5-1-2000

Prepare Preservice Teachers to Use Technology in Education Classrooms: An Evaluation of the Program Used at the University of Nebraska at Omaha

Anna Marie Mudd
University of Nebraska at Omaha

PREPARE PRESERVICE TEACHERS TO USE TECHNOLOGY IN EDUCATION CLASSROOMS: AN EVALUATION OF THE PROGRAM USED AT THE UNIVERISTY OF NEBRAKSA AT OMAHA

A Thesis

Presented to the

College of Education

and the

Faculty of the Graduate College

University of Nebraska at Omaha

In Partial Fulfillment

Of the Requirements of the Degree

Master of Arts in Secondary Education

University of Nebraska at Omaha

by

Anna Marie Mudd

May 2000

ProQuest LLC.
789 East Eisenhower Parkway
P.O. Box 1346
Ann Arbor, MI 48106 - 1346

THESIS ACCEPTANCE

Acceptance for the faculty of the Graduate College,

University of Nebraska, in partial fulfillment of the

requirements for the degree Master of Arts in Secondary Education,

University of Nebraska at Omaha.

Committee

C. Elliott Ostler — Teacher Education

Dr. Elliott Ostler

Deborah M. Irvin — Special Education

Dr. Deborah Irvin

Chairperson Neal W Topp

Dr. Neal Topp

Date 4/11/00

ABSTRACT

PREPARE PRESERVICE TEACHERS TO USE TECHNOLOGY IN EDUCATION CLASSROOMS: AN EVALUATION OF THE PROGRAM USED AT THE UNIVERISTY OF NEBRAKSA AT OMAHA

Anna Marie Mudd, MA

University of Nebraska, 2000

Advisor: Dr. Neal Topp

Universities are facing the dilemma of keeping up with technology while facing budget cut. Preparing preservice teachers to face the demands of the technologically advanced classroom is a continuing challenge and of great interest.

The purpose of this study was to evaluate the laboratory/modular approach currently being used at University of Nebraska at Omaha College of Education and the effectiveness in preparing preservice teachers for the technology needs of the classroom. This study also investigated whether the elements of technology required to meet Nebraska competencies were covered in the laboratory/modular training program used at UNO.

Two groups, preservice teachers and student teachers, participated in the semester long study. The preservice teachers responded to a pretest, posttest, and participated in a discussion group to help answer eight research questions. Student teachers answered an online survey to help determine if the program prepared them to use technology in the classroom, their responses help answer five research questions. Each group provided valuable information to help evaluate the current technology program and its effectiveness.

The data showed that the UNO College of Education is currently meeting the educational technology needs of the preservice teachers and that student teachers felt the College of Education had adequately prepared them to use technology in the classroom. The current technological proficiency of students indicated preservice teachers required a program to teach basic technology skills. The module/laboratory program is effective and only a few minor changes will help move UNO into the next phase of technology training, infusing technology into the classroom curriculum through projects.

ACKNOWLEDGEMENTS

During the last two years I have had the privilege of working with many talented educators at the University of Nebraska at Omaha College of Education. I would like to thank the many people who have helped support me and have given me direction along the way.

I would like to thank Dr. Neal Topp my advisor and thesis chair. He has always taken the time from his busy schedule to guide, support, and help me achieve my goal. Thank you for sharing your resources, time and enthusiasm and encouraging me to reach beyond.

I would like to thank Debi Mackiel a true friend and confidant. Thank you for giving me the chance to work at UNO as a graduate assistant. I have enjoyed working with such an outstanding individual. Never have I met such a sincere loving individual so committed to all you do. Our friendship will last a lifetime.

To my family, my husband Joe and my children Joe III and Pam. You have always been my greatest supporters. No words could ever express how much I have appreciated your support through my entire educational pursuit. Without you I would never have reached my goals. I love you all.

To my loving parents, Mary Ann and Joe Rock. Words can never express my love and appreciation for all you have done for me. You have always been there to support me and celebrate my accomplishments. I am proud to be your daughter.

Table of Contents

Table of Contents Continued

Table of Contents Continued

Table of Contents Continued

List of Tables and Figures

Tables

Figures

CHAPTER ONE

Introduction

As we enter the twenty-first century, technology and its effect on current classroom practices is foremost on educators' minds. Many schools are linked to the World Wide Web and are encouraging staff to use the resources available in their classrooms. Educators are feeling the pressure to be technologically literate and are involved in training to improve their technology skills. Inservice teachers are being trained to use technology although training is usually limited and there is little time to implement the changes in the classroom. Many teachers spend time outside of school hours and strive to learn technology skills on their own as they develop ideas for the classroom (Breithaupt, 1997). Ideally preservice teachers, with a working level of technology, are better equipped to enter the classroom with the skills needed to infuse technology within the curriculum. For 14 years the University of Nebraska at Omaha has included technology as one element in the education sequence for preservice teachers.

The federal government as well as most states is addressing the need to standardize technology requirements for preservice and inservice teachers. The International Society for Technology in Education (ISTE) has written standards to use as benchmarks for the educational technology qualifications (Larson, 1995). National educational associations have also provided information and been instrumental in developing guidelines (Denniston, Long, & Reehm, 1997). Following this trend to educate teachers in technology, the state of Nebraska developed educator technology competencies in 1998 (see Appendixes C). These guidelines are currently being used at

the University of Nebraska at Omaha (UNO) in the College of Education (COE). According to Dr. Raymond Ziebarth, the UNO teaching team chair for EDUC – 2520 "Instructional Systems," the guidelines serve as a roadmap for technology requirements for preservice teacher preparation program (R. Ziebarth, personal conversation February 16, 1998).

Curriculum requirements for preservice teachers involve tradeoffs; in order to increase one area of study, another area must be omitted. Fitting a technology requirement into an already demanding education program is a challenge faced by all teacher preparation institutions. Two common methods for addressing the dilemma are: 1) computer skills taught as a stand–alone, technology–specific class; or 2) technology skills incorporated within the current curriculum. Studies have shown that incorporating technology skills within the current curriculum helps preservice teachers retain technology skills better than in a stand–alone, technology–specific class (Keizer & Wright, 1997; Galloway & Blohm, 1997).

Purpose of Study

The purpose of this study was to evaluate the laboratory/modular approach currently being used and the effectiveness in preparing preservice teachers for the technology needs of the classroom. This study also investigated whether the elements of technology required to meet state guidelines are covered in the laboratory/modular training program used at UNO.

Goal and Research Questions

The goal of this study was to examine the current process used at UNO and analyze the effectiveness of the program. Several research questions were asked in order to achieve the goal. Two groups were studied, preservice teachers and teachers who had just completed their student teaching component at UNO. For the purpose of this study, different survey questions were asked of each group. Pre/post surveys provided the data to help answer the following research questions dealing with preservice teachers:

1. What is the current level of proficiency among preservice teachers before the semester of study in the areas of technology including: 1) basic computer operation skills, 2) setup, maintenance, and troubleshooting of equipment, 3) word processing, 4) spreadsheets, 5) database, 6) networking, 7) telecommunication, 8) media communication, and 9) social, legal, and ethical issues?
2. What is the attitude of the students towards the required hours spent outside the classroom in order to meet the technology requirements included within the course guidelines?
3. What is the attitude of the students towards computer competency before and after completing the course?
4. What is the attitude of the students towards using technology in the classroom?
5. Do nontraditional students have the same levels of technological skills before taking the class as traditional students? (Because of the lack of literature based

evidence and a personal interest in nontraditional students this question has been included in the study.)

6. Following the semester of instruction, have nontraditional students had the same increase in technology skills as traditional students?
7. Is UNO meeting the "Nebraska Educator Competencies for Technology"?
8. In which of the following areas of technology have the preservice teachers improved their skills following the semester of study: 1) basic computer operation skills, 2) setup, maintenance, and troubleshooting of equipment, 3) word processing, 4) spreadsheets, 5) database, 6) networking, 7) telecommunication, 8) media communication, and 9) social, legal, and ethical issues?

Student teachers were asked to complete an online survey at the end of their student teaching semester. The research questions the study answered dealing with student teachers are:

1. Do student teachers feel adequately prepared to use technology in the classroom?
2. Are student teachers using technology with their students in their classrooms?
3. Are student teachers using technology to help with their tasks for preparation, presentation, and/or record keeping?
4. Were student teachers required to infuse technology in any area of their preservice training before student teaching?
5. In what areas of technology are student teachers most/least prepared?

Significance of the problem

A thorough preparation of preservice teachers is critical to their success as new teachers struggle to meet all the demands of the modern classroom. During student teaching the students are guided through their first "real" application of skills in lesson planning, addressing students' needs creatively, motivating students, learning technology skills, and managing time in the classroom environment. Many new teachers find their first year to be overwhelming in all these areas. Every university tries to prepare their teacher candidates to handle all areas of education to ensure that student teachers graduating from the program are prepared to enter the workforce. Because of increasing demand to include technology in the classroom and in order to meet each student's needs, the teacher preparation institutions must prepare teachers to effectively infuse technology into the curriculum. The UNO students begin to use educational technology through a modular/laboratory course. If new teachers are prepared to use and teach with technology within their classroom, students and schools will be preparing to meet the challenges in our changing society.

Schools not only prepare students to read and write, but also prepare them for entry into an ever-changing world. In an effort to keep pace with the changes in society, many schools have developed web pages for sharing information such as homework assignments, projects, classroom activities and e-mail. Teachers are being asked to help maintain and contribute information for the web pages. Preservice teacher education programs are trying to train their students to be prepared for these tasks.

As a member of the technology support staff during 1997–1998 in Fairfax County, Virginia, this researcher experienced the frustrations that teachers, both new and veteran, faced with technology. This researcher's experience showed that teachers who feel comfortable with technology enjoyed infusing technology in the curriculum. However, teachers who struggled with technology skills were not excited about using e–mail, let alone infusing technology in the curriculum.

Definitions

Preservice teacher: Student currently enrolled in a teacher-training program at an accredited university.

Inservice: Training offered to currently certified teachers employed within a school district. These sessions are offered by the district to educate teachers on current trends or issues. The sessions often range from one hour after school to one-day workshops.

Nontraditional student: A college student above the age of 26 years during their sophomore year in college.

EDUC 2520 Instructional Systems: This course content includes instructional development and evaluation. Specific attention is focused on LB 581 (Nebraska's law outlining teacher training programs; requirements; preparation plan.) The complete Law can be found in Appendix A and the pedagogical utilization of microcomputers, VCR's and other contemporary technologies. Laboratory and field experience outside of class time are required. A course syllabus is included in the Appendix A.

UNO EDUC 2520 Module: An individual unit of study that gives students training in a specific area of competency including: telecommunication, word processing and drawing,

Internet usage, digital camera and scanning, AppleWorks presentation tools, Hyperstudio, evaluation of technology, web page development, spreadsheet applications, database and grading software. Also included is an introduction to both the Macintosh (MAC) and Personal Computer (PC) platforms. See Appendix A for the module competencies.

Procedures

Three data sources were used to gather information for this study: 1) a survey, pretest and posttest, for preservice teachers including survey questions about their attitude toward technology and technology competencies, 2) a discussion group with preservice teachers, 3) an online survey for student teachers including survey questions on technology areas in areas such as: attitude, competency, interest, frequency of use, and evaluation. The surveys included Likert scale responses as well as open–ended survey questions for the student teachers.

Preservice teachers attended eleven hours of directed lab instruction during the semester. Graduate assistants taught the modules and verified students completed assignments.

Assumptions and Limitations

This study attempts to control both internal and external variables. The following assumption has been made: a survey was used to assess attitudes and competencies of the preservice teachers. It was assumed all students were truthful in their reporting. The survey was given during the first week of class and again just prior to the end of the semester. Due to the fact that participants took a pretest and posttest they were aware of areas of the technology skills the study would include. Students had fifteen weeks

between pretest and posttest, therefore, the chance of them remembering topics and specific survey questions was probably lessened.

Students may tend to think they have a lower or higher level of skill than they actually possess, therefore, self-reporting could affect the outcome of the study. It is assumed if students believed they had a lower or higher level of skill this would probably be reported consistently.

Another factor affecting response is the preservice teachers' prior experience with technology. Addressing the nontraditional student versus the traditional student outcomes will help to compensate for these differences.

Delimitations

For the purpose of this study, the following delimitations have been identified: this study was limited to preservice teachers enrolled in EDUC 2520 and student teachers enrolled in TED 4060 Student Teaching during the Fall 1999 semester at UNO. Consequently, generalization of results to other programs is limited.

Summary

Preparing preservice teachers to enter the classroom with technology skills is an important task. Technology is an ever changing field and encompasses such a wide variety of skills that it is difficult to address all of them. Once the college has chosen an approach to train preservice teachers for the current technology requirements, the program must continually reevaluate whether the program is effectively meeting the current student population's technology requirements.

The College of Education at the University of Nebraska at Omaha determined it was time to reevaluate the program being used to teach preservice teachers; several studies have addressed similar issues in preservice teacher training in the area of technology. Chapter two will review the background literature and supporting factors for the study.

CHAPTER TWO

Review of Literature

Introduction

The inclusion of instructional technology in teacher preparation programs is a relatively new addition to many colleges and universities. It has only been since 1993 that the preservice teacher preparation program at the University of Nebraska at Omaha (UNO) included a technology component in conjunction with one of the core education required courses, Instructional Systems. Many other teacher education programs also began including instructional technology in their programs in the early 1990's. Colleges and universities now see the need to reevaluate and research their instructional technology programs to determine if they meet current needs. These studies are just now sharing findings of the evaluation of their teacher preparation programs supporting instructional technology.

This review will include research information gathered from some of the studies, especially focusing on several specific areas. The first area of interest is the need for preparing teachers to use technology in the classroom. Next is an overview of programs several schools have tried and their results. The third topic focuses on student attitudes towards technology, the role it plays in the education process, some interesting findings concerning student attitudes towards technology, and how this affects learning. The final literature review investigates traditional versus nontraditional students in preservice education preparation programs.

The Association of Computing in Education (AACE) hosts a conference each year resulting in an annual collection of presentation papers. Large portions of the

literature reviewed were from the annuals over the past several years. Each volume contains over 150 papers presented at the Society for Information Technology & Teacher Education Conferences (SITE) and serves as a major source document indicating the current state of teacher education and information technology (AACE,1998). Other research studied supporting the literature reviewed from AACE is included.

The need for preparing teachers in technology

The need for teaching computer competencies in a preservice program is overwhelming (Cobbin & Driskell, 1997; Breithaupt, 1997). Computers now permeate our lives and they can be found throughout elementary, secondary and post secondary classrooms. Educators are expected not only to use the computer as a word processor or grade book, but also to incorporate the computer into appropriate lessons. Teachers are including technology in the classroom to help students learn more and be able to apply their learning to real world applications. Studies have indicated that the inclusion of technology helps students to work more independently (Topp & Grandgenett & Mortenson & Norris & Solowary, 2000, US Congress, 1995). As technology is used to create lessons for the classroom, teacher roles shift from "teacher centered" to "student-centered"; teachers become coaches rather than lecturers (National Commission For Teaching and America's Future (NCTAF), 1996; Sheingold, 1991). Technology also allows teachers to accommodate the needs of all learners, as one teacher stated "leveling the playing field" (NCTAF, 1996). According to a recent survey of Nebraska educators, teachers are continuing to increase their technology skills, and use technology in the classroom (Topp et al., 2000). The survey also showed that teachers are still asking for

more training and time to increase their skills and to develop lessons implementing technology in the classroom. A study done by Novak and Berger (1991) looked at computer use in the classroom and found that the new teachers struggle with many areas during the first few months of school and tend to wait until they begin to feel comfortable before introducing technology into their lesson plans. If after the first few months teachers have had technology training, they slowly begin to use the computers with their students. They often begin using computers as drill and practice for students, but as they continue to build confidence in the classroom they begin to infuse more technology into the curriculum areas (Willis & Mehlinger, 1996, p. 982).

How are teachers prepared to teach technology? Inservice workshops and instructional classes are the two most common methods teachers choose to learn new methods for using technology in the classroom (McKenzie, Kirby, Clay, Davidson, 1997). In a 1996 report, the National Commission on Teaching and America's Future (NCTAF) recommends schools increase spending for professional development by at least 1 percent and look for grants to help train their teachers. Currently only one to three percent of most schools' budgets fund professional development for teachers (NCTAF, 1996). Goals 2000, goal 4: Teacher Professional Development, focuses on teacher development and how the nation can help train teachers in the newest classroom techniques including using technology. From this goal, dedicated grant money for teacher development is available to states and universities (U.S. Office of Technology Assessment, 1995). Even if there is more money for professional development, teachers

will still struggle to find the time for training. For this reason it is even more important that preservice programs include a good technology training component.

It is important that students now preparing for teaching assignments are familiar with technology and learn to include the appropriate use of technology in their lessons. Colleges are expected to address the need for instruction and adjust their courses to meet those needs. Studies suggest programs where instructors are now using technology as a modeling tool for their students have a much more successful technology integration program (Willis, & Mehlinger, 1996, p. 999). According to Faison (1996), students are motivated to use technology in the classroom once they have seen college faculty model technology within their classrooms. Once the faculty have a good working knowledge of technology, the college is ready to reevaluate its educational program to instruct preservice teachers in instructional technology.

