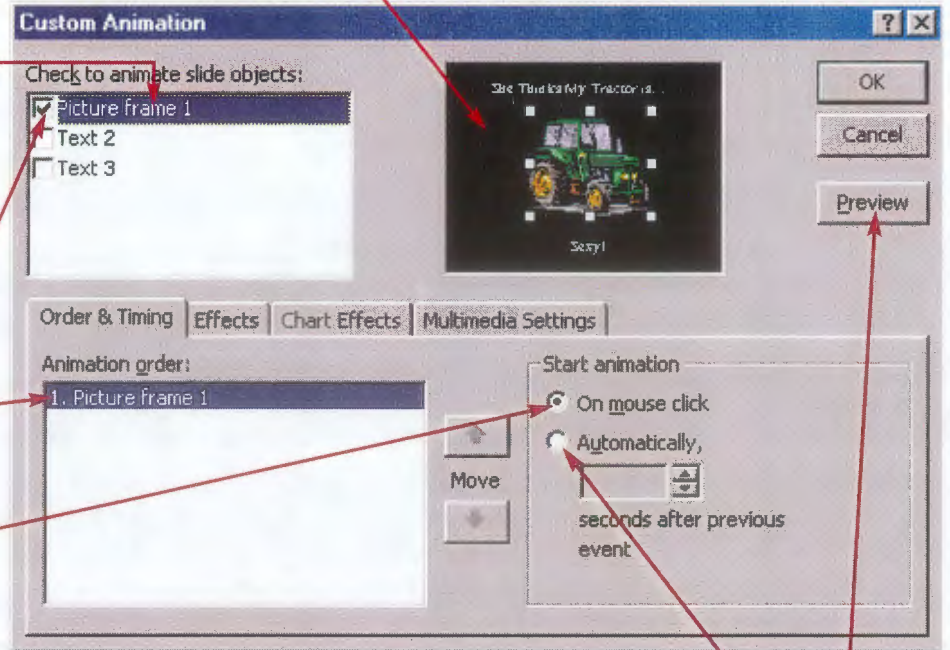
Notice the preview of your slide in the middle of this window.

7. Click the words (not the box), and a frame will appear in the preview to show you which element it represents. Click "Picture Frame 1," and notice how a box appears around your graphic.

8. Click the box next to an element, and it becomes part of your animation. Click the box next to "Picture Frame 1," and it is added below to "Animation order:"

9. Under the "Start animation" box, make sure that "On mouse click" is currently selected. For the most part, you will want animations to be performed after clicking the mouse.

In some cases you may want the animation to occur automatically after so many seconds. The second option gives you that flexibility.

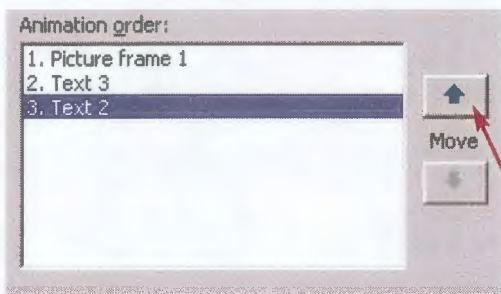


10. Click the "Preview" button on the right side of the window to see how your slide has been animated.

11. Now we need to animate our text boxes. Click the box next to "Text 3." It is added to the animation order.

12. Finally, click the box next to "Text 2." It is added to the animation order.

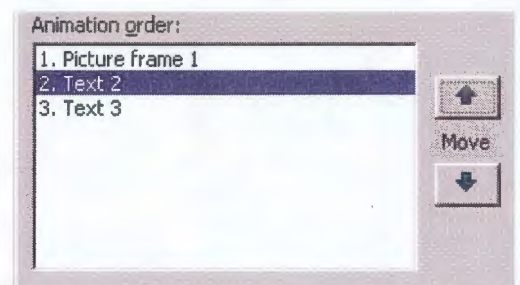
13. Click the "Preview" button to see your animation. Everything is now animated, but not exactly right. The graphic appears first, but the bottom text box appears before the top. We need to switch these two around. That's where our "Animation order:" box comes in handy.



Your animation order should look like the one to the left. According to the list, "Picture frame 1" is animated first, "Text 3" comes second, and "Text 2" comes last.

We need to move "Text 2" into the second animation position. Click on "Text 2" so it is highlighted. Then click the Up Move Arrow.

14. Your animation order should now look like the one on the right. Click the "Preview" button to see if your animation is correct. The graphic should move in first, then the top text box, and finally the bottom text box. Practice changing the order of your animation, but make sure it looks like the one on the right before continuing.



Step Three: Custom animation: Effects

When you previewed the animation on your slide, you probably noticed that all of the elements seemed to glide in from the left side of the screen. Although this might be desirable in some cases, PowerPoint offers a diverse array of animation effects. Again, consider the purpose of your animation before deciding which effect is best for your presentation.

1. Click the “Effects” tab.

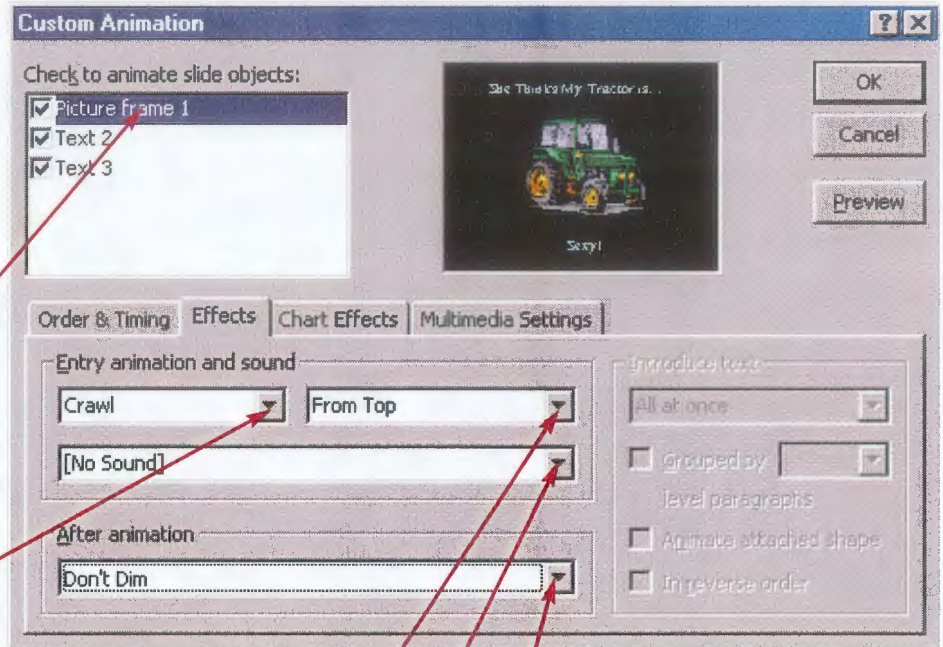


2. A window like the one below appears.

3. The “Effects” menu allows you to choose animation effects for each individual element on your slide.

4. **Important:** Before changing the effects, make sure your element is selected first in the top box. Click on the “Picture frame 1” to select it, but **NOT** on the box next to it (otherwise you will take it out of the animation). Now, whatever you change will affect just your graphic.

5. Click the down arrow to choose an effect. Choose “Crawl” for your graphic.



6. Click this down arrow to choose specific options for your effect. In this case, from where to you want your graphic to crawl? Choose “From Top.”

7. To add sound to your animation effect, click this down arrow and choose a sound effect. Sound will be covered later in the tutorial, so don't add any right now.

8. **Advanced:** The last box gives you several choices for what to do with the element after it is animated. For the most part, you will leave it as “Don't Dim.” This leaves the element untouched. Otherwise, you can make your element turn a certain color after being animated, you can have the element hidden, or you can have it hidden on the next mouse click.

9. Click the “Preview” button to see how your animation has changed. The graphic should now slowly move from the top of the screen to the middle.

10. Following the instructions in items 4. to 9., change the animation effects of the “Text 2” text box and the “Text 3” text box.


11. After you have completed these steps, click the “OK” button. You are brought back to the edit screen. Click the “Slide Show” view button to view your presentation. Notice how the animations occur when you click your mouse button. After you get past your first slide, end the slide show.

Step Four: Practicing animation

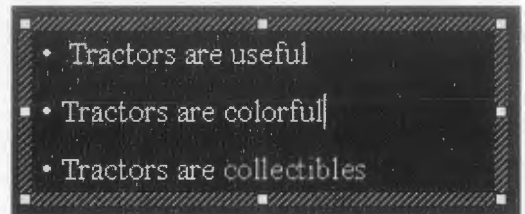
1. Go to slide #2.
2. Insert three graphics of your choice.
3. Animate all three using different effects. Follow Steps Two and Three above if you need help.

Step Five: Animating a single text box.

In most cases, if you want to animate different strings of text, separate your text into different boxes like we did in Step Two. You then have control of exactly how each box is animated and what effect is utilized. There are times, however, when you might need to animate words or phrases in a single text box. Creating separate text boxes for long phrases or lists can be very time-consuming. Luckily, PowerPoint can help.

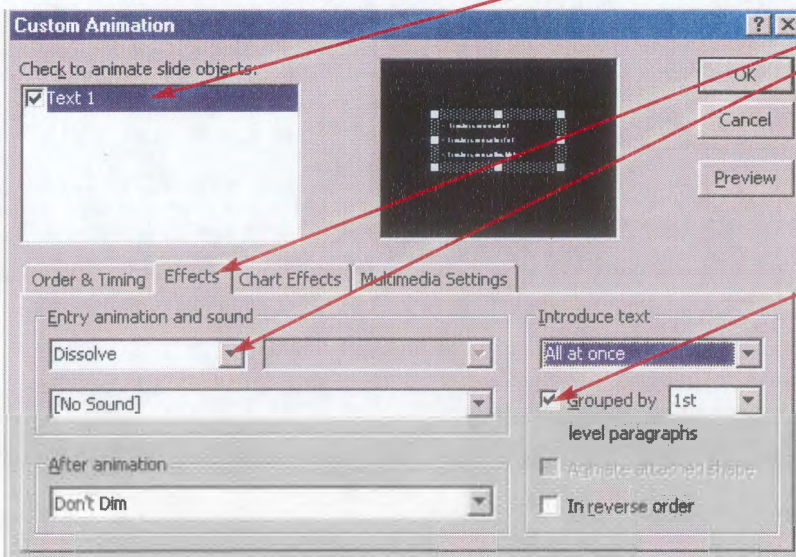
1. Go to slide #3.
2. Insert a single text box in the middle.
3. Type in a list of three phrases that relate to your first slide. Use bullets by clicking the “Bullet” button  on the top toolbar.

4. Your list should look something like the one at the right. You would like each phrase to appear when you click the mouse button.



5. Click “Slide Show” on the top menu, and then click “Custom animation”

6. Make sure your textbox is selected (“Text 1”), and click the “Effects” tab.



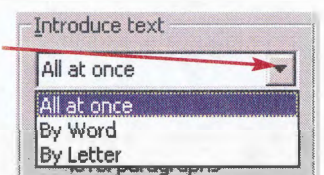
7. Choose the “Dissolve” animation effect.
8. If we left it this way, all of the phrases would appear at the same time. We need to change something in the “Introduce text” box.

9. Click on the box next to “Grouped by 1st level paragraphs.” Since we pressed the “Enter” key after each phrase, every phrase is considered a paragraph. By clicking here, each paragraph is revealed one at a time.

10. Click the “Preview” button to see your animation.

11. Click the “OK” button. View your presentation, and notice how each phrase appears when you press the mouse button.

12. For some interesting effects, click the down triangle next to “All at once” and choose a different option. Text can appear word by word, or even letter by letter.

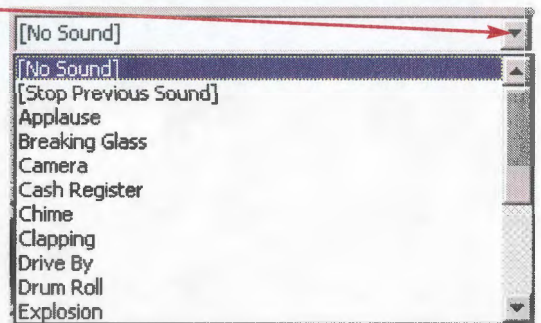


Step Six: Adding sound: Animations and Transitions

Sound is another aspect of PowerPoint that can enhance the effectiveness of your programs. Audio clips can transport people to another time and place, conjure up memories, or provide humor relief. Think of the power of a famous speech, the roar of a rocket ship, the entertaining beat of a song, or the calming trickle of a stream. As with all special effects, however, the purpose of using audio in your program must be well defined and help contribute to your theme.

If you're working in a computer lab on campus, or on a computer that doesn't have speakers, it would be a good idea to bring along headphones so you can hear the sounds. The lab assistants will know where to plug your headphones in.

1. Go to slide #4.
2. Insert a graphic of your choice. Make it as large as possible.
3. Animate the graphic however you would like.
4. Preview your slide to make sure it is correct.
5. Now it's time to add sound to the animation. Click on your graphic, click "Slide Show" on the top menu, and then click "Custom Animation."
6. Make sure "Picture frame 1" is selected. Click the "Effects" tab.
7. Click the down arrow next to "[No Sound]." The menu that appears contains several sounds that come standard with PowerPoint. All computers on campus have these sounds.
8. Choose a sound for your animation effect. Then click on the "Preview" button. You should be able to hear the sound you chose as your effect takes place.
9. Most sound files are saved as "Wave" files (they have a .wav extension). You can choose a sound that you saved in another location by clicking on "Other sound..." located at the bottom of the list.
10. Remember, sound effects should be used sparingly, and only when they contribute to your overall presentation. As you saw in the last tutorial, this same method can be used to add sounds to your transitions between slides.



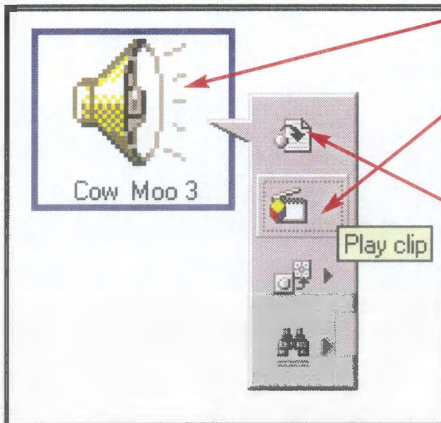
Step Seven: Adding sound and music: Separate

Adding sound to your custom animation is only one way to incorporate sound into your presentation. More often, you will want to add sound or music as a separate component independent from your other animations. There are three methods for adding audio.

Method 1: Microsoft Clipart.


1. The good news is that the easy-to-use Microsoft Clipart Gallery also contains sounds for your programs. The bad news is that your options are rather limited. The Clipart Gallery is a good place to start in your search for audio clips.
2. Go to slide #5. Click "Insert" on the top menu. Then move the cursor down to "Movies and Sounds >". Finally, click on "Sound from Gallery."

3. You have seen this window many times before. You search for sounds the same way you search for pictures. Click on the “Animals” category and find a sound of a cow mooing. Or, type “cow” in the search box, and press the “Enter” key.



4. Once you have found the clip, click on it.
5. On the menu that appears, click the second icon to hear a preview of the sound.
6. Click on the first icon to insert it into your presentation.
7. A box will pop up asking you want your sound to play automatically in the slide show. This is a matter of preference depending on the purpose of the sound. In this case, click the “No” button.

8. A small Speaker icon has been inserted in the middle of your slide. 

9. Click the “Slide Show” view button to view this slide full screen. While in the presentation, move the mouse cursor over the Speaker icon. The cursor changes into a Pointing Hand. 

10. Click the Speaker icon. You should hear the sound effect that you just inserted.

11. Click the Speaker icon again. You hear the sound effect once more. When you click off of the Speaker icon, the slide changes to the next one.

Method 2: From file

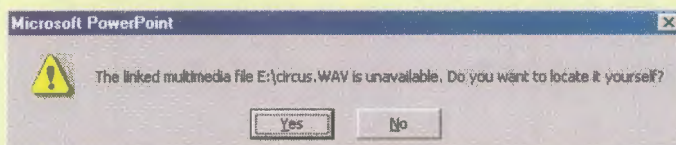
1. Other sources of sound are available that offer far more selection than the Microsoft Clip art Gallery. Once again, the Internet is an amazing source of audio material. Use your favorite search engine, type in a few key words, and see what you can find. Sound files range from recorded sound effects (.wav) to simple computer-generated music (.mid) to high quality music (.wav and .mp3). In addition, thousands of sound effect CDs are available that offer an immense selection. Schmeckle Reserve has a generous collection that are available to students. Also check out the local library and department stores. If you need help transferring CD tracks to computer files, ask a computer lab assistant or contact Schmeckle Reserve. There are special programs designed to do this.
2. Minimize PowerPoint. Open up Internet Explorer. In the address box, type “<http://students.uwsp.edu/jbuch209>”. Click on the “Tutorial #4” link (refer to Step Five in Tutorial #3 for help).
3. A list of sound files should appear on the web page. Right-click the “Circus” file. Click on “Save Target As...”
4. Choose a location to save the sound file; either your zip disc or private drive. Then click the “Save” button. The file called “circus.wav” has been saved (for help refer to Option #2 in Step Five of Tutorial #3).
5. Minimize Internet Explorer. Maximize PowerPoint by clicking it on the taskbar.

6. Go to slide #5. You already inserted a sound from Clipart on this slide. Move the Speaker icon to the left side of the slide working area.
7. Now, click “Insert” on the top menu, move down to “Movies and Sounds >”, and then click “Sound from File...”
8. You have seen this window before (refer to item 12. of Step Five in Tutorial #3). Choose the location where you saved the sound clip (zip disk or private drive). Then click once on the sound file (“circus.wav”). Finally, click the “OK” button to insert the audio.
9. The same question will appear as in Method 1, asking if you want the sound to play automatically. For this tutorial, click the “No” button.
10. Now you have two Speaker icons on the slide. Move the one you just inserted to the right side of the slide working area.
11. Click the “Slide show” view button to look at this slide as it will appear in your final presentation. Click both of the Speaker icons, and notice that each contains the sound you assigned to it.
12. On this same slide, insert one more sound from the Internet using the steps above. Preview the slide again to make sure the sound works.

The Problem with Sound

Although sound is an effective way to enhance your presentation, using sound requires more thought than graphics. Graphic files viewed on screen are usually quite small. When you insert a graphic, PowerPoint incorporates that graphic into itself, which means you don’t need the original graphic file. Audio files, on the other hand, are usually quite large. Your presentation would get much too large if the audio files were incorporated. This means, that you need to have separate audio files for PowerPoint to read from.

Important: Make sure that you save all of your sound files in the same location as your PowerPoint presentation. When you switch to another computer, make sure that your audio files still work. Switch to “Slide view,” and double-click each of your Speaker icons. If they don’t work, you will get a message like this:



If this window appears, simply press the “Yes” button, and find your audio file. This is called *re-linking* your files.

Method 3: From CD

1. PowerPoint also allows you to play a song directly from a CD. This is especially useful if you would like to incorporate a long song, or don’t have the tools available to convert a CD track to a computer file.
2. Choose a music CD that you would like to add to your presentation. Put it in the CD-Rom drive of the computer.

3. Stop the CD from playing if it starts automatically (it will on most computers).
4. Go to slide #6. Click “Insert” on the top menu, move to “Movies and Sounds >”, and then click “Play CD Audio Track...”
5. A window like the one on the right appears. Choose the options that you would like.

- Click here to continuously play the selected tracks until you stop it.
- Choose the number track you would like the sound to start from.
- Choose the specific time within the track to start at.
- Choose the number track you would like the sound to end at.
- Choose the specific time within the track to end with.
- When you are done, click the “OK” button.



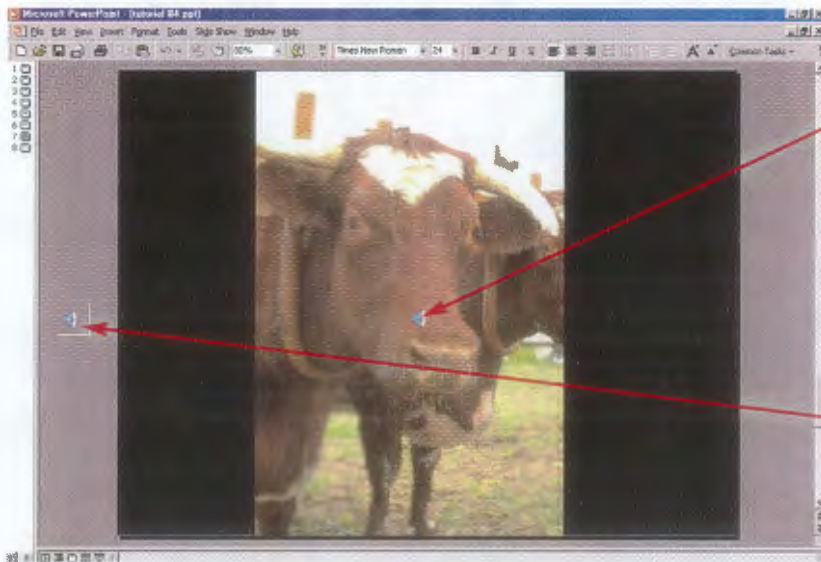
6. You will see the same window asking if you want the sound to automatically play. Again, click the “No” button.
7. A small CD icon has been inserted into the middle of your slide working area.
8. Click the “Slide show” view button to look at your slide as it will appear in your actual presentation. Click the CD icon. You should hear your CD play the tracks you selected in item 5.
9. If you are going to use this method, remember to bring along your CD the day of the presentation.



Step Eight: Combining sound and animation

1. With each of the three methods of incorporating sound, we end up with an icon on our slide that needs to be clicked before the sound clip or music is heard. Often, the icon may be more distracting than it is useful. By combining what we learned about creating animation and inserting sounds, we can eliminate the need for the icon.
2. Go to slide #7. Insert a large picture in the middle of the slide. Enlarge it to the maximum size.
3. Now, insert a sound effect of your choice. You can either use the Microsoft Clipart Gallery, or another file from the tutorial web site (“<http://students.uwsp.edu/jbuch209>”). Click the “No” button when asked whether you want the sound to be played automatically.
4. You should now have a small sound icon on top of your large graphic. How unsightly! Let’s move the sound icon.

- Remember, only elements on the slide working area will be displayed in your final presentation. We will move the sound icon off the slide working area. We can still see it in while editing our slides, but it will be hidden when we view the actual presentation.



- Click on the sound icon and hold down the mouse button.

- Drag the icon off of the slide working area, to the dark gray background.

- Click the “Slide Show” button to preview this slide as will look in the final presentation. Notice that the sound icon is not displayed. But without the sound icon to click on, how can we hear the audio? That’s where Custom Animation comes back into the picture.

- End the slide show. Make sure you are still on slide #7. Click “Slide Show” on the top menu, then click “Custom Animation...”

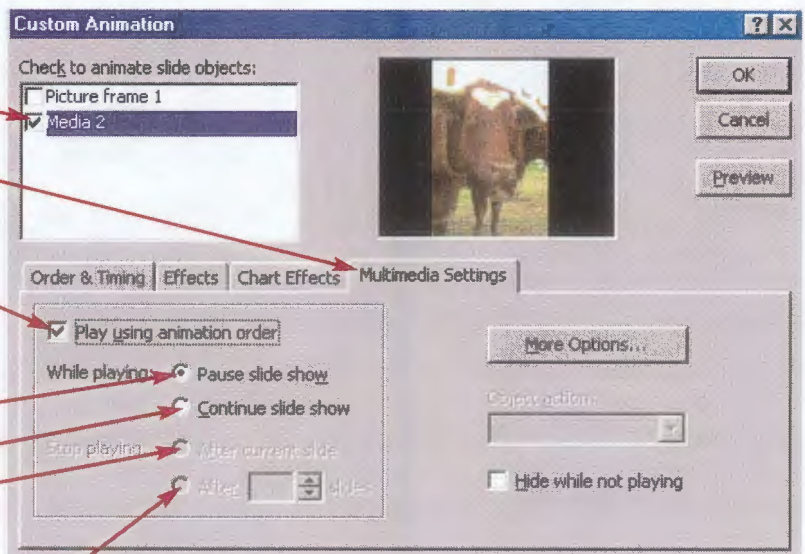
- On the window that appears, click the box next to “Media 2” (our sound clip).

- Click the “Multimedia Settings” tab.

- We want to animate our sound. Click the box next to “Play using animation order.”

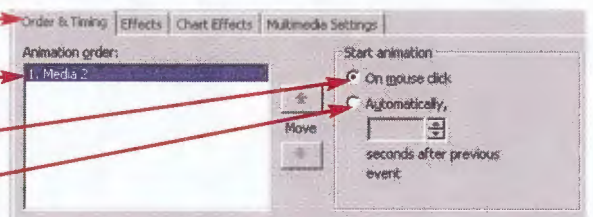
- While the sound is playing, you have different options.