Several approaches have been used to teach technology in preservice education programs. In 1999, a study of 30 teacher education programs found two methods of instruction to be the most common, lecture and lab-based and direct computer-based instruction (Sheng Chieh Leh, 1999). Both approaches use a lecture and a lab, but the location of the lecture varies, either, in a large lecture hall or where students have direct access to a computer. Both approaches can be effective and have advantages and disadvantages. The advantage to a lecture and lab-based class is having one instructor relaying information to a large group of students. This allows for more consistent course content and better organization. Also students who need more support and time to learn and update their skills receive theory and conceptual help from a faculty member. The

disadvantage is having a large group to instruct rather than being able to focus on the needs of only 20 students. The direct computer-based instruction is coupled with a short lecture, then a hands-on lesson. The advantages of this type of instruction are direct access to a computer and more direct information from the instructor. The disadvantage is that all students do not receive the same instruction throughout the course. All of the universities covered about the same content and concepts. Many of the universities used presentation software during the lecture, modeling the use of technology in the classroom. This study concluded that no matter what method a university uses to teach technology to educators, it is important that the schools do have a technology requirement, and that the program is the best for that institution.

If student teachers and new teachers are expected to come to the classroom prepared to infuse technology into the current curriculum, the preservice programs must determine the best method for their institution to include technology skills in the education program. UNO has adopted a laboratory/modular program for their preservice teachers. The program consists of eleven topics covered in one-hour sessions in a UNO College of Education computer lab. The students are given a brief lecture along with a presentation of the software used to complete the assignment. All assignments have an education base and require a level of understanding of how the program can be used in the classroom. The preservice students complete the assignment using a tutorial and receive guidance from a graduate assistant. The chair of the teacher education department oversees the program. Each year the modules are evaluated for effectiveness

and application within the classroom (R. Ziebarth, personal conversation, November 15, 1999).

Whether universities choose to use a separate lecture and lab application or a computer-based application, several models are available using each approach. One type of instruction includes using computer technology within the current curriculum. This has many variations, whether paired with a current course such as a methods course or a stand-alone computer class; each has advantages and disadvantages (Keizer & Wright, 1997, Breithaupt, 1997). The following will examine examples and report the results of two approaches, lecture based versus computer lab based, for including technology in preservice programs.

Teaching technology skills in the preservice teacher program

Two approaches will be reviewed in this study, the stand-alone computer class and the modular model. A stand-alone computer class is usually a three credit hour course taught either as a lecture with a lab requirement or as a computer lab course that includes instruction (Breithaupt, 1997). The typical course runs for one semester and includes many of the same components taught in a module approach

A modular approach is held in a computer lab where the students complete projects, usually with the help of a faculty member or a graduate assistant (Keizer & Wright, 1997). The modules are completed during the semester of study and the class is often paired with another class already in the program of study.

Many schools have reexamined their method of teaching technology to preservice teachers due to finances. The University of Alabama had a stand-alone computer class

with a dedicated computer lab, which limited enrollment due to size restrictions, and requirement of at least one full-time instructor. The university was faced with staff reductions and wanted to maintain a high quality of instruction. They decided to try a pilot program using a modular approach. Students received a short tutorial from lab assistants and were then given a lab assignment to complete. Lab assistants added support by helping individuals as needed during the open lab periods. The course focus changed from whole class to small group instruction, and from summative tests to performance-based testing.

The University of Alabama found the new modular approach had several advantages, a larger enrollment, a more constructivist approach to learning, and a lower cost factor. They were able to triple their enrollment without compromising the instruction or instructional support (Keizer & Wright, 1997). Students assumed the responsibility for completing their assignments and learned to stretch their abilities throughout the course. Due to the success of the pilot program and the reduced cost, it was adopted after the study and traditional stand-alone courses are no longer offered at the University of Alabama.

Many other schools have adopted similar programs. Research done at the University of California at Davis (UC Davis) found that integrating computer technology instruction within the current course offerings showed that students who received instruction through an integrated approach were more likely to integrate computers into their classrooms (Breithaupt, 1997).

Integrated learning ranges from labs to projects. Labs can be used to give small group instruction, such as in the Keizer and Wright (1997) study, or group projects as in the study conducted at UC Davis. UC Davis discontinued its core computer course in 1994–1995 and adopted modular computer based instruction paired with a methods class. UC Davis also included a project building on the basic skills learned during the methods class and extended the learning into the student teaching experience.

During the UC Davis student teaching semester, participants are paired with a mentor teacher. The mentor teacher had no special training or technology skills, but did have knowledge of the classroom curriculum. The mentor teachers helped guide the student teacher through revisions of a technology-based project. The mentor teacher's role was to make sure the project was curriculum appropriate. This program's goal was to expand the learning from the technology skills learned during modules in the methods class to the student teaching classroom.

In both situations the results were the same: attitudes towards computers improved and a high level of technology competency within the classroom setting was attained. Helping preservice teachers be prepared to use technology in the classroom requires a hands-on approach for students while they are in a teacher education program.

Willis and Mehlinger (1996) support the integration of technology within the curriculum, citing several studies that attributed success to the integration of technology within the program rather than it being taught as a separate application or class. Education technology programs have gone through many phases, from stand-alone computer classes to classes that include technology within the current curriculum (Willis

& Mehlinger, 1996, p. 1020). The next step will be to include technology in more than one education class; infusing technology throughout the educational sequence from the first education class through student teaching.

Attitudes towards technology influence student outcomes

A student's attitude will influence all areas of study. Several factors helps students to achieve his/her educational goals, a willingness to learn and the feeling that what you are learning is important and applicable. Several studies have investigated the connection between attitude towards technology and the influence of attitude in mastering technology. The studies reviewed for this proposal found a connection between attitude and ability. McCoy and Baker (1997) found that as computer aptitude increased the student's anxiety level decreased. Willis, Thompson, & Sadera (1999) reviewed the current research in the area of technology and teacher education (ITTE) and summarized their findings by saying: "...most teacher-education students have very positive attitudes towards the use of technology in education but are far less confident about their ability to actually use technology." Based on these studies, one may conclude that technology-based preparation of preservice teachers will allow for better acceptance of the responsibilities of computer-related tasks in the classroom. If students are more comfortable with their technology skills, they will be more interested in integrating technology into their classroom lessons.

Nontraditional students versus traditional students

Nontraditional students (those over the age of 26 during their sophomore year) bring many qualities to the education classrooms that are different from traditional

students. These students are more centered on the tasks at hand due in part to the fact that they have little time or interest for outside activities. (McCormick, 1995). Nontraditional students need to know why they are learning something before they learn it and they tend to apply real-life applications to the subject area (Eifler & Potthoff, 1998). Eifler and Potthoff also believe nontraditional students bring strengths to the classroom such as flexibility and organization. They also have some of the same struggles as traditional students, especially classroom management issues. Since the 1980's, computers have been directly involved in the process of teaching, but preservice teachers over the age of 26 may have little or no experience with computers in their education. During their years in high school, there was no modeling or computer-aided study, and this may have been a disadvantage for the nontraditional preservice teacher, leaving them uncomfortable with the technology requirements and unsure about using a computer in the classroom (Hofinger & Lehman, 1997). However at the same time, nontraditional students may have jobs and/or life experiences that will make him/her feel more comfortable with technology. There are few studies that address the correlation of the technological skills of nontraditional preservice teachers, so little is known about the actual differences.

Summary

More information continues to become available each year, with more and more interest in including technology into preservice programs. The literature addresses a variety of courses and techniques to help preservice teachers. New programs are offered,

and universities and colleges continue to upgrade the current programs to meet today's technology needs for preservice teachers.

The common thread in the literature suggests an integrated approach to teaching technology to preservice teachers in order to meet the requirements. More programs are trying to integrate technology throughout the preservice experience. The stand-alone computer classes are becoming outdated and general integration appears to be the trend of the future.

No matter whether preservice teachers enter the program with technology skills or not, most believe technology is an important tool for the classroom. Their attitudes are positive even when their confidence levels are lower. Whether a traditional or nontraditional student, attitude is a factor in learning. No matter what their age, there is a need to assess and address the needs of students and to consider the attitude and experience they bring to the classroom. Preparation is the key to successful integration of technology in the classroom for preservice teachers.

It is important to evaluate students' needs and attitudes at the beginning of each semester to address their evolving needs and also to keep up with the constant changes in technology. Once this information is gathered and processed, minor adjustments can be made to help prepare preservice teachers infuse technology into their classrooms. To facilitate these changes, this study uses surveys to asked questions of preservice teachers and student teachers. The surveys and procedures of the study are explained in Chapter Three.

CHAPTER THREE

Methodology

Introduction

This study was designed to evaluate the current integrated laboratory/modular approach used at the University of Nebraska at Omaha (UNO) and its effectiveness in preparing preservice teachers for the technology needs of the classroom. This chapter outlines the methods for the study and includes the following topics: procedures, subjects, instruments, student teacher procedures, module laboratory instruction, analysis of data, and summary.

The pretest and posttest surveys provided the data to answer the following research questions for preservice teachers:

1. What is the current level of proficiency among preservice teachers before the semester of study in the areas of technology including: 1) basic computer operation skills, 2) setup, maintenance, and troubleshooting of equipment, 3) word processing, 4) spreadsheets, 5) database, 6) networking, 7) telecommunication, 8) media communication, and 9) social, legal, and ethical issues?
2. What is the attitude of the students towards the required hours spent outside the classroom in order to meet the technology requirements included within the course guidelines?
3. What is the attitude of the students towards computer competency before and after completing the course?

4. What is the attitude of the students towards using technology in the classroom?
5. Do nontraditional students have the same levels of technological skills before taking the class as traditional students? (Because of the lack of literature based evidence and a personal interest in nontraditional students this question has been included in the study.)
6. Following the semester of instruction, have nontraditional students had the same increase in technology skills as traditional students?
7. Is UNO meeting the "Nebraska Educator Competencies for Technology"?
8. In which of the following areas of technology have the preservice teachers improved their skills following a semester of study: 1) basic computer operation skills, 2) setup, maintenance, and troubleshooting of equipment, 3) word processing, 4) spreadsheets, 5) database, 6) networking, 7) telecommunication, 8) media communication, and 9) social, legal, and ethical issues?

The research questions dealing with student teachers are:

1. Do student teachers feel adequately prepared to use technology in the classroom?
2. Are student teachers using technology with their students in their classrooms?
3. Are student teachers using technology to help with their tasks for preparation, presentation, and/or record keeping?

4. Were student teachers required to infuse technology in any area of their preservice training before student teaching?
5. In what areas of technology are student teachers most/least prepared?

Procedures

This study gathered both quantitative and qualitative information. Two groups of subjects, preservice teachers and student teachers, participated in a semester-long study. By gathering data from two sources, the research will not only examine the current program with students actively learning new technology skills, but also look at how the program works for students who are actually using the skills in the classroom setting. Using feedback from both groups will help evaluate the approach UNO uses and determine whether the students have acquired and maintained enough technology skills to use in the field.

The university required authorization for students to participate in research projects. An Internal Review Board (IRB) reviewed the research proposal and approved the study. A copy of the approval is included in Appendix D.

During the first week of classes of the Fall 1999 semester, the researcher administered the pretest survey to all five sections of EDUC 2520. Of the 142 students enrolled in the class, 136 students completed the pretest survey. Students were informed about the purpose of the study and the format of a pretest and posttest survey as well as a discussion group. Students were asked to complete the 72 question survey about their attitudes related to computers and their proficiency in nine areas of technology. The survey required approximately 20 minutes to complete. At midterm, discussion groups

were selected and met. During the last week of the semester, students were again visited in the classroom and they completed the posttest survey.

During the semester, preservice teachers received instruction in eleven selected areas. Each student was required to attend weekly one-hour sessions, offered at a variety of times, in a COE computer lab. Students were given support and coaching and used their tutorial to complete the assignment each week. Graduate assistants taught the unit of study and evaluated each student's completed assignment.

The variables of the study are students' attitudes towards technology, and competencies in technology and students' ability to include the use of technology within the actual classroom setting. The results of the study will show areas of increased proficiency, areas of weakness, and attitudes toward technology after completion of the course.

Subjects

The subjects were students enrolled at the University of Nebraska at Omaha. Preservice teachers must have enrolled in EDUC 2520: Instructional Systems. The preservice participants' information is available in Table 1.

Table 1
Preservice Participant's Descriptive Information

Gender		Major		Students		Academic Year	
Male	27	Elementary	63	Nontraditional	32	Sophomore	1
Female	90	Secondary	26	Traditional	85	Juniors	49
Total	117	Special Education	8			Seniors	48
		K-12	7			Post Baccalaureate	19
		Speech Pathology	13				

The student teacher subjects were enrolled at the University of Nebraska at Omaha. Student teacher participants in TED 4600: Student Teaching for the Fall 1999 semester. Their personal information is shown below in Table 2.

Table 2
Student Teacher Descriptive Personal Information

Gender		Major		Students	
Male	13	Elementary	42	Nontraditional	10
Female	42	Middle	4	Traditional	45
Total	55	High	2		
		K-12	42		

Instruments

The information for the study was gathered from surveys and a discussion group. Three surveys were adopted and modified to meet the study's requirements. Two surveys

were combined and used for both the pretest and posttest for preservice teachers currently enrolled EDUC 2520. The third survey was used to obtain information from the student teachers.

Pretest and posttest surveys were given to students during the Spring 1999 semester and served as a pilot test. The information was analyzed and demographic changes to the survey were made to meet the modules for the Fall 1999 semester. No tests of validity were done since no survey data was altered on any way. All surveys used had already been tested for validity by the original authors.

Rather than developing new surveys, three existing instruments were used: 1) The Basic Technology Competencies of Educators (BTCE), 2) Attitude About Computers survey, and 3) The Survey of K-12 Computer-Related Technology Used by Iowa State Graduates (SK-12CRT), were modified to meet the needs of this study.

The Basic Technology Competencies of Educators (BTCE) was developed by Claudia Flowers and Robert Algozzine (1998). The BTCE is a self-assessment tool which measures nine areas of computer competency: 1) basic computer operation skills, 2) setup, maintenance, and troubleshooting of equipment, 3) word processing, 4) spreadsheets, 5) database, 6) networking, 7) telecommunication, 8) media communication, and 9) social, legal, and ethical issues. From each of the nine areas five statements are made to help focus on the skills required. To evaluate their level of proficiency before instruction and upon completion of the course the preservice teachers used a five-point Likert scale ranging from: Highly proficient (5 points); Medium (4 points); Low proficiency (3 points); No (2 points); Unfamiliar (1 point). The BTCE has

been tested for content, concurrent, construct, validity, stability, and internal reliability. A team of educators evaluated the survey and found its content to be appropriate. Concurrent validity had the coefficient of .62 ($p < .01$) while the correlation coefficient ranged between .41 to .69 ($p < .01$) for each item scored. The two reliability tests, stability and internal also had a high coefficient. For stability reliability the range was .73 to .93 and internal reliability ranged from .41 to .69 for each item scored. The BTCE proved to meet the requirements for all tests performed. The BTCE was used to study the change in a student's ability from the beginning of instruction to completion of the course. The BTCE, however, does not test for attitude as related to competency.

For a measure of attitude, the Attitude About Computers (AAC) developed by McCoy and Baker (1997) was used. The AAC was initially used to study attitudes about computers as related to gender differences. The survey was adapted to cover the content in EDUC 2520. The AAC is broken down into three areas: 1) computers, 2) Internet, and 3) using computers in the classroom. The first three statements use the semantic differential scale with a series of five choices in each category listed above. Survey questions four and five ask the preservice teacher to use a 1 – 5 point system to rate their proficiency with computers and the likelihood of the preservice teacher for incorporating technology in his/her classroom. The preservice teacher survey can be found in Appendix B.

The preservice teachers used a four-digit code to allow for matching the pretest and posttest survey data. Included in the pre survey were questions about the year of graduation from high school, instructor for the course, and the availability of computers

at school, home and work. This information was used to gather data for the study. The posttest survey was identical to the pretest survey except for the above mention questions, questions 4 – 9 were not included in the post survey.

Due to the varied schedule of the students, it was determined that the best process for selecting discussion groups would be to use two of the five sections. Two sections, one daytime and one evening class, were chosen to participate. Each of the two classes was divided into three small groups, each with a moderator. The moderator was either a faculty member or a graduate assistant. The students were asked five questions and their responses were recorded. Students were then given the opportunity to voice any other concerns or thoughts not included in the selected questions. The questions and students responses can be found in Appendix B.

Student teachers responded to a survey developed by Dr. Neal Topp. The Survey of K-12 Computer-Related Technology Used by Iowa State Graduates (SK-12CRT) developed by Topp (1993), was modified to meet the study's needs. The survey has four sections: 1) general respondent information, 2) student teachers' computer use, 3) student teachers' attitude towards computers, and 4) respondent preservice computer preparation. A Likert scale was used for student teacher response to their instructional use of computer-related technology. Reliability was tested on the original survey, using the Cronbach alpha coefficient and was found to be within the acceptable range. A group of educators evaluated the survey and found it to be a valid measure of inservice teachers. The survey was adapted for the study and placed online. The survey can be found in Appendix B.