- Click here to pause the show.
- Click here to continue the show.
- Click here to stop the sound from playing after the current slide.
- Or, choose the number of slides after which the sound should stop playing.



- Click the “Order & Timing” tab.

- Notice that our sound clip is the first and only element to be animated.
- Also notice that the clip will be animated on the mouse click. You could make the sound play automatically using the option below it.



13. Click the “OK” button. You are returned back to the edit mode.
14. Click the “Slide Show” view button. Your large graphic will appear on the screen. When you click the mouse, you activate the animation... your sound clip. You should hear the sound clip being played. When you click the mouse again, the slide changes to the next one. By combining sound and animation, you can play an audio clip without the distraction of clicking the sound icon.

Step Nine: Adding movies

The final unique element that you can incorporate into your PowerPoint presentation is video. Moving pictures with sound have an amazing ability to attract and hold people’s attention, while making complex information understandable. Unfortunately, movie files on the computer are huge. Even a short, high-quality video clip could easily fill an entire zip disk. Because of these large sizes, video files are often condensed, which makes the quality on screen rather poor. Still, video clips can be used to enhance your presentation.

1. Inserting movie files into your presentation is almost identical to inserting sound files. For more detailed instructions, refer to Step Seven above.
2. Go to slide #8. To insert a file from the Microsoft Clip art Gallery, click “Insert” on the top menu, then move to “Movies and Sounds >”, and finally click “Movie from Gallery...” Explore the galleries, preview the clips (same as item 5. of Method #1 in Step Seven) and insert a movie into your presentation.
3. You can move and resize movie files just like regular graphics.
4. Click the “Slide Show” view button to see the slide as it will appear in your actual presentation. The movie graphic appears and begins to play automatically.
5. End the slide show.
6. Open up Internet Explorer and type “<http://students.uwsp.edu/jbuch209>” in the address box. Click on the Tutorial #4 link. Scroll down until you see the video files. Right-click “The Crabs,” choose “Save Target As...”, and save the movie file on your zip disk or private drive.
7. Go back to Microsoft PowerPoint. Make sure you’re still on slide #8. Click “Insert” on the top menu, then move to “Movies and Sounds >”, and finally click “Movie from File...”
8. Choose the location where you saved the movie file (“crab1.mpg”), click on the file, and then click on the “OK” button.
9. Once again, you will get a window asking you if you want the movie file to play automatically. This time, click the “Yes” button.
10. The movie file you just inserted is black and matches the background. You can move and resize the movie file, just like a regular graphic. Make the movie box larger, and move it to one side of the slide. Move your Microsoft Clipart movie to the other side. Click the “Slide Show” view button to see the slide as your actual presentation, and watch the show. Both movies play automatically.

11. You can change whether the video clip plays automatically or on a mouse click. Follow the instructions in Step Eight. By combining video and animation, you have complete control over when the animation plays and for how long.
12. Video is a unique way to add flair and thematic material to your presentation. Like sound, the video file must be saved to the same location as your PowerPoint presentation. Also like sound, you should check that the movies still work when you change computers. Otherwise, the files may need to be re-linked.
13. Many of the computers in the library are attached to VCRs that allow you to convert tapes into computer video files. Ask a computer assistant for help if you would like to utilize this technology.

Assignment:

1. Create a new e-mail message (see Tutorial #1)

Make sure to send it to my mailbox: *jbuch209@uwsp.edu*

2. Answer the following questions in the e-mail.

1. Why would you use animation in your presentation?
2. In your own words, how can sound enhance your program?
3. When would video clips be appropriate in an interpretive program?
5. Which sections of this tutorial did you have the most trouble with?

3. Insert your presentation in the e-mail. (see Tutorial #1)

Your presentation should be eight slides.

Slide 1: Graphic, upper and lower text box. Animated (different effects) in that order.

Slide 2: 3 graphics. Animated with different effects.

Slide 3: 1 text box with bulleted list. Each line animated separately.

Slide 4: Graphic, animated with a sound effect.

Slide 5: 3 sound effects: one from Clip art, two from internet

Slide 6: 1 CD sound effect

Slide 7: Graphic. Sound icon not visible in actual presentation, but heard.

Slide 8: Two movies: one from Clip art, one from internet

Your entire presentation should have a black background.

Your entire presentation should have the “fade through black” transition.

4. After you insert your presentation and answer the questions, click the “Send” button on the “top toolbar.”

Congratulations! You have completed PowerPoint Tutorial #4.

Appendix B

Desktop Publishing Module

Computer terminology outline.....	261
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NR 363/563/364/564
Computer Technology in Interpretation Lab
Session 1

Computer Lingo

Hardware

CPU:

Processor:

RAM:

Monitor:

Disk Drives:

3 1/2" Floppy:

Zip Drive:

CD-Rom:

CD-Writer:

Hard Drive:

Private H: Drive:

Size/Capacity:

Windows

Desktop:

Icons:

Start Menu:

Left mouse button:

Right mouse button:

My Computer:

Folders:

Task bar:

Title bar:

Moving a window:

Primary size buttons:

Secondary size buttons:

Top menu:

Top toolbar:

Bottom toolbar:

Message bar:

Scroll bars:

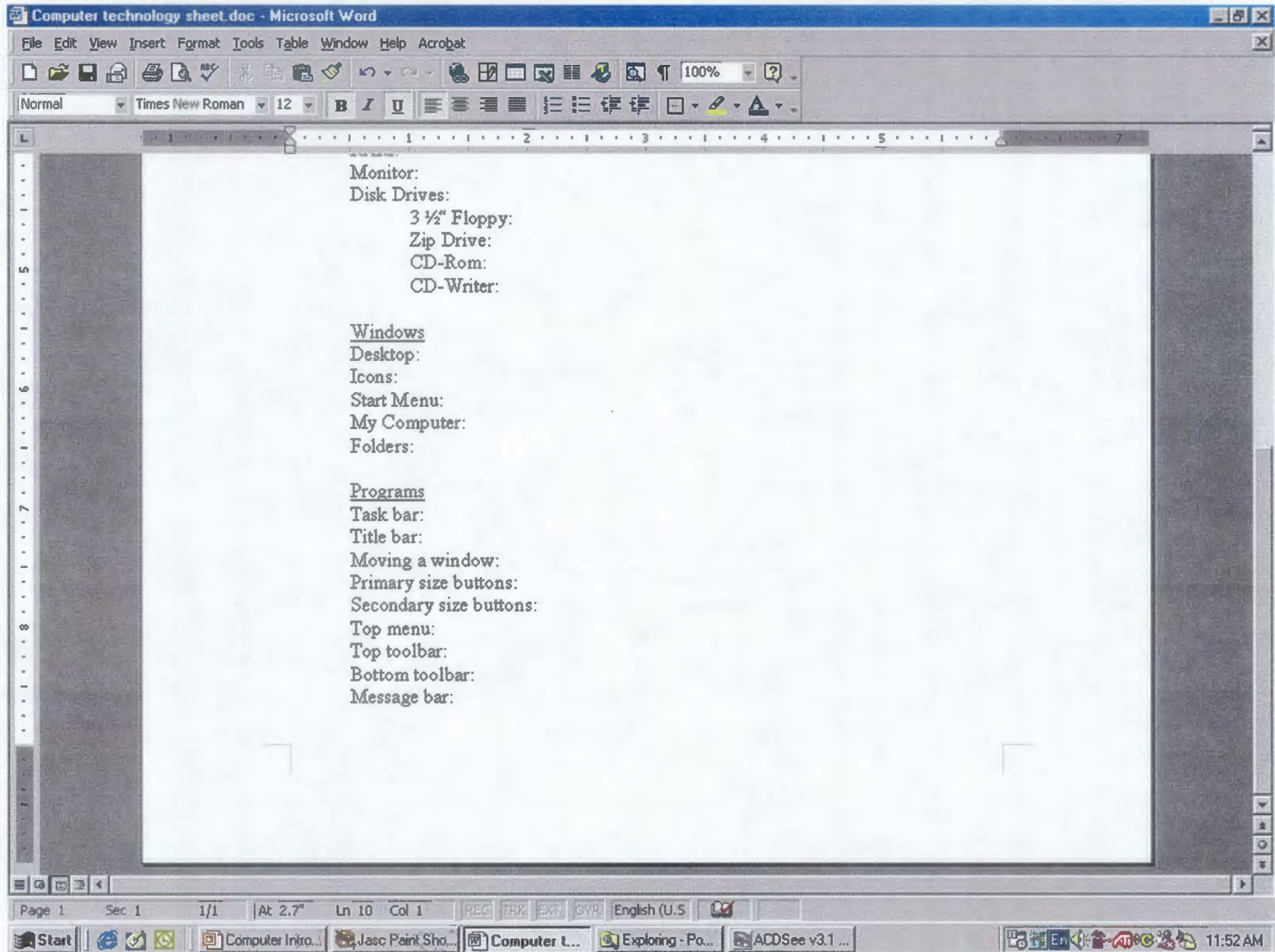
Programs

Graphic editing:

Photo editing:

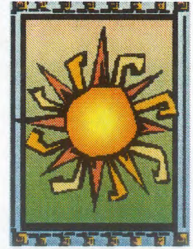
Page Layout:

Programming:






QuarkXpress



The Basics

1. Open “QuarkXpress”

- Either double-click the QuarkXpress icon on the desktop, or... 
- Click the Start Menu button. Choose “Programs” folder. Choose “Quark Xpress” folder. Then click on the “QuarkXpress” program.

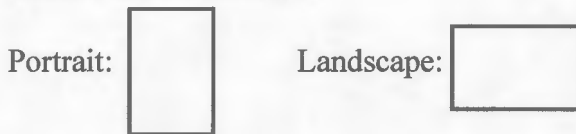
2. Change preferences to inches (not require every time).

- Click “Edit” on top menu. Choose “Preferences.” Then click “Document.” The first two choices under the “General” tab are “Horizontal Measure” and “Vertical Measure.” Change both options to “Inches.”

3. Create a new document

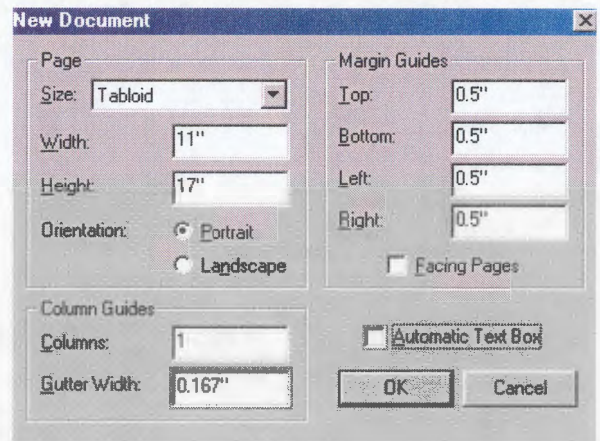
- Click “File” on top menu. Choose “New.” Click “Document.”
- On the menu that appears, choose the size of your document.
 - US Letter: 8.5” x 11”
 - US Legal: 8.5” x 14”
 - Tabloid: 11” x 17”

- Choose the orientation.



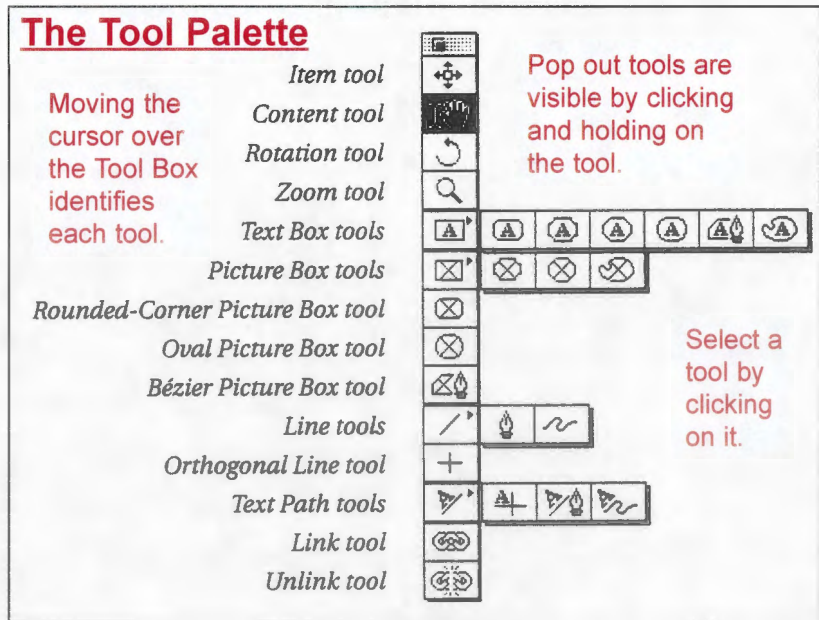
- Do not select “Automatic Text Box.”

- (Optional) Select the number of columns in your document, and the “Gutter Width” (space between columns)
- Click “OK”




4. Tool Palette

- If the “tool palette” is not visible, click “View” on the top menu, and choose “Show Tools.”
- The Item Tool, Content Tool, Text Box Tools, and Picture Box Tools will be the most important to learn.




5. Zooming

When your document first appears, it will probably be too large to work with. Zooming allows you to control how large or small your document appears.


- If your screen isn’t already maximized, click the middle size button to make it full-screen.
- On the bottom left-hand side of your screen is a small box that has “100%” in it. This represents the zoom. 
- Change this to a smaller number. Click in the box. Delete the “100%.” Type in a new number, like 50 or 60, and press the “Enter” key on the keyboard. Your page should appear smaller. Use the scrollbars on the bottom and side to center your page.
- Keep changing this number until you find a comfortable size to work with.

or

- Another method you can use to change the zoom is to use the “Zoom Tool.”  Click the “Zoom Tool.” Your cursor changes to a magnifying glass with a plus sign. Click on your document a couple of times to zoom in (up to 800%).
- To zoom out, press and hold the “Alt” key on your keyboard. The plus on the magnifying glass changes into a minus sign. While holding the “Alt” key, click on your document a couple of times. The document zooms out (down to 10%).


6. Basic Text Box

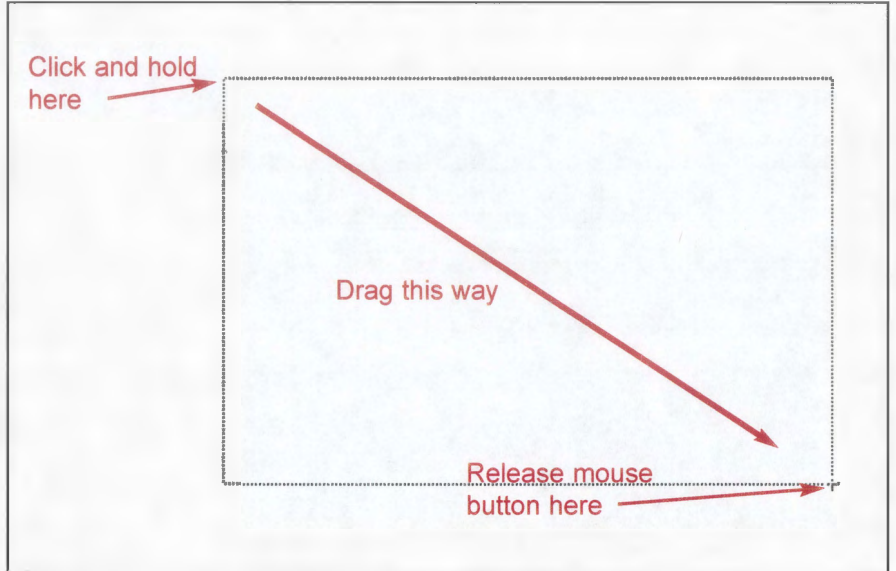
Before you can type text into a document, you must show Quark where you want the text to go by creating a text box.

- Click the rectangle “Text box tool.”  Your cursor changes to a +.

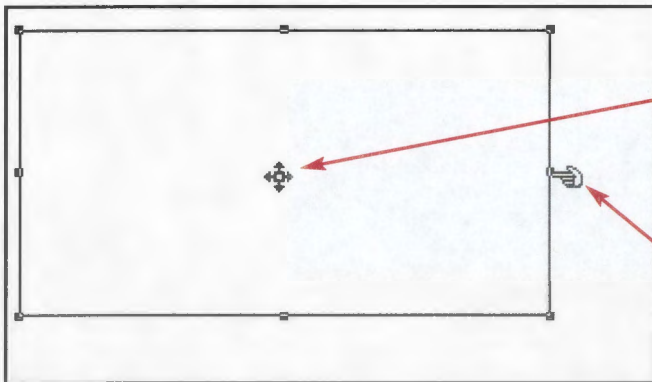
- Click the left mouse button down and hold it. Then move the mouse diagonally to draw a box. Release the mouse button when your box is large enough.

- Don't worry about the size or position of the box. You can modify it using the “Item Tool.”

-  Click the “Item Tool,” and then click on your new text box.



Handles (small squares) appear on the box.



To move the box: Click and hold anywhere on the box **except a handle**. Move the box to another location. The icon is a box with arrows.

To change the box: Click and drag a handle to enlarge or shrink the text box. The icon changes to a pointing finger.

- To type text in the box, select the “Content Tool.”



Then click on the text box.

- Be sure your “Measurements Palette” is visible. If it is not, click “View” in the top menu, and click “Show Measurements.” Click on your text box. Use the options on the palette to change your text.

The Measurements Palette for Text

Position of the text box on page

Size of the text box

Angle of rotation of text box

Justification of text

Font type

Font size

Plain, Bold, Italics, Underline, Word underline, Strike thru, Outline, Shadow, All caps, Small caps, Superscript, Subscript, Superior

7. Beyond Basic Text Boxes

Add a Border to a Text Box

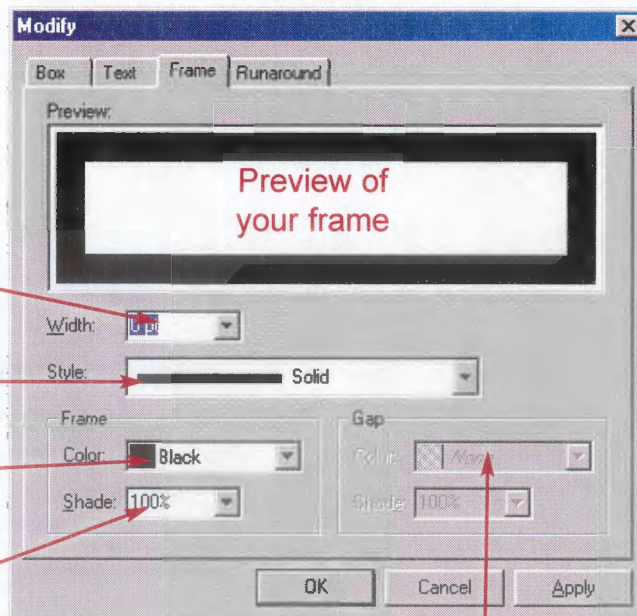
- Click on your text box to select it.
- Click “Item” in the top menu. Then click “Frame.”
- Select options for the border.
- Click “OK” when done.

Width of frame: Must be more than “0”.

Style of border

Color of the border

Shade of color



Color behind the border

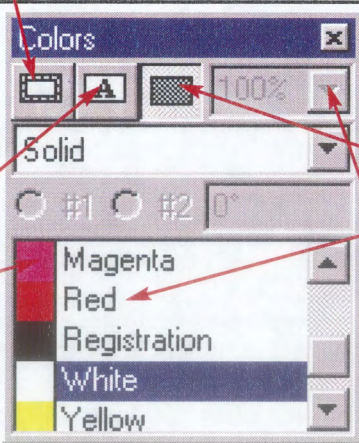
Add Color to a Text Box

- Click “View” in the top toolbar, then choose “Show Colors.”
- A window appears with standard colors (See Design Tutorial for more color information)
- Click on your text box to select it.

Click here to for an easy way to change the color of a frame.

To change the color of your text

- Highlight the text you want to change by using the “Content Tool”.
- Click the “A” rectangle
- Then click a color.



To change the background of your text box

- Click the solid rectangle
- Then click a color
- To make a text box **transparent**, select “None” for the color.
- You can also choose a shade of the color.

Moving Text Away From the Sides of the Box


- Click on the text box to select it.
- Click “Item” in the top menu, and click “Modify”
- One of the options in the window is “Text inset,” or how far away the text should be from the side of your text box. Increasing this number pushes text further away from the sides.

Checking Spelling

- Unlike Microsoft Word, Quark does not constantly check your document for spelling errors. To run the spell check, click “Utilities” in the top menu, choose “Check Spelling,” and then choose “Document.” Follow the instructions on the screen to find questionable words, and either replace or skip the words.

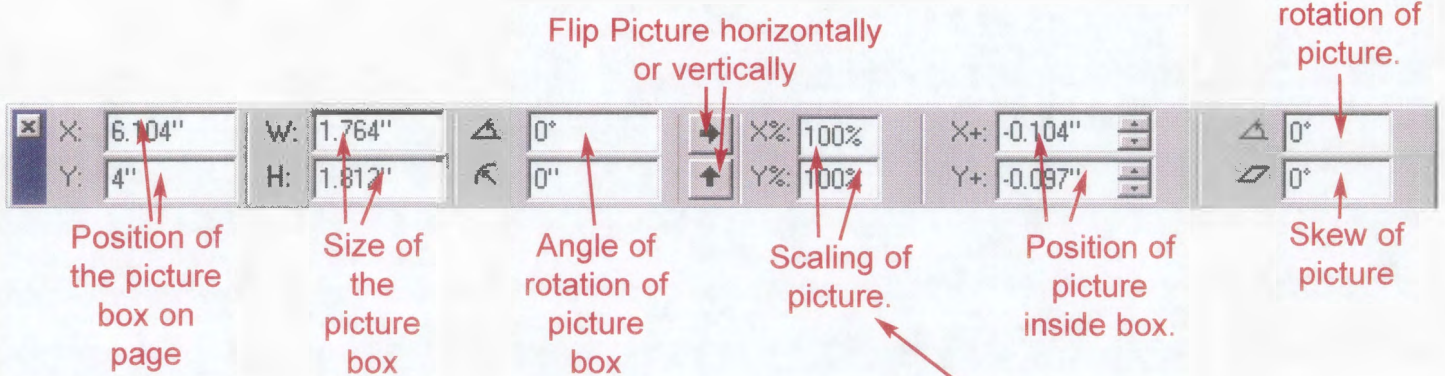
8. Basic Picture Box

Before you can import a graphic into a document, you must show Quark where you want the picture to go by creating a Picture Box.

- Click the rectangle “Picture Box Tool.”  Your cursor changes to a +.
- Create a picture box in the same way as you created the text box. Click the left mouse button down and hold it. Then move the mouse diagonally to draw a box. Release the mouse button when your box is large enough. The box will have a large X through it.
- By using the “Item Tool,” you can change the size and position of a picture box, just like a text box.
- To insert a graphic into your new box, click your picture box to select it. Click “File” on the top menu, and click “Get Picture...” Navigate to the location of your graphic (Private drive, Zip disk, hard drive). When you find it, click the “Open” button to send it to your picture box.
- Click the “Content Tool.” When you move the mouse over the picture box, the cursor changes into a hand. Click and hold the mouse button. Then move the mouse. The picture moves inside the picture box, but the picture box stays put.
- Be sure your “Measurements Palette” is visible. If it is not, click “View” in the top menu, and click “Show Measurements.” Click on your picture box to select it. Use the options on the palette to change your picture.



The Measurements Palette for Graphics



- **Changing the size of a picture:** One of the most useful tools is the scaling option. Use this to enlarge or shrink the picture within the picture box. For example, changing both X and Y to 200% will double the size of the picture. The larger you make a picture, the less resolution it has.
- **Flipping your picture:** Another useful tool is the ability to flip your picture horizontally and vertically. If an animal is facing the wrong way on your sign, for example, you can flip it to face the correct way.

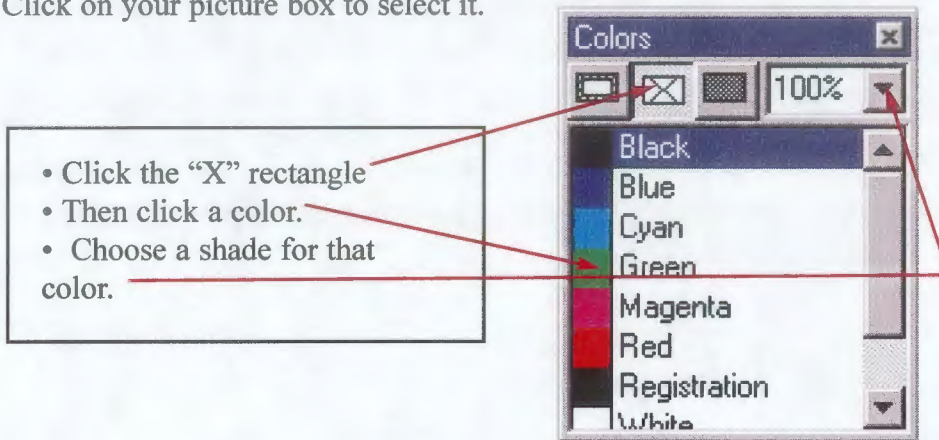
9. Beyond Basic Picture Boxes

Add a Border to a Picture Box

- Click on your picture box to select it.
- Click “Item” in the top menu. The click “Frame.”
- Select options for the border.
- Click “OK” when done.

Changing the Color of a Picture

- This can **only** be done on black-and-white pictures.
- Click “View” in the top toolbar, then choose “Show Colors.”
- A window appears with standard colors.
- Click on your picture box to select it.



Other Color Options for a Picture Box

- For all types of pictures, you can change the color of a frame by clicking on the “frame rectangle,” just like on a text box.

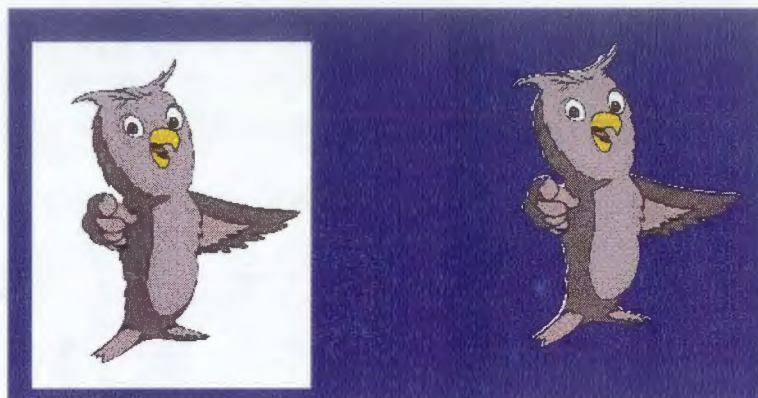


- With black-and-white pictures and some types of transparent clipart, you can also change the background color by clicking on the “solid rectangle.”

Clipping

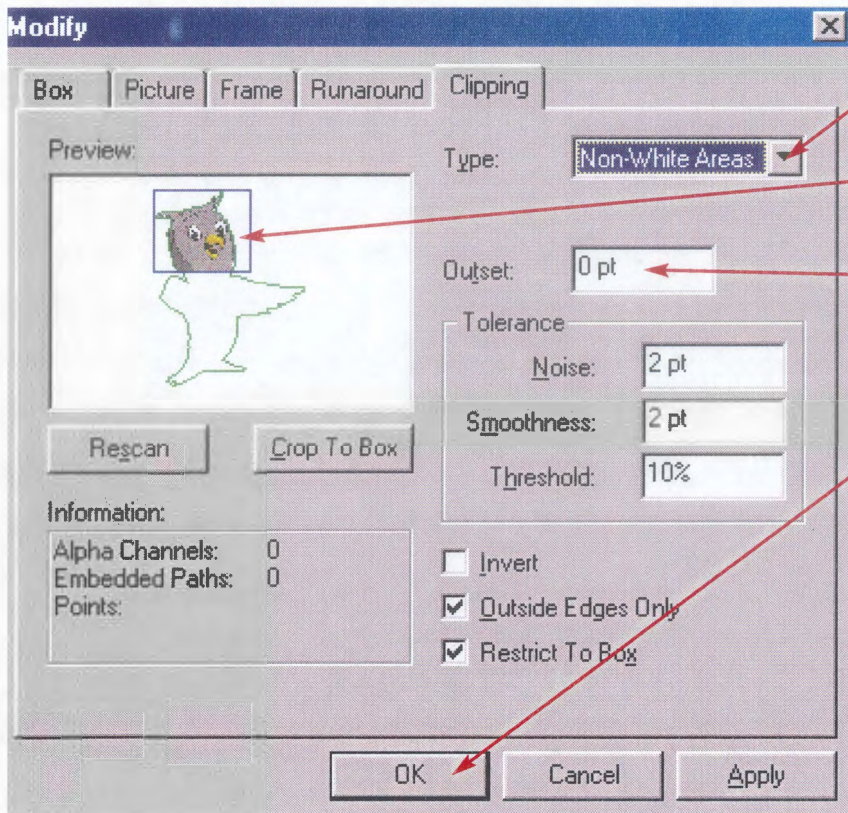
- Clipping is the ability to “cut out” the background of a graphic. Quark includes basic tools to assist you with clipping your pictures. Advanced clipping must be done in a graphics program like Adobe Photoshop.

Unclipped
Picture



Clipped
Picture

- You need to start with a picture that has a solid white background color. If it doesn't, you will need to manipulate it in a graphics program.
- Click on the picture box to select it.
- Click "Item" on the top menu and choose "Clipping."



• Change the Type to "Non-White Areas."

You should see a green outline around your picture.

• The Outset is how close you want the picture to be cut to the edge. To eliminate all white space, change this number to -1 or -2.

• Click "OK" to see how the clipping worked. If it is unsatisfactory, choose "Clipping" from the Item menu and try again.

10. Layering

When a new item is inserted into the Quark document, it becomes the new top layer. Therefore, no matter where you move the item, it will always be above the other items. Changing the layering is a simple but essential tool.

- Click on the object that you want to change the layering of.
- Click "Item" on the top menu. Near the bottom of the menu, you will see four choices:
 - "Send Backward": Sends the item one layer lower.
 - "Send to Back": Sends the item to the bottom of the layers.
 - "Bring Forward": Sends the item one layer higher.
 - "Bring to Front": Sends the item to the top of the layers.

11. Runaround

Runaround is the way text wraps around a picture box or another object. If the text box is on the top layer, it will not be affected by other objects. However, if an object is above a text box and they overlap, the text changes to avoid the object. To change the runaround:

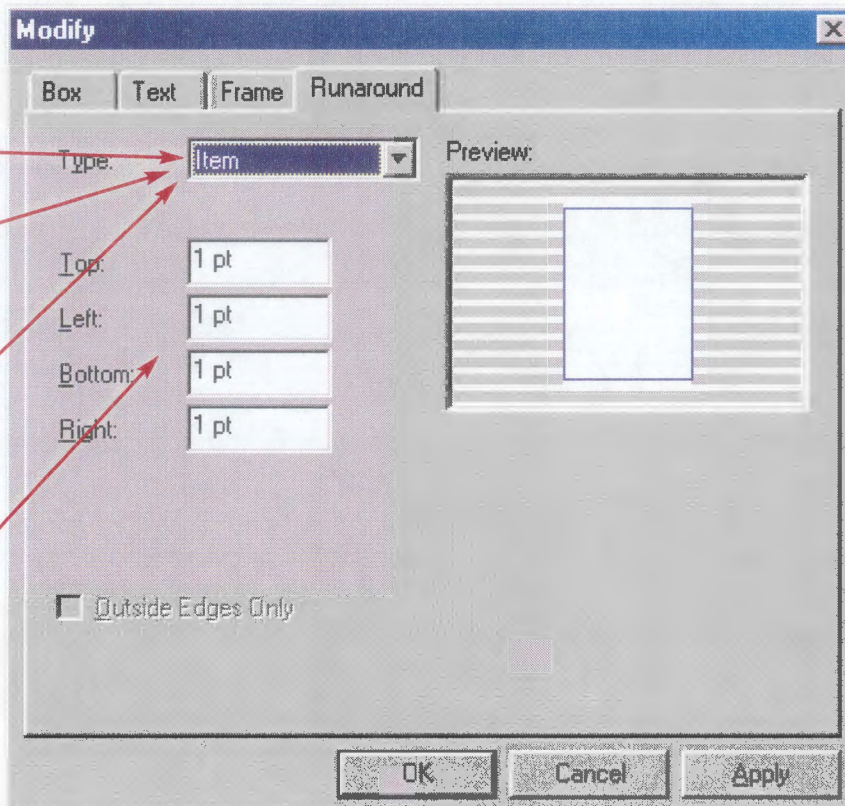
- Click the object that is causing the text to wrap.
- Click “Item” on the top menu, and click “Runaround.”

• The default runaround will be around the item box. If you don’t want the text to wrap around the object at all, select “None” from the Type option.

• If you want the text to wrap around the box, leave the Type as “Item.”

• If you want the text to wrap around an image inside of the box, change the Type to “Auto Image.” You will need a white background on your graphic in order for this to work.

• These numbers change how close the words will come to different sides of the box. The larger the numbers, the further away the words will wrap from the object.



12. Saving Your Work

Remember to save your work frequently.

To save for the first time, or to save under a different filename:

- Click “File” on the top menu, and click “Save as...”
- A browser window appears. Navigate to the folder where you want to save the file.
- Type a name for the file in the “File Name:” box.
- Click the “Save” button.

To save under the same filename:

- Click “File” on the top menu, and click “Save.” Your file is automatically updated.

13. Printing the Document

Every printer has different options.

- At Schmeckle Reserve, refer to the “Colored Laser Printer” or “Large-format DesignJet Printer” instructions sheets.
- At other locations, try printing with the default options (Click “File” on the top menu, choose “Print,” and click the “Print” button, or ask a staff person for assistance.



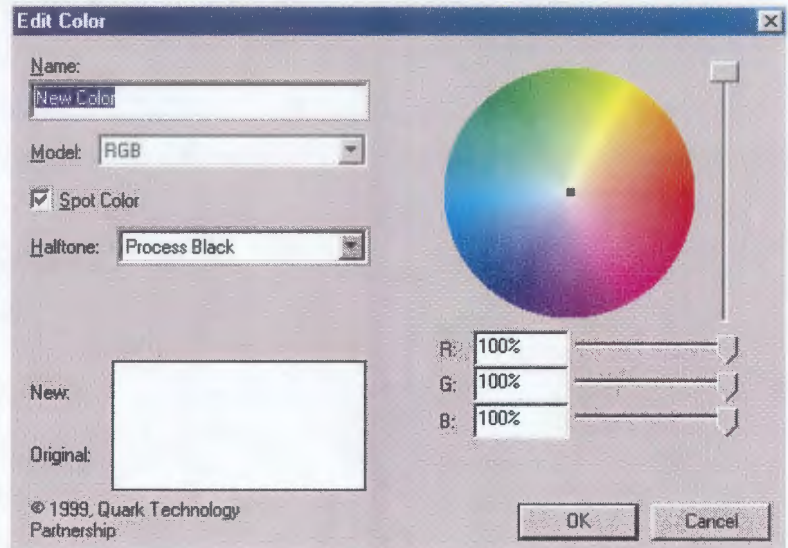
QuarkXpress



The Design Fundamentals

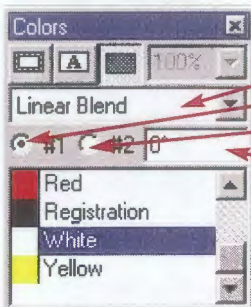
1. Adding Your Own Colors

- Click “Edit” in the top menu and choose “Colors...”
- A window appears showing your current color choices. Click the “New” button- you want to create a new color.
- In the “Edit Color” window, type a name for your new color (like “Dark Green”).
- Click anywhere on the color wheel, and the color at that point will appear next to the word “New:”
- Hold down your mouse button and move around the color wheel to see all the subtle color changes.
- Move this bar up and down to increase and decrease the brightness of your colors.
- When you have chosen the color you want, click the “OK” button.
- The first color window now has your new color added. Click the “Save” button to save your choice.
- Your new color is now a choice in the colors window.



2. Blending Colors

- Make sure your color window is visible.
- Choose an item on your document that you wish to blend. On the color window, click the solid rectangle.



- Change the “Solid” to a different type of blend.
- Click next to “#1” and choose the first blend color and shading.
- Click next to “#2” and choose the second blend color and shading.
- Type an angle here to adjust the direction of the blend.

3. Text Lines

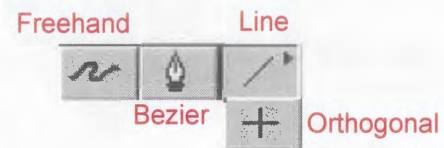
- You can make your text follow a straight or curved line that you draw.
- Click and hold over the “Text-Path” tool to get more options.



- Select one of the tools.
 - Orthogonal: Text in a horizontal or vertical line (perpendicular).
 - Freehand: Text follows whatever curve you draw (need to have a steady hand).
 - Line: Text in a straight line of any angle.
 - Bezier: Text follows a curve that is defined by Bezier curve equations (very accurate).
- On your document, click and hold on the starting point for your text line. Then drag the mouse to the ending point (create curves if freehand). Let go of the button. (Note: There are more clicks necessary for Bezier curves. Refer to Quark Manual for more information).
- Select the “Content tool” and click on the text line. Start typing, and the text follows the line you created. All of the text box options also work with text lines (font type, size, color, bold, italics, etc.).

4. Other Lines

- Other types of lines work the same way as a text line.
- Click and hold over the “Line” tool to get more options.
- Select one of the tools.



Orthogonal: Draw a horizontal or vertical line (perpendicular).

Freehand: Draw a curve using the mouse.

Line: Draw a straight line at any angle.

Bezier: Draw a curve that is defined by Bezier curve equations (very accurate but difficult).

- On your document, click and hold on the starting point for your line. Then drag the mouse to the ending point (create curves if freehand). Let go of the button. (Note: There are more clicks necessary for Bezier curves. Refer to Quark Manual for more information).
- To change the thickness and style of your line, and to add arrows, select the line with the “Item tool” and change options on the measurements palette.



Starting point of line

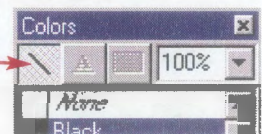
Ending point of line

Width of the line

Style of line

Add arrows to line

- To change the color of your line, select the line with the “Item tool.” Select the “line button” on the colors window, then choose a color.



5. Turning Text Into a Graphic

- By transforming text into a graphic box, we have much more control over it. For example, we can easily outline letters, create a color blend, or add a picture behind the letters.
- Select **one line** of text to transform into a graphic by highlighting it (be sure you are using the content tool). Only one line can be transformed at a time. Graphic text is often used for headlines, so the text should be rather large.
- Click “Style” on the top menu, then choose “Text to Box.”
- A copy of your text is pasted next to the original. The text is an outline, and is covered by small handles. This is very difficult to work with. To make it easier, click the item tool and select your new text. Click “Item” in the top menu, choose “Edit,” and get rid of the check mark next to “Shape.”
- Your text has been transformed into a graphic box. You can resize the text by using the handles and move it, just like any graphics box.



Text

- To color your letters, click the solid rectangle on the colors window and choose a color. You can also choose to create a blend behind the letters.

Text

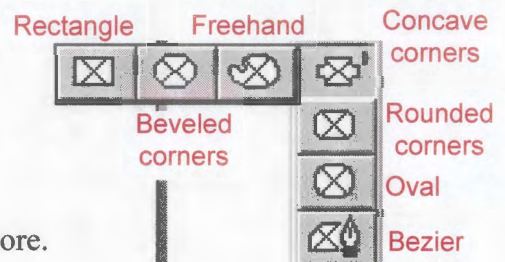
To outline the letters, click "Item" on the top menu and choose "Frame." Select options for the outline.

- To insert a picture behind the text, click "File" on the top menu and choose "Get Picture." Choose an image that you would like to put behind your text, and click "OK." By using the content tool, you can move the picture inside of the letters (just like a graphic box).



6. Other Graphic Box Shapes

- Click and hold over the "Picture box" tool to get more options.
- Select one of the tools.



Rectangle: Rectangles and square boxes.

Beveled corners: Rectangle with corners curved in.

Freehand: Draw any shape with the mouse.

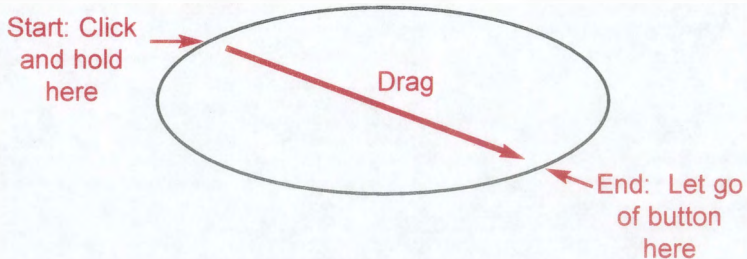
Concave corners: Rectangle with corners curved in more.

Rounded corners: Rectangle with corners rounded.

Oval: Circles and oval boxes.

Bezier: Draw a curved box with bezier equations.

- With most tools, click and hold down the mouse button on the starting point of your box, then drag the mouse to the other corner. Your box is drawn between the two points. With the Freehand Tool, draw your box as you drag. When you let go of the mouse button, the point where you ended is connected with the starting point. The Bezier box requires extra clicks and manipulations. See the Quark manual for more information.
- Make sure your box is selected. Click "File" on the top menu, and choose "Get Picture" to insert an image in your box.



7. Other Text Box Shapes

- The other text box shapes are the same as the graphics shapes. Click and hold over the "Text box" tools. Look at #6 for an explanation of each of the text box options.

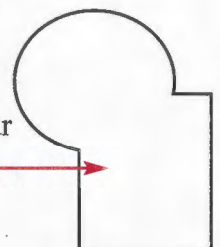
8. Merging Box Shapes

- Instead of drawing boxes freehand, it's often easier to merge two text box shapes together. Create two different shaped graphic boxes. Arrange them so they overlap each other on one end.



- Select both of the objects. Use the item tool and click on the first box to select it. Then, hold down the "Shift" key on the keyboard. Click the second box. Let go of the "Shift" key. Both boxes should now be selected (look for the handles).

- Click "Item" on the top menu, choose "Merge," and select "Union." Your graphic box has been transformed to a new shape.



9. Inserting Pages

- To insert another page in your document, click “Page” on the top menu and choose “Insert.”
- On the window that appears, type the number of pages to insert, and where to insert them (after page #, before page #, or at the end of the document). Click “OK” to insert the pages.

10. Deleting Pages

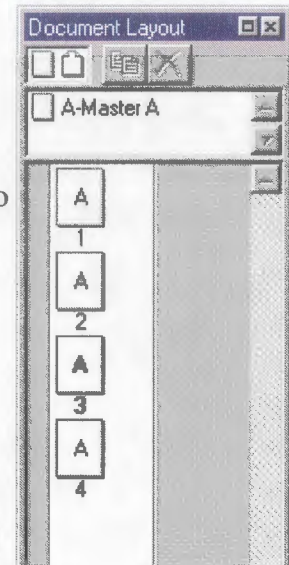
- To delete a page from your document, click “Page” on the top menu and choose “Delete.”
- Type the page number you would like to delete, or the range of pages you would like to delete. Click “OK” to delete the pages.

11. Moving Pages

- Click “View” on the top menu, and choose “Show Document Layout.”
- This window shows you a map of all the pages in your document. To delete a page, click on it and click the “X” button.
- To move a page, click and hold down on the page. Then move the page to another location in the document layout window.

12. Inserting Page Numbers

- Click “Page” on the top menu, choose “Display,” choose “A-Master A.” This shows you a picture of the “master page” of your document. Anything you put on the “master page” will show up on every page of your document.
- Create a text box on the page where you want the page number to show up. Select the “content tool”, choose the font type and size you want, and then hold down the “Control (Ctrl)” key on the keyboard and hit the “3” key on the keyboard (Control+3). This places a <#> in the text box, which represents page numbers.
- Click “Page” on the top menu, choose “Display,” and choose “Document.” Each page will now be numbered.





Microsoft Publisher



The Basics

1. Starting a Publication

- A. By Wizard
- B. By Design
- C. Blank Publications

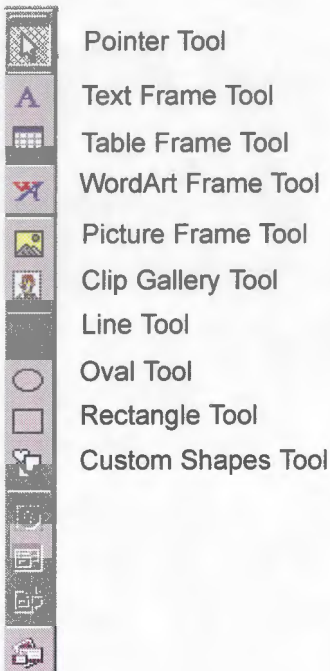
2. Setting the Document Size

- A. Normal Page Sizes
 - File -> Print Setup
- B. Other Page Sizes or Special Folds (card or brochure)
 - File -> Page Setup

3. Set the Guides

- A. Arrange -> Layout Guides...

4. The Objects Palette



5. Zooming



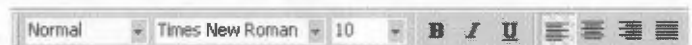
6. Make a Frame



7. Inserting Text

8. Modifying Text and Text boxes

- A. Moving box:
- B. Resizing box:
- C. Deleting box:
- D. Editing text:
- E. Margins (properties):
- F. Hyphenation (right -> Proofing tools):



9. Inserting Word Art



10. Inserting Microsoft Clip Art

11. Inserting a Graphic from File or Disk

- A. Insert -> Picture -> From File

12. Layering

- A. Arrange

13. Modifying Graphics and Graphic Boxes

- A. Moving box
- B. Resizing
- C. Scaling (Format)
- D. Recolor Picture (Format)
- E. Wrapping Text (Properties)
- F. Advanced Wrapping (Edit irregular wrap)



13. Previewing Document for Printing

- A. View -> Hide Boundaries and Guides

14. Saving Document

- A. File -> Save As...
- B. File -> Save

15. Printing the Document

- A. At Schmeckle:
- B. Other Locations:



Paint Shop Pro



The Basics

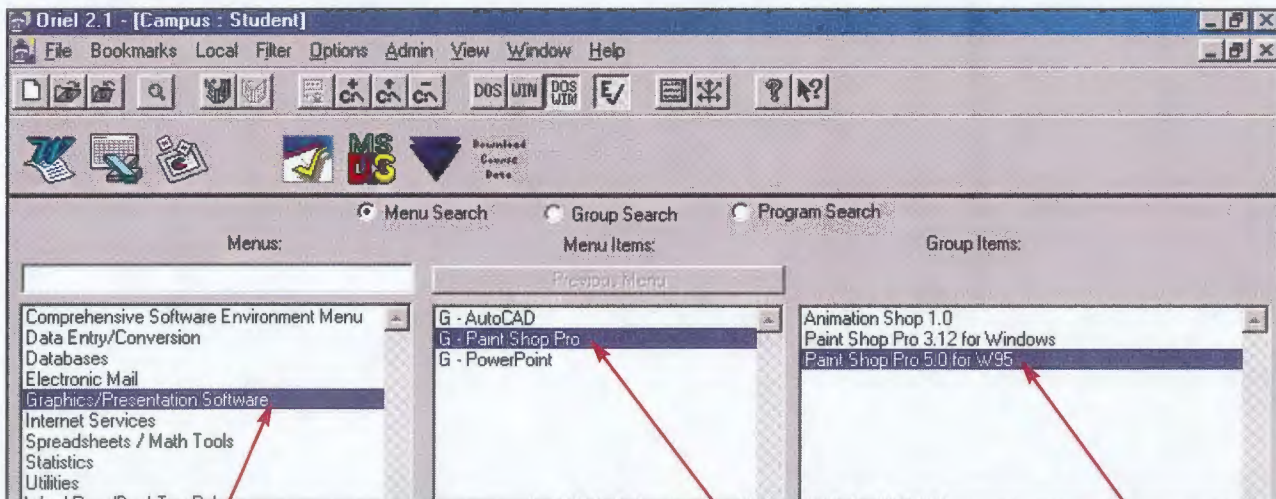
1. Open "Paint Shop Pro 5" at Schmeeckle Reserve

- Either double-click the Paint Shop Pro 5 icon on the desktop, or...
- Click the Start Menu button. Choose "Programs" folder. Choose "Graphics" folder. Then click on the "Paint Shop Pro 5" program.



2. Open "Paint Shop Pro 5" on campus

- Paint Shop Pro 5 is available on all campus computers through the Oriel program.
- Click the Start Menu button. Choose "Programs" folder. Click the "Oriel" file.
- A window like the one below appears.



A. Double-click "Graphics/Presentation Software" in the left menu box.

B. Double-click "G-Paint Shop Pro" in the middle menu box.

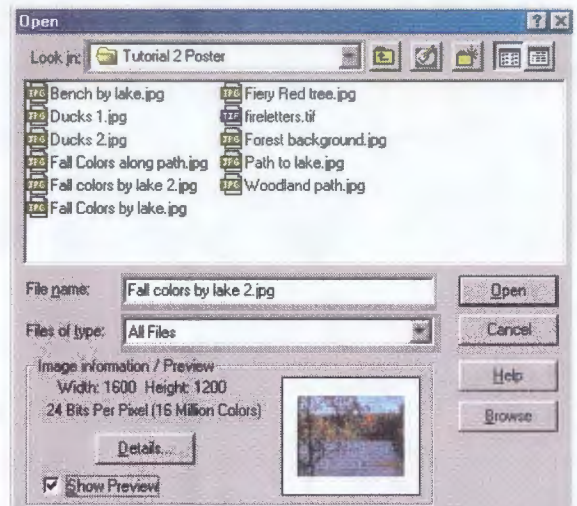
C. Double-click "Paint Shop Pro 5.0 for W95" in the right menu box.