Student Teacher Procedures

Student teachers were asked to complete an evaluation for the UNO, College of Education, Office of Student Services. During the Fall 1999 semester, this evaluation was combined with the survey for this study and placed on the Internet. In November 1999, the student teachers received a newsletter at their home from the Office of Student Services. The newsletter explained the purpose of the survey, provided the Internet address and made known the deadline for completion. The survey was developed and converted to web pages with radio buttons and text fields. The web pages and database resided on the University of Nebraska at Omaha's Office of Internet Studies web server. Each student used a four-digit code in order that an accurate count of respondents could be kept. During the second week of January 2000, a postcard was mailed to all student teachers asking them to respond to the survey if they had not already done so.

Module Laboratory Instruction

Students registered for EDUC 2520 were required to attend eleven one hour laboratory sessions during the semester. They had the choice of lab times and were required to sign in each time the lab was used; these records verified attendance at the lab. Graduate assistants in the COE computer lab were the instructors for the modules and were available for extra help in the computer lab throughout the semester. A graduate assistant presented a mini–lesson on one of the required components and assigns a task to be completed by the preservice teachers. Attending the mini lesson was mandatory. The attending graduate assistant checked the assignment for accuracy and completed competencies and recorded the completed assignment in a database. The labs

were scheduled so students had one week prior to finals to complete any missed labs. During the lab students used the tutorial packet. The module competencies can be found in Appendix B.

Analysis of Data

Preservice teachers used traditional scan sheets to answer the pretest and posttest survey. Data were imported into SPSS (a statistical data analysis program). The data were compiled and frequency, means, and standard deviations were calculated. Due to the large number of participants it was determined the best statistical interpretation could be calculated using effect size.

Effect size is a statistical formula use to compare quantitative data. Effect size compares the magnitude of difference between two groups. This statistical interpretation takes into account the size difference between the means, using the standard deviation rather than the statistical significance. (Fraenkel & Wallen, 1996)

The student teachers completed the survey online and data were inputed directly into FileMaker Pro, a database program. Then, data were imported into SPSS (a statistical data analysis program) where the data were analyzed for frequency and mean.

Summary

Using a series of surveys and discussion groups, the preservice teachers and student teachers at the University of Nebraska at Omaha helped determine whether current programs at UNO are meeting Nebraska requirements for training of preservice teachers. Surveying student teachers helped determine the programs effectiveness in preparing teachers to use technology in the classroom.

Studying the modular/laboratory teaching method and determining if state competencies are being covered helped bolster the preservice program at UNO. Response from student teachers showed how they feel about their technology skills and whether they were able to use technology as required in their teaching assignments. Chapter four will present the findings of the study.

CHAPTER FOUR

Presentation and Analysis of Data

Introduction

The purpose of this study was to evaluate the laboratory/modular approach currently being used in the teacher education class EDUC 2520 at the University of Nebraska at Omaha (UNO) and the effectiveness in preparing preservice teachers for the technology needs of the classroom. Also investigated was whether the elements of technology required to meet Nebraska guidelines were covered in the laboratory/modular training program.

This chapter presents the analyzed data gathered during the study. First, the results from the preservice teachers pretest and posttest survey will be presented. The preservice teachers completed the survey at the beginning of the semester and fifteen weeks later, after the semester of instruction, the posttest survey was administered. The data summaries below answer the study's research questions. The second part of chapter four summarizes the student teachers' responses from the online survey. Finally, recommendations are made for the UNO program and future studies.

Presentation of Results

Results of Preservice Teachers

Preservice teachers completed a pretest and posttest survey and some of the participants also participated in a discussion group. The data were compiled and analyzed using a variety of statistics. The data were interpreted, each research question and the findings are as follows.

Research Question 1. What is the current level of proficiency among preservice teachers before the semester of study in the areas of technology including: 1) basic computer operation skills, 2) setup, maintenance, and troubleshooting of equipment, 3) word processing, 4) spreadsheets, 5) database, 6) networking, 7) telecommunication, 8) media communication, and 9) social, legal, and ethical issues?

During the pretest, students answered survey questions addressing nine areas of technology skills. Each of the nine areas had five survey questions included in the category. Students had the choice of responses using the following scale:

A(1) = Unfamiliar – I do not know what this item is

B(2) = No proficiency – I have no proficiency. I know what this item is, but do not know how to use it

C(3) = Low proficiency – I have a little proficiency with this item

D(4) = Medium proficiency – I have some proficiency with this item, but could use some advanced training

E(5) = High proficiency – I am very highly proficient with this item

Participants answered the survey questions on a scale of 1–5, one being very little, how proficient are you in using a computer? Their response indicated an overall proficiency with a mean of 3.38 to be about average. Although they had an overall average proficiency their responses in each of the nine areas indicated proficiencies between 2–no proficiency to 3–low proficiency.

Looking at each of the nine areas, only setup, maintenance, and troubleshooting of equipment had more than fifty percent of the participants rate their skills with an

overall proficiency of medium to high. In this category all five survey questions had a mean score between .36 to 4.43 with 60 to 94 percent of the participants having a medium to high percentage of proficiency. In several separate survey questions within the nine categories, more that fifty percent of the students reported a medium to high proficiency, including the following categories: Basic computer operation skills, inserting and ejecting a floppy disk (55 percent); Spreadsheets, using formulas (50 percent); Telecommunications, sending and receiving e-mail (81 percent); and navigating the WWW (76 percent).

Each of the categories overall proficiency along with one survey question is included in the table below. The table includes the percentage of students with a zero to low proficiency rating along with the pretest mean score. Most of the areas had a mean between 2 and 3 which corresponds to a response between "I have no proficiency" to "I have a low proficiency." A summary of the results can be found below in Table 3, the survey with results can be found in Appendix B.

Research Question 2. What is the attitude of the students towards the required hours spent outside the classroom in order to meet the technology requirements included within the course guidelines?

Information about the time factor came directly from the students who participated in the discussion group. The students were asked the following discussion question: When you learned about the lab requirement and looked at the module schedule, what was your initial reaction? Overwhelmingly, students were concerned about the additional work required for the class. This is a three–credit hour class that requires the 11 hours of lab

Table 3
Selected Results From the Pretest Survey Reporting Technology Proficiencies of Participating Preservice Teachers

Category	Survey Question	Proficiency Percent		Mean
		No	Low	
Basic computer skills	Overall proficiency	32	29	2.59
	Inserting and ejecting floppy diskettes.	21	19	3.10
Setup, maintenance, and troubleshooting of equipment	Overall proficiency	4	6	4.09
	Managing memory	14	18	3.66
Word processing	Overall proficiency	40	21	2.14
	Cut, copy and paste features	32	6	1.82
Spreadsheets	Overall proficiency	23	33	2.88
	Using formulas	27	33	2.74
Database	Overall proficiency	33	33	2.50
	Entering data in a database	30	32	2.70
Networking	Overall proficiency	37	24	2.25
	Knowing the advantages of a server	38	22	2.08
Telecommunication	Overall proficiency	17	26	3.35
	Subscribing to a list serve	16	20	2.66
Media communication	Overall proficiency	46	14	2.20
	Develop an electronic slide show	48	12	2.29
Social, legal and ethical issues	Overall proficiency	27	30	2.74
	Knowledge of software piracy	28	23	2.80

and an additional 20 hours of classroom observation. The lab component is pass/fail and students thought the course should give credit for the work. Those students who had prior knowledge felt they should be able to test out. Students who were familiar with technology but had not used these skills for some time and those who needed to learn technology were thankful for the requirement but still worried about fitting the lab time into their schedule.

Research Question 3. What is the attitude of the students towards computer competency before and after completing the course?

Students have shown in past studies that they come into technology classes with a positive attitude. This study had the same results, with little significance noted in the pretest and posttest results in any area other than the Internet. On the posttest, participants had a more confident attitude in using the Internet, with a mean of 3.56 pretest and 4.15 posttest with an effect change of 0.62.

Research Question 4. What is the attitude of the students towards using technology in the classroom?

Again participants confidence rose after completing the course of instruction from a mean of 3.23 to 3.74 with a change in effect of 0.51. No other categories had a significant change in means according to the effect size.

Research Question 5. Do nontraditional students have the same levels of technological skills before taking the class as traditional students?

Using a t-test with a significance interval of 0.05, the difference between nontraditional versus traditional students in each the nine areas of technology skills were

analyzed. Three areas had a significant difference: 1) basic computer skill/storing file in a folder/subdirectory, 2) setup, maintenance, and troubleshooting of equipment/protection of floppy diskettes, and connecting peripheral devices, 3) social, legal, and ethical issues/knowledge of copyright laws, knowledge of intellectual property rights, and overall rating of social, legal and ethical issues. View the t–test results in Table 4.

Table 4
Results of Nontraditional Versus Traditional Students Technology Skills

Category	Survey Question	Pre Mean		T–test results
		Nontraditional	Traditional	T(df) p <= .05
Basic computer skill	Storing file in a folder/subdirectory	2.91	2.44	t(52) = 2.018
Setup, maintenance, and troubleshooting of equipment	protection of floppy diskettes	4.17	4.60	t(43) = 2.065
	connecting peripheral devices	3.71	4.37	t(47) = 2.416
Social, legal, and ethical issues	knowledge of copyright laws	3.53	3.00	t(59) = 2.264
	knowledge of intellectual property rights	2.91	2.29	t(51) = 2.454
	overall rating of social, legal and ethical issues	3.12	2.57	t(53) = 2.091

Research Question 6. Following the semester of instruction, have nontraditional students had the same increase in technology skills as traditional students?

Again effect size was the chosen method of comparison for analyzing the change in mean difference. Only three areas showed a difference between nontraditional and

traditional students after the semester of study. Table 5 shows the areas of change and the group of students, nontraditional or traditional, which had the reportable change.

Table 5
Categories of Significant Change Between Nontraditional Versus Traditional Students After a Semester of Instruction

			Mean		Effect
Category	Survey Question	Student	Pre	Post	change
Basic computer skill	Storing file in a folder/subdirectory	Traditional	2.38	4.32	0.54
	Create and delete folders/subdirectories	Traditional	2.38	4.02	0.64
Word Processing	Use grammar tools including thesaurus	Nontraditional	1.86	4.37	0.65

Research Question 7. Is UNO meeting the Nebraska Educator Competencies for Technology?

The Nebraska Educator Competencies in Technology (NECT) are the recommended competencies for teachers in Nebraska. Each competency has examples of performance indicators and references to the ISTE standards. The modular/laboratory units used during the semester of instruction met all areas of technology requirements.

- Competency One includes examples such as "uses basic computer operations such as editing, file management, printing, multi-tasking" preservice students had a medium to high proficiency, means 4 or above in all basic computer operation skills. The modules meeting this requirement are 1, 2, 4, and 8.
- Competency Two focuses on identifying the correct devices for a give topic, preservice students are trained in using the computer, scanner, digital cameras, and

transparency creator in the lab. Students also learn to use equipment for classroom presentation in EDUC 2520 Instructional Systems. The modules meeting this requirement are 1, 4, and 5, means ranged from a pretest low of 2.17 to a posttest high of 4.74.

- Competency Three expects teachers to be able to use word processing – mod 4; database – mod 10; spreadsheet – mod 11; hypermedia – mod 6 and 7; web authoring – mod 9; simple graphics – mod 3, 4, 5, 6, 7, and 9; desktop publishing – mod 4; encyclopedias (CD) – mod 8; subject-matter software – mod 8; on-line resources – mod 8; and presentation and administrative software – mod 6 and 7. Upon completion of the course, students were proficient in all areas. Below are some of the means for related skills covered under this competency see Table 6.

Table 6
NECT Competency Three Preservice Teacher Means

Competency Three Skill	Means		Effect Size
	Pretest	Posttest	
Word Processing	2.14	4.27	2.13
Database	2.50	3.44	0.94
Spreadsheet	2.88	3.89	1.01
Hypermedia	2.20	3.67	1.47
Web Authoring	2.80	3.11	0.31
Graphics	1.93	4.18	2.25

- Competency Four asks that teachers are to apply the programs in competency three. Preservice teachers are not required to use these outside of the lab; they had been

prepared to use the programs and have seen examples of appropriate use for the classroom.

- Competency Five requires teachers to use technology to meet the needs of individual students. The modules include presentation, web building, software and web evaluation (module 7, 8, 9); all help students to accomplish this task. Preservice teachers media communication means ranged from a low pretest mean of 2.20 to a high pretest mean of 3.67.
- Competency Six infuses technology within the classroom. Preservice teachers are trained to be able to use technology but application occurs later in the program.
- Competency Seven requires teachers to use hypermedia and telecommunications. Hypermedia means increased for a pretest mean of 2.29 to a posttest mean of 3.72 while telecommunication pretest mean was 3.35 with a posttest mean of 3.82. The modules that focus on these skills are modules 1 and 7.
- Competencies Eight through Eleven are the professional technology competencies. All of these competencies are for teacher use and are taught during the semester. Preservice teachers' professional tools included evaluation of software and web sites for educational use, telecommunications, word processing, grading programs, spreadsheets, and database management. For pre and posttest means as well as the effect size see Table 6 above.
- Competencies Twelve and Thirteen focus on the social, ethical and human impact of technology. Preservice teachers increase knowledge in this area with pretest means as low as 2.47 meaning none to low proficiency, with all posttest means above 3.4

with 4 being medium proficiency – I have some proficiency with this item, but could use some advanced training:

Overall all preservice teachers were trained in all of the competencies. Application will not be used until later in their education program. The complete NECT's can be found in Appendix C along with a table pairing the competency to the corresponding module. The module competency can be found in Appendix A.

Research Question 8. In which of the following areas of technology have the preservice teachers improved their skills: 1) basic computer operation skills, 2) setup, maintenance, and troubleshooting of equipment, 3) word processing, 4) spreadsheets, 5) database, 6) networking, 7) telecommunication, 8) media communication, and 9) social, legal, and ethical issues?

During the posttest, students used the same survey and answered questions over the same nine areas of technology skills with the five questions in each category. Students had the same choices of responses using the following scale: A(1) = Unfamiliar – I do not know what this item is; B(2) = No proficiency – I have no proficiency. I know what this item is, but do not know how to use it; C(3) = Low proficiency – I have a little proficiency with this item; D(4) = Medium proficiency – I have some proficiency with this item, but could use some advanced training: E(5) = High proficiency – I am very highly proficient with this item.

In Table 7 each of the categories overall proficiency and one survey questions response from the area is reported. The table includes the pretest and posttest mean score along with the effect size. Most of the areas had a mean between 3 and 4, which

corresponds to a response between "I have a low proficiency" to "I have some proficiency with this item, but could use some advanced training." A summary of the results can be found below in Table 7; the survey with results can be found in Appendix B.

Results of the Student Teachers Online Survey

Student teachers were asked to complete an online survey at the end of their student teaching semester. The following research questions were answered with the responses of 55 out of 127 respondents.

Research Question 1. Do student teachers feel adequately prepared to use technology in the classroom?

Of the respondents, 53 percent reported they were adequately prepared, 12 percent more than adequately prepared, and 4 percent thought the training they received for using technology in the classroom at the UNO was outstanding.

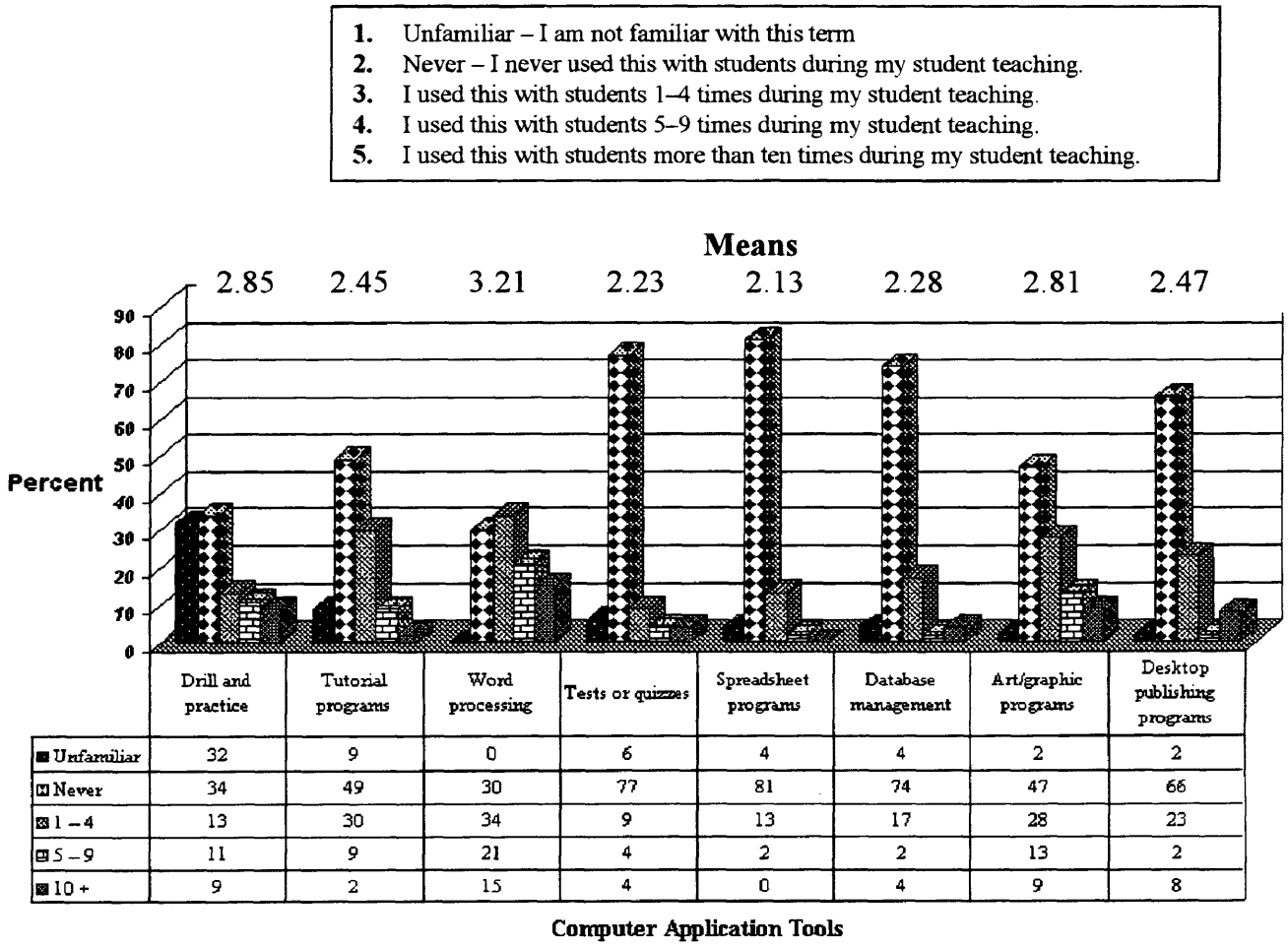
Research Question 2. Are student teachers using technology with their students in their classrooms?