3. Wait for Paint Shop Pro 5 to load up

- If any windows appear asking to link file extensions or giving you a "Tip of the Day," just click the "Cancel" button or close the window.

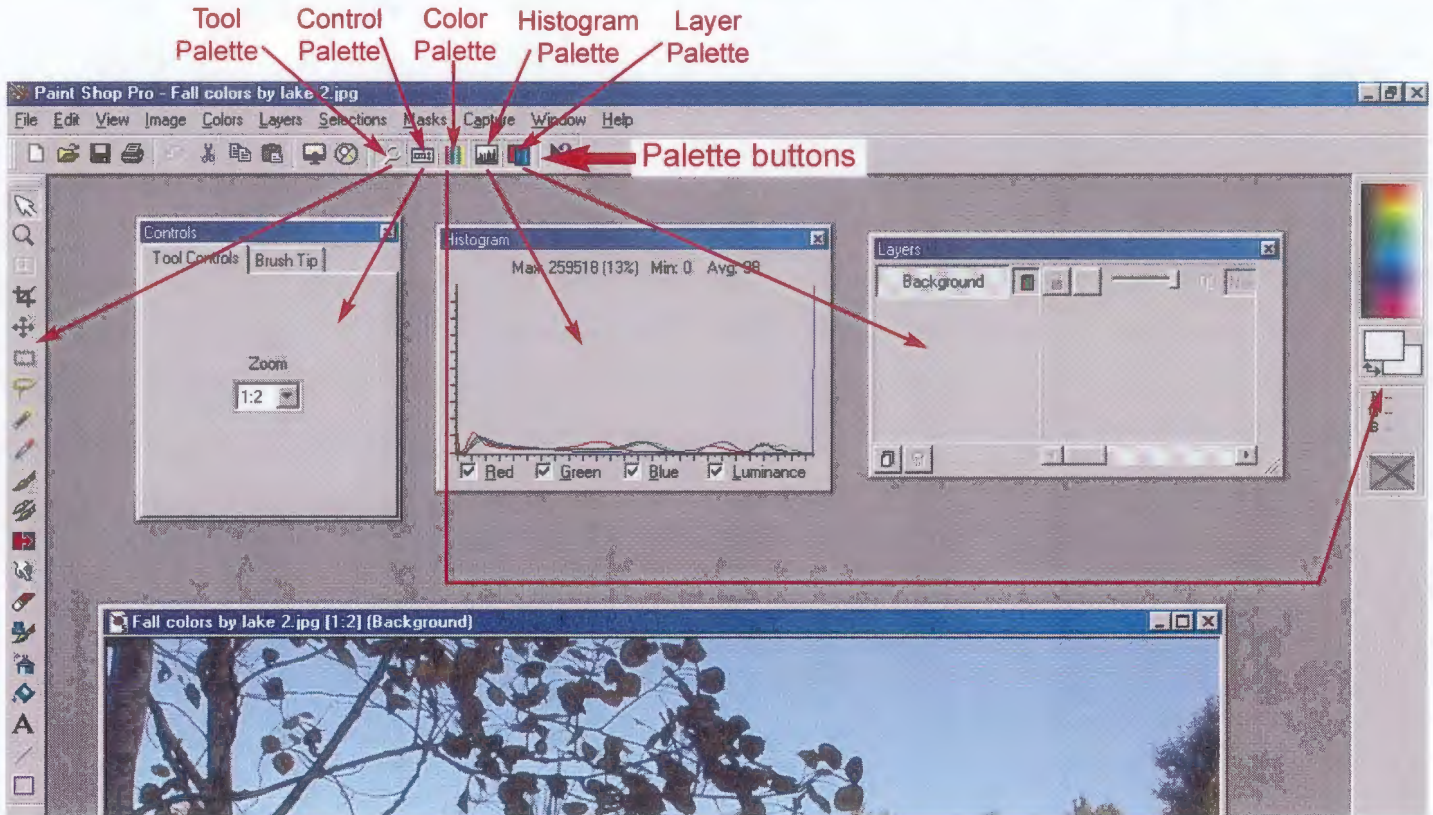
4. Open a Graphic file.

- Click "File" on the top menu, and choose "Open." Find a graphic file that you would like to edit in Paint Shop Pro.
- Make sure there is a check mark next to "Show Preview." Click once on a graphic file to preview it. Click the "Open" button to open it in Paint Shop Pro.



5. The Palettes

- Your picture will appear in its own window. You can load several pictures at once.
- “Palette buttons” are located on the top toolbar. When you press a “Palette button,” an individual palette window appears that gives you more options. We will be using these palettes frequently. Click each of the palette buttons to see what they control. A description of each is below the picture.



Tool Palette: Select the tools you will be using to edit your picture.

Control Palette: Choose options that are related to your selected tool.

Color Palette: Choose the foreground and background colors for the editing tools.

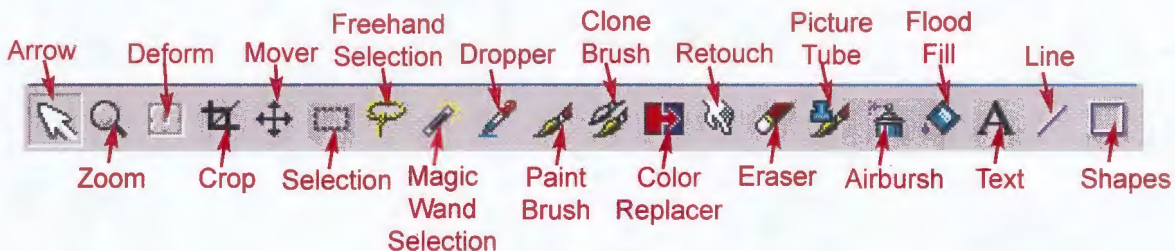
Histogram Palette: A graph of the distribution of Red, Green, Blue, and Luminance in your picture. Horizontal axis represents dark to light (left to right), and vertical axis represents numbers of pixels.

Layers Palette: Powerful tool that allows you to add different layers to your picture, giving you control of transparency and reducing mistakes to the original.

- For most projects, you will want the Tool Palette, Control Palette, and Color Palettes visible and all the rest hidden.
- Palettes can be moved by clicking and holding the mouse button down on the title bar, and then moving the mouse. They can be closed by clicking the “X” button on the title bar.

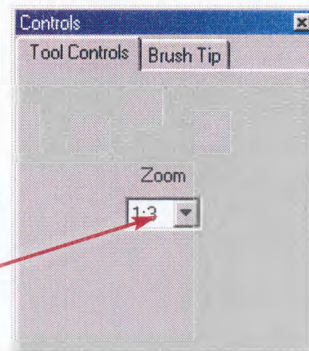
6. The Tool Palette

- The most important palette is the “tool palette.” Each tool works in a slightly different way. As we progress through this tutorial, use the picture below to locate the various tools.



7. Zooming

- Maximize your graphic window (click the secondary sizing button) if it is not already.
- Click the “Zoom” tool on the tool palette. Your mouse cursor changes into a magnifying glass.
- Move the magnifying glass onto your graphic. Click the **left** mouse button to zoom in (up to 16 times the original size). Click the **right** mouse button to zoom out (up to 1/16 of the original size).
- You can also directly change the zoom using the Control Palette.



8. Choosing Colors

- The second most important palette is the color palette, where you choose which colors to work with.



- Move your mouse over the rainbow colors. Your cursor changes into an eye dropper. As you move the eye dropper over the rainbow, the color you are pointing at is displayed in the bottom rectangle, along with the RGB (red, green, blue) value of the color.
- The top box represents your current **foreground** color. The bottom box represents your current **background** color. When you find a color you like in the rainbow box, click the **left** mouse button to select a new foreground color. To select a background color, click the **right** mouse button on the color.
- Click the arrows to switch the foreground and background colors.

- You can also choose colors directly from your picture.
- Click the “Dropper” tool on the tool palette. Your mouse cursor changes into an eye dropper.
- Move the eye dropper over your graphic. As you do this, watch the bottom rectangle on the color palette. It displays the color you are pointing at on your graphic.
- To set the foreground color, click the **left** mouse button on the color you want in your graphic. To set the background color, click the **right** mouse button on the color. Notice that the foreground and background colors change on the color palette.

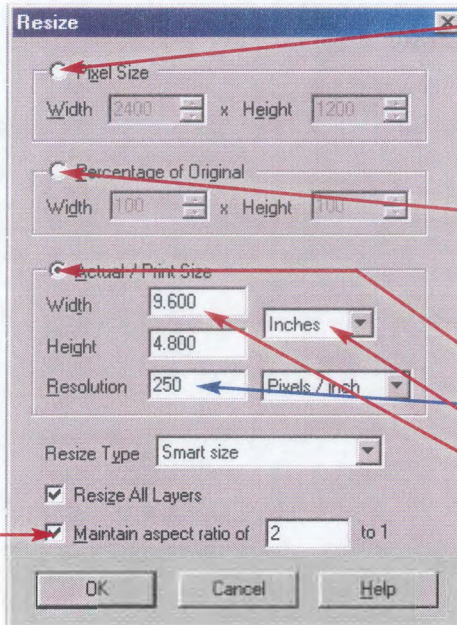
9. Cropping Images

- If your pictures has ragged edges or wasn't scanned evenly, you may want to crop your image. Cropping cuts out a picture within a specified box.
- Click the “Crop” tool from the tool palette. Your mouse cursor changes into a cropping symbol.
- Start in one corner of the image where you want to draw the crop box. Click the mouse button down and hold it. Drag the box to the opposite corner, and let go of the mouse button. A cropping box is added to your image.
- To move the cropping box, click and hold in the middle of the box (your cursor changes to four arrows).
- To resize the cropping box, drag the sides of the box bigger or smaller (your cursor changes to two arrows).
- When you are satisfied with the cropping box, click the “Crop Image” button on your control palette. Or, click “Image” on the top menu and choose “Crop.”



10. Resizing Pictures

- Click “Image” on the top menu, and choose “Resize...”
- A window like the one below appears.
- In most cases, you will want to resize your graphic proportionally (so it doesn't stretch). Make sure the “Maintain aspect ratio:” is checked. If you change a width measurement, the height will change automatically, and vice versa.



• If you want to display the graphic on a computer screen, choose “Pixel Size” and change the width and height in pixels. Most projectors can display a width of 800 pixels by a height of 600 pixels.

• Select “Percentage of Original” if you want to scale your picture larger or smaller. For example, change the width and height to 200% to make your image twice as large.

• If you want to print your graphic, choose “Actual / Print Size.”

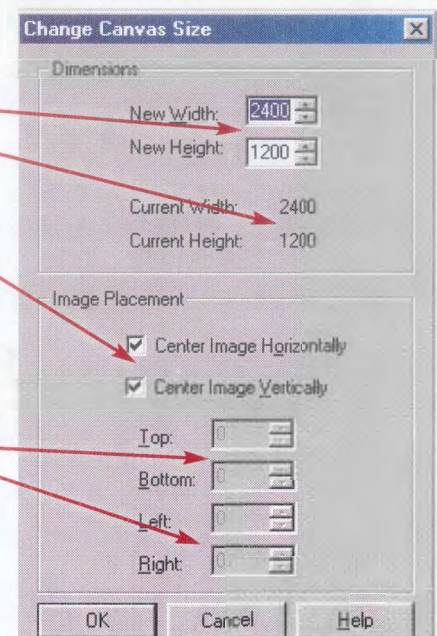
- First, type in a resolution (250-300 for high resolution prints)
- Then choose your measurement (default is inches)
- Finally, change the height and width.

• Click “OK” to resize your picture. You may need to zoom in and out to see the changes.

11. Changing the Canvas Size

- The “canvas” represents the space underneath your picture. If you want to add something beyond the edges of your picture, you need to enlarge the canvas. This is different than resizing your picture. Your picture stays the same size, but extra space is added around the picture.
- Click “Image” on the top menu, and choose “Canvas size...”
- A window like the one below appears.

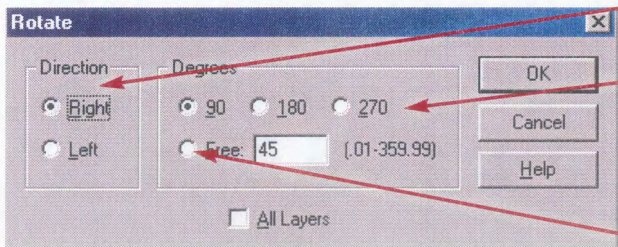
- Type a new width and a new height for your canvas. The current width and height are displayed here for comparison.
- Your image will need to be placed somewhere on the newly enlarged canvas. Check these boxes to center the image either horizontally, vertically, or both.
- If you don't want your image centered, uncheck the “Center Horizontally,” the “Center Vertically,” or both. Change these measurements to represent the positioning of your image. The numbers represent how far the image will be from the top, bottom, left, or right sides of the canvas in pixels. For example, typing a “0” in the “Top:” measurement and a “0” in the “Left:” measurement will position your picture in the top-left corner of the canvas.



- Click “OK” to enlarge your canvas and reposition your picture.

12. Flipping, Mirroring, and Rotating Your Picture

- To flip your image **vertically**, click “Image” on the top menu and choose “Flip.”
- To flip your image **horizontally**, click “Image” on the top menu and choose “Mirror.”
- To rotate your image, click “Image” on the top menu and choose “Rotate...” A window like the one below appears.

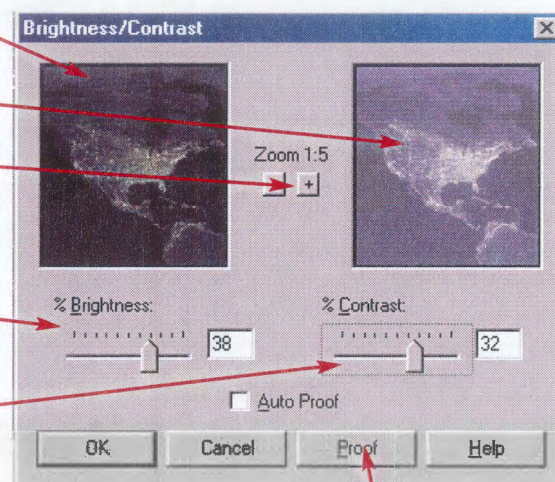


- Choose the direction of rotation (right = clockwise, left = counter-clockwise).
- Choose commonly used degrees of rotation (use 90° or 270° for pictures that are **sideways**, use 180° for pictures that are **upside-down**).
- or
- Choose custom degrees to rotate. Type in the degrees.

- Click the “OK” button to rotate the image.

13. Adjusting the Brightness and Contrast

- Click “Color” on the top menu, choose “Adjust,” and select “Brightness/Contrast.” A window like the one below appears.
- The **left** preview box represents your current picture. The **right** preview box shows you how your picture will look with the changes.
- Use the “**zoom**” buttons to zoom in and out of the pictures in the preview boxes.
- Click inside of the preview boxes and hold down the mouse button to move the pictures (cursor changes to a hand).
- Move the “**brightness**” slider to adjust the light intensity of the picture. Moving to the right increases brightness.
- Move the “**contrast**” slider to adjust the intensity of dark and white portions. Moving to the right increases contrast.
- Click the “**Proof**” button to preview what the changes will look like on your actual image.
- Click “OK” to change the brightness and contrast of your picture, or click “Cancel” to get rid of the changes.



14. Changing other Color Options

- Click “Color” on the top menu, choose “Adjust,” and select another menu item. Each will have a window almost identical to the “Brightness/Contrast” window above. Changing the sliders will have different effects on your picture.
 - Gamma Correction = Adjust the overall brightness of Red, Green, and Blue in your image.
 - Highlight = Add lightness proportionately
 - Midtone = Shift the middle quarter of the lightscale up and down
 - Shadow = Remove lightness proportionately
 - Hue = Shift all colors in the image around the color wheel
 - Saturation = Adjust the intensity of color
 - Lightness = Adjust the lightness of the entire image
 - Hue Map = Adjust individual colors in the image
 - Red/Green/Blue = Changes the level of red, green, and blue in the image

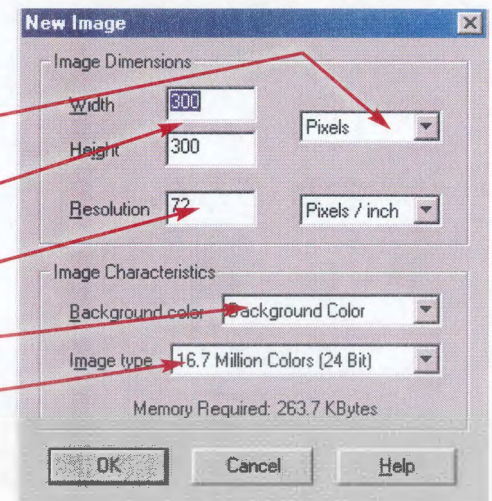
15. Sharpening and Blurring an Image

- To make a picture more crisp and focused, use the sharpen command. Click “Image” on the top menu, choose “Sharpen,” and then select...
 - “Sharpen” = Applies a medium sharpness
 - “Sharpen more” = Applies a greater sharpness
 - “Unsharp mask” = Opens a window that lets you choose sharpness options
- To blur a picture, click “Image” on the top menu, choose “Image” on the top menu, choose “Blur,” and then select...
 - “Blur” = Applies a medium blur
 - “Blur more” = Applies a greater blur
 - “Gaussian blur” = Opens a window that lets you choose blur options
 - “Motion blur” = Opens a window that lets you choose the direction of a blur
 - “Soften” = Doesn’t blur the picture, but softens the edges
 - “Soften more” = Applies a greater softness to the edges

16. Creating a New Image

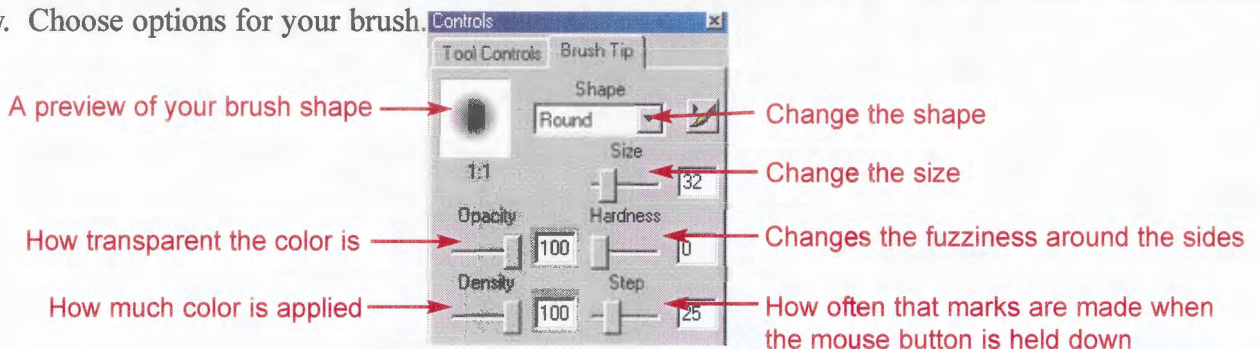
- Paint Shop Pro is a powerful program for editing already existing graphics, but it can also be used to create your own graphics from scratch.
- Click “File” on the top menu, and choose “New...” A window like the one below appears.
- You will need to have some idea of what this graphic will be used for, and how large it should be.

- Change the measurement unit of your new image. If you will be printing it on a document, choose “Inches.” If you will be using it just on a computer screen, choose “Pixels.”
- Change the Width and Height of your new image.
- Change the Resolution of your new image. For printing, choose 250. For computer screen, choose 90.
- Change the background color of your new graphic.
- Make sure the “Image type” is set to “16.7 million colors.”



17. Using the Paint Brush Tools

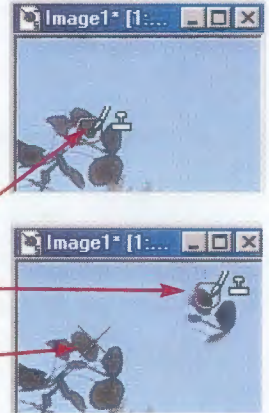
- Open a graphic that you wish to edit, or create a new image (see Step 15).
- Click “File” on the top menu, choose “Preferences,” and select “General Program Preferences...”
- Click the “Cursors and Tablet” tab on top of the window.
- If it’s not already there, place a check mark next to “Show brush shape outlines for brushes.”
- Click the “OK” button.
- Click the “Paint Brushes” tool on the tool palette. Your cursors changes to a paint brush.
- Choose a foreground and background color in the color palette (see Step 7).
- Bring up the control palette, and click the “Brush Tip” tab. You will see an option window like the one below. Choose options for your brush.



- To paint using the **foreground** color, click and hold the **left** mouse button on your image while you move the mouse.
- To paint using the **background** color, click and hold the **right** mouse button on your image while you move the mouse.

18. Painting with the Clone Brush

- The clone brush is a useful tool that allows you to copy sections of your picture to another location. This lets you blend in cracks or other defects in your image. The brush works much like the normal paint brush option.
- Click the “Clone Brush” on the tool palette. Your cursor changes to a paint brush with an ink well.
- Bring up the control palette, and click the “Brush Tip” tab. You will see an option window that is identical to the one in Step 16. Choose options for your brush.
- To start painting, **right-click** once on the portion of your picture that you want to **copy**. You will hear a small click.
- Then move your mouse to the area where you want to paint. Hold down the **left** mouse button and move the mouse. You will be painting the portion of your picture where you right-clicked. An “X” will appear where the picture is currently being copied.



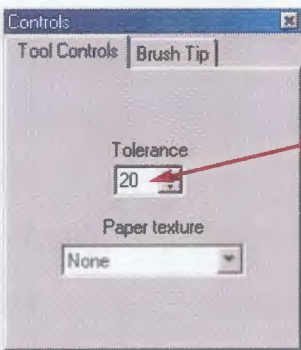
19. Replacing Colors in your Image

- You can replace one color in your picture with another color. For example, if you have a photograph with a gray sky, you could replace the gray with a sky blue.
- **Important:** The “Color Replacer” tool replaces your **background** color with the **foreground** color.



- Select the “Dropper” tool from the tool palette. Right-click on the color you wish to replace in your image. This will set it as the background color.

- On the color palette, left-click on the new color. This sets it as the foreground color.



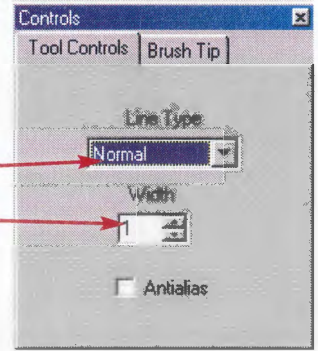
- Click the “Color Replacer” tool on the tool palette.
- Bring up the control palette, and click the “Tool Controls” tab. The “Tolerance” option represents the variation in color that will be replaced. A tolerance of 1 means that only the color you selected will be replaced. A tolerance of 200 means that all colors in your image will be replaced. A tolerance of 20-50 will usually be sufficient.

- Double-click the left mouse button on your image. All of the selected background colors will be replaced with the foreground color.



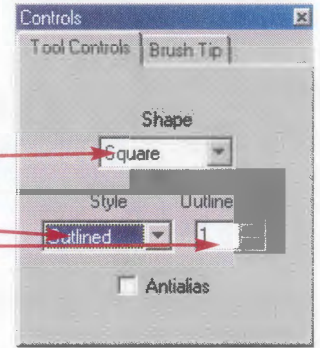
20. Lines

- Click the “Line” tool on the tool palette.
- The foreground color represents the color of your line.
- Bring up the control palette.
- You can choose between a normal line or a bezier line for drawing curves.
- Choose the width of your line.
- Click your mouse where you want the line to start, hold the mouse button, and drag the line in any direction. Let go of the mouse and your line is drawn.



21. Shapes

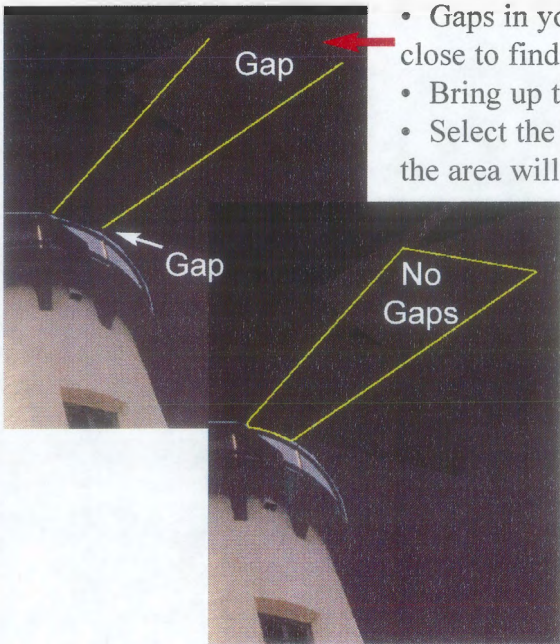
- Click the “Shapes” tool on the tool palette.
- The foreground color represents the color of your shape.
- Bring up the control palette.
- Choose the shape.
- Choose whether you want the shape outlined or filled in.
- Choose the width of the outline.
- If you are drawing a square or rectangle, click the mouse where you want the first corner of the shape to be, and drag to the other corner.