Student teachers were asked how often they provided opportunities for their students to use specific computer tasks or programs. Their responses were based on the number of times students had the opportunity to use the computer ranging from

Table 7
Selected Results from the Pretest Survey Reporting Technology Proficiencies of the Participating Preservice Teachers

Category	Survey Question	Mean		Effect size
		Pre	Post	
Basic computer skills	Overall proficiency	2.59	4.13	1.54
	Inserting and ejecting floppy diskettes.	3.10	4.74	1.64
Setup, maintenance, and troubleshooting of equipment	Overall proficiency	4.09	3.35	–0.74
	Managing memory	3.66	3.27	–0.39
Word processing	Overall proficiency	2.14	4.27	2.13
	Cut, copy and paste features	1.82	4.34	2.52
Spreadsheets	Overall proficiency	2.88	3.89	1.01
	Using formulas	2.74	3.80	1.06
Database	Overall proficiency	2.50	3.44	0.94
	Entering data in a database	2.70	3.70	1.00
Networking	Overall proficiency	2.25	3.32	1.07
	Knowing the advantages of a server	2.08	3.04	0.96
Telecommunication	Overall proficiency	3.35	3.82	0.47
	Subscribing to a list serve	2.66	3.54	0.88
Media communication	Overall proficiency	2.20	3.67	1.47
	Develop an electronic slide show	2.29	3.72	1.43
Social, legal and ethical issues	Overall proficiency	2.74	3.51	2.09
	Knowledge of software piracy	2.80	3.51	0.71

unfamiliar, never 1–4 times, 5–9 times, or more than ten times during their semester of student teaching (See Figure 1). The student teachers answered twelve questions relating to student use. The results of the twelve questions will be grouped into two areas, computer application tools and computer based instruction. Most means ranged between 2 – never used during student teaching, and 3 – used 1–4 time during student teaching (see Figure 1).



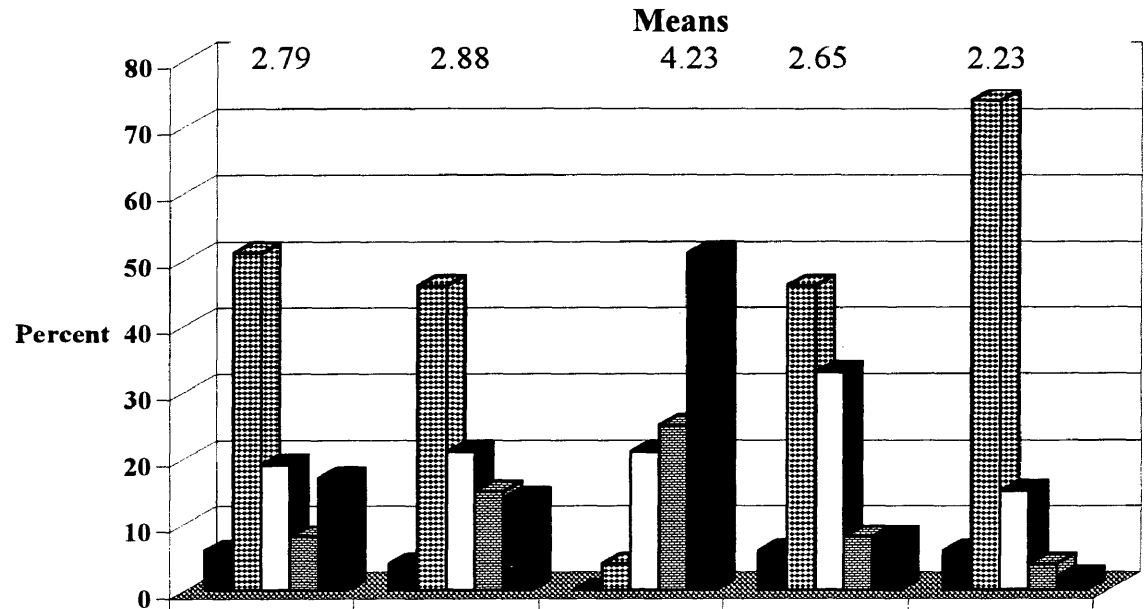
	Drill and practice	Tutorial programs	Word processing	Tests or quizzes	Spreadsheet programs	Database management	Art/graphic programs	Desktop publishing programs
Unfamiliar	32	9	0	6	4	4	2	2
Never	34	49	30	77	81	74	47	66
1 – 4	13	30	34	9	13	17	28	23
5 – 9	11	9	21	4	2	2	13	2
10 +	9	2	15	4	0	4	9	8

Figure 1. Student Teachers Use of Computer Application Tools with Students During Their Semester of Student Teaching

Research Question 3. Are student teachers using technology to help with their tasks for preparation, presentation, and or record keeping?

When asked 76 percent of student teachers use a computer in their teaching and 91 percent have daily access to a computer to use with their students. Student teachers were asked about specific programs and computer tasks that they used in their student teaching. Figure 2 highlights the results. Complete results can found in Appendix B.

1. Unfamiliar – I am not familiar with this term
2. Never – I never used this with students during my student teaching.
3. I used this with students 1–4 times during my student teaching.
4. I used this with students 5–9 times during my student teaching.
5. I used this with students more than ten times during my student teaching.



	Use computer to manage student	Use e-mail to communicate for work	Web for education	Use computer for demonstration	Use presentation applications
Unfamiliar	6	4	0	6	6
Never	51	46	4	46	74
1-4	19	21	21	33	15
5-9	8	15	25	8	4
10+	17	14	51	8	2

Figure 2. Student Teachers Use of Computer Utilities

Research Question 4. Were student teachers required to infuse technology in any area of their preservice training before student teaching?

A total of 47 percent of the students used the Internet at least once per week to complete assignments in their undergraduate program. Only 19 of the 55 students had more than one computer specific class. Most students did see technology modeled at lease once per week during their undergraduate studies. Overwhelmingly student teachers believed a computer class dealing with education computing was very important, with 39 percent suggesting a class should be required.

Research Question 5. In what areas of technology are student teachers most/least prepared?

A complete listing of the means, along with the technology skill, can be found in Table 8. Responses ranged from 1–Unfamiliar–I do not know what this item is; 2–None–I have no proficiency, I know what this item is, but do not know how to use it; 3–Low–I have a little proficiency with this item; 4–Medium–I have some proficiency with this item, but could use some advanced training; and 5–High – I am very highly proficient with this item. The survey with the complete results can be found in Appendix B.

Summary

The complete preservice teachers' surveys with the statistical results including pre and posttest means and effective size of each response can be found in Appendix B. Some of the preservice teachers participated in the discussion groups and the discussion questions; a summary of their responses is also in Appendix B. The student teachers survey, along with the means responses from the two open-ended discussion questions

are in Appendix B. Chapter Five discusses the results of both the preservice teacher and student teachers research questions. Recommendations for the UNO College of Education Program as well as future studies can also be found in chapter five.

Table 8
Mean Scores of Student Teachers Technology Skills

Computer Task	Mean
Programming	2.49
Distance Learning	2.50
Teacher Utilities	2.61
Simulations	2.87
Drill and practice	3.07
Telecommunications	3.07
Tutorials	3.22
Problem solving/ Higher order thinking	3.26
Desktop Publishing	3.31
Grading program	3.33
Graphics/drawing programs	3.36
Hypermedia	3.39
Spreadsheets	3.61
Databases	3.67
Educational games	3.72
E-mail	4.43
Web Searching	4.48
Word Processing	4.65

1. Unfamiliar – I am not familiar with this term
2. Never – I never used this with students during my student teaching.
3. I used this with students 1–4 times during my student teaching.
4. I used this with students 5–9 times during my student teaching.
5. I used this with students more than ten times during my student teaching.

CHAPTER FIVE

Discussion and Recommendations

Introduction

The purpose of this study was to evaluate the laboratory/modular approach currently being used in the teacher education class EDUC 2520 at the University of Nebraska at Omaha (UNO) and the effectiveness in preparing preservice teachers for the technology needs of the classroom. Also investigated were whether the elements of technology required to meet Nebraska guidelines were covered in the laboratory/modular training program.

This chapter will focus on the results of the study and evaluate the findings as related to this study. Recommendations will be discussed as related to the future technology requirements at UNO, as well as recommendations for future studies and suggestions.

The goal of the College of Education is to prepare students to be qualified teachers; training them to meet the demanding challenges of the new decade. By far, the first and foremost student goal is to graduate from the education program and get a job. Although they think they have a good idea about what it will be like to teach and how prepared they are, never can one truly be prepared for the classroom. The last requirement they want when attaining their goals is one more mandatory class.

At the end of the Instructional Systems class EDUC 2520, students have completed the four core courses and are ready to finish the last required classes before their student teaching. One of the requirements for completing the class is an evaluation

of the EDUC 2520 class. Students' evaluations often include the comment, "I learned a lot from the class but it was very time consuming for only three credit hours." Many think that completing the class work, field experience, and the lab/modular technology requirement is too taxing.

Student teachers also complete an evaluation at the end of the program. Not surprisingly, the most frequent comment is about the need formore training. They often state that they would like to have had more time in the classroom, more required elements including classroom management, and more training in practical applications, uses such as using technology in the classroom; never stating that they had too much preparation. Depending on the outlook of the students, preservice teachers or those finished with student teaching, adding more requirements is still a burden. What does all this mean as related to this study? Preservice teachers must be given the best training in the most effective manner.

Preservice educators have offered insight and given suggestions to change the program through surveys and a discussion group. They have also indicated that the program has been effective in many areas and identified what worked best for them. Student teachers evaluated their use of technology skills, implementation, and preparation. After experiencing 16 weeks in the classroom, they shared their input and recommendations for including technology in preservice education. Each of the two groups, preservice and student teachers, helped answer the research questions posed by this study. Each research question has a discussion of the results and includes what was learned from the surveys and discussion group.

Discussion

Preservice Teacher Discussion of Results

The preservice teachers completed a pretest and posttest survey, and participated in a discussion group. The information gathered gave insight to the program by answering eight research questions.

Research Question 1. What is the current level of proficiency among preservice teachers before the semester of study in the areas of technology including: 1) basic computer operation skills, 2) setup, maintenance, and troubleshooting of equipment, 3) word processing, 4) spreadsheets, 5) database, 6) networking, 7) telecommunication, 8) media communication, and 9) social, legal, and ethical issues?

Research question one looked at the entry level of technology skills for the preservice teachers in nine areas. Each of the nine areas had five subcategories related directly to the skill in question. The study found that many of the participants were either unfamiliar with, or had no proficiency in, a majority of the nine areas of technology. Only two of the nine areas (1. setup, maintaining, and trouble shooting equipment, and 2. telecommunication) had 25 percent or less of the participants unfamiliar with, or having no proficiency, in these technology skills.

In the study, 85 percent of the participants had a computer at home. Since a home computer is usually set up and maintained by someone in the household, it is not surprising that this would be one area the participants would have more skills. Many home computers are used for communication through email. Therefore, telecommunication may be another area where participants might have at least some

knowledge of the skills required. One surprising result of the study was the pretest scores for word processing skills. A total of 69 percent of the participants did not even have a low proficiency in this area. Most of the participants were at least juniors in college, and 70 percent of them report using a computer in other university classes. It is interesting that they did not have a higher level of proficiency in word processing. Word processing is certainly a skill required in the classroom and the need for training in this area is evident. Overall mean, between 2 – 3 in most of the nine areas, suggests students have a need to be trained in basic skills as well as teacher utilities and presentation applications.

Research Question 2. What is the attitude of the students towards the required hours spent outside the classroom in order to meet the technology requirements included within the course guidelines?

Although advisors try to prepare students for the requirements of EDUC 2520 when they register for the semester, participants are overwhelmed with the actual requirements explained during the first week of the class. The students attend class, have twenty hours of classroom observation, and eleven hours of computer laboratory instruction. From the survey it can be determined that at least 47 percent of the participants have jobs, as this was the percentage of those who reported using a computer at work. Not surprisingly, participants worried about fitting the computer lab instruction into their schedule.

Some of the participants thought they needed the computer lab instruction but did not like the fact that they did not get an additional credit for this class. The students thought that they should have the opportunity to test out of the modules in which they felt

they already had an adequate proficiency. The students also suggested that the lab instruction be more in-depth and independent. They felt that the time they spent in the computer lab should be well spent and that if they were more responsible for self-directed learning, with support from the lab assistant, they would retain more of the skill they were learning.

Research Question 3. What is the attitude of the students towards computer competency before and after completing the course?

There was little change in the students' attitude before or after the class. Past studies, including Willis & Mehlinger (1996), found students' attitudes do not tend to change; with most students having a positive attitude about computers even when they are not very proficient in their computer skills. Of the ten direct responses, the pretest mean range was between 3.28 to 3.95, which is between low to medium proficiency. The only area that had a marked effect change was confidence. Following the course, preservice teachers were more confident in their computer skills and using the Internet.

Research Question 4. What is the attitude of the students towards using technology in the classroom?

It is not surprising that students' confidence improved after completing the semester of instruction. The largest increase was in using the Internet with confidence, the pretest mean was 3.56 with a posttest mean of 4.18. Students used the Internet for completing several of the modules and learned to use the Internet more effectively. Students worked for at least eleven hours on the computer, using a variety of software products and the Internet. At least one of the students usually experienced some small

problem with the software or the hardware during the lab instruction; from these experiences they learned troubleshooting techniques. Students became more confident computer users and felt that they could handle the problems student might have with using computers in the classroom.

Research Question 5. Do nontraditional students have the same levels of technological skills before taking the class as traditional students?

Little research has been done comparing nontraditional students' technology skills with those of traditional students. Prior to the study, an assumption was made that nontraditional students' skills would not be as high as the traditional students. The pretest results showed the nontraditional students had lower pretest score in only one of the nine areas, setup, maintenance and troubleshooting of equipment; the sub-categories, protection of floppy diskettes and connecting peripheral devices, were lower than the traditional students. Prior to the course of study, the nontraditional students had higher proficiency than the traditional students did in two areas, basic computer skills (one sub-category, storing files in a folder), and three of the five sub-categories in social, legal, and ethical issues. One explanation for this may be that students over the age of 26 are more aware of copyright and property right laws. During their lifetime, more emphasis was placed on traditional values such as plagiarism. Students now believe that what is available on the Internet is free for the taking. They do not think that others have the right to the information, nor do they give much thought to using a CD burner to copy software or material downloaded from the Internet. The legal and ethical issues of the classroom are often implied, rather than directly addressed. By the end of the semester

both nontraditional and traditional students were familiar with the social, legal, and ethical laws.

Research Question 6. Following the semester of instruction, have nontraditional students had the same increase in technology skills as traditional students?

Nontraditional and traditional students did not have a significant difference in the pretest, nor in the posttest, in more than three out of the forty-five survey questions. The only area where nontraditional students improved significantly more than traditional students was in the word processing tool: using grammar and the thesaurus. Since most traditional students would have had access to a computer at school during their high school years, this is not a surprising finding. Also, nontraditional students most likely did not have spell check, grammar check or a thesaurus imbedded in their word processor or typewriter.

Data from this study did not show any reason to treat nontraditional students differently than traditional students in the computer training requirements for the EDUC 2520 Instructional Systems course. All students would benefit equally from the training in all the skill areas and would require the same course offerings. It did not appear that when it came to the need for technology training, neither the students' age nor their prior exposure was a factor for success.

Research Question 7. Is UNO meeting the "Nebraska Educator Competencies for Technology?"

There is no doubt that UNO is not only meeting each area of competency but that many modules reinforce learning by meeting more than one of the thirteen required areas.

Although all the modules fit into the requirements, the most important modules seem to be those that infuse technology in the classroom curriculum such as presentation software and web page development. Teacher utilities are also important to include within the course offerings, but basic skills such as word processing, using spreadsheets and database development are not directly required by the competencies. The competencies include all the basic skills required to be computer literate in today's workplace but go beyond this to include skills specifically used within the classroom. Students are prepared to use technology in the classroom according to the Nebraska Competencies in Technology.