If you are drawing a circle or ellipse, click the mouse where you want the center of the shape to be, then move outward to increase the size.

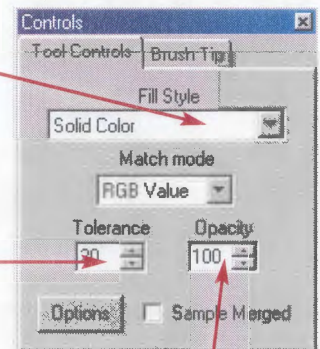
22. Flood Fill (Filling Large Areas with Color)

- In order for flood fill to work, you need an area that has **boundaries on all sides** and a **similar background color**. You can create boundaries by using the paintbrush, line, or outline shape tools. If the background is complex, you may need to cut out the picture and paste it as a new image (Step 23).



- Gaps in your border can often be difficult to see. You may need to zoom in close to find them all. Be sure to fill in all gaps.

- Bring up the control panel.
- Select the “Fill Style.” If “Solid Color” is selected, the area will be filled with the foreground color. If a “blend” is selected, the area will be filled with a blend from the foreground color to the background color.



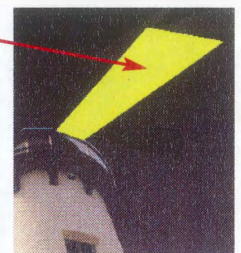
- Tolerance affects which colors are filled. The higher the tolerance, the more colors that will be filled. A tolerance of 20-40 is usually appropriate.

- Opacity represents how transparent the fill color will be. Opacity of 100 has no transparency.

- Click the “Options” button to choose different directions for your blends.

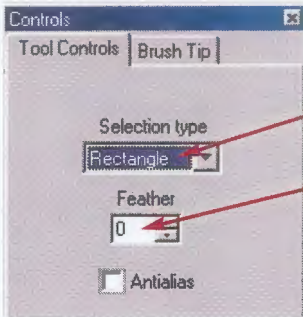
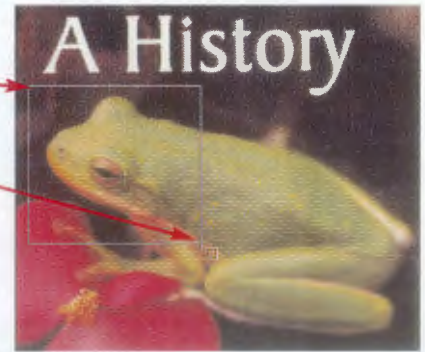
- Left-click the area to fill it with your foreground color or blend. Right-click the area to fill it with your background color or an opposite blend.

- If your color spills out of the area, you still have a gap. Click “Edit” on the top menu, and choose “Undo.”

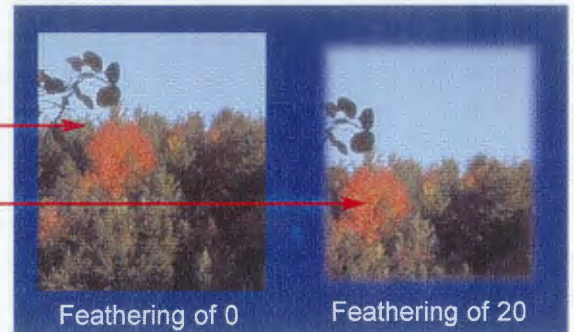


23. Making Selections

- Selections can be used for a variety of purposes: to limit what you edit, to copy and paste certain sections of your image, and to accurately erase the background of an image (to use clipping in QuarkXpress).
- To explore how selections work, click the “Selection” tool on the tool palette. Start in one corner, click and hold the mouse button, and drag a rectangle over a portion of your picture. A moving dotted box marks your selection.
- Click the “Paint brush” tool on the tool palette. Try to paint inside the selection box. Now try to paint outside of the selection box. When a selection is made, you can only manipulate parts of your image inside the selection box.
- To remove a selection box, simply right-click somewhere on your picture outside the selection box. Or, create another selection box.



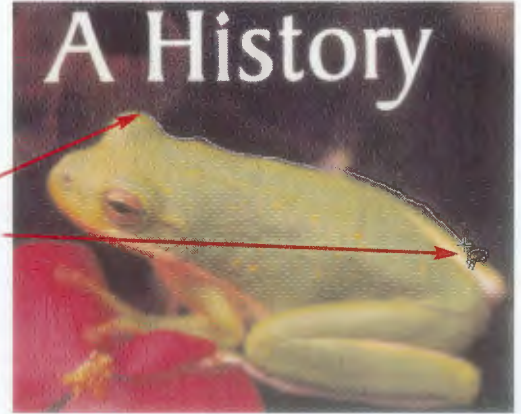
- **To make a differently shaped selection box and set feathering**
 - Bring up the control palette, and click the “Tool Controls” tab. Under “Selection type,” choose a different shape for the box.
 - Feathering represents how “fuzzy” the sides of your selection will be if it is copied and pasted into another image. “0” means the edges will be crisp. “20” means the edges will be very faded.



- **To create a new image using the selection:**
 - Create a selection box around a portion of the picture.
 - Click “Edit” on the top menu, and choose “Copy.”
 - Click “Edit” on the top menu, choose “Paste,” and select “As New Image.”
 - The copied portion of your original image should be a separate image.
- **To add a selection from another graphic into your picture:**
 - Open both the graphic that you want to insert and your picture.
 - Create a selection box around a portion of the graphic that you want to include in your picture.
 - Click “Edit” on the top menu, and choose “Copy.”
 - Select your picture (make sure the title bar is highlighted).
 - Click “Edit” on the top menu, choose “Paste,” and select “As New Selection.”
 - Move the selection to wherever you want it on your picture.
 - Click the right mouse button place the selection.

24. Cutting Out Graphics for QuarkXpress and Publisher

- At times, you may want to erase the backgrounds of objects in an image. You can use the “Freehand Selection” tool to select any shaped object.
- Click the “Freehand Selection” tool in the tool palette. Your cursor changes into a lasso.
- Bring up the control palette, and click the “Tool Controls” tab. Under “Selection type,” make sure that “Freehand” is chosen.
- Click and hold down the mouse button, and draw a selection box around an object in your picture. Try to stay as close to the side of the object as possible. When you let go of the mouse button, your starting and ending points are connected by a straight line.



- Click “Edit” on the top menu and choose “Copy.” Click “Edit” on the top menu, choose “Paste,” and select “As a new image.”
- The object should be alone on a transparent (checkerboard) background. Save the graphic as a .tif or .jpg and the background is transformed to white.



For more control over the selection

- Click the “Freehand Selection” tool in the tool palette.
- Bring up the control palette. Under “Selection type,” choose “Point to Point.”
- Now, a selection line is drawn in between every mouse click. Click, move the mouse to the next point, click, move the mouse to the next point, and so on until the object is completely selected. Double-click when you are done with the selection. The starting and ending points are connected by a straight line.
- Click “Edit” on the top menu and choose “Copy.” Click “Edit” on the top menu, choose “Paste,” and select “As a new image.” The object should be alone on a transparent (checkerboard) background.
- Save the graphic as a .tif or .jpg and the background is transformed to white.



25. Creative Graphic Manipulations

- Many tools in Paint Shop Pro are used to add unique effects to your graphics. Explore these different options to see how your images change.

Airbrush

- Click the “Airbrush” tool on the tool palette. This provides a “spray can” look to your lines.
- Paint on your graphic.

Picture Tube

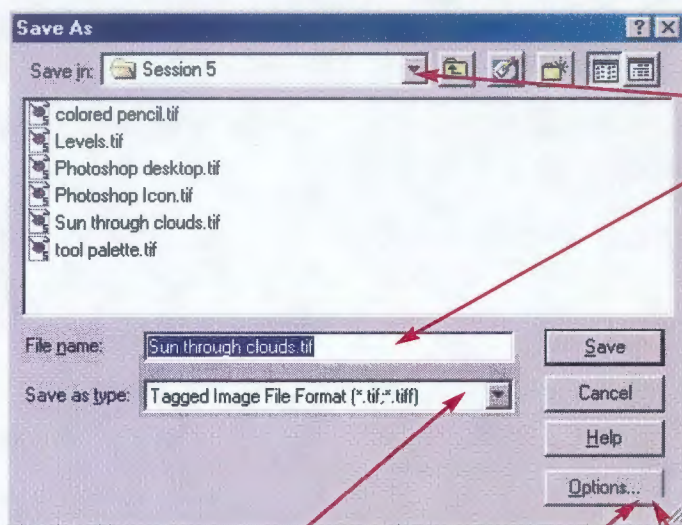
- Click the “Picture Tube” tool on the tool palette.
- Bring up the control palette. The “tube” represents what images (feet, spiders, butterflies) will be painted on your screen. Choose one that you would like to try.
- You can also change other options as well.
- Paint on your graphic.

Filters

- Click “Image” on the top menu. Choose “Other.”
- Select a filter to see how your graphic changes.

25. Saving your Graphic

- Click “File” on the top menu and choose “Save as...” A window like the one below appears.



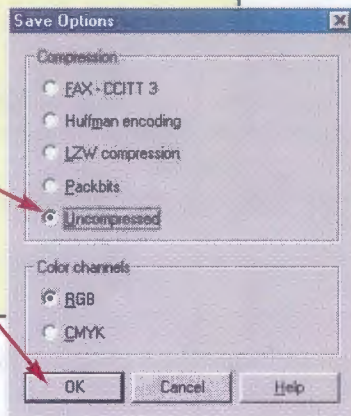
- Choose the location where you would like to save.
- Type a filename for your graphic (do *not* type an extension, like .tif or .jpg)

- Choose the **type** of graphic to save.:

For printing, choose “Tagged Image File Format (*.tif, *.tiff)”.

Click the “Options” button.

Choose “Uncompressed” as the compression.
Click the “OK” button.

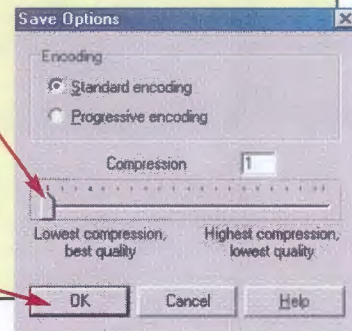


For screen (PowerPoint), choose “JPEG - JFIF Compliant (*.jpg, *.jif, *.jpeg)”.

Click the “Options” button.

Move the slider all the way to the left (Compression = 1).

Click the “OK” button.

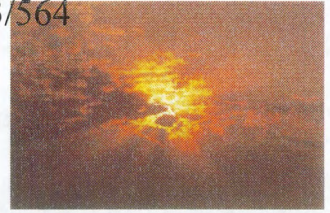


- After the options are set, click the “Save” button.



Adobe Photoshop

The Bare Essentials for Design



Adobe Photoshop is a complex program that gives you control over nearly every aspect of graphic design. All of the options in Paint Shop Pro can be found in Adobe Photoshop. Due to the enormous scope of the program, only a few useful tools will be covered in this tutorial.

For more information, read the [Adobe Photoshop 5.0 User Guide](#) which can be checked out at the Schmeckle Reserve Visitor Center. In addition, numerous workshops that cover the features of Photoshop are presented throughout the state.

1. Open “Adobe Photoshop” at Schmeckle Reserve

- Either double-click the “Adobe Photoshop” icon on the desktop, or.
- Click the Start Menu button. Choose “Programs” folder. Choose “Graphics” folder. Then click on the “Adobe Photoshop 5.5” program.

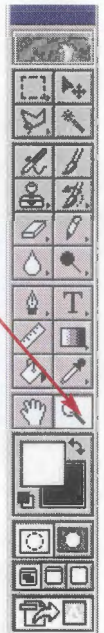


2. Open a Graphic file.

- Click “File” on the top menu, and choose “Open.” Find a graphic file that you would like to edit in Adobe Photoshop.
- Click the “Open” button to open it in Adobe Photoshop.

3. Zooming

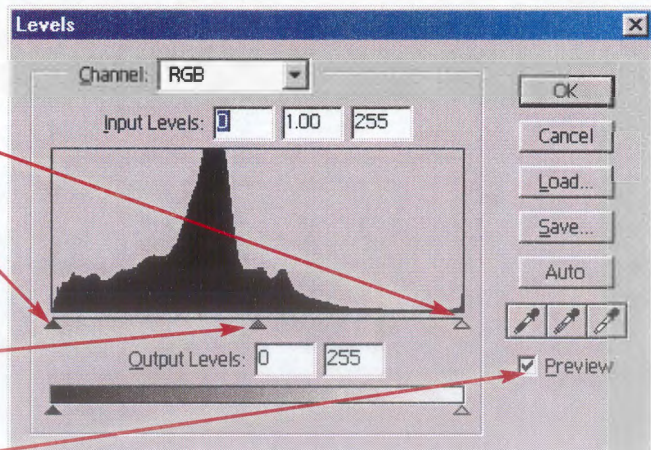
- Make sure your tool palette is visible. Click “Window” on the top menu, and choose “Show tools.”
- Maximize your graphic window (click the secondary sizing button) if it is not already.
- Click the “Zoom” tool on the tool palette. Your mouse cursor changes into a magnifying glass.
- Move the magnifying glass onto your graphic. Click the **left** mouse button to zoom in (up to 16 times the original size). Press the **Alt** key on the keyboard, and while it is pressed, click the **left** mouse button on your picture to zoom out (up to 1/16 times the original).



4. Levels

- One of the most powerful tools of Adobe Photoshop is the ability to manipulate the light and dark portions of your picture. This can make even a poorly taken picture look professional.
- Click “Image” on the top menu, choose “Adjust,” and then select “Levels...” A picture appears like the one below.

- This is visual representation of the darkness and lightness in your picture.
- Move the light arrow left to make the lightest areas of the picture even lighter.
- Move the dark arrow right to make the darkest areas of the picture even darker.
- Move the middle arrow to change the midtone colors in the picture. Left=lighter, right=darker.
- Click the Preview checkbox to see the effect on your actual picture. Click off the Preview checkbox to see your original picture.
- If you are not satisfied with the results, click the “Cancel” button to return to your original picture.
- If you are satisfied with the results, click the “OK” button to accept your changes.

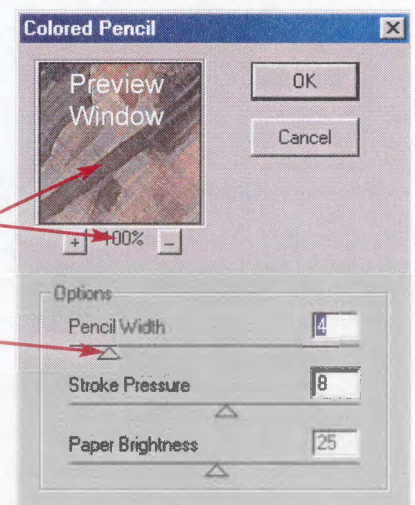


5. Auto Levels

- A simple way to adjust the levels of a picture is by using the “Auto Levels” command. The program makes the adjustments for you. Usually, the results look great. Sometimes, however, the picture ends up being worse than when you started.
- Click the “Image” in the top menu, choose “Adjust,” and select “Auto Levels.”
- The levels of the image have been changed. If you are not satisfied with the results, click “Edit” on the top menu and choose “Undo Auto Levels.”

6. Using Filters

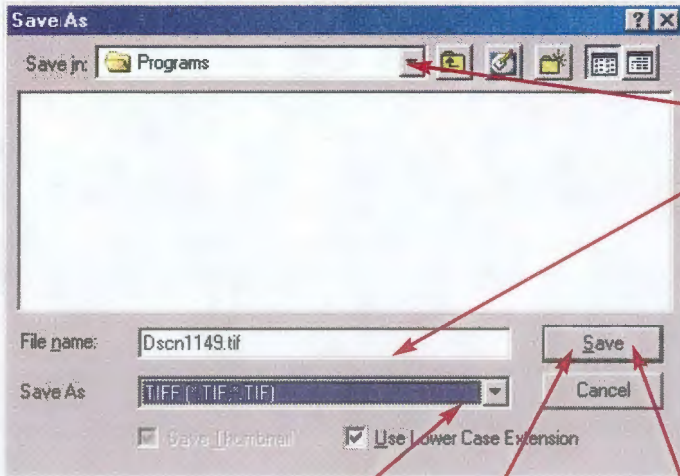
- Filters are special tools that add interesting and sometimes strange effects to your pictures.
- Click “Filter” on the top menu, choose “Artistic,” and select “Colored Pencil...” A window like the one to the right appears.
- Click the “Zoom” buttons to zoom in and out of your picture. Click and hold the mouse button inside of the preview window, and move to a different part of your graphic.
- Change the options by moving the slider or typing in numbers. The changes will be displayed in the preview window.
- To keep your changes, click the “OK” button.
- To throw away your changes and return to the original picture, click the “Cancel” button.



- Explore some of the other filters. Click “Filter” on the top menu, choose a category, and then select an individual filter. Most will have option windows similar to the “Colored Pencil” window above.

7. Saving your Graphic

- Click "File" on the top menu and choose "Save as..." A window like the one below appears.



- Choose the location where you would like to save.
- Type a filename for your graphic (do *not* type an extension, like .tif or .jpg)

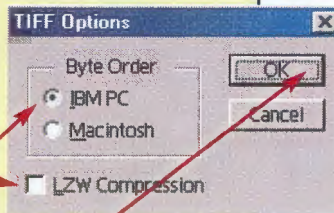
- Choose the type of graphic to save.:

For printing, choose "TIFF (*.TIF, *.TIF)".

Click the "Save" button.

Choose "IBM PC" as the Byte Order. Make sure LZW Compression is *not* checked.

Click the "OK" button.

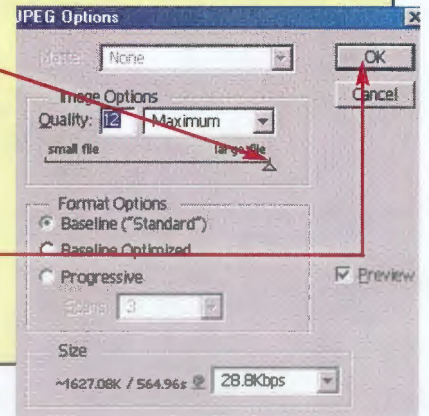


For screen (PowerPoint), choose "JPEG - JFIF Compliant (*.jpg, *.jif, *.jpeg)".

Click the "Save" button.

Move the slider all the way to the right (Quality = 12).

Click the "OK" button.



Appendix C

Focus Group Evaluation

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University of Wisconsin-Stevens Point

Institutional Review Board for the Protection of Human Subjects

Protocol for Original Submissions

A complete protocol must be submitted to the IRB for approval prior to the initiation of any investigations involving human subjects or human materials, including studies in the behavioral and social sciences.

Send: 10 copies of (1) the completed protocol; (2) project abstract; and (3) samples of informed consent forms to the IRB chairperson. PROTOCOLS LACKING ANY ONE OF THESE THREE ELEMENTS WILL NOT BE APPROVED. In addition, copies of questionnaires or interview questions MUST be attached.

PLEASE TYPE

Project Title: Integration of Computer Technology Skills into Interpretation Courses at UWSP

Principal Investigator: James Joseph Buchholz

Department: College of Natural Resources

Rank: Graduate assistant

Campus Mailing Address: Schmeeckle Reserve / College of Natural Resources

Telephone: (715) 346-4992

E-mail address: jbuch209@uwsp.edu

Faculty Sponsor (if required): Dr. Michael Gross

(Faculty sponsor required if investigator is below rank of instructor.)

Expected Starting Date: 03/14/02

Expected Completion Date: 06/01/02

Are you applying for funding of this research? Yes _____ No _____

If yes, what agency? _____

Please indicate the categories of subjects to be included in this project. Please check all that apply.

Normal adult volunteers

_____ Minors (under 18 years of age)

_____ Incarcerated individuals

_____ Mentally Disabled

_____ Pregnant women

_____ Other _____ (specify)

(Faculty Member) I have completed the "Human Subjects Protection Training" (available at <http://www.uwsp.edu/special/irb/start.htm>) and agree to accept responsibility for conducting or directing this research in accordance with the guidelines.

(Signature of Faculty Member responsible for research)

(Department Chair or equivalent) I have reviewed this research proposal and, to the best of my knowledge, believe that it meets the ethical standards of the discipline.

(Signature of Department Chair or equivalent)

Proposal Abstract

Write a brief description of the purpose of the proposed research project. (100-200 words)

Computers have been integrated into all aspects of our society, and the interpretation profession is no exceptions. Interpreters use computers daily to create posters and other publications, design visitor center exhibits and sign panels, give PowerPoint presentations, scan images and documents, and complete other common office tasks. The goal of this project is to integrate computer skills training into the existing Environmental Education/Interpretation curriculum at UWSP, so students graduate with a basic knowledge of computer hardware and software essential to interpretation.

This was done by designing and teaching tutorials that covered common software used in the field including Microsoft PowerPoint, QuarkXpress, Microsoft Publisher, Paint Shop Pro, and Adobe Photoshop, and common hardware including flatbed scanners, slide scanners, CD-burners, digital cameras, large-format printers, and large-format laminators. The computer technology skills were integrated into the existing courses in two phases.

Phase #1 was the creation of 4 Microsoft PowerPoint tutorials that provided students in the Oral Interpretation class (NR 367/368) with step-by-step instructions using the program. The students completed these tutorials on their own time. Each week, students completed an assignment that tested their skills.

Phase #2 was the development of an Interpretive Technology Lab, an additional 1-½ hours devoted entirely to computer skills training. The lab was attached to the Signs, Trails, and Waysides class (NR 363) and the Environmental Publications class (NR 364). Tutorials and outlines were created for QuarkXpress (2), Paint Shop Pro, Microsoft Publisher, and Adobe Photoshop. Students were guided through the tutorials by instruction in the Schmeekle Reserve Technology Lab. Each week, students completed an assignment that tested their skills. Using step-by-step instruction sheets, students also learned to scan with flatbed scanners, take and import pictures using digital cameras, and are currently in the process of using the large-format printer and laminator to create full-size sign panels.

Since the integration of computer technology skills into the curriculum is almost complete, we are now planning focus group sessions with the students to evaluate the effectiveness of the training sessions. The focus groups will determine the student's attitudes and opinions toward the training sessions, and establish the strengths and weaknesses of the program. Two different focus group discussions are being planned: One that deals with the Microsoft PowerPoint tutorials (Phase #1) and the other that deals with the Interpretive Technology Lab (Phase #2). Each focus group (Phase #1 and Phase #2) will include approximately 3 sessions, with 6-10 people per session.

Please complete the following questions for all research.

1. Describe the characteristics of the subjects, including gender, age ranges, ethnic background, health/treatment status and approximate number.

The subjects will be students at UWSP that have taken one of the following interpretation courses: NR 367/567, NR 368/568, NR 363/563, NR 364/564 in Semester 1, 2001-2002 or Semester 2, 2001-2002. The majority of participants are female, ages ranging from 19-28 (most 20-23), from various ethnic backgrounds (most Caucasian with European descent), and healthy. The total number of subjects will be approximately 50.

2. Indicate how and where your subjects will be obtained. Describe the method you will use to contact subjects.

The subjects include all students that participated in the classes listed in Question #1, and are still attending UWSP. I will be using e-mail to contact all the subjects and invite them to participate in the focus group.

3. What are you going to ask your subjects to do (be explicit) and where will your interaction with the subjects take place?

The subjects will be taking part in a focus group at the Schmeckle Reserve Visitor Center meeting room. They will be asked a series of open-ended questions related to the computer training skills sessions (see attached sheet). Students will be encouraged to answer the questions openly and honestly. We are hoping to discover how students feel about the training sessions. The sessions will be taped and transcribed for qualitative analysis.

4. Will deception be used in gathering data? Yes _____ No X
If yes, describe and justify.

5. Are there any risks to subjects? Yes _____ No X
If yes, describe the risks (consider physical, psychological, social, economic, and legal risks) and include this description on the informed consent form.

6. What safeguards will be provided for subjects in case of harm or distress? (Examples of safeguards include having a counselor/therapist on call, an emergency plan in place for seeking medical assistance, assuring editorial rights to data prior to publication or release where appropriate.)

Participants will have the opportunity to access data before it is released. Overall, however, the project poses no harm or distress to the subjects.