Research Question 8. In which of the following areas of technology have the preservice teachers improved their skills following the semester of study: 1) basic computer operation skills, 2) setup, maintenance, and troubleshooting of equipment, 3) word processing, 4) spreadsheets, 5) database, 6) networking, 7) telecommunication, 8) media communication, and 9) social, legal, and ethical issues?

Research question eight is the heart of this study. If students did not have a significant overall improvement after completing the eleven hours of study, then the program would have to address the effectiveness of the current approach.

Of the nine areas investigated, only one area had decreased proficiency; setup, maintenance, and troubleshooting of equipment. In all of the five survey questions asked in this category, the mean dropped after the semester of study. One cannot say for sure why the students felt their proficiency dropped, but one can speculate that, after working on the computer and seeing the different software and some of the problems that can

occur, students realized that they did not truly know as much as they thought they did. When a person does not have many technology skills, they do not realize all that is involved in using and maintaining a computer. The more complex the software and the hardware, the more that can go wrong. Students used both the Macintosh and the PC computers during the class and only 12 percent of the students had used both platforms before the EDUC 2520 course. During the eleven modules the students are required to use both the Macintosh and the PC. Students become familiar with both platforms, not knowing where they will be employed or the hardware and software that will be available. At the end of the semester they came to understand how complex the setup, maintenance, and troubleshooting was, and the students realized they had a lower proficiency than they had originally reported.

Students felt secure with their telecommunication skill upon entering the computer lab. Many of the students (82 percent) had a medium to high proficiency level in sending and receiving e-mail. Other areas of telecommunication had an effect size of about 0.4, except for list serve that had a difference of 0.88. After the semester, all students felt competent in the area of telecommunications.

The next two areas of technology, database and spreadsheet proficiency improved overall with effect score of 0.94 and 1.01 respectively. Students used both of these utilities to manage student information. Database proficiency effect size was around 1, ranging from 0.92 to 1.0, all within an acceptable range for improvement. Spreadsheet management was slightly higher, ranging from 1.01 to 1.07. Both of these computer

applications are often used to manage student records, and preservice teachers will be able to adapt to the software utility offered by their school.

Networking proficiencies ranges from using a server to working in a network environment. All students at the college work on a network and use the server. Most of the learning, also with an effect size of about 1, is indirect. Many people use a server and network without actually directly working with the software or configuring the hardware of the system. Preservice students would be able to use a network and work with the network support person effectively.

Media communications, a diverse field ranging from using and overhead (effect size 1.94) to developing an electronic slide show (1.43), are all of vast importance to the classroom curriculum. Using an electronic slide show is an effective way of developing an interactive classroom tool. Students improved in this area and learned to use the information effectively, both teacher and student applications were shown so that preservice teachers experienced practical classroom practices.

Basic computer skills improved across the five areas. All of the students showed that they could manage files and use file storage tools with an improvement from the mean of 1.07 at pretest to 4.28 at posttest.

An area where students became more aware of the new rules and will be able to students to understand the laws was social, legal, and ethical knowledge. Students have a better understanding of the copyright laws and the sharing and pirating of software. This area is often gray to students and needs to be explained. Preservice teachers felt that they now have a medium to high proficiency in this area.

The last area, word processing, had the highest level of improvement. All students improved their word processing skills. These skills are very important in all areas of teaching. As mentioned in research Question One, the preservice scores were very low even though students were juniors and seniors. Students will use word processing as a teaching tool, a utility, and a communication tool. It is important that the improvement was high, with an effect size in all areas over 2 and as high as 2.52. Students seemed adequately prepared in this area of technology upon completing the course.

Several facts came out during the discussion group. Two course sections of students participated in the discussion groups, each small group was given five questions to answer and shared their concerns and comments. From this discussion group the following information was gathered:

- Preservice students wanted the option to test out of the skill areas where they were already proficient.
- Students felt that the lab requirement, although time consuming, was beneficial.
- Students wanted the module lessons to become more self-directed, rather than a step by step walk through of the lesson. They wanted to use their tutorial and have the help and support of the lab technicians.

Overall, the scores improved, with the exception of setup, maintenance, and troubleshooting. Preservice students all feel more comfortable using computers and have a higher level of skills. Overall students felt they would use the skills learned from the course.

Student Teacher Discussion of Results

Student teachers were asked to complete an online survey at the end of their student teaching semester. The research questions the survey answered dealing with student teachers are:

Research Question 1. Do student teachers feel adequately prepared to use technology in the classroom?

Not surprisingly, after analyzing the preservice teachers results, student teachers felt that the technology training they received at UNO was adequate. The student teachers were also asked to justify their answer; some of the responses were as follows:

"With the way things change in this field, a brief introduction seems to be enough. The exposure allows you to practice and take in new concepts and apply them. By the time we move on, many things have already changed."

"I thought that through the class of Instructional Systems and the required computer lab I was introduced to several programs that I had not used before. I think that the accompanying manual that was made up that walked us through each step was very helpful and easy to understand. In some of the programs, I still use it today."

"At the time that I took Instructional Systems, the course was sufficient for the level that technology skills needed. Today technology has advanced so much, that I feel like I am not as knowledgeable as some of the students who are in elementary schools today. I strongly believe that a course dedicated strictly to the use and application of computers and computer programs would help the next group of student teachers immensely."

"I feel that the computer-related technologies taught at UNO were adequate because I feel very comfortable using a computer. I know how to use the computer for the purposes and needs of my career. I enjoy using it."

The student teachers had both positive and negative comments as well as suggestions. A complete copy of the responses to the open ended survey questions is available in Appendix B.

Research Question 2. Are student teachers using technology with their students in their classrooms?

Overall a majority of the student teachers are not using technology in the classroom with their students. Although student teachers felt prepared to use technology, they are not using it with their students, perhaps because their cooperating teachers are not using technology. According to a recent survey by Topp (2000), Nebraska teachers are more comfortable with technology, but they still do not have the time to develop lessons which include technology in the classroom. Unless the cooperating teacher is modeling the use of technology, student teachers many not feel comfortable using technology in the classroom. It would be interesting to follow these students over the next two years and see if, after they are in their own classroom and they feel comfortable, they would include technology, as suggested by Novak and Berger (1991).

Research Question 3. Are student teachers using technology to help with their tasks for preparation, presentation, and or record keeping?

Student teachers thought that they were well trained and were confident in their abilities. The data show they use technology skills for education purposes, especially

using the World Wide Web (WWW). It is interesting that using WWW had a mean of 4.23 (used more than 5 times during student teaching) while e-mail only had a mean of 2.88 (used less than four times). Although the means were only between 2 – (never use) and 3 – (to used 1-4 times) except for WWW, it must be noted that the student teachers had only sixteen weeks of teaching. Of those sixteen weeks student teachers have only about twelve weeks of full time teaching, usually spending both the first and last weeks slowly picking up and giving back the classroom responsibilities.

Research Question 4. Were student teachers required to infuse technology in any area of their preservice training before student teaching?

Student teachers did use technology in their undergraduate classes, although only 50 percent use it often. They did see modeling of technology and this finding supports those suggesting the importance of faculty infusing technology in the classroom (Faison, 1996).

Research Question 5. In what areas of technology are student teachers most/least prepared?

Student teachers highest proficiency was the same as the preservice teachers, word processing. The means, student teachers – 4.65, preservice teacher – 4.27, were very close. Other areas that were about the same level of preparedness were the following: telecommunications, spreadsheets, and media communications. When the means of the student teachers were rated highest to lowest they nearly matched the highest to lowest effect size change for the preservice teachers. These results show that

the technology skills are retained, and effective preparation is accomplished by the approach used at UNO.

Overall the responding student teachers' information provides insight and answered many questions. The student teachers reinforced the programs needs and showed that they are prepared to use technology as currently used in the education classroom. With the student teacher responses almost identical with the preservice teachers' responses to similar survey questions, we assume they are retaining their skills and feel comfortable with their level of technology after completing EDUC 2520. The fact that student teachers interest in improving their current level of technology skills should encourage the university to continue to expand the offerings in this area.

Recommendations for the UNO technology component

Although the current program has shown positive results in improving students' overall technology skills, some changes are recommended. After early analysis of the data, and before the study was completed, some initial recommendations were adopted. One of the major areas of change included allowing preservice students the opportunity to test out of modules during the first three weeks of the semester. Initially, of the 146 students enrolled during the spring 2000 semester, 54 students attempted to test out of the modules. Of those, 49 students tested out of at least two modules, 36 students tested out of three modules, and only 8 students tested out of all the modules. The modules most students tested out of were e-mail and Internet evaluation. Presentation and web development modules were the two modules most students did not attempt to pass.

After allowing for testing this semester, it has been determined that students should be given the opportunity to test out of all modules except for presentation and web development. Students who can follow a tutorial, still benefit from seeing projects and actual classroom applications. Also, eleven modules have been combined into ten modules, incorporating e-mail and the Internet evaluation during the same module. Students responded positively to both the testing and the reduction to only ten modules.

Another implemented change was in teaching styles. During the discussion groups, students suggested a more student-centered style of teaching to help them retain their skills beyond the computer assignment. When this study began the modules were instructor led, but now the instructors are using more of a support technique. Students are shown the completed assignment, along with an example of appropriate educational use for the application, and then given the assignment to complete. The instructors supervise the computer lab and support students, answering questions, trouble shooting, and checking competency requirements.

Suggested recommendations to further improve the program include changing the order of requirements. Student should have training in several modules before they are juniors or seniors. In the early educational core requirements, basic introduction to both the Macintosh and the PC, e-mail, Internet, and word processing would help students. During these classes instructors required students to use skills such as communicating through e-mail, word processing and using the Internet for education. The UNO College of Education has two required classes before students can enroll in EDUC 2520 Instructional Systems; the early modules should be required in conjunction with the early

prerequisite classes. Presentation and web development should be taught along with Instructional Systems and should be expanded to require actual application, including using a presentation or a web page to teach the required micro teaching lesson. Teacher utility units such as spreadsheet, database and grade programs along with software evaluation could be required prior to student teaching.

The advantages of spreading the requirements over the course of study include the following: 1) students would have better technology skills earlier in their college career and therefore have more practice using those skills; 2) the time requirement would not be so intensive in an already full semester of study; 3) students would have a better opportunity to actually use skills, such as presentation, in an appropriate classroom activity allowing for more infusion in the classroom; and 4) more than one presentation of a skill could be offered for better understanding without adding more time requirement to one semester.

The current program does not expect students to have only the modules to help them prepare to teach and infuse technology in the classroom. Although no other technology is required in other classes, instructors are encouraged to use technology and require their students to use technology within the curriculum. Preservice teachers need to use the skills in actual projects for true understanding of technology in the curriculum. Methods classes are an appropriate and recommended place for a technology project within a student's area of study. Currently, there is no accountability for students to develop such projects with their methods class. Some accountability would be appropriate such as a presentation developed during a methods class for use in the student

teacher's classroom. A level two checklist of competencies is required for student teachers; listing a technology unit among the other requirements would insure including technology through student teaching.

According to Willis and Mehlinger (1996), who reviewed current studies, infusion of technology in the entire course of study is important for practical use in the classroom to occur. Preservice teachers need to be prepared to use technology within the classroom. The proposed recommendations would help improve overall preparation for teachers and help move the College of Education's program into the next phase of preparation as suggested by Willis and Mehlinger (1996).

The last recommendation is for student teaching. Student teachers need to see technology modeled by their cooperating teacher. Without students actually using technology with guidance in the student teaching classroom, they will question whether they have the skills to do so and will be less likely to risk attempts to use technology on their own time. Pairing student teachers interested in using technology with cooperating teachers who use technology in the classroom will help both teachers and student teachers improve their skills. Everyone will gain, especially the young students who become more interested in learning.

Recommendations for future study

Technology is an ever-changing field, and teaching programs must to be constantly updated. As students continue to use technology prior to beginning their college career, there is less of a need to teach basic skills. Each year the program will need to be evaluated to meet the needs for current student technology skills.

If the recommendation for changing the requirements are adopted and modules are taught along with all four core classes, a study should be done to see if this helps students to learn and retain more technology related skills into their teaching career. The study should look at technology skills, time factor and organization of the modules, and include projects to use the skills. Continued fine tuning would ensure the correct sequence for the best preservice teacher learning.

The final recommendation involves studying student teachers and new teachers. Following a group of students, not only through student teaching, but also into their first two years of teaching would, give the College of Education even more information. Student teachers often model their cooperating teacher and may not include technology due to other bias or lack of training. During their first two years of teaching they may include technology as they gain confidence (Novak & Berger, 1991). A study could show whether this is true and whether student teachers/new teachers benefit from the training.

Summary

The research for this study was gathered over one semester. Preservice teachers completed a semester of study, including eleven hours of technology training and completed a pre- and posttest survey to determine their level of technology skills. The results showed preservice teachers improved their technology skills and became more confident using the computer.

Student teachers answered questions about their technology training at UNO and the technology they used in their classrooms. The data were obtained through an online

survey and included demographics, proficiency of skills, interest in using the computer, use of computer for classroom preparation as well as student use. The student teachers felt that they were adequately prepared to use technology although actual usage with students was limited.

Overall, the current method of teaching technology is working but could benefit from some changes. Students are more prepared to use e-mail and set up, maintain, and troubleshoot equipment, but they do not have other basic skills such as word processing. Preservice students need not only training in technology skills but also need to use those skills in projects to prepare them for actual classroom application.

UNO's College of Education is always striving to improve their education program and looks towards the future and how best to meet students' needs. Subsequent to the initial data being gathered and analyzed, changes were instituted. The program continues to evolve and grow as education continues to change. Through continued studies and changes, the program will continue to meet the students needs and to move into the next phase of instructional technology in education.

References

Association for advancement of computing in education (AACE) (1998, November 21) *Learning more about the AACE* . Retrieved November 21, 1998 from the World Wide Web: http://www.aace.org/about.htm.

Breithaupt, D. (1997, April). Collaborative computer education for preservice and inservice teachers. Proceedings of the Society for Information Technology & Teacher Education 1997 Conference. Orlando Florida.

Cobbin, J. & Driskell, T. (1997, April). A key to technology integration into the classroom: The campus facilitator. Proceedings of the Society for Information Technology & Teacher Education 1997 Conference. Orlando Florida.

Dennison, M., Long, C. & Reehm, S. (1997, April). Preservice teachers' - perceived computer competencies compared to demonstrated skills. Proceedings of the Society for Information Technology & Teacher Education 1997 Conference. Orlando Florida.

Eifler, K; Potthoff, D. (1998) Nontraditional teacher education students: A synthesis of the literature. Journal of Teacher Education, 49 (3), 187–195.

Faison, C. (1996) Modeling instructional technology use in teacher preparation: Why we can't wait. Educational Technology 36, 57-59.

Flowers, C & Algozzine, R. (1998, November 24). A self-assessment instrument for evaluating basic technology competencies of educators. Retrieved 1998, 24 November from cpflower@email.uncc.edu.

Fraenkel, J. & Wallen, N. (1996) How to Design and Evaluate Research in Education. United States of America: McGraw Hill, Inc.

Galloway, J. & Blohm, P. (1997, April). Planning for technology in the 21st century: Perspective, knowledge, commitment and process. Proceedings of the Society for Information Technology & Teacher Education 1997 Conference. Orlando Florida.

Hofinger, R. & Lehman, F. (1997). *Teaching the nontraditional student*. Retrieved November 12, 1998 from the World Wide Web: http://www.ecn.purdue.edu/FrE/asee/fie95/4d3/4d34/4d34.htm.

Keizer, J. & Wright, V. (1997, April). Constructivism implementation in undergraduate computer application classes. Proceedings of the Society for Information Technology & Teacher Education 1997 Conference. Orlando Florida.

Larson, A. (1995) Technology Education in Teacher Preparation: Perspectives from a Teacher Education Program. Retrieved March 15, 2000 from the World Wide Web: http://www.ed.uiuc.edu/projects/tta/conferences/AESA-95.html

McCoy, L. & Baker T. (1997, April). Gender differences in preservice teachers' computer and Internet attitudes. Proceedings of the Society for Information Technology & Teacher Education 1997 Conference. Orlando Florida.

McCormick, C. (1995, July). Focus groups: An active learning approach to identifying nontraditional students' needs. Paper presented at the meeting of the American Psychology Society Institute on the Teaching of Psychology, New York. (ERIC No. 392 907)

McKenzie, B.& Kirby, E. & Clay, M. & Davidson, T. (1997, April). Redesigning technology training programs: What is and what could be. Proceedings of the Society for Information Technology & Teacher Education 1997 Conference. Orlando Florida.

National Commission on Teaching & America's Future (NCTAF) (1996). What matters most: teaching for America's future. Retrieved February 26, 2000 from the World Wide Web: http://www.tc.columbia.edu/~teachcomm/what.htm

Novak, D. I. & Berger, C. F. (1991). Integrating technology into preservice education: Michigan's response. *Computers in the Schools, 8*(1/2/3), 89-101

Sheingold, K. (1991). Restructuring for learning with technology: The potential for synergy. Phi Delta Kappan, 73 (1), 17 - 27.

Sheng Chieh Leh, A.(1999, March) Research on the characteristics of "the technology course." Proceedings of the Society for Information Technology & Teacher Education 1999 Conference. San Antonio, Texas.

Topp, N. (1993) Teacher preservice experiences and classroom computer use of recent Iowa State University graduates. Unpublished dissertation, Iowa State University.

Topp, N. & Grandgenett, N. & Mortenson, R. & Norris, C. & Solowary, E. (2000) A snapshot of the implementation of education related technology in Nebraska's P–12 schools. Retrieved March 15, 2000 from the World Wide Web: http:// .

Willis, J, & Mehlinger, H. (1996) Information technology and teacher education. In J. Sikula, T. Buttery, & E. Guyton (Eds.), Handbook of research on teacher education: a project of the Association of Teacher Educators (pp 978- 1028). New York : Macmillan Library Reference, USA.

Willis, J, Thompson, A, & Sadera, W. (1999). Research on technology and teacher education: current status and future directions. Educational Technology Research and Development, 47 (4), 29 - 45.

U.S. Office of Technology Assessment (1995) Teachers and Technology: Making the Connection Retrieved March 15, 2000 from the World Wide Web: http://www.ncrel.org/mands/docs/8-3.htm

APPENDIX A

EDUC 2520: INSTRUCTIONAL SYSTEMS
Course Syllabus

1.0 COURSE DESCRIPTION

OVERVIEW

1.1 Instructional Systems is a course designed to acquaint students with the basic aspects of curriculum design and implementation, instructional delivery strategies based on the assessment, prescription, implementation, and evaluation model; media selection, design, production, utilization and evaluation. It will seek to help students understand the role of a teacher as the orchestrator of the learning environment and how the above mentioned topics when managed correctly play an integral part.

FOR WHOM INTENDED

1.2 The course is intended for sophomore students pursuing the degree or certification through the College of Education.

PREREQUISITES

1.3 Prerequisites include a minimum grade point average of 2.25, and completion of EDUC 2010 and EDUC 2020.

UNUSUAL CIRCUMSTANCES OF COURSE

1.4 Included in the course design are provisions for classroom instruction, aiding in selected school settings (minimum of 20 hours) and "hands on" experiences in the Educational Technology Lab. Students must register for EDUC 2520 Lab along with EDUC 2520.

2.0 OBJECTIVES

For successful completion of EDUC 2520, students will demonstrate the ability to perform the tasks listed under the following:

COGNITIVE DIMENSION

2.1

C.1 Define curriculum by comparing and contrasting a variety of definitions.

C.2 Identify and explain various forces that shape the curriculum of the school.

C.3 Discriminate between educational goals and objectives.

C.4 Describe the three domains of learning and discriminate among various levels in each domain.
C.5 Identify or select educational goals and objectives for all domains and levels.
C.6 Identify the components of a good lesson plan.
C.7 Explain task analysis to develop a lesson plan.
C.8 Identify and explain a variety of curriculum planning resources.
C.9 Describe the three phases of evaluation (pre-assessment, formative and summative) and explain the purposes of each.
C.10 Describe, in terms of purpose, the difference between an entry behaviors test and a pre-test.
C.11 Develop evaluative strategies/instruments which relate to measurement of learning in each domain.
C.12 Describe/explain the role and nature of assessment, prescription, implementation and evaluation in the instructional process as the teacher orchestrates the learning environment.
C.13 Write examples of test items and/ or describe procedures for assessing learning/performance at each level in the cognitive domain and discuss examples in the other domains.
C.14 Assessment, prescription implementation and evaluation as they relate to the teachers' orchestration of the learning environment.
C.15 Discuss the nature and advantage of computer generated tests.
C.16 Differentiate between norm-referenced and criterion-referenced tests.
C.17 Explain the purpose of evaluation in terms of its relationship to providing data to substantiate curriculum adjustments to meet student needs.
C.18 Describe and explain what is meant by instructional delivery systems (including telecommunications).
C.19 Describe and explain the purposes of at least 3 instructional strategies in terms of how they could be integrated into instructional delivery systems.
C.20 Describe/explain the factors which influence the selection of instructional delivery strategies.
C.21 Discuss the use of media as it relates to learning and retention.
C.22 Describe/explain the use of media selection and utilization guidelines.
C.23 Discuss the use of specific examples of media pertinent to learning in each of the domains.

FIELD EXPERIENCE DIMENSION

2.2 This portion of the course will involve direct observation and participation in the local K-12 schools with specific activities from this experience discussed in class.

Placements are made in schools within the Omaha Metropolitan area. All 20 hours will be completed in the same school. Written documentation for verification of both attendance and activities is required. Attendance verification forms will be provided with the field experience placement packet. Verification of

the field experience activities will be provided by means of a log/journal that should be completed during and after the experience. Specifications for the format and content of the log/journal follow the listing of the field experience competencies/objectives listed below.

The field experience involves two distinct but related aspects-observation and participation. The observation component involves observing, identifying, and commenting upon the processes by which the cooperating teacher orchestrates the learning environment to achieve the desired learning outcomes. The participation component involves assisting the cooperating teacher with various instructional functions and interacting with students on an individual or small group basis.

Competencies/Objectives

Observation

The student will observe, identify, and describe the physical setting of the field experience classroom. (Assessment)

The student will observe, identify, and describe the learning environment of the field experience classroom. (Assessment)

The student will observe, identify, and describe the class level, students, and curriculum focus of the field experience classroom (Assessment)

The student will observe, identify, and describe the processes by which the cooperating teacher assesses student readiness for learning. (Assessment)

The student will observe, identify, and describe the processes by which the cooperating teacher prescribes learning experiences for students. (Prescription)

The student will observe, identify, and describe written instructional plans that the cooperating teacher creates for follows as a part of or result of the prescription phase. (Prescription)

The student will observe, identify, and describe the procedures used by the cooperating teacher to implement the instructional prescription. (Implementation)

The student will observe, identify, and describe the instructional models used by the cooperating teacher to implement the instructional prescription. (Implementation)

The student will observe, identify, and describe the instructional strategies and tactics employed by the cooperating teacher to implement the instructional prescription. (Implementation)

The student will observe, identify, and describe the various means the cooperating teacher employs to evaluate the effectiveness of the instructional prescription and implementation. (Evaluation)

The student will describe and summarize the overall manner in which the cooperating teacher orchestrates the learning environment of the field experience classroom. (Assessment, Prescription, Implementation, Evaluation)

Participation

The student, working with individual or small groups of students, will assess the learning needs, levels, and styles of those students. (Assessment)

The student, working with individual or small groups of students, will prescribe an instructional plan for those students that is based on the assessment of their learning needs, levels, and styles. (Prescription)

The student, working with individual or small groups of students, will implement an instructional prescription using appropriate strategies, media, materials, and technologies. (Implementation)

The student, working with individual or small groups of students, will evaluate student accomplishments and the effectiveness of the instructional prescription and implementation. (Evaluation)

2.3 LABORATORY DIMENSION (Media Design, Production, Utilization)

M.1 Describe and use several procedures to evaluate selected examples of media.
M.2 Demonstrate the ability to operate selected media equipment.
M.3 Demonstrate instructional use of the computer.
M.4. Design/construct instructional materials using various production techniques.
M.5. Develop a media utilization plan for a variety of learning situations large group, small group, utilizing individualized instruction, contracting, computer assisted instruction Instructional T.V., laser disks, photo/computer applications and learning centers.

3.0 COURSE CONTENT AND ORGANIZATION

3.1 DISCUSSION TOPICS

3.10 Curriculum Definitions and Terminology
3.11 Curriculum Influences and Planning Models
3.12 Taxonomies
3.13 Curriculum Goals and Objectives
3.14 Assessment, prescription, implementation and evaluation as they relate to teachers' orchestration of the learning environment.

3.15 Task Analysis and Lesson Planning
3.16 Evaluation Phases and Strategies
3.17 Linking Testing and Objectives
3.18 Writing/Selecting Test Questions
3.19 Delivery Strategies
3.20 Media Selection, Utilization, and Evaluation

4.0 TEACHING METHODOLOGY

4.1 The instructional procedures will include demonstration of pre-assessment utilizing semantic mapping or pre-instructional knowledge probes and how instruction is planned accordingly. Demonstration and lecture on the implementation of the planned instruction and evaluation of that instruction will be an integral part of this course. Small group and team learning will also be utilized.

4.2 The students will be expected to participate in class experiences, complete reports and assignments, complete field experience assignments during the 20 hour field experience, and demonstrate competencies specified for ED 2520 Lab.

5.0 EVALUATION

5.1 Final grades will be based on the following scheme:

a.	Tests/Quizzes	40%
b.	Instructional Plan	20%
c.	Discussion Observation Log	20%
d.	Presentations	20%
	TOTAL	100%

Laboratory competencies must be completed to receive course credit.

5.2 The grading scale to be utilized is as presented below:

a. 95-100 = A+
b. 90-94 = A
c. 85-89 = B+
d. 80-84 = B
e 75-79 = C+
f. 70-74 = C
g. 65-69 = D+
h. 60-64 = D
i. 59 and below = F

6.0 OTHER

6.1 Students will be expected to attend the equivalent of 3 hours lecture per week.

6.2 In terms of outside class time, students will need to:

a. Schedule 20 hours for school visitation during the semester

b. Register for EDUC 2520 LAB (1 hour per week) for a total of 16 hours during the semester.

7.0 RESOURCE MATERIAL

7.1 Textbooks: Possible textbooks to be used include:

Borich, G. (1996). Effective Teaching Methods (3rd ed). Englewood Cliffs, NJ: Prentice-Hall.

7.2 Other suggested resource material

Possible computer software, video resources and printed matter include:

Computing & Information Collections, (20 software programs), Minnesota Educational Computing Corporation (M.E.C.C.), 1986-88.

Problem Solving, (8-10 programs), Sunburst, 1985-88. Pleasantville, NY.

Improving Teacher Effectiveness, M.E.C.C., 1987. (Video Disk)

Teaching Episodes: Resources for the Analysis of Instruction., M.E.C.C., 1987. (Video Disk)

EDUC 2520 - INSTRUCTIONAL SYSTEMS

Instructional Technology Component

Introduction/Overview

The tutorial packet contains the materials that will guide and assist you as you develop the competencies related to the technology component of the Instructional Systems course. It contains 11 learning modules, each of which identifies a competency or competency cluster and describes learning materials and experiences that will help you attain those competencies. Following many of these modules are guides and tutorials that will assist you with specific areas of technology you will encounter. The items are printed on colored paper for easy identification.

Lecture/demonstrations are provided several times each week during the week(s) that a particular module is considered (See the Laboratory Schedule). The guides/tutorials are NOT substitutes for those lecture/demonstrations. They are intended to supplement the lecture/demonstration information and provide you with reference material when you want to use a technology at a later date.

Outcomes/Competencies

Eleven technology competencies or competency clusters that have been identified serve as the outcome focus for this course component. A complete listing of these competency statements follows:

Competencies

Module 1. Demonstrate the ability to operate the Macintosh computers in Macintosh Computer Laboratory. This includes turning on the computer and monitor, accessing the hard drive and file server, properly inserting disks in the disk drives, formatting data disks, accessing the printers, and shutting down the computers in an appropriate fashion.
Use the e-mail feature of S-CWIS to send e-mail messages and attachments.

Module 2. Use Netscape to access the Internet, locate various Web sites that are useful and appropriate for educators, and find information that is relevant for teachers.

Module 3. Using the ClarisWorks (AppleWorks) word processing application program, create and enter text into a new word processing document. Demonstrate the ability to change the font, text style, text size, justification, and spacing according to

instructions provided. Also demonstrate the ability to copy, cut, and paste text material and to change margins, indents, and tabs. Save and print a copy of the document you created.

Create a ClarisWorks(AppleWorks) Draw document and use the Draw tools to create objects and shapes.

Module 4. Demonstrate the ability to operate the Gateway microcomputers in the Windows Computer Laboratory. This includes turning on the computer and monitor, accessing programs on the hard drive and file server, properly inserting disks in the disk drives, formatting data disks, using selected programs, accessing the printer, and shutting down the computers in an appropriate fashion.

Module 5. Take video pictures using at least one type of digital camera and digitize printed pictures/graphics using the scanner.

Module 6. Prepare a minimum of four "slides" using the presentation feature of ClarisWorks.
Use the Print-Shop program to prepare a Calendar or Greeting Card.

Module 7. Create a simple interactive hypermedia program using HyperStudio. The program should consist of at least five cards that are "linked" with buttons in an appropriate fashion.

Module 8. Review one disk-based or CD-ROM instructional program and two education-related World Wide Web sites. Prepare and submit a word-processed review/evaluation of the program and Web sites using the Software Review/Evaluation Guide and the Web site Review/Evaluation Guide adopted for the Instructional Systems course.

Module 9. Create a Web page that contains text, graphics, and links to other files and Internet sites.

Module 10. From a paper database containing a variety of fields, prepare a ClarisWorks Database for these records. Name the fields, identify the nature of the entries in each field, and enter the data into the fields for all records. Using that database, **sort** it on two different fields and **select** records on the basis of two different selection criteria.
Using the Micrograde program, create a computer "gradebook" that contains numerical information about a "class" of students. Generate "reports" based on the data included in the gradebook.

Module 11. Using ClarisWorks Spreadsheet, create a computer "gradebook" that contains numerical information about a "class" of students. Also create a chart based on the data included in the spreadsheet.

Module Design

Each module has the following common features:

Introduction/Overview that provides a brief discussion of the content focus of the module including the reasons for its inclusion in the course.

Competency Statements that specify the outcome skills that should be attained through completion of the module activities.

Learning Experiences/Materials that describe the Lecture/Demonstrations and support materials related to the module content.

Competency Demonstration that describes what must be done to provide evidence that the competency has been attained.

Competency Demonstration

This individualized module approach to technology skills focuses on the outcomes of the module experiences. Thus, the capacity to demonstrate the skills identified in each competency is crucial. These skills are constant for everyone in the course. The particular Lecture/Demonstration session in which you develop them is a variable.

Each competency must be demonstrated in the manner described in each module. In most instances, this can be done as a part of the Lecture/Demonstration session. Occasionally, it may require scheduling time in the Computer Lab above and beyond a Lecture/Demonstration session. During that time, the tasks set forth in the Competency Demonstration section of the module should be completed under the direct supervision of a laboratory attendant. A schedule of when the laboratories will be open will be posted in key locations around Kayser Hall.

Facilities/Materials

The primary support facility for the module learning and competency demonstration activities is the Macintosh Computer Laboratory located in KH 541 and 542 although the Windows Computer Laboratory, located in KH 543 will be used for Module 4. The Macintosh Computer Laboratory will simply be called the Mac Lab throughout these modules.

There will be lecture/ demonstrations for each module. You will be expected to attend one of the lecture/demonstrations each week.

Records

Since selection of the Lecture/Demonstration session you will attend each week is an individualized decision, keeping an accurate profile of your progress is important. You will receive an Individual **Competency Verification Sheet** for your use in monitoring your progress. Periodically throughout the semester your course instructors will be given a summary of your status. Always compare your records with the summary and bring any discrepancies to the attention of a laboratory attendant. Also, keep your copy of the Competency Verification Sheet that has been signed by a laboratory attendant.

Law LB 581

79-1311. Teacher training programs; requirements; prepare plan. (1) In order to derive the fullest benefits from educational telecommunications, to assist with the improvement of elementary and secondary education, to encourage and apply research on human learning, perception, cognition, and instructional design, to encourage and apply any other relevant research to the development and use of technology, and to establish ' Nebraska as a leader in educational technology and teacher training, teacher training programs in Nebraska shall develop and integrate into their curriculum academic programs which train future teachers in an understanding of the latest information and communications technologies, including, but not limited to, instructional television, instructional computing, film, videodisc, and other telecommunications technologies and in the appropriate uses of such information and technologies in the instructional process. The programs shall make every effort to develop interdisciplinary approaches and are authorized and directed to draw upon techniques and expertise found throughout the public and private sector, including, but not limited to, the State Department of Education, the Nebraska Educational Telecommunications Commission, educational service units, postsecondary educational institutions, and private entities.

(2) By September 1, 1988, all teacher training programs at state postsecondary educational institutions shall report to the Legislature a plan for achieving the intent of subsection (1) of this section. The plan may be submitted individually or jointly with other teacher training programs in the state. At a minimum, each plan shall include evidence of agreements arrived at with at least two other entities, either in the public or private sector, to share resources and enhance teacher training programs. Such entities may be located either within or outside the state.

Source: Laws **1987, LB 581, § 1;** R.S. 1943, (1994), § 79-12,153; Laws **1996, LB** 900, § **967.**

APPENDIX B

EDUC 2520 Instructional Technology Pre and Post Survey With Results

Part 1: Personal information

We are gathering information about your area of interest. Please bubble in the response that best fits your situation.

1. What is your gender? 21 Male 96 Female

2. Who is you EDUC 2520 course instructor?
   26 Akers 25 Edick 25 Topp 41 Ziebarth

3. What is your intended certification area?
   63 ELED 26 SED 8 SPED 7 K – 12 13 Speech Path

4. When did you graduate from high school?
   a. 1982 or earlier 12
   b. 1983 – 1986 7
   c. 1987 – 1991 16
   d. 1992 – 1995 41
   e. 1996 or later 41

   Age: 82 under the age of 26 32 over the age of 26 2 wrong data 1 missing

5. What is your academic year in college?
   a. Freshman 0
   b. Sophomore 1
   c. Junior 49
   d. Senior 48
   e. Post BS 19

6. Do you use a computer at your place of residence?
   a. yes 99 b. no 18

7. What type of computer do you have at your present place of residence?
   a. MAC 11
   b. PC 86
   c. both 14
   97 people have computers (2 missing data)

8. Do you use a computer at work?
   a. yes 55 b. no 61 1 missing

9. Have/do you use a computer in other University classes?
   a. yes 82 b. no 35

Part 2: Attitudes about computers

Please mark scan sheet with the corresponding letter for the response which most closely indicates your choice.