7. What are the benefits of participation/involvement in this research to subjects? (Examples include obtaining knowledge of discipline, experiencing research in a discipline, obtaining course credit, getting paid, or contributing to general welfare/knowledge.) Be sure to include this description on the informed consent form.

As interpretive courses change in the future, the ideas generated by this group will be used to shape the computer skills training sessions. Students will also receive a small gift from the Schmeckle Reserve gift shop for taking the time to participate.

8. Will this research involve conducting surveys or interviews? Yes X No _____
If yes, please attach copies of all instruments or include a list of interview questions.

9. If electronic equipment is used with subjects, it is the investigator's responsibility to determine that it is safe, either by virtue of his or her own experience or through consultation with qualified technical personnel. The investigator is further responsible for carrying out continuing safety checks, as appropriate, during the course of the research. If electronic equipment is used, have appropriate measures been taken to ensure safety? Yes X No _____

We will just be using a tape recorder to tape the focus group sessions.

10. During this research, what precautions will be taken to protect the identity of subjects and the confidentiality of the data?

The transcribed focus group sessions will not be associated with individual subjects. Only comments will be recorded, not the subject stating those comments. Transcriptions will be completed by a Schmeeckle employee unfamiliar with students in the interpretation courses. After the transcription is done, the tapes will be erased and destroyed to prevent any connections from being made. The researcher will not discuss "who said what" with anyone.

11. Where will the data be kept throughout the course of the study? What provisions will be taken to keep it confidential or safe?

The data will be kept in a locked filing cabinet downstairs at the Schmeeckle Reserve Visitor Center. The principle investigator (myself) and faculty members overseeing the project (Ron Zimmerman and Dr. Michael Gross) are the only people that will have access to the data.

12. Describe the intended use of the data by yourself and others.

The data will be used to obtain a general picture of the computer technology sessions from the vantage point of students, and to provide specific recommendations for improving the sessions in the future.

13. Will the results of the study be published or presented in a public or professional setting?

Yes No

If yes, what precautions will be taken to protect the identity of your participants? **State whether or not subjects will be identifiable directly or through identifying information linked to the subjects.**

Individual students will not be identifiable through the information linked to the subjects. See question 10 for precautionary steps.

14. State how and where you will store the data upon completion of your study as well as who will have access to it? What will be done with audio/video data upon completion of the study?

The data will be stored in a locked file cabinet downstairs at the Schmeeckle Reserve Visitor Center. The executive director of Schmeeckle Reserve (Ron Zimmerman) and the head of the interpretive program (Dr. Michael Gross) will be the only people that have access to it. The tapes used to transcribe the sessions will be erased and destroyed after the study.

15. Please identify personnel assisting in conducting this research project. Include students or others who will be carrying out or directly supervising the carrying out of the research.

Name: Ron Zimmerman

Position: Executive director of Schmeeckle Reserve Campus Phone: x4992

Campus Address: Schmeeckle Reserve / College of Natural Resources

Informed Consent to Participate in Human Subject Research

Dr. Michael Gross, Professor of Environmental Interpretation at the University of Wisconsin-Stevens Point, Ron Zimmerman, executive director of Schmeeckle Reserve, and Jim Buchholz, graduate assistant, are conducting a study on the effectiveness of computer skills training in the interpretive courses. We would appreciate your participation in this study, as it will assist us in making recommendations for improving the way computer skills are integrated into the curriculum.

As part of this study, we would like to ask you questions in a group discussion that pertain to the PowerPoint Tutorials you completed, or to the Interpretive Technology Lab you participated in. We feel that your opinions and feelings about the training sessions will be valuable to us as we improve the interpretation courses in the next few years. Your ideas will make the incorporation of computer skills training more effective for future interpretive students.

We do not anticipate the study will present any medical or social risk to you other than the inconvenience of the extra time required for you to participate in the group discussion.

For participating in the group discussion, you will receive a small token of our appreciation from the Schmeeckle Reserve Visitor Center shop. Besides the gift, your participation will be integral in shaping the interpretation curriculum at Stevens Point in the years to come.

The information we gather through focus groups will be recorded in anonymous form. Your comments will be recorded to tape and transcribed, but your identity will not be associated with any comment. The tapes will be erased after they are transcribed. We will not release information to anyone else in a way that could identify you.

If you want to withdraw from the study at any time you may do so without penalty.

Once the study is completed, we would be glad to give you the results. In the meantime, if you have any questions, please ask us or contact:

James Buchholz
Schmeeckle Reserve
University of Wisconsin-Stevens Point
Stevens Point, WI 54481 (715) 346-4992

If you have any complaints about your treatment as participant in this study, please call or write:

Dr. Sandra Holmes, Chair
Institutional Review Board for the Protection of Human Subjects
Department of Psychology
University of Wisconsin-Stevens Point
Stevens Point, WI 54481
(715) 346-3952

Although Dr. Holmes will ask your name, all complaints are kept in confidence.

I have received a complete explanation of the study and agree to participate.

Name _____ Date _____
(Signature of subject)

This research project has been approved by the UWSP Institutional Review Board for the Protection of Human Subjects.

Interpretive Technology Focus Group Participants and Schedule

Desktop Publishing Module Focus Groups

- **April 3 at 1:00 p.m.**
Nelli Atkinson
Miranda Graceffa
Lori Kroll
Kyle Niedfeldt
Nina Pokora
Carolyn Seramur
Tara Short
Megan Hatzinger
Anne Sheridan
Tina Naylor
Holli Wallner
Sarah Johnston
Kelli English
- **April 3 at 5:00 p.m.**
Ambra Baldwin
Brian Koscielniak
Miriam Wyman
Kelly Yngsdal

Digital Presentation Module Focus Groups

- **April 2 at 5:00 p.m.**
Roberta Kollmansberger
Aaron Lehnert
Nina Pokora
Carolyn Seramur
Lori Kroll
- **April 3 at 4:00 p.m.**
Ambra Baldwin
Joseph Paul
Colleen Robinson
Kelly Malahy
- **April 4 at 5:00 p.m.**
Stephanie Israel
Sarah Johnston
Michael Kerkman
Kelli English

Coded Transcripts: Digital Presentation Focus Groups

Response categories are organized based on the number of focus group comments related to the topic, which are indicated by the number in parentheses. The categories with the highest number of comments, and thus assumed to have high importance to the participants, are listed first.

1. Students feel that the tutorials should be available in a lab manual for purchase. However, the tutorials should also be on reserve in the LRC and available online. (18)

I like the idea of keeping them as handouts instead of buying them at the bookstore.

Since the computers are upgraded all the time, putting the tutorials into a book might be a waste of money.

Public folders. They are there for you to reference, but I will only print it off if I feel I need the information a lot. Maybe for PowerPoint tutorial number one, people have the assignment sheet, but not necessarily the whole tutorial printed out. You pay for a certain number of pages to print, and I know I haven't used mine at all, so I might as well use it.

Maybe you could keep a hard copy available at the circulation desk for someone who is having a hard time with computers.

You can put these on reserve in the library for people enrolled in class.

Public folders is a good idea and it saves a lot of paper. But maybe the support of being able to get somebody hard copies if they need them. I do use all of my paper credits and it frustrates me to no end. So having another thing that I would have to print, I wouldn't like that very much. I don't know how to do double-sided at school. Letting people know that it's on public folders, but also say if you need copies, then the class will support you in printing off and getting you a hard copy.

If it is a matter of fee, make it an option to purchase your tutorial manual for however much. If you don't want to purchase the already printed out copy, it is on public folders.

For people really used to using public folders and they like that, they really might prefer not to pay \$10 to have something hardcopy. It becomes a logistic thing.

Just sell them in a binder. You don't have to deal with the bookstore. You have the option to get them or not get them.

I know that there's been talk of maybe combining all of the interpretive technology into one course, and if that were the cases, if you had a sourcebook for that class with all the tutorials for all the programs in it, I don't know if I would want to see the QuarkXpress tutorial in black-and-white; I think if you would actually do it as a sourcebook, you would almost have to do it in color just for unity and aesthetics.

That's what you should totally do. Just like Zimmerman and Gross sell us that book at the beginning, like totally just put this into a book and be like here you have to buy this for the class... and you could totally make a bunch of money, Jim. And it would probably be cheaper than printing them out on a computer on color all the time. Just make a little lab manual that's in color like the Interpreter Handbook.

It would probably be less wasteful also. If you have something as a book, you take it a lot more serious than paper stapled together.

And it will be easier for those of us who want to refer back to it later.

I could see that making the people that thought they were really comfortable more angry. It would be a really good solution, but I could see it causing a lot of problems too.

What if you had a book in the lab or something. You don't have to purchase it if you don't want to, or have a few on reserve. If you really want it to keep you can have an optional purchase.

You can always just put them on reserve or online.

That's true... online. Then people if they wanted to print it out, they can. They can print it out in color.

I don't think that would be very fun to learn from, because you'd have to go back and forth.

2. The written specific step-by-step tutorials are an effective teaching method. (17)

I liked that they are very specific.

They were very concise. They had all of the steps you needed to do in them. Didn't take very long to do it.

... or you had the exact directions you needed to accomplish the task.

Very explicit in what you should do. Very detailed.

Anybody can figure stuff out through the instruction.

These have helped me so much. I came into the project like Oh Great, I have to learn this, and it wasn't that hard even for me, because you had it so specific, step 1, start up Microsoft PowerPoint.

I liked that they were really step-by-step, you couldn't really miss something.

I like having it written down for me, because when we do it visually through class, I can't catch it fast enough. It actually saves on time.

I don't think they could have gotten much more descriptive.

You have all the details like the different windows you open up, and the different things you click on, so that helped because I don't know anything about computers.

The fact that you had them at all. Most other classes you do a PowerPoint presentation and they're not there.

I thought they were very user-friendly, very easy to essentially teach yourself.

I agree. It was so detailed and laid out. It was simple. It was a lot of help.

I really liked how you labeled things (categories). When we are referring back to them, we can find that easily.

Another good thing is the important points are bolded. If you didn't need every single step.

I thought they were great.

Very helpful.

3. The visual nature of instruction sheets increased comprehension (pictures, arrow). Students had mixed emotions about using color. (16)

You showed pictures. Could always refer back to the pictures when you were doing it for real. I am a very visual person.

I liked how you presented the icon right there, and with the arrow to it

The pictures are good because otherwise it is real difficult to find things.

The color is helpful to see things. I wonder how much that's costing them. The color was really helpful though, I don't know how you could really do this without putting it in color, because you really need to see the details. Maybe looking into cheaper printing or something.

I think it saved on time too just having even the pictures, you have arrows going to everything you should do next. It was very easy to follow.

I like this copy in color, because it's helpful. But if it was in Public Folders, you could print it off not necessarily in color.

I liked having them in color, but I don't think I needed them in color necessarily. You have the option to print stuff off in color (on public folders).

But the color is nice.

I really like where you point to the buttons and describe them. I thought that was very helpful because that was one of the harder things to figure out.

The pictures of the screens. Probably if we had them in black-and-white we would realize how helpful the color was. If it was just the text it would be harder to follow, and it would be less inviting to follow.

I really liked the color. I know it costs more to print them in color. It made it more inviting to come in and take a look, and the fact that what was on the page mimicked the screen in every way including color really helped me to understand it better.

I think it could be done in black-and-white. The color adds but I don't think it's critical.

If it's in the same color that it is on the screen it really helps people. If it works for other people then it's fine for me.

I think that for people who aren't as comfortable with the program color could be critical. Maybe you could try printing half of them in color and half of them in black-and-white.

I think if you're going to have people pay for them, you would have to ask them if they want to pay for color, or just print them in black-and-white.

But would that be a good idea? Because then if it would really help them to be in color, but they wouldn't know it? Everyone would go for the cheap ones.

4. Students use the tutorials and skills from NR 367/368 for other classes and presentations (16)

I didn't use it for a class, but I used it for another presentation I did. I used a lot of the principles, like using the black background... it really helped a lot.

It would have been useful for some presentations I did before, for other classes, and I give presentations for County Board. To know some of things would have been a lot more beneficial beforehand.

I use different skills from it, like whether it was taking pictures, scanning pictures, not necessarily putting together a whole PowerPoint. I have used various skills, like the sound option as well for other things I've done. She had to give presentations to class. Hey I know how to do that, I'll get my things out, so I whipped them out and looked it up, and she used them too.

I've also done PowerPoint outside of class. It was for a student organization. It was fun to actually know how to do PowerPoint.

I kind of looked forward to doing these, because I knew this is something I will use after school all the time. I know I'll use it after school. I kind of looked forward to learning more about it.

I'm definitely glad I learned it, I'm using it a lot this semester in a bunch of other classes I have.

This will help me not only with PowerPoint but with other things in the future.

I used it for my Youth Agency class for a presentation I had to do.

I used it for my public presentation for Schmeackle practicum.

This class was the first time I used, but after that I used it for a Roots and Shoots presentation, but am now using it for a case study presentation in Ecosystem Management and Restoration class.

I haven't used it yet, but I'm sure I will in the future.

In visitor centers too, and I know I went back and looked at them to figure out how to do them.

The people that were in my class that hadn't had the tutorials were really impressed with by what I put in my PowerPoint, and my professor was just impressed that we used the computer. These skills that we are learning carrying over to other classes. You could definitely tell the difference between the people that had had the tutorials, and those that just put PowerPoints together based on what they had done before.

Since we are required to do PowerPoints and presentations, it's nice to actually have a class that teaches it. Since lots of our classes require some sort of presentation-oriented projects.

For graduate seminar. I talked my gullible housemate into putting his voice onto my graduate seminar as a quote. And it worked really well. When I first got here, if I hadn't had a PowerPoint tutorial I would have had a really hard time putting that seminar together. In fact, two of my fellow graduate students who did not have the tutorial and didn't know anything about PowerPoint, had to put a seminar together, and I actually referred them to these tutorials, and they also found them very helpful and were very appreciative to have them.

I've given them out to friends too. Because they ask me how to do it, and I say take these, you can do it.

5. The take-home tutorial teaching method is preferred over an instructor-led course. (16)

I like the tutorials better than having someone go through it with you. It was easy enough for me to do without having an instructor there.

It was probably a better use of the class time.

For me, because if the directions were not so specific and laid out, then I would need that.

I think the other lab is a lot more harder than this is. No instructor needed.

When you first brought that up, I thought, woah a lot of time. Because when you go through this with the whole class, everyone goes at different speeds. You would need a lab and take lots of class time.

I think people that were more advanced would be so annoyed with that.

It would have been overkill to have an entire lab devoted to PowerPoint. You were still available to help me. It was easy enough to get to you and have you help me out with that. I would just have been frustrated if I were in a lab and wasn't having problems figuring stuff out.

I think that it's so detailed that it's better if you just take it and do it on our own. That way we can learn at our own pace, and if we have questions, we can write them down. Taking it home was better then you can do it on your own time.

I don't think you really need a teacher there to tell you how to do it... it's pretty well said on paper for you.

There's something different about walking yourself through the tutorials.

Student schedules are so varied too, and they can work on it when they can.

These were probably better, with an instructor, the different levels would get really impatient. A level 10 would be like I'm not waiting for her to go through all of this. The other people would be like slow down, slow down.

I agree it should be on your own. The ones that are downstairs now are probably programs that most people haven't done a lot with. But since a lot of people have been exposed to it a little bit, it's easier to go about it on your own.

I would agree, I think these are user-friendly enough and it's not that technical. People can figure it out themselves. When you have different levels, people will get frustrated.

I totally agree. The other applications are much more complicated and necessitate having an instructor. PowerPoint is not as complex and I think you can save time, energy, and goodwill among more experienced PowerPoint people.

6. Students are comfortable using PowerPoint and enjoy using it (14)

I find PowerPoints are a lot more fun and easy to do when you want to do a presentation for class. I like that I know how to do it now.

Very comfortable.

Number 10.

I feel very comfortable. It's a great skills to have.

I feel much more confident than I had coming in, that's for sure.

The fact that it was given to us early, so by the time a presentation for the class was due, we were already pretty confident with what we needed to do.

Very comfortable.

As long as I had the tutorials.

Now I actually can put PowerPoint on resumes so they will hire me over other people.

I feel a lot more confident with my ability to use PowerPoint than my ability to use QuarkXpress. I try and use Quark now, and I have no idea. We had no tutorial and our professors didn't know how to use it, so we were just sort of out there.

Extremely comfortable

Very comfortable

I would need the tutorials next to me, but I can do it.

Thanks for giving me more things for me to put on my resume. It really made me comfortable using applications that I never used before.

7. Students prefer the homework assignments (14)

At the end, when you had detailed specifically what your assignment should say that was really good too, so you can look back quickly and make sure you did everything that you wanted us to do.

If you don't make us do it, we're not really going to learn how. Yeah, you might tell us how to it. Computer programming, in general, you should have to do it to learn how to do it.

I was actually kind of relieved with this kind of homework. I like the kind of homework where you're like assigned, this is when it is due, do it, and write it out. Instead of here read this, and I'll test you on it in a month. I learn better that way.

When you had us answer the questions, you made sure we listed what we had trouble with, and I think that was really good to get your frustration off your mind or so it can be improved in the future.

You need to have assignments. Because I wouldn't have done them otherwise. I thought the questions were good, because you had to think through why you were doing stuff. That's how I told you I was in XP and totally lost.

I think it's good too, because it's not just you were able to do it. But then knowing why you do a certain thing or what it's going to mean for your presentation, that's important.

I agree with that. You look it up again, and that's a reinforcement of why you're doing it.

I thought the questions at the end were really good. I found they were really helpful, and they really made you go back and reinforce what you had thought you learned.

I thought it was actually good that it was an assignment rather than voluntary. I would have said I know PowerPoint enough and I wouldn't have done it. A lot of people that benefited from it probably wouldn't have done it. And it wasn't such a pain that it was mandatory.

I thought they related back to what we had learned.

I thought they were very relative. Sometimes I remember thinking that this almost seemed too easy though.

I thought that the questions were really good given that you had people with a variety of different levels of experience. Some of the questions were easy for me. I also thought that the specific questions about when would this be appropriate or why would you want to use this feature, I thought those were really helpful because it really made you think about the best way to utilize the program. It made you think a little bit more, and I think everybody benefited from that.

I didn't mind doing the questions, but it seemed like they were in there to make sure that you had read it.

I agree with you. I think that has to do with the level at which you're at.

8. The majority do not understanding images or resolutions (13)

Maybe how you've dealt so much with the pixels of the pictures, it seems important that you have to know what to use in what situation.

Like jpeg and all of that?

Where to save it?

I was confused by that.

Because, for me, I need an explanation of why. And I don't think I really know why we had to save it as a .tif or .jpeg. Those are just words to me.

Sometimes it would take longer for certain frames to come up, I wasn't sure why that was happening. If there's a way to make it go faster...

With the DPI's and the resolution, I don't even still understand any of that, so maybe more explanation. It tells you how to change it and everything, but I just don't understand it at all.

That's true. Every picture I scanned just became a motion.

But I didn't know what it meant.

I don't either. I still don't

That's true, like when it would be a good idea to change those things.

I had big pictures and small pictures and I put the same things in all of those, and I was questioning if I was doing that right if it was going to look right when it came up.

Maybe a whole section in the scanning tutorial about picture sizes, and dimensions, and resolutions.

9. Many had problems with sound (13)

I remember I had a problem with the sound. When I transferred it to Zip disk the sound didn't come with it.

I did have trouble when I did my final PowerPoint presentation getting my sound to transfer as well, and I'm not sure what happened. Maybe that was the fault of me, but I don't know what happened there exactly.

And like with your sound, or something, maybe more explained.

Remind the students to bring a CD when you're doing the sound tutorial.

A lot of people had trouble with the sound. I don't know why. I know a lot of people that tried to put sound in their final project. And it either didn't work or the computer wasn't fast enough to make it go when they needed it to. I don't know if that's anything that you can change with the tutorial.

I had problems with the sound one.

Where to put the sound box and just click on the slide when you wanted it to go or stop. That's the main reason I didn't use any sound in my final project.

Maybe some more advanced techniques like that might be something to even have a one-time lab session for.

I had some problems with the sound. There were quite a few times when we had the icon and we pushed it but we just didn't hear anything.

On one slide there was the icon and the sound was working, the next slide the sound from the exact same place was not working. I'm not really sure what happened.

Maybe like a whole one-time sound/video lab session, since those tend to be more complicated. A lot of people forgot to put the sound file on the same zip disk as their presentation.

That was one of the things I don't think people understood, was that the sound had to be on the same computer.

I'm just learning that now.

Me too. That's why my sound didn't work. I didn't know that.

10. Students would prefer a 33mm slide instruction (12)

There was a lot of emphasis on PowerPoint in my section. PowerPoint doesn't exist everywhere, and you might be better off bringing your own slides, and actually stuff that makes your presentation run. Physical slides.

I have no idea how to do slides.

It was briefly discussed and that was more helpful than not having anything at all.

It always expensive too.

It's good that you brought it up, because PowerPoint isn't everywhere, and is an expensive for small non-profit places to have it.

Maybe more emphasis should be put on those other ways, because PowerPoint was so emphasized.

I was even going to do slides, but you should do PowerPoint.

It would be neat to take a day and go through how they produce the slides, instead of having each person do their own.

Field trip to the media lab or something.

I was going to do a slideshow as well, but just as far as which one would be more efficient for me at the time, PowerPoint was the one.

I think using slides will always be used, I don't think it will be terminated too soon in the future with technology.

I think there are a lot of applications, like the blending, that are neat to see how it works.

11. Most students preferred having the tutorials start at a very basic level, though some were frustrated by it. (9)

I thought of this on the way here about the remedial thing. As technology advances, you are going to get more students that know more about this stuff, so more people might start saying that comment. But there are still people out there that don't know anything. But that's going to make a challenge.

Several students that did say that wow, I never used PowerPoint before and it's really helpful that this is so detailed. I had made a couple of presentations. Not everyone is in that situation.

I know the basics of e-mail and this and that, but that's about all. It was really good to have it explained that way.

Not for me, I don't know anything about computers

For me, I had done stuff with PowerPoint before, so in a way it was, but in a way it was still good, because you don't get sloppy and start skipping stuff, and then later on forget to do that. I can go through it a little bit quicker. Yeah, there's a lot of stuff, but on the same note, it was a good reminder and on the same page as everyone else.

I didn't have any experience with PowerPoint. For me, I really needed to start from that point otherwise I would have been really lost. I was actually kind of worried about the assignment when you gave it out, but once I read through it, it was fine.

I felt that when it started getting repetitious or more obvious, then I could just skip over the parts that seemed more intuitive.

The problem that I could see, the people that knew PowerPoint being pissed off because they have to do this whole thing. I think it was fun enough and quick enough if you knew it that it wouldn't be a big deal. That's something that you'll continue to run into. I don't think that should necessarily be worked around.

I don't see how you could go around it, because everyone would have a different level, and you're not going to please everyone.

12. Many had problems with scanning tutorial, and agree that it should be rewritten. (8)

One part I did find a little challenging, I remember the first time we scanned, and there were a few of us in the library and it was a whole thing because there wasn't enough scanners at the time, now they've gotten more since, but getting the scanners getting to work the way we wanted to and following the instructions, that was a little challenging.

You don't find a scanner open during the times when you are available to work on the tutorial. So maybe a list of all of the scanners on campus where they are would be good to include in the scanner tutorial.

I had difficulty later on doing my final presentation, when scanning my pictures. Resizing was confusing to me. I knew I had to do it, and I knew what to put the measurements in, but I had no idea really what I was doing, or why I was doing it, or how it was changing my presentation. I really didn't know why.

I agree with that. I think that's something that confused me. If it was a smaller picture, if I needed to change the DPI or if they were always going to be 800, or if it depended on the size of the picture you scan.

With pictures, I still don't know a lot about this, certain pictures people had would take forever so you would sit and wait for the slide. And how to make that not happen. Just one of my pictures was like that, and I don't know why.

I remember that the way it said to use the scanner seemed to me quite round-about. It didn't work for me for some reason the first time. It was a different way than I had used a scanner.

All the scanners are different.

You have a lot of good details in the scanning tutorials. One thing you might want to include is some guidelines for selecting images, even if you scan it the right way. Maybe it just needs to be in its own little section.

13. Many would like to learn more about videos (8)

I would have liked to have been able to take a movie of our own and put it in, I know we took the one off the internet and put it in.

That is a neat idea unless you don't have an ability to make a movie or any video.

If you don't have time for that, I understand why it's bypassed. It's a little more advanced.

In high school we learned how to take movies and put it into our PowerPoint. In yours, you already had it and we just had to click on it. That would be helpful to know how to do that, so you can put in all in one media.

One part that was difficult that might be nice to go through with class, would be converting video over and installing that. I had to go figure it out myself through someone in the library, which took hours and the quality was horrible so I didn't end up using it. I think several other students in the class wanted to use video, but didn't really know how.