Results:		Pre Mean	Post Mean	Effect Size
How do you feel about computers?				
10. Nervous	a b c d e Confident	3.54	3.88	0.34
11. Good	a b c d e Bad	2.04	1.79	-0.25
12. Hard	a b c d e Easy	3.28	3.60	0.32
13. Uninterested	a b c d e Excited	3.53	3.59	0.06
14. Important	a b c d e Unimportant	1.64	1.63	-0.01
How do you feel about the Internet?				
15. Nervous	a b c d e Confident	3.56	4.18	0.62
16. Good	a b c d e Bad	2.11	1.87	-0.24
17. Hard	a b c d e Easy	3.57	4.04	0.47
18. Uninterested	a b c d e Excited	3.88	3.83	-.002
19. Important	a b c d e Unimportant	1.86	1.86	0.00
How do you feel about using the computer in the classroom?				
20. Nervous	a b c d e Confident	3.23	3.74	0.51
21. Good	a b c d e Bad	2.13	1.97	-0.16
22. Hard	a b c d e Easy	3.32	3.61	0.29
23. Uninterested	a b c d e Excited	3.56	3.74	0.18
24. Important	a b c d e Unimportant	1.89	1.81	-.08

Computer Experience

25. On a scale of 1 – 5, one being very little, how proficient are you in using a computer?	3.28	3.79	0.51
26. On a scale of 1 – 5, one being not very likely, how likely are you to use a computer in your teaching, if they are available?	3.75	3.91	0.16

Part 3: Basic Computer Competence Survey

Please answer question 27 – 71 by bubbling the response you feel best fits your level of proficiency for each of the following computer-related technologies.

A. Unfamiliar – I do not know what this item is.
B. No proficiency – I have no proficiency. I know what this item is, but do not know how to use it.
C. Low proficiency – I have a little proficiency with this item.
D. Medium proficiency – I have some proficiency with this item, but could use some advanced training.
E. High proficiency – I am very highly proficient with this item.

Results:	Pre Mean	Post Mean	Effect Size
Basic Computer Operation Skills			
27. Insert and eject floppy diskette	3.10	4.74	1.64
28. Store files in a folder/subdirectory	2.58	4.28	1.70
29. Access information on CD-ROM, floppy drive, hard drive	2.17	4.16	1.99
30. Create and delete folders/subdirectories	2.42	3.97	1.55
31. Overall rating of basic computer operation skills	2.59	4.13	1.54
Setup, Maintenance, and Troubleshooting of Equipment			
32. Protection of floppy diskettes	4.47	3.97	–0.05
33. Virus protection	4.43	3.28	–1.15
34. Connecting peripheral devices	4.17	3.20	–0.97
35. Managing memory	3.66	3.27	–0.39
36. Overall rating of ability to setup, maintain, and troubleshoot equipment	4.09	3.35	–0.74
Word Processing Proficiency			
37. Set margins, change font size and type	1.97	4.41	2.44
38. Use grammar tools including thesaurus	1.89	4.40	2.51
39. Cut, copy, and paste in and between documents	1.82	4.34	2.52
40. Insert files, graphics, and tables in a document	1.93	4.18	2.25
41. Overall rating of word processing ability	2.14	4.27	2.13
Spreadsheets Proficiency			
42. Enter data in cells	3.20	4.35	1.02
42. Move data within a spreadsheet	3.02	4.09	1.07
43. Use formulas	2.74	3.80	1.06
44. Create charts	2.91	3.93	1.02
45. Overall rating of spreadsheet management ability	2.88	3.89	1.01

Results:	Pre Mean	Post Mean	Effect Size
Database Proficiency			
46. Enter data in a database	2.70	3.70	1.00
47. Sort and search in a database	2.63	3.55	0.92
48. Produce a report in a database	2.50	3.42	0.92
49. Queries	2.15	3.09	0.94
50. Overall rating of competencies using a database	2.50	3.44	0.94
Networking Proficiency			
51. Logging on a network	2.65	3.66	1.01
52. Working in a network environment	2.44	3.38	0.94
53. Electronic file sharing	2.11	2.99	0.88
54. Knowledge of advantages of server	2.08	3.04	0.96
55. Overall rating of networking skills	2.25	3.32	1.07
Telecommunication Proficiency			
56. Send and receive E-mail	4.31	4.66	0.35
57. Navigate the WWW	4.10	4.50	0.40
58. Subscribe to a List-serve	2.66	3.54	0.88
59. Develop programs using authoring system or language	2.80	3.11	0.31
60. Overall rating of telecommunication	3.35	3.82	0.47
Media Communication Proficiency			
61. Use an overhead	2.26	4.20	1.94
62. Develop an electronic slide show	2.29	3.72	1.43
63. Develop an interactive electronic slide show	2.09	3.51	1.42
64. Develop a presentation utilizing graphics and sound	2.20	3.61	1.41
65. Overall rating of media communication skills	2.20	3.67	1.47
Social, Legal, and Ethical Issues			
66. Knowledge of copyright laws	3.16	3.78	0.62
67. Knowledge concerning shareware	2.53	3.45	0.92
68. Knowledge of software piracy	2.80	3.51	0.71
69. Knowledge of intellectual property rights	2.47	3.42	0.95
70. Overall rating of social, legal, and ethical issues	2.74	3.51	0.77

Discussion Questions for Level I with Student Responses

1. When you learned about the lab requirement and looked at the module schedule, what was you initial reaction?
   Overwhelmingly students were concerned about the additional work required for the class. This is a three credit hour class that requires the 11 hours of lab and 40 hours of classroom observation. The lab component is pass/fail and students thought the course should give credit for the work. Those students who had prior knowledge felt they should be able to test out. Students who needed refreshed or to learn technology were thankful for the requirement but still worried about fitting the lab time into where schedule. Students were interested in testing out of the modules they felt they already had a good level of proficiency.

2. After completing half of the modules required what is the impact on your technology skills?
   Most students felt the labs were too much information to fast. Not enough time for mastering the task.
   Broadened skills, only how step by step - could not do outside of class. Some do not seem relevant. More familiar. Did not master, very frustrating. Could have done the first half by myself. New most already. Software review. Went too fast to really learn. What can a person learn in 35 minutes? Relieved anxiety and helped brush up on skills.

3. If you had the option to test out of modules during the first two weeks of class, knowing that you would not receive any help, how many modules do you think you could have tested out of? And would you try to test out?
   Students stated they would take the time to test out of at least half of the modules. If they could use the tutorial 3/4 of the students though they could test out of most if not all of the modules. Even students who did not feel they had great skills felt they could test out of at least three of the modules.

4. After completing the modules this week do you feel prepared to use one of the skills you have learned in your lesson plan?
   Most students thought they could use at least one of the skills learned to prepare a lesson.

5. Do you think you could do the modules without the direct instruction from the lab techs? Do you use the tutorial during the lab?
   Overwhelming consent: students would learn more if they had to go through the modules themselves with only the support of the lab techs. The student's thought the lab should be changed to either be self paced with the lab support or to be more instructional and less step by step instruction.

Other thoughts: The class should be given more weight or credit.

The Survey of Student Teachers Computer-Related Technology with Results

Section One: Teacher Background Information

We need some information about you. Please fill in the corresponding bubble on the answer sheet to the letter which best answers each question.

1. What is you gender?
   A. Female -- 42 B. Male -- 13

2. What is your age?

A. 20 to 22	B. 23 to 26	C. 27 to 28	D. 29 or Over
21	13	2	8

3. Do you have a computer at home?

A. Yes	B. No
45	9

4. What grade level did you Student teach during the Fall 1999 semester?
   A. Pre - K to 3 -- 30 B. 4 to 6 -- 12 C. Middle School -- 4
   D. High School -- 7 E. K – 12 -- 2

5. Do you use a computer in your teaching?

A. Yes	B. No
42	13

6. Do you have access to a computer daily to use with students in your school?

A. Yes	B. No
50	5

7. Did you complete UNO course EDUC 2520?

A. Yes	B. No
52	3

8. Did you complete any other computer related course?

A. Yes	B. No
32	2

9. What year of college education did you complete EDUC 2520?

A. Sophomore	B. Junior	C. Senior	D. Post Degree	E. Not complete
12	29	4	7	3

10. How many computer-specific courses did you complete in your undergraduate experience?

A. None	B. One	C. Two	D. Three	E. Four or more
11	22	16	3	3

11. Did you receive an educational computing minor?

A. Yes	B. No
0	55

12. What was your undergraduate grade point average?

A. Less than 2.0	B. 2 - 2.99	C. 3 - 3.99	D. 3.5 - 4.0
0	4	17	33

13. When you were in college, did you have daily access to a computer at your residence?

A. Yes	B. No
35	20

14. During your undergraduate courses, did you see uses of computer related technology used with students (excluding slide presentation)?

A. Never --6
B. Less than once per week -- 24
C. About once per week -- 9
D. 2 to 4 times -- 12
E. Almost daily -- 4

15. When you were in high school, how did you use the computer most frequently for school related activities?

A. Did not use -- 20
B. Programming -- 3
C. Word Processing -- 31
D. Database or spreadsheet -- 1
E. Computer Assisted Instruction -- 0

16. During your undergraduate courses, did you use the Internet to complete any assignments?

A. Never -- 1
B. Less than once per week -- 22
C. About once per week -- 26
D. 2 to 4 times per week -- 0
E. Almost daily -- 6

17. What is the importance of undergraduate education majors completing a course dealing with educational computing in the classroom?

A. Not important at all -- 0
B. Not very important -- 0
C. No opinion -- 6
D. Very important -- 27
E. Very important and should be required -- 21
1 Missing

18. What platform to you use most often?

A. PC -- 36
B. MAC -- 17

Section two: Instructional Uses of Computer-Related Technologies

In the following section we will be looking at these three areas of uses of computer-related technologies: 1) your proficiency in using these technologies, 2) your interest in using these technologies, and 3) you frequency of using these technologies.

Part 1: Your proficiency
We would like you to rate your proficiency in using the following computer-related technologies. Please mark the corresponding bubble on the answer sheet to the number that best describes your proficiency in using each item.

A. Unfamiliar – I do not know what this item is.
B. Nil – I have no proficiency. I know what this item is, but do not know how to use it.
C. Low – I have a little proficiency with this item.
D. Medium – I have some proficiency with this item, but could use some advanced training.
E. High – I am very highly proficient with this item.

Computer Based Instruction	**A**	**B**	**C**	**D**	**E**	**Mean**
23. Drill and practice	11	5	15	15	8	3.07
24. Tutorials	8	6	11	24	5	3.22
25. Educational games	1	4	15	22	11	3.72
26. Problem solving/ Higher order thinking	4	8	18	16	7	3.29
27. Simulations	7	14	16	13	4	3.26

Computer Tool Software	**A**	**B**	**C**	**D**	**E**	**Mean**
28. Word Processing	0	0	1	17	36	4.65
29. Databases	1	3	20	19	11	3.67
30. Spreadsheets	0	5	21	18	10	3.61
31. Desktop publishing	2	10	20	13	9	3.31
32. Graphics / drawing programs	1	5	20	15	13	3.36
33. Grading program	1	10	20	16	7	3.33

Other	**A**	**B**	**C**	**D**	**E**	**Mean**
34. Teacher Utilities	12	12	16	13	1	2.61
35. Telecommunications	6	10	17	16	5	3.07
36. Distance Learning	10	18	17	7	2	2.50
37. Programming	3	27	18	4	1	2.49
38. Hypermedia (e.g. Hypercard, Hyperstudio, Power point, Clarisworks)	2	8	19	17	8	3.39
39. E-mail	0	0	8	15	31	4.43
40. Web Searching	0	1	3	19	31	4.48

Part 2: Your interest
We would like you to rate your interest in using the following computer-related technologies for instruction in your classroom or computer lab. Please mark the corresponding bubble on the answer sheet to the number that best describes your level in using each item.

A. Unfamiliar – I do not know what this item is.
B. Nil – I have no interest in using this in my classroom or computer lab.
C. Low – I have little interest in using this in my classroom or computer lab.
D. Medium – I have some interest in using this in my classroom or computer lab.
E. High – I am very interest in using this in my classroom or computer lab.

Computer Based Instruction	**A**	**B**	**C**	**D**	**E**	**Mean**
42. Drill and practice	6	4	20	16	7	3.26
43. Tutorials	6	7	14	16	9	3.29
44. Educational games	2	1	2	24	24	4.26
45. Problem solving/ Higher order thinking	2	1	7	19	24	4.17
46. Simulations	4	4	10	22	13	3.68

Computer Tool Software	**A**	**B**	**C**	**D**	**E**	**Mean**
47. Word Processing	0	0	1	4	13	4.55
48. Databases	0	4	10	18	21	4.06
49. Spreadsheets	1	7	7	19	19	3.91
50. Desktop publishing	0	4	7	20	22	4.13
51. Graphics / drawing programs	0	2	4	20	27	4.32
52. Grading program	1	0	3	14	35	4.55

Other	**A**	**B**	**C**	**D**	**E**	**Mean**
53. Teacher Utilities	6	3	5	21	18	379
54. Telecommunications	4	4	10	19	16	3.74
55. Distance Learning	6	6	16	14	11	3.34
56. Programming	4	10	17	16	6	3.19
57. Hypermedia (e.g. Hypercard, Hyperstudio, Power point, Clarisworks)	1	4	9	13	26	4.11
58. E-mail	0	1	5	11	36	4.55
59. Web Searching	0	0	3	11	38	4.67

Part 3: Your frequency of use
We are trying to find out what frequency these computer-related technologies are being used for instruction. Please mark the corresponding bubble on the answer sheet to the number that indicates the approximate number of times you have used these computer-related technologies in your classroom or computer lab during the your student teaching semester.

A. I am not familiar with this term
B. Never
C. Sometimes (1 – 4 times a year)
D. Often (5 – 10 times a year)
E. Very often (more than 10 times a year)

Computer Based Instruction	**A**	**B**	**C**	**D**	**E**	**MEAN**
60. I provide opportunities for my students to use drill and practice.	5	17	18	7	6	2.85
61. I provide opportunities for my students to use tutorial programs.	5	26	16	5	1	2.45
62. I provide opportunities for my students to use a word processing program as a writing tool.	0	16	18	11	8	3.21
63. I provide opportunities for my students to take tests or quizzes on the computer.	3	41	5	2	2	2.23
64. I provide opportunities for my students to use spread-sheet programs.	2	43	7	1	0	2.13
65. I provide opportunities for my students to use database management programs to store, access and manipulate information.	2	39	9	1	2	2.28
66. I use a computer to explain or demonstrate an idea or skill to the entire class.	3	24	17	4	4	2.65
67. I provide opportunities for my students to use simulation programs.	1	36	13	3	0	2.34
68. I provide opportunities for my students to use desktop publishing programs.	1	35	12	1	4	2.47
69. I use the computer to teach problem solving.	2	38	10	3	0	2.26
70. I provide opportunities for my students to work on the computer in groups.	1	18	16	9	8	3.10
72. I provide opportunities for my students to use interactive videodisc systems.	4	29	10	6	3	2.42
73. I use the computer to help manage student information	3	27	10	4	9	2.79
74. I provide opportunities for my students to use art / graphic programs.	1	25	15	7	5	2.81
75. I use hypermedia to present information (e.g. Hypercard, Hyperstudio, Power point, Clarisworks)	3	39	8	2	1	2.23
77. I provide opportunities for my students to use any type of CD ROM applications.	2	22	18	5	6	2.83

78. I provide opportunities for my students to use hypermedia applications.	5	37	9	1	1	2.17
79. I use e-mail to communicate with other teachers.	2	24	11	8	7	4.23

Section Three: Teacher Attitudes Toward Computers and Computer-Related Technologies

To what extent do the following statements characterize your attitudes toward computers and computer-related technologies. Using the categories below, indicate the extent to which you agree or disagree with each statement by marking the corresponding bubble on the answer sheet to your response.

A Strongly Disagree **B** Disagree **C** Undecided **D** Agree **E** Strongly Agree

	SD	D	U	A	SA	Mean
80. I think computers make my professional work more difficult.	18	26	5	2	2	1.94
81. I am comfortable in using computer-related technologies for my own work.	18	21	7	6	1	2.08
82. Having a computer in the classroom is essential.	0	3	5	20	25	4.26
83. I would use computer-related technology more if the necessary hardware and software were available in my school.	2	4	9	26	12	3.79
84. It has been a struggle for my to learn how to use a computer successfully.	15	26	3	7	2	2.15
85. Computer-related technologies are an important part of the future for improving the quality of education.	0	2	8	19	24	4.23
86. I lack confidence in using a computer to complete my work.	18	21	7	6	1	2.08
87. I would like to improve my skills in the use of computer-related technologies.	0	0	3	29	21	4.34
88. The computer is useful for accessing and organizing information.	0	0	2	26	25	4.43
89. Computer-related technologies are an important part of the future for improving the quality of education.	0	2	8	19	24	4.23
90. Computers are of little value in education because they can be used to teach only one or two subjects.	34	15	3	0	0	1.40
91. Computer-related technologies should be used to improve learning throughout the curriculum.	0	1	4	31	17	4.21
92. Computer-related technologies should be used by teachers more than they are now.	1	3	7	28	14	3.96
93. I believe that textbooks will be replaced by electronic media within 5 years.		8	16	20	9	0 2.57
94. I believe that the role of schools will be dramatically changed because of the Internet within 5 years.		1	13	15	17	6 3.27

95. I do not have the time to incorporate computer-related technologies into my classroom.	17	23	8	4	1	2.04
96. Overall, I think the computer is a very important tool for instruction in my classroom.	1	2	11	21	18	4.00
97. Computer-related technologies are of little value in the classroom because they are to difficult to use.	19	26	7	1	0	1.83
98. I would like to use computer-related technologies more in my teaching.	0	1	9	30	13	4.04
99. I believe that the role of teachers will be dramatically changed because of the Internet within 5 years.	4	14	19	13	3	2.94
100. I believe that having my students search the Internet for information for a classroom assignment is time well spent.	0	1	14	25	13	3.94
101. Technology can help accommodate different learning styles.	0	1	0	31	20	4.35

102. Using the following scale please mark the bubble on the answer sheet that best indicates your evaluation of the preparation you experience for using educational computer-related technologies at University of Nebraska.

A	B	C	D	E
Very Inadequate	Inadequate	Adequate	More than Adequate	Outstanding
3	13	27	6	2

103. What is your rational for the rating selected in question #102

Technology Responses from Student Teacher Survey Fall 1999

- It would have been more helpful for each student to be given more instruction about computers during the instructional systems class. I would have liked to had more detailed instruction followed by enough time to actually work on and experience the functions of each program.
- I think that more time should be spent in the computer lab learning how to use both PC and MAC. During my Instructional Systems class, the only type of computer offered for tutorials was the MAC. College students should be required to take at least two - three credit classes in how to use computers in different ways in the classroom. College students should be exposed to both types of computer (MAC/PC) so that they are not wasting their own classroom time learning how to navigate whatever computer their district has decided to go with.

- The vast majority of the computer-related technology education I received took place in only one or two courses. These teachings had a "crash course" type of pace and feeling to them. It seemed that they were set up and conducted with the frame of mind that they were merely something that HAD to be taught to prospective teachers (i.e., it wasn't REALLY important that we became truly knowledgeable and skillful at applying the computer-related technologies in a real classroom with students). Computer-related technologies instruction took place only occasionally in my other Teacher Education courses...when it did, it was presented simply as an interesting adjunct to the rest of the course requirements.

I was only required to take the computer class that went along with Instructional Systems. I would have liked to have been able to take more classes that dealt with computers, but because none of my other classes required computers or having to know about computers, I didn't get a chance to learn more about them. Computers are a large part of today's kids' lives. I think that teachers should be aware of how to use them and all of the programs that are available to them. I would have liked having more time to learn about useful ways to use the computer in a classroom and both formats - PC and MAC

- I am not very interested in computer technology, however, if I had access to a computer, I would be more likely to become interested.
- I feel it was too early in my undergraduate experience. I forgot or wasn't able to use the technology until I was in my student teaching. I think it should be one of the last classes we take so it is fresh in our minds.

- I received little training in computer technology at UNO. I am self taught but I believe it would be nice to offer a program to teachers.
- While the program itself was well organized and well thought out, the time frame was too short for me; too much to digest in too little time. I have managed to retain some of what I learned and continue to use that portion of the training.
- I think UNO should require a class specifically to teach how to use MACs and PCs.
- I have found computers very valuable in the classroom. I have had to spend a lot of time going over various aspects in order to present it to students, but it was time well spend. My classes at Uno that prepared me for this are Instructional Systems with Dr. Ziebarth and Interactions between Parents and Professionals with Dr. Armfield.
- The Instructional Systems class we took had too much information jammed into one semester. I wouldn't have minded taking one more semester of a computer related course. I wish I would have learned more about different grading programs and where to obtain them.
- The only time I was taught about computer use and related technologies was in instructional systems, and doing a hyper-studio stack in social studies. As an untraditional, part-time student there was a lot of time between those classes and student teaching where I did not get to apply what I had learned, so I don't remember much! If EVERY class required some educational computer-technology, those of us who are not naturals at computers would greatly benefit.

- I use computers daily, but know a few things very well. I struggled with computer classes because I was intimidated by computers, and did not want other students and teachers to know it.
- My reason for selecting inadequate is because of the method of instruction that was in our Instructional Systems class. We spent computer time following directions out of a book - which I forgot immediately after the first use. In order for learning to take place, we have to cover an area more than once. If I had to try and remember how to put a link on a website now, I would have to go to the book and follow the directions. I don't feel it was time well spent, especially since what we learned was never reinforced (used in assignments, projects, etc.).
- Daily exposure to all forms of technology. Availability of computers and technological programs.
- I did not receive any computer training while at UNO except for the Power Point Presentation program from one of my professors on the side for a project.
- I believe that UNO gives ample access to its computer room and all its accessories. I also believe that the courses covering computer technology were more than accurate.
- I just don't feel as though I received ample amounts of opportunities to practice my skills in computer technology. I wish that I would have had more opportunities to use a variety of computer technology during my college courses. I think that the more practice I receive, then the better and more successful I will become in this area.

- I feel that the computer-related technologies taught at UNO were adequate because I feel very comfortable using a computer. I know how to use the computer for the purposes and needs of my career. I enjoy using it.
- it helped be to prepare for student teaching a lot
- I already had much of the background I needed for student teaching through other training programs.
- At the time that I took Instructional Systems the course was sufficient for the level that technology was at the time. Today technology has advanced so much, that I feel like I am not as knowledgeable as some of the students who are in elementary school today. I strongly believe that a course dedicated strictly to the use and application of computers and computer programs would help the next group of student teachers immensely.
- because I am still so unfamiliar and uncomfortable using computers with my students, they usually tell me how to use them
- I feel that we should have been required to take more computer related courses.
- I was able to use a computer lab at any time.
- The time spent was too short for the information to be retained.
- For me, the best way to learn is by doing. UNO did not really hinder or help. I use a computer at home and UNO made me use their computer in that lab section. I was already familiar with what they were teaching so what was the point?

- I do not think that if I had known nothing about computers at all when I took the one computer based education class, I would not have used technology the way that I do now.
- I think the computer classes I took gave me just enough experience on a computer to do things on my own. This has helped me grow on the computer as I use it now.
- I was rushed through several Clarisworks programs during EDUC 2520. We were not in the lab enough to actually learn how to use the programs to benefit our teaching.
- I think that more time learning about computers and the way that teachers can use them would help teachers in training a lot. I would have liked to to know how I, as a teacher, could incorporate computers and what computers have to offer to my classroom. I still don't know all that the computer can do for me or my classroom.
- I thought that through the class of Instructional Systems and the computer lab that was required introduced me to several programs that I had not used before. I think that the manual that was made up that walked us through each step was very helpful and easy to understand. In some on the programs, I still use it today. Kelly was a great instructor in the labs!!!
- All of the computer training I had for my education courses was on the Mac. High Schools do not use Macs. I would have liked to learn more PC software, such as Power Point, and Excel.
- I do not think that there was enough time in the class that was given to "learn" anything about the computer or the things that you can do. Most of us just know from

experience and "playing with the computer". I think that there should be a class that really takes time to break down the computer and how you could use it in the field of education.

- I know how to use computers
- If I had not taken a software class for my special education endorsement, EDUC 2520 would have been my only exposure to computers.

104. Please write comments, questions, or concerns.

- I would have appreciated it if I had been informed as to who exactly receives my survey information and what exactly they do with it. The only information I received in this regard was in the notification which was mailed to me...it read, "The University seeks to improve programs and services to student teachers through the evaluation process". This is quite vague and diluted the importance of your survey in my eyes.
- This questionnaire is not a good tool for evaluating student teaching. More needs to be asked about the student teaching experience, not about computer technology. I think the concern of the University should be with our experience in dealing with our cooperating teachers and University supervisors.
- Ms. Mudd please stress to future student teachers that using computer programs for teacher records is an easy program to figure out and it saves a lot of valuable time. Instruction wise, it adds spice and variety in the classroom. Kids get excited and gain the valuable computer experience that the new millennium will require.

- I would like to know of some classes that UNO offers that are basic computer courses where I could learn more about the different programs that are in the schools today and also programs that I could use in my personal life. I noticed that the classes offered at UNO are all programming or business related computer courses. What about the basic knowledge classes? Where are they?
- I think the university should require a more detailed computer course as well as a course in multimedia.
- Another area that you may want to consider having a required course on is Classroom Management. I think that it would help the student teachers feel more at ease if they had a base to work with when they walked into their classroom for the first time. I never had such a course and I still managed to keep my classroom in order, but it would have been much easier if I had a bag of tricks to pull from to get some ideas on how to deal manage certain situations.
- Have one single class totally devoted to computer technology and require the class to be taken the semester before student teaching. After over a year of not using ClarisWorks or a MAC computer, it took awhile to reteach myself. I am very proficient with a PC, so I didn't have a lot of trouble, but I have friends who know little about computers and they really struggled later on.
- I don't feel that I should have to pay the technology fee during student teaching. I'm never on campus to use the labs. I use the school's computers or I use my home computer. I don't think it's fair to be charged for paper when I'm not even there to print.

- My degree in Special Ed never prepared me for the prejudice against sped students. If I wanted to use a computer lab, regular education classes had priority over me. I had such varying levels in my classes that using a computer lab would've been below the ability of some of my students. I defiantly believe that there is a place for the computer in the classroom.

APPENDIX C

Guidelines from the Nebraska Department of Education Education Technology Center Nebraska Department of EDUCATION	This document was created by a task force made up of representatives from the Nebraska Department of Education, Nebraska State Education Association, Nebraska Education Technology Association, K-12 Classroom Teachers, Higher Education, Technology Coordinators and Educational Service Units. It is based on the International Society for Technology in Education (ISTE) National Education Technology Standards for Students (NETS). There were a few instances where additions or revisions were made to the original NETS standards. Each modification is noted.

BASIC TECHNOLOGY OPERATION

APPLICATION OF TECHNOLOGY IN INSTRUCTION

PROFESSIONAL USE OF TECHNOLOGY

SOCIETAL, ETHICAL AND HUMAN IMPACT OF TECHNOLOGY

BASIC TECHNOLOGY OPERATION

Educator Competencies	Examples of Performance Indicators	Referenced ISTE Foundation
1. The educator is able to: use computer platforms to run programs; search for, access, generate, and manipulate data; print, publish, and communicate electronically	• Uses basic computer operations such as editing, file management, printing, multi-tasking. • Evaluates the capability of a computer system and identifies appropriate peripherals that are compatible with the system. • Applies basic trouble shooting strategies for the hardware and software components of the computer system. • Understands the concepts of networks. • Operates a computer and peripherals on a network or through remote access. • Uses Internet applications such as telnet, Web browsers, file transfer protocol, video conferencing, Listservs and Newsgroups, E-mail and search engines. • Uses technologies such as E-mail, professional interchange networks, and research data bases like ERIC to access and exchange information. • Uses terminology related to computer and technology appropriately in written and oral communication. • Accesses help or support resources in solving problems.	*A1. Operate a multimedia computer system with related peripheral devices to successfully install and use a variety of software package.* *A2. Use terminology related to computers and technology appropriately in written and oral communications.* *A3. Describe and implement basic troubleshooting techniques for multimedia computer systems with related peripheral devices*
2. The educator is able to identify, evaluate, and use appropriate computer and other current educational technologies to support the learning process for all students.	• Knows how to assess, select and use various hardware types to support instruction such as: computer systems, CD-ROMs; scanners; projection devices; calculators; audio/video recorders and players; videodiscs, cameras; and other distant education systems. • Demonstrate knowledge of uses of computers and technology in business, industry and society. • Applies effective uses of broadcast instruction, audio/video conferencing, and other distant leaning applications.	*A1. Operate a multimedia computer system with related peripheral devices to successfully install and use a variety of software package.* *A4. Use imaging devices such as scanners, digital cameras, an/or video cameras with computer systems and software.* *A5. Demonstrate knowledge of uses of computers and technology in business, industry, and society.* *B8. Observe demonstrations or uses of broadcast instruction, audio/video conferencing, and other distant learning applications.*

APPLICATION OF TECHNOLOGY IN INSTRUCTION

Educator Competencies	Examples of Performance Indicators	Referenced ISTE Foundation
3. The educator is able to evaluate and use different types of educational software and electronic resources.	• Selects and uses various software types to support instruction such as: word processing; data base; spreadsheet; hypermedia; web authoring; simple graphics; desktop publishing; encyclopedias (CD); subject-matter software; on-line resources; and presentation and administrative software.	*C1. Explore, evaluate and use computer/technology resources including applications, tools, educational software and associated documentation.*
4. The educator is able to apply current instructional principles, research, and appropriate assessment practices as related to the use of computers and technology resources in the curriculum.	• Applies an understanding that the characteristics of learners and the nature of the learning task, influence the selection and use of technology-based instructional strategies and presentation techniques. • Implements various assessment strategies when utilizing technology in the curriculum.	*C2. Describe current instructional principles, research, and appropriate assessment practices as related to the use of computers and technology resources in the curriculum.*
5. The educator is able to design, deliver, and assess student learning activities that integrate computers/technology for a variety of student group strategies and for diverse student populations.	• Creates and uses learning activities which incorporate technology while considering the diverse needs of all students such as multiple languages and physical and learning challenges. • Facilitates learning in individual, small and large groups using differing amounts and types of technological resources. • Implements various assessment strategies when utilizing technology in the curriculum.	*B5. Demonstrate awareness of resources for adaptive assistive devices for student with special needs.* *C3. Design, deliver, and assess student learning activities that integrate computers/technology for a variety of student group strategies and for diverse student populations.*
6. The educator is able to design, develop, and implement instructional units utilizing computers and related technologies to enhance the curriculum area(s).	• Infuses appropriate technology which supports the curriculum focus. • Facilitates the transfer of technology from one subject to another. • Prepares and delivers learning activities integrated into instructional units that utilize computer based technology tools.	*None*
7. The educator is able to use multimedia, hypermedia, and telecommunications in instruction.	• Uses multimedia, hypermedia, and telecommunications to support effective instructional activities for lessons, presentations, demonstrations and student projects. • Facilitates or delivers effective learner centered instruction using distance education technologies.	*B2. Apply productivity tools for creating multimedia presentations.* *C3. Design, deliver, and assess student learning activities that integrate computers/technology for a variety of student group strategies and for diverse student populations.*

PROFESSIONAL USE OF TECHNOLOGY

Educator Competencies	Examples of Performance Indicators	Referenced ISTE Foundation
8. The educator is able to utilize applicable software to create word processing documents, data bases, spreadsheets, graphics, presentations and electronic publications.	• Uses productivity tools to enhance professional tasks such as correspondence, assessment, classroom materials, presentations, etc.	*B1. Use productivity tools for word processing, database management, and spreadsheet application.*
9. The educator is able to utilize various technologies for problem solving, data collection, information management, communications, presentations, and decision making.	• Uses computers for problem solving, data collection, information management, communication, presentations, and decision making in producing surveys, technology plans, staff development activities, collegial communication, budget preparation, class schedules, and develop curriculum.	*B4. Use computers to support problem solving, data collection, information management, communications, presentations, and decision making.*
10. The educator is able to use computers and related technologies to access information to Enhance professional growth.	• Utilizes computer-based technologies in accessing information to enhance professional productivity, conducts research and communicates through local and global networks. • Uses technology to remain current in specific disciplines.	*B3. Use computer-based technologies including telecommunications to access information and enhance personal and professional productivity.*
11. The educator is able to identify and use resources for staying current in applications of educational technologies.	• Uses available resources which support currency in computing and related technologies in education such as ESUs, Nebraska Department of Education, Internet, professional organizations, conferences, and journals.	*None*

SOCIETAL, ETHICAL AND HUMAN IMPACT OF TECHNOLOGY

Educator Competencies	Examples of Performance Indicators	Referenced ISTE Foundation
12. The educator models appropriate behaviors inside and outside the classroom which promote equitable, ethical, and legal use of computers and related technologies.	• Understands equity, ethical, legal and human issues of computing and technology use as they relate to society. • Models behaviors in and outside the classroom which promote ethical and legal use of computer-based resources. • Understands and upholds current copyright laws, rights and responsibilities. • Understands and applies appropriate attitudes and skills towards: the change process; advanced training; new ideas; adapting software and strategies to individual and group needs; and utilization of available resources. • Designs student learning activities which foster equitable, ethical, and legal use of technology by students.	*B6. Demonstrate knowledge of equity, ethics, legal, and human issues concerning use of computers and technology.* *C5. Practice responsible, ethical and legal use of technology, information, and software resources.*
13. The educator is able to use computers and related technologies to accommodate lifelong learners and the emerging roles of learners and educators.	• Utilizes computers and related technologies to facilitate emerging roles of learners and educators such as creating active learners, teachers as facilitators of information, life long learners and an awareness of the impact of technology on lives and careers.	*B7. Identify computer and related technology resources for facilitating lifelong learning and emerging roles of the learner and the educator.*

Nebraska Educator Competencies in Technology and Corresponding Module Which Satisfy the Competencies Requirement

Educator Competencies	Modules Satisfying Competency
BASIC TECHNOLOGY OPERATION	
1. The educator is able to: use computer platforms to run programs; search for, access, generate, and manipulate data; print, publish