Maybe some more advanced techniques like that might be something to even have a one-time lab session for. (Also 11)

Maybe like a whole one-time sound/video lab session, since those tend to be more complicated. A lot of people forgot to put the sound file on the same zip disk as their presentation (Also 11).

Video.

14. Open communication with and quick feedback from the instructor is important (8)

It was good that you e-mailed us back right away too when you graded them. I like that if you forgot something you told us and you could redo it.

That was great, if you ask us now what we had trouble with, we'd just be like we got the assignment done. You're getting feedback fresh.

If we had any questions we could always e-mail you or ask each other.

I thought it was excellent correspondence with us. If you're having trouble, here you go I'll help you out or you got back to us right away.

I liked that the author of the tutorial was available to us real-time, so if we had questions, we could e-mail you, or call you, or we could see you in class. Whereas, a book about teaching PowerPoint programs, but if something is unclear, where could we go?

I think it's important to get feedback if we are having any trouble. It might be a lot harder for somebody to go through and correct all of those assignments if they don't all look the same. So if that creates a situation that pushes back correcting the assignments, that could be a problem too. I don't know how it would work.

It's a good way to keep yourself in check. That way you get all the comments back, and you can see a pattern of people are all having trouble with the same question.

I liked that when we e-mailed it to you, that you got back to us if we did something wrong, and that we had a chance to redo it. It was nice to get feedback right away.

15. Students like the idea of having an optional basic assignment available for students that have no experience with PowerPoint. They agree that everyone must do the same assignments. (8)

Maybe have an optional assignment. Or if the first assignment is too difficult, have a more basic one that's available but not required.

I think it's a good idea. An optional one for people that think they need it, they can go ahead and take the easier one.

I don't think anybody is going to raise their hand and be like I think I need that extra work, I don't know what I'm doing, like I wouldn't have. I would have been like I'll just figure it out.

I like the idea, of how okay, if you don't know these more basic things, there will be things that are repetitive. Optional assignment.

I don't think you should have two separate assignments. I don't think it would be good for one person to be doing a lesser thing.

Agreement about fairness that everyone should be doing the same assignments.

Maybe in cases where people feel like they know PowerPoint inside and out, some sort of assignment should be a requirement. Maybe making it so they don't have to do assignments 1, 2, and 3 but they have to do the last one and it counts for all of the same points as the other ones put together. On the other hand, there's a tendency to feel like you know a little bit about something that you're an expert in it, and that sort of option would encourage people not to do the first three.

If you wanted to make something optional in the beginning, the first one was very basic. I think maybe if that one was either optional or extra credit, so the people that have never done PowerPoint can do that one.

16. The order of the tutorials was effective, increasing in both degree of difficulty and creativity (7)

I liked how towards the end they got to be more specific and more things were added... doing more challenging things.

Each tutorial was a little more difficult.

I liked how it was broken up a little bit, and then you would add a little bit more, it wasn't too much at once.

I think it was good that each one built upon the last.

At the beginning, it was get this picture or type this. As we got more familiar with the tutorial you gave us much more freedom. You could be creative and put what you wanted into it, and you were still getting the basis. Made it a lot more fun and inviting.

I thought the order was really appropriate too. They almost built on each other, built on past skills with previous ones.

I agree, I think they totally built on skills, and that helped to reinforce our sense of being comfortable with the program and really kind of empowered us to learn how to use it more.

17. Other skills should be taught in the tutorials. (7)

A lot of teachers use backgrounds that have a border. I noticed a lot of people choose to use that if it's a professional presentation. **Background templates.**

I would have liked to have learn animation, and I know that's more of an in-depth thing to get into. There were ideas I had, but I just didn't know how to make them work because I didn't know about it all.

I didn't know how to enter a website link and I couldn't find it. But I needed to know how to do that and it wasn't in there.

Maybe a suggestions in terms of pictures and backgrounds the color... a lot of times when you project it onto the screen it's different.

How to print out the notes with the small pictures.

When you're in Microsoft Clipart, you can go on this little button that says get more from the Net. They have basically anything you could want.

I know we talked about copyright laws, I'm sure mine was illegal. I don't know if it was in there or not. You might want to throw something in there for people like me that see a picture on the Internet and just take it.

18. The scoring of the assignments is fair. (6)

I personally thought it was fair.

I didn't notice.

I thought that was fine.

All, no problems

I think as long as it like the fact that if you screwed up on something you could fix it. If someone was blowing it off they didn't get points. But if you actually did do it, and you got most of the points that would be appropriate.

So it's more of the experience than the actual product.

19. Students could complete the tutorials at their own pace, depending on their ability (6)

If you were busy, at least it was an easy assignment to do. It wasn't too challenging. You can learn and yet it was easy enough to understand, you could just quickly do it, it wouldn't take you three hours or something.

A little bit, but like I said you can just get it done quickly. Just sit down and do it and quit complaining.

Man, the last three weeks we've had an assignment. But like she said, it was easy to fit in if you just sit down and do it.

If there was someone in the class that had never used PowerPoint before, they could go at their speed that they needed to with the tutorial. Whereas someone who had experience could go through it a lot quicker. You really got to go at your own speed.

I felt like I knew PowerPoint pretty well, but it was fun enough that I didn't mind doing it. It didn't take a whole long time if you did know PowerPoint. It was interesting enough that if you did know PowerPoint, it didn't seem like a pain to do. Along the way there were little things you picked up.

So that's why it's good that the individual can put their creative influence into it, and also that is so detailed so that it's good for the unexperienced person because they have all the details needed, and then for somebody who feels they know it might actually come across something and say oh I didn't know that.

20. Students use the hard copy to refer back to (6)

I like that we each got a copy of it, and that we always had it with us. I still use these in my other classes when I have to do PowerPoints

I agree, I'm going to keep mine so I can refer to it again. Tiny details that you are going to forget are good to look back on.

I may have trouble with the details, because you lose that in time, but even having these guides to look back on, you could do anything.

I agree with that, you can refer back

We had the information in a packet for us and we could back if we forgot how to do something.

I think it's good to hand these out, just to have later reference to.

21. The PowerPoint training should be incorporated into future classes (6)

All responded yes.

All yes.

Yes, keep teaching it and teach it to the professors (also #14)

Yes

Absolutely.

Interpreters going out into the field post-Stevens Point really need to have these skills.

22. All instructors of the course should have training in PowerPoint (4)

I think professors should use them as well as students. So that if you are not available, or another expert on PowerPoint, someone who is an expert in the kinds of programs we are developing will also be able to support us with the programs we are developing them on. My experience has been that a lot of the professors just don't know, and that isn't helpful at all (specific to EE/interp)

It would be very helpful to have our professors on the same page with things.

I feel a lot more confident with my ability to use PowerPoint than my ability to use QuarkXpress. I try and use Quark now, and I have no idea. We had no tutorial and our professors didn't know how to use it, so we were just sort of out there (Also #1)

Yes, keep teaching it and teach it to the professors.

23. Doing a tutorial every week reinforced the students' skills and learning (3)

It was nice that you made us do one every week, even though it was really difficult if you didn't have time that week to get it done, but if you had waited another week you forget the little stuff real quick.

Really programmed it in my head. I think it was good to have us do tutorials, separate from class, doing it again to practice it.

I think it was good that they were spread out, that you didn't just hand us all five at one time. It made it a lot more inviting also.

24. Students liked referring back to previous steps or tutorials for reinforcement (3)

I like how you referred back to the other tutorials. Like a review in each one.

Sometimes you mentioned to go back to another step, and that was good, so you didn't have to repeat it in the type-out.

Some of them even had stuff from the previous ones which was cool.

25. Students would like the tutorial assignments to work toward a final goal, instead of stand-alone. (3)

There was no point to my assignments. I wasn't working toward a greater end. I don't know if it would be feasible to try and pick out your topic beforehand and have our topics approved and then start your tutorials so you can kind of be working towards it. I know I would have taken more time and care in actually doing it well.

I agree with that. If you could pick your topic early on, that would be key, and then you could build off of it, and then when it gets to be to the end you actually even have it done already. You've been working on it all semester.

Even if they just built on each other. If what we did in Tutorial 1 carried into number 2 and number 3. That way you're kind of working toward something, even if it's something that you're not presenting.

26. More and more students may be frustrated with the basic elements of PowerPoint as they enter college with more advanced computing skills. (3)

I thought of this on the way here about the remedial thing. As technology advances, you are going to get more students that know more about this stuff, so more people might start saying that comment. But there are still people out there that don't know anything. But that's going to make a challenge (Also 22)

The problem that I could see, the people that knew PowerPoint being pissed off because they have to do this whole thing. I think it was fun enough and quick enough if you knew it that it wouldn't be a big deal. That's something that you'll continue to run into. I don't think that should necessarily be worked around (Also 22)

If you do this continually, you will run into more and more of them, since more people would be familiar with PowerPoint from high school.

27. Some had problems with disk drives (2)

I think a lot of people were confused about Zip disks and H: drives, I think that some people had 200-something Zip disks and those didn't work with certain computers, so you needed to have a 100-Zip disk, but yet it worked faster if you had it on your H: drive, so I think if for the last one, that could be more explained because a lot of us didn't know that.

The H: drive and Zip disk I didn't really understand, I was a little confused, but I kind of figured it out. I think you're going to have all different levels.

28. The students would like a digital camera session. (2)

It might be kind of neat to do a lesson on how to use the digital camera. I'm always scared to use them because I don't know what to do once I take the picture.

I think that would be a good idea too. I think that's why I didn't use it, because I didn't know how to use it.

29. Other problems that the students encountered (2)

Office XP is completely different. As much as I tried to follow the tutorial, a lot of it ended up being trial-and-error.

Not all computers are going to have the fonts that you have. If you go on a computer that doesn't have XP, not everything is going to switch down. If people do want use a font that portrays a certain mood, they can meet with you on how to put it on that computer.

30. The tutorials help students to evaluate PowerPoint programs presented by others (1)

I find myself critiquing other people's PowerPoints now too. To see what they've done wrong.

Un-coded Responses

Any spots that I did get a little off track, it was good because I could strengthen those skills by playing around with it a little more and seeing how different options work.

The lab assistants can always talk to you to. If something didn't seem to work, we could always find someone to help us with it.

I didn't think so. I thought sometimes it was a little too remedial

I didn't.

I think it was important to have a little survey to find out what skills levels you are working with, to see are people more advanced, or do people need that beginning stuff too.

Concerning the survey idea, ask what classes you had. If you had certain classes, then you would understand which students or where they are.

With any seminar class, where you do presentations, even though they are higher level, you still might be getting students that have done the higher level courses before.

How would you know?

Unless you did the survey thing? And then they'd have to put their name on it so they'd know who it was

That and grading. You'd have to grade them differently.

Maybe someone's doing a little bit more to catch up.

Creating a PowerPoint presentation and scanning pictures, instead of using overheads and other stuff that's not as clear. It's more professional.

I liked learning how to import other medias into your program.

Adding the sound was good, and animation was neat too. It's not just a plain old picture show, you actually get to get people involved with the movies and stuff like that.

You gave us tips throughout how to make a better presentation. Keep all the slides the same, don't use too much animation.

Both. (Session and tutorial)

Having you present it like that makes it more concrete too. Understanding how to do things.

I thought that you presented yours in class that was effective too. We knew exactly what you were talking about it.

Open lab type where you'd come in if you had questions. That's a pretty good idea.

That might help with people that don't know as much about computers.

Maybe you could make a more challenging PowerPoint tutorial, something incorporating a lot more details.

Or just have it available for those that want to further their skills that have some of those basic ones down. But not necessarily make it a requirement.

When I had this class last semester, I would talk to friends that aren't in a 4-year university, or are still in high school, or adults in general and they don't know what PowerPoint is or they've heard of it but they've never used it. So it's still out there in the layperson area that it's a technology skill that not everyone has.

I feel this course is going to be ever changing just because of how technology is in general.

Also included were default settings likely for the computers that we were using. It made sense for some of the hidden things that could have messed up our programs.

Does it need to be in color?

Another bonus to not having color, is that it would be easier to do double-sided tutorials maybe. Double-sided is always a bonus.

It's not a bad idea. Adventure education minor is insanely expensive. This one is only \$10, but on the other hand, you're adding more money on. It wouldn't be backbreaking, but it would be another course fee.

Options are a good thing.

If you do end up putting this in a book, maybe you can include some more extreme tutorials.

I think just at the end if there was more to be learned, or if there was more to learn.

I don't know what I don't know about PowerPoint now. If I don't know it all, it would be really cool to learn more.

I thought going from 4 little tutorials to an 80-slide PowerPoint was a nice test to see if we really get it or not.

It was kind of fun.

The assignment is 10 easy points.

I made the mistake of using mine for scratch paper. I actually should have saved those last ones that talked about video and sound.

Thanks for taking all the time you put into them, I know that it must have taken you hours to create these.

I hope you're getting paid for it.

Thank you, you have changed our lives.

Major Categories for Coding: Interpretive Lab Focus Groups

Response categories are organized based on the number of focus group comments related to the topic, which are indicated by the number in parentheses. The categories with the highest number of comments, and thus assumed to have high importance to the participants, are listed first.

1. Students liked the overall interpretive lab training experience and found it helpful for real-life applications. (14)

I liked the overall experience.

I think it really did a good job relating the class part of 363 and 364 to what we actually are going to be doing in the future. You learn it in class, a lot of times it doesn't actually stick with you.

I've always had troubles with computers, and these just amazed me. Going through the labs made me really excited about going into this field, I guess I never realized how much creativity you get to put into it. The labs were so well put together that even I could understand it, because I was really nervous about the computer aspects, and it made me real excited with how creative you can get with panels and stuff.

I'm just thinking about those of us who took 251 here and had to do the GIS thing and I'm just comparing it. Like, I don't know remember anything of how to do ArcView or GIS with their tutorials, nothing at all, and I know I can do this stuff now with the tutorials and because of how it was taught.

I don't think I would have gotten very much out of the class if I didn't learn the programs and stuff.

It was fun. Sometimes frustrating. Always fun, even sometimes when it was frustrating.

I really just liked how much I learned. I think that it's probably the most applicable lab I've had so far. Applicable to everything: other classes, my jobs, anything I'm going to need to do, I can do so much better now, as far as making something so that people can look at something, be drawn into something, want to read it.

I think what you wanted us to learn, was the stuff we needed to know in order to use it. When I asked you how to use the fade out, you were willing to show us, so you included that. It was helpful to know that you were open to new ideas.

I thought what we learned was good considering these weren't in-depth classes.

I personally am striving now to make things look a lot more professional and nicer.

I really liked these labs. I just think they were really beneficial for taking away from class. You can have labs that get you through the semester, get you your grade at the end, and you'll forget about them and never go back to the stuff you learned, but I think that these are really something that will continue to be beneficial even after graduation.

This is an elective that I took because I figured it would help me out a lot in the future. So the labs were very important. Because, if I had just did the in-class work, it wouldn't have helped me out nearly as much as the lab would have.

I really enjoyed the labs. I got frustrated. Maybe it wasn't enough time in the lab, maybe it wasn't enough one-on-one, but I think they were very helpful, and if we wouldn't have had them, I would have been lost.

Ditto. The labs are really good.

2. Some students believed that completing a project with the 1-credit students (who didn't have the technology training) was unfair. (12)

I thought with our class mixed with the one-credit class that didn't have the class, I thought it was really frustrating working with a student that didn't have the knowledge of the programs. I felt like there was a lot of pressure on us to make that stuff happen. The work wasn't very equally shared.

And yet they got the equal grade.

I don't think we should have been expected to that.

It seems like we were expected to show them how to use these programs.

Maybe if they could have at least got copies of things we were learning. It would have taken a little bit off our shoulders.

I think personally, if the roles would have been defined a little more that would have helped.

Or if they could have had a night session that went through all the programs faster. Maybe they should have a shortened version of the lab so they know how to do this.

Maybe it shouldn't even be offered for 1-credit, if they really want to get the true meaning of the class and take it along.

We were familiar with the lab downstairs and the programs, but they (one-credit people) weren't as familiar with it, so all of a sudden there was more people down there and they had a lot of questions.

Our partner didn't really do a lot. We didn't really invite him much, because he doesn't need to do any of the computer stuff. It's not like he could really help us in any way. He helped us with the design of it, and we did the rest of the work. And he helped us write out what we were going to put. If they're going to help anymore, then they need the lab.

My partner had had some experience with the computers. Although I didn't feel like he wasn't doing stuff, you did end up doing almost the entire project yourself. And only because it was easier to do it that way, if I wanted to I could have taught him. I don't have time to do that, I'm going to do what's the easiest and the quickest to get the grade I need to get.

Although I can relate to this from other projects. It's up to both people to agree on dividing up the work and making sure they're doing their part. It just means the two people have to work well together and agree to different aspects of the job.

3. The tutorials were specific and enhanced learning. (11)

I think your handouts made it really easy. You could do it there with you, but then when you were away, you could just look back at your handout and still figure out how to do it.

The handouts will be really nice for the future too. Everything was very well described.

I think so too. I really like the tutorials.

The tutorials were excellent.

The tutorials we went through as a group I think were excellent. I think you should talk about Rebecca Clark about doing one of the tutorials at the EE workshop in the fall. You put them in such easy-to-learn formats, going right through all the basics.

My mom had to do a PowerPoint presentation, I basically just handed it to her and she could do it. Those tutorials are independent, they can stand alone, along with the stuff we learned in class it was beneficial.

I liked how much effort you had put into this, because it's so specific that it's easy to follow. The directions are well-written.

I also thought the handouts were very user-friendly. The pace that you went over the specifics made it really easy.

I liked how you could basically pick up the direction sheet here and learn everything yourself. You have arrows pointing. When I was going through the tutorials, I was able to go ahead and tweak a bunch of other things right away. It was really easy for me to get into the program. It was good reference too when I forgot what to do.

The guides were super, super helpful.

And these guides that you made are awesome and I'm keeping them in a binder and I'm keeping them. I think that you did an excellent job on them.

4. Microsoft Publisher should not be taught as a 50-minute lecture. A more detailed tutorial and lab discussion would reduce problems with the program. (11)

When I was doing my poster, I was a little confused when that came up (all the different options). I don't know if that wasn't explained good enough. I had to play with it a little bit.

About Publisher, we went through Publisher really fast. I understand why we did that. Still the fact that we were using it and making our posters. How do I use this application again? I feel we could have used more of a Publisher tutorial, even though it is easier, maybe more a take-home thing so we could have more practice with it.

I didn't enjoy having the Microsoft Publisher thing in class instead of lab. Because I don't have a long attention span about that stuff. When we got done, I didn't even know what Microsoft Publisher was, so we should have just had a tutorial for that. Especially since that's what our poster was done on.

You didn't have an assignment for that one either. You were just kind of like yeah, play with it. I didn't play with it at all until we got to the poster.

I know with my poster, that's the one we had to do it in Publisher. It was hard to do it in Publisher. You told us that you could do almost everything in Publisher that you can do in Quark, but I had no idea how to. Also with my poster, I wanted to have a translucent text box over my pictures, and I had no idea how to do that, but that's a feature you see in a lot of publications. Learning that would have been nice.

I didn't think that one was helpful at all. That was one of the most difficult ones that I had a hard time with. The steps weren't as defined and was hard to follow.

I didn't really care for it. Because I didn't think it was very effective. It's hard to teach stuff like that in a lecture format. And I think that's why I didn't like my poster. We were told we had to do it in Publisher.

I don't remember much of it. I thought it was good and I'm glad I learned how to use it.

All: Yes (Would it be more effective in a lab setting?)

Definitely

More hands-on

5. It was difficult for students to find time to come to Schmeeckle Reserve and complete their assignments. (10)

They were tough to find time to come in and do them.

Having them overlap would have been good. Sometimes a time conflict was the issue.

A lot of times I felt it was a real hassle to come over here. I found that a real big hassle.

I also found that hard, because I'm busy until 5, and it closes at 5, and I don't have a car.

I always had to walk, and I have class late every day. So I would have to get up super early in the morning if I wanted to get here.

As well, me too, on the same issues that other people had mentioned. Then, to have enough time when I could get here, oh man, I need more time.

The only thing I didn't like, on some of the programs like Quark, I actually had to come to Schmeeckle to work on it. That kind of irritated me a little bit. I had to come all the way to Schmeeckle to work on the assignment.

I agree. It was kind of a deterrent.

Just with our tutorial assignments, having everything on the computers here, you didn't have an option of just doing it on a different computer that did have Quark.

The only thing that bothered me besides having to come to Schmeeckle all the time, is when I would come to Schmeeckle outside of the actual lab, and there were a lot of people working.

6. Students would prefer to have more lab sessions to reinforce the training and teach more skills. (10)

I think once a week is a good amount of time, but I think that there could have been more weeks of it then. Because there were some things that I would have liked the full class period for you to explain. At least one more week if not the full semester.

Some of the topics in our tutorials were just mentioned and could have been elaborated on a lot more. The cool things to do. If we had the tutorials we got the basics, and then at another point we got to come back and learn the elaborated forms of everything. I think that would have been very useful.

I agree.

I definitely always have the tutorials to look back to, but I almost needed more reinforcement of ideas. Maybe just more labs. We definitely want to be able to do really interesting things if we are going to making panels.

I think that the 1.5 hour was appropriate, but I don't like computers. For me to get on a computer and practice it, I need to be made to come at a certain time. A whole week is a big span of time to keep that knowledge where you're comfortable with it, and I think if we would have it one other day of week, for even just an hour for review, I think it would have been a lot more helpful. It may not need to be done for everyone, but maybe for those there could be a time where they could come in.

I thought the amount of time was fine.

I would have liked a few more. It would have been nice to have a review. When I go down to work on a computer now, I have to get all of these things out and go through it again, I just have not retained a lot of that. Because I haven't used these programs for much.

I would like to have had more of them, not necessarily to review but to learn features of the programs.

I agree with you, but if we were to learn more in-depth with what was available, I think we would have had to have a lot more sessions. Sometimes even the amount of info that was presented was just kind of overwhelming because we'd go through some steps so quickly.

7. Students would like more computers available in the lab. (9)

As far as the lab, the touchscreen computers were very frustrating for me, because I only had a limited amount of time. And I spent like my whole time trying to figure those out because there were none other available during those time.

This major seems like its getting more popular, so you might have trouble with lab space and the number of computers too.

The spacing adequate enough of computers, or almost enough computers, that was okay.

I do (need more computers).

I do, because I am a hands-on learner, so I have to be that person that's doing everything. It wasn't sticking in my head, and I would forget how to do that.

I would agree. I really would have liked to have played around with it, but to let my partner get the experience and do it. It would have been nicer if I could have worked by myself just to play and reinforce what I was working on.

The only thing that bothered me besides having to come to Schmeeckle all the time, is when I would come to Schmeeckle outside of the actual lab, and there were a lot of people working. I guess maybe there aren't enough computers, or something has to be done with scheduling.

But then again, it was really packed on the weekend. You need to use the scanner, you have to rotate through.

There were ten million people that needed to print their posters off, and it took forever. That was frustrating.

8. Most students prefer to have the lab times set before they sign up for the class. (9)

I liked how you let us figure out at the beginning of the semester when we were free to do it.

I wish that would have been told to us before the class. I think it worked out that way, but I wish I would have been informed of that before the fact, so that I would have known that I could have taken a class that met during that time.

The same thing happened to me.

I think the lab should be scheduled and not to be arranged. Then it would be in the time table.

Or just make it obvious that it will work around your schedules. I just remember it being a hassle.

I thought that was really frustrating in the beginning of the year when we had to wait to come to class to find out when we have lab. That to me was the dumbest thing. There are so many people that have jobs, and I need to know the schedule. It took longer than it should have. I think it can be done when we sign up for classes.

If it does need to be arranged, I think having more slots would have solved more problems. If we were all in one lab it wouldn't have worked.

You could have three sections of the class, that way then, you know that you can't schedule work in there.

Probably easier just having it chosen for you in advance.

9. Students want to learn how to create brochures and pamphlets. (8)

Something I think would have been nice to add in is learning how to make a brochure, or pamphlet or something, and maybe even cut out the poster.

I have no skills whatsoever in how to make brochures.

Especially since they get complicated with the front and back.

The poster was fun to make, but it was something that we were definitely all capable of and we didn't need to prove it. I had a few job interviews and every single person asked me if I knew how to make a pamphlet.

I think the brochures are a really good idea. A poster assignment might be a good assignment for a one-credit person to do. And the two-credit people could create a brochure.

All: yes (Would you like to have learned to create brochures).

That's something you can use anywhere. A sign is one thing, but it's a little different to create a brochure.

I think brochures would be very helpful, because anywhere we go for a job, they always want brochures and people always use brochures. It's a lot different than making a sign panel. More often someone is going to ask you to make a brochure, just because its more user-friendly, you can mail it, and you can do multiple things with it.

People are more likely to pick it up and look through it than having a sign. People just drive or walk by a sign. If they take the time to pick it up, they're more likely to flip through it.

10. Students prefer having the assignments, even if they were somewhat frustrating. The assignments reinforced skills and enhanced learning. (8)

I actually liked the assignments we got, not so much because I enjoyed doing them, but having to figure out how to do certain things really helped me to retain some of the information.

One thing I really liked was that when we did the homework assignments, you had the photos that we needed on there so we didn't spend time trying to play with the photos.

And you had all the instructions in the lab. It was nice to have those things handy.

I thought they were effective.

I thought they were effective and fairly easy with the hints you gave us on the sheets. I think they would still be fair without the hints.

I thought the projects related to what we had learned that day, so I thought they were appropriate. I got frustrated with a lot of the assignments.

I guess you would be fair if you didn't put the hints on. I think since it was a beginner assignment and we're still learning, I think that was fine. And I'm glad you did that because I might not have figured it out. If there were more labs getting more in-depth, then maybe cut out the hints as you go along.

All: General agreement.

11. Students would like the lab to be open for extended hours. (8)

It would have been nice if it could have been open even to 7.

It would be nice if there was some way that people that can use the lab had a swipe card or key, where they would be able to get to on off-times when the visitor center wasn't open itself. The time was constraining to me also.

My frustration was having to work on stuff between 8 and 5. I do all my homework at night. Having that be part of my homework, I had to try to schedule that into my school day and workday and not into my homework time.

The only complaint I have is I would agree with the 8-5. That was especially difficult when we were working maybe in partners. We had a hard time because I had to work to.

The weekends were good. That's when we got most of our Point Iroquois thing done.

Maybe like reopen just for us.

7-9 would be awesome. Meetings and stuff get done around 7-8.

And that's not necessarily something you have to do every day. That might entail another person to be here. Even if it were three days a week, that would be so much more helpful.

12. The "No food or drink" rule in the lab is generally agreed upon. (8)

Food in there. I think if we come in with Nalgene bottles with lids on or coffee mugs with lids on, can we please bring coffee in the lab? It's all I ask.

It's not like it's a long walk to that table. I've spilt before.

It's annoying though.

I think it makes sense. They're nice computers, I think it's a lot of money in equipment.

As many times as I broke that rule, I have to say I didn't disagree with that rule. I was down in the lab a lot. I totally agree with the principle of the rule.

All: General agreement

I think it would be nice to be able to have it in there, but one person doing it versus every single person would not be good.

Although I think it should be universal; it applies to me, it applies to Dr. Gross, it applies to everyone else that goes in there.

13. The training could be offered as a separate class open to all natural resource majors. (8)

I really like the idea of this as a separate class.

I think if you put it as a separate class you could go over like how to make brochures, posters, pamphlets, and handouts, and why these things are different.

I'm all for the separate class thing, but I think you need to anticipate getting lots of other people that want to take, who are not part of the major.

You can put a restriction like that on there (letting people outside of the major coming in). There are limits on the number of computers.

I think having it as a separate class though, if I wasn't an EE major, I would like to take this class, I think it would be great for anybody in any major in natural resources.

The wildlife people have to do tons of PP presentations, they have to make brochures, they have to work with people to present PP presentations. I know for them it would be highly valuable. Lots of these skills could be easily adjusted for other majors.

Do people need design principles before they go at the computer programs? I wonder if design principles should be its own little quick thing that you need to take before you get on a computer and start doing it.

It would be nice to have them as two separate classes for grading purposes and interest level. But I think it was really nice to have them at the same time. Because we would go through something in class, and then you would have to apply it right away. Whereas breaking it up between semesters, I think everybody just kind of loses something.

14. Students feel comfortable using the skills they learned. (7)

All yes

I'd have to bring the tutorials along. To be honest, I couldn't do half of the stuff without the tutorials. Like I have to refer back to my tutorials constantly. But I feel like I'm definitely more prepared than I would have thought I have been.

Even revising my resume, I know all of these programs that I can help out with.

I'd feel pretty comfortable, I think. I know the programs enough where I can make the box and put the text in and pictures. It would just be more of an art of fine-tuning.

I would be comfortable with it. Not only is it a comfort thing, these labs kind of fanned the flames. I can make that look a lot better and it's not that hard to do.

Compared to before the classes, I feel pretty confident in making posters and panels.

I also feel comfortable enough where I could definitely put something together. It might take me some time. I feel comfortable enough where I could have a nice product.

15. Students believed that an instructor-led lab was essential to teach the more complex programs. (7)

I personally liked that you were around and that you went through it like that, because I thought that these were a lot harder than the PowerPoint ones. Not the tutorial, but the technology itself was harder to understand how to do.

I don't know what we would have done with Quark and Paint Shop Pro had we not had those weekly sessions to go through that stuff. I think that for those advanced programs the instructional labs are really, really important.

This class was different than PowerPoint because each time we had class it was a different program. With PowerPoint you built on top of the last weeks. Because everything is so brand new each program that you work with, you do need more instructions each time.

I think this stuff was a lot more difficult with working with, so I think it was good the way we did it.

I agree. I thought Quark and Photoshop were much more technical than PowerPoint, so I thought it was good that you took us through that.

I enjoyed having the labs for this. I think they were helpful. For this, there were so many different options that you had that you needed to be shown what they were. Having someone there to answer questions when you were at that screen instead of trying to e-mail.

I imagine it would be easier to have the lab.

16. Students would like at least some of the computers on campus to be set up with the same programs available at Schmeeckle. (6)

But on the other hand, I thought it would be almost nicer to be able to work on campus.

I think a way to kind of get around that would be, have everything set up here, but also have at least a couple of computers in the CNR somewhere that we could use for those time when we only have a few minutes to get something done.

I think you need to let it be known right away that there are computers on campus that already have QuarkXpress and Adobe Photoshop and everything we worked with is on campus.

I think it would be handy for people to work on their projects other places, but it was really nice to have control over the printing here. Whoever was here could troubleshoot it and print it out again.

It would be nice if there was a lab in the CNR that has exact same stuff as here.

If there's a way to have similar programs in other labs on campus. That may solve some of the problems, and you may not need to expand hours necessarily.

17. Students would like to have the tutorials available to purchase as a lab manual. (6)

Perhaps you could put together a bound edition of those, so that we buy them ahead of time, or something that is already put together.

I really, really like the idea of putting the tutorials into a hard copy and have it as a requirement to buy for the class or given to the class, because then you get publication and we have something we can put on our bookshelves.

You mean like making a lab book with everything in it, even these instructions and stuff?

I think that something like this would be worth purchasing.

I think it's always nice when it's hidden within the costs of the class and you just hand it out the first day. Then you don't feel like you're spending extra.

All: General agreement over this.

18. Students prefer having open communication with the instructor. They had mixed feelings, however, over how the instructor answers questions. The attitude of the instructor is also an important component of learning. (6)

I remember the lighthouse tutorial, I had the hardest time. I was so upset, and it took me hours to do it, and I was getting so frustrated, and I'd keep on calling you over. Now I can appreciate that you wouldn't outright do it for me. Right now I can appreciate sitting at the computer and like messing around with things. I think I learned a lot during those two frustrating hours.

On the other hand, I found that quite annoying. Granted, I don't want you to baby-step me through everything. But if I ask a question, I don't want a parable back. Different learning styles require different sorts of things. For me, I need you to go, right there, and I'll remember that.

I actually kind of agree with you. If I'm trying to figure something out and I'm getting frustrated and I'm trying all of these different things and I finally figure it out, I don't remember how I figured it out. If I'm actually shown that this is where it is, I'll definitely remember that.

I think you have a lot of patience. Lord knows you must have gotten tired of every day hearing the same questions from different people. And so I think that really helped to keep morale up. You never got tired of helping and giving hints when people needed them.

And smiling. It really helped. I was so emotionally drained that I want to bawl at my computer. Thanks for that smile.

And I think that having three lab sections would be a lot more beneficial for us the students, because we would have more one-on-one with you. Sometimes it was just too many questions at once and you couldn't get around to everybody at one time. It would be helpful to have more of that one-on-one so we have a clearer understanding. I think it was really nice that just one person was teaching the class, because if there are two people, it's hard to teach something exactly alike.

19. The majority of students believed the interpretive technology lab should be graded, but they had mixed opinions on the weight of the grading. (6)

I don't necessarily think it needed to be graded. Everyone did their assignments. You went through it with us, and you showed us how to change it. It's a learning experience so it shouldn't be graded. If you do have to have it as a graded thing, I think it should only be 10%

I think it should be graded but I do think it should be minimal. If it's not graded, some students won't do it, and that's the only way that you'll make them do the work and learn it.

I also think it should be graded, because there really wasn't incentive to do it. If I'm going to put time into something, I know that I put more time into things that you are graded on. And I think that our grades for 363 and 364 are based on very little. By having grades on other things, will make people feel they have a better chance of succeeding in the class. 10-15%

I think these should be graded as well, because people are more likely to do it. It would make a little more of a cushion. If you did bad on a test and you just had two other projects to make up for it, it might be a little more difficult.

More on yes they did it, yes they put effort into it, rather than this one is exceptional and this one poorly done.

Doing that when you are checking the assignments so they can see what the mistakes are but not necessarily get downgraded on it.

20. Other suggestions for teaching or skills to learn (6)

Taking the survey thing of finding out where your class is at is highly important, to find out what levels you're working with here.

Along with that a list of where we can get copyright-free stuff.

More with the fading of the pictures and the colors.

I really wanted to learn how to do the text box and watermarking photos, and different things like that. I tried to watermark the photos so that they were still colored but faded, just to make my text show up, and I couldn't even figure out how to do that.

It would have been nice to have the computers networked, because I know we did a lot of e-mailing of people's projects. The project was on the hard drive, it wasn't on a disk or anything. We had to e-mail it to another computer.

I would have liked to have learned more of the Adobe programs, even of just Photoshop, because they're on Macs and they're on PCs. Depending on where you're working, they may be on Macs, at least you know that program.

21. Students liked the interpretive lab at Schmeeckle, and all of the equipment and software in one place. (5)

Having that lab there was very good because it gave us all the opportunity to go out and use what we're going to eventually probably be using in the field.

It's nice just having the lab here in general. Having a separate set of computers and an area for us to spend time and work on it. It was a real plus instead of having to go into a public computer lab and hoping that the computer you find works with the program.

The size of lab at first I was uncomfortable with it being so tight in there. And then as I started going through the class, I really thought it was nice to have a small connected little area.

I thought it was really nice to have it here, especially so that you're available.

The good thing about having the lab here, if the printout comes all off, there is some stuff that you did with mine that I would have no clue how to do. He's got it all under control.

22. Students feel that the hands-on instruction is extremely important for learning. Every students needs a computer; watching is not effective. (5)

One thing that might be important is to make sure you limit the class size so each person can be on a computer doing it hands-on. That's a factor in how much you'll remember doing it. If you're just sitting and watching you can follow along but you won't remember it as well.

There were definitely some days where I was watching, yeah I know how to do that. Then I come to do the tutorial one week later, and be like, what am I supposed to do?

I think it's very important for everyone to have their own computer.

I do, because I am a hands-on learner, so I have to be that person that's doing everything. It wasn't sticking in my head, and I would forget how to do that (Also 5).

I would agree. I really would have liked to have played around with it, but to let my partner get the experience and do it. It would have been nicer if I could have worked by myself just to play and reinforce what I was working on (Also 5).

23. Some students believe that the more simple tutorials could be completed on their own time, and the labs would be devoted to answering questions and more advanced skills. (5)

I think with some of the aspects of these other programs we just learned, part of that could have been given to us to do at home, some of the beginning things were pretty basic. But maybe we could go into more stuff. We could come into the lab and you could teach us more of the advanced type things since we already did the basic things on our own.

We come into the lab and we get the tutorial and the assignment, and we get to work through it, and then you'd be there to ask any questions we have about the assignment. And also it would give people who feel a little more comfortable with it to go on and ask you questions that maybe aren't in the tutorial, but you're able to do it and show us.

If you wanted to get even more advanced with some of the programs, have an optional first session for people who aren't as comfortable with computers or with that particular program.

Maybe doing the simple stuff at home and then coming back and doing the harder stuff. And then we get to a part where we really want to experiment, and I would just keep on playing while you were changing and going on to something new.

At the end of each lesson you could hand out the pamphlet for next week's lesson. Have people do it ahead of time. Have the first hour of lab be introductory. If you felt comfortable doing it, you could just come for the second hour and do the more advanced stuff and get your questions answered. Or if you didn't do it then you could come in the beginning and learn the whole way through.

24. Students feel that one hour-and-half session per week was an appropriate timeframe for the training. (5)

I think one session is good, because getting up here is difficult for people that don't have a car. I wouldn't do more than that, because it would just be so much worse.

I think that the time was appropriate, the amount of lab time (1.5 hours). If we had any more it would have been too overwhelming. The amount of information that was included was about right.

I think it's just about right, because going through to learn hands-on, you need some time and people learn at different rates. Some people might grasp on quicker, so they can work ahead, whereas other people that need to go through every step can go at their rate.

I thought that 1.5 hours was good time, but it was sort of frustrating having people on a totally different level than you.

I think that the 1.5 hour was appropriate, but I don't like computers.

25. A few students felt frustrated by the different learning abilities. (5)

I thought that 1.5 hours was good time, but it was sort of frustrating having people on a totally different level than you. The time limit was good, but a possibility for dividing the lab up, based on the surveys, different lab groups (based on different levels).

And then the other thing, the first lab was to get people on the same page, but I was extremely frustrated during that lab (the computer stuff). I'm not a really patient person.

I kind of felt that way too.

I think when you have people with all different levels, some of that stuff was new information.

It's understandable why we had to do it, but maybe divide the labs up among levels.

26. Students would like to see less emphasis placed on older page layout techniques and printing methods in the NR 363/364 lecture. (4)

I know they didn't go all that much in-depth about the layout and how it used to be done and stuff, but I thought that was extremely boring to read through. We're probably not going to have to do that much, and since we're learning the technology, I thought it was really kind of a waste of our time.

And the printing part too.

I think it's important to know how things get printed. If we are really going to be immersed completely into the process which the class is, so I think it's important so we at least know something about it, so we don't come out of a publications class and have no idea how the whole process goes, but I don't think they need to elaborate that much for sure.

I don't think it was explained at all, we just had to read it. If they had explained it, that might be cool. It doesn't make sense to me.

27. A library of resources should be developed in the interpretive lab, especially books with images for scanning. (3)

Maybe like a library of resources. I know you had a whole bunch of books down there. It's our responsibility to be at school and go to the library and get your stuff, but you know you could bring it here, but what if you can't bring it here, what if you forget it, or what if you just totally didn't think of it. Just more books with more pictures, would be really nice. Especially pictures that pertain to the assignments.

Maybe indicate on them which ones are copyright free too.

An suggestion in addition to the library that you're putting down there, because we keep talking about not enough computers, maybe in the library area maybe have something to sit it too so the lab doesn't get super cluttered if there's not a place for people to start working. They could at least sit down out there, get their stuff laid out and ready, and then when a computer is ready then come into the computer lab itself.

28. The interpretation lab encouraged communication among students. (2)

And then as I started going through the class, I really thought it was nice to have a small connected little area. I'm really having trouble can you please help me. And there was people there all the time. And it helped build our friendships and just knowledge of each other.

We all ended up helping troubleshoot each other too.

29. The lab should be tied more closely with the actual class projects they are working on. (2)

It would be nice if we could have been working on our project itself while learning some of those things.

Maybe with our Point Iroquois, maybe if there could have been certain components that had to be accomplished that we learned in the lab. And then we put it all together on our first project.

30. Other trained Schmeckle staff should be available to run the computer equipment in the instructor's absence. (2)

We have all just been talking about how our lives would be much worse if Jim wasn't here, the tutorial pamphlets you gave us were great, I think it would also be good; no Jim, no tutorial, I think that maybe if like during the days when there are workers here, if even the workers learned how to print things or we did, so there's some extra mentorship or help if you're not here.

If you are looking at extending the hours, you could probably consider hiring someone who already took this class.

31. Sheets should be written that compare different programs in terms of advantages, disadvantages, and price. (2)

One thing I think could have been improved, certain things you would say but never elaborate on them. "Quark was great and Microsoft Publisher was great, but there's things you can do on one and not on the other." But you never told us what those things were. Even if that could just be a handout sheet, with some of the key things that cannot be done on this. That would be very helpful to me.

Just having a concrete list of the benefits of each would help when we are at a visitor center or a nature center somewhere, and maybe they don't have any of them. Just so we can show them what the benefits and negatives are of each one. Along with that, having a list of places you can go for more information and where to buy them. And the prices for them.

32. Students are confused about images. (2)

During the labs, we were talking about .tiffs and .jpgs and stuff, I need a better explanation of what they are and why we need to do that.

In addition to what they had mentioned yesterday, the .jpg and all those files, the pixels, I'm still confused on like the pixels and which pictures will turn out good, and downloading from the Internet. I think that would be really helpful.

33. Students believe the interpretive technology training should be incorporated into future classes. (2)

All yes

I feel totally empowered now to go off and really know how to look at exhibits and publications in a way that I never did before. Even if I never create another one again, at least I know what to look for. It's a really valuable skill that I don't think too many people have right now.

34. An open lab session could be offered to answer any questions students were having trouble with. (2)

You could have weekend or evening open-hour help sessions. That might be one way of dealing with people of different abilities and confidence.

I was actually going to suggest a discussion time.

35. An instructor-led digital camera training would be very helpful. (2)

I would have liked more with scanners and cameras and stuff. Especially with digital cameras. Just explaining what some of the different options are if we are looking for a digital camera.

I think that's especially important because they're changing too. Some additional digital camera stuff might be really helpful.

36. Assignments and projects should focus on integrating various software programs together. (2)

I think what would have been more helpful is to maybe give us a couple of more projects that integrate the different programs. You can't do everything in one program, and integrating them you can do a lot more. That's when you can really get different and really good looking products.

I would agree with the need to integrate some of the programs.

37. Scheduling student use in the lab should be considered to reduce conflict. (2)

The only thing that bothered me besides having to come to Schmeeckle all the time, is when I would come to Schmeeckle outside of the actual lab, and there were a lot of people working. I guess maybe there aren't enough computers, or something has to be done with scheduling (also 5).

If you could do some sort of scheduling. So maybe people have to sign up for a slot, but it would ensure that they have a computer and time to work.

38. The tutorials were not as specific as the PowerPoint tutorials, which made them more difficult to follow. (1)

Although I do have one complaint. A couple of these guides were hard to follow because they weren't as specific as the ones last semester. Even if you had us go through these and write what you don't like and write what you want me to put in.

39. The interpretive lab training provided students with skills for evaluating publications. (1)

It's made me such more critical of other publications. Now that I know how to do something and how much effort is required, when you see something that looks less than good, you know it could be done a lot better.

40. Students would like a hard copy of the equipment instruction sheets normally kept in the lab. (1)

To take the instruction sheets with you might be something that would be handy. I know one day there wasn't one there, and I couldn't work on the scanner.

Un-coded Responses

It depends on who is available at other times too.

But they didn't have the sheets, so maybe if you e-mailed us the instruction or the hint sheets.

If people found they didn't have time to do the first part then they would come. You would have to be strict enough to say that we are moving on the second hour.

It would be kind of nice if you had questions like on the PowerPoint. How did you find this or that? What did you didn't like about this. Like how you had those questions at the end, and then you sent it through e-mail. I think that was a good review and at the same time you have a response right away with what you didn't understand.

The way the classes are set up, I didn't know what class I was in. There obviously wasn't a very good separation.

There is a publications class, NR 320. I know most other majors have to take that class.

I don't feel like we have to take that class outside of this class.

The accessibility of the lab in this building isn't accessible for everybody... like physically is what I'm thinking. **Explained that is accessible.**

I also liked during lab we would learn one thing at a time, and then we had a week to practice that and get to know what we were working with.

But that's also one of our assignments for one of the classes (**Verify not necessarily**)

Appendix D

Questionnaire Evaluation

Coded survey open-ended questions.....	332
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Coded Open-ended Questions

Professional Interpreter and Supervisor Survey

I. Types of software (212 responses)

A. Online software (73)

1. Web design and maintenance (42)
 - a. Curriculum for Internet and family activities (3)
 - b. Use of Internet for marketing (4)
 - c. General interpretive website design (35)
2. Internet navigation and research skills (evaluate what is credible and good, use search engines) (16)
3. E-mail and listservs (10)
 - a. Use e-mail lists and listservs (5)
 - b. E-mail etiquette (4)
 - c. Familiarity with Microsoft Outlook (1)
4. Chat rooms (2)
5. Distance learning (2)
6. Online conferences (1)

B. Graphic editing and page layout software (26)

1. Specific skills (10)
 - a. Working with digital images (modifications, color, translate into different formats) (5)
 - b. Fonts (problems with print shops and required NPS Fonts, purchase postscript rather than truetype fonts) (2)
 - c. Brochure design (1)
 - d. Creating images to add to publications (1)
 - e. Overlay text on images (1)
2. Specific programs (16)
 - a. QuarkXpress (5)
 - b. Microsoft Publisher (3)
 - c. Adobe Photoshop (3)
 - d. Adobe Pagemaker (2)
 - e. Paint Shop Pro (1)
 - f. Adobe Illustrator (1)
 - g. Corel Draw (1)

C. Database software (Microsoft Access) (22)

D. Mapping software (GIS/GPS, mapping software, ArcView) (21)

E. Spreadsheet software (Microsoft Excel) (14)

F. PowerPoint issues (13)

1. PowerPoint is an important tool to learn (big growth in future, advantage in interviews, need to know, more critical) (9)
2. Should not spend much time teaching PowerPoint (ineffective, overused, poor, cheap-looking, bore audiences, used as a crutch) (4)

G. Resources available for interpretation (1)

H. Other types of programs (42)

1. Word processing (Microsoft Word) (6)
2. Multimedia programming (Macromedia, Visual Basic) (4)
3. Adobe Acrobat/Reader (4)
4. Microsoft Office products (4)
5. File management (organizing, information retrieval, storing, backup) (3)
6. Statistical programs (3)
7. Digital video (3)
8. Digital images archive (3)
9. Graphs and charts (2)
10. School program reservations (2)
11. Digital sound (2)
12. Exhibit design (2)
13. Windows environment (2)
14. Financial management (1)
15. Mail merge (1)

II. Moral issues with technology and interpretation (73 responses)

A. Interpreters must use technology carefully (58)

1. Solid interpretive skills are more important than technology (people skills, effective communication, knowledge of resource, learning styles, target audience, creativity) (25)
2. Technology is just one tool for interpreters (used appropriately, means to an end, not an end themselves) (14)
3. Technology cannot take the place of real interaction with the site (hands-on, sensory activities, not a substitute, nature) (13)
4. Balance the amount of time spent on computers and in the field (efficiency and prioritizing skills, younger employees spending more time on computers) (6)

B. Technology is an important part of interpretation (12)

1. The more students know, the better (Jacks of all trades, knowing flora, fauna, history isn't enough, computer skills are of *critical* importance, use computers everyday) (5)
2. Interpreters should be comfortable using technology (5)

3. Computers are liberating tools (not restrictive, shouldn't fear computers) (2)

C. Teach about technology copyright use and ethics issues (3)

III. Preparing students for the real world (68 responses)

A. Students should work on real hands-on projects (products, real world, exploring programs, guest speakers, perhaps unrelated to field) (19)

B. Learn computer troubleshooting and maintenance (many sites do not have IT division, computer exhibits, equipment, system, Dos commands) (13)

C. Learn to work with limited technology resources (teach older methods also) (10)

D. Course must keep current in technology knowledge and skills (changes quickly, specific skills learned are not applicable for long, which best fits needs) (10)

E. Learn to work with other professionals and other fields (vendors, graphic designers, advertisers, fabricators, educators, marketing, leave more advanced skills to professionals) (8)

F. Teach about funding sources for technology (grants) (4)

G. Learn how to evaluate interpretive products created with technology (3)

H. Learn about the sign fabrication process and materials (1)

IV. Learning the basics (25 responses)

A. Students must understand basic design elements (images, colors, fonts, text) (11)

B. Students must understand computer basics (take a computing course, computer course specific to interpretation) (7)

C. Students must understand basic English skills (grammar, spelling, solid writing skills) (5)

D. Students should have basic typing skills (1)

E. Students should know photography basics (1)

V. Types of hardware (10 responses)

- A. Networks (use and security) (5)
- B. Familiarity with multiple platforms (Macintosh, Linux, import and export across systems) (4)
- C. Digital Cameras (skills are a must) (1)

VI. Course structure and providing other training (7 responses)

- A. Workshops should be offered for professional interpreters (NAI conference, permanent staff) (2)
- B. Require a course or classes dedicated just to this subject (3 units) (2)
- C. Training should be required for all permanent interpreters (1)
- D. Training sessions should be an appropriate length (1)
- E. Instructor must make computers accessible (1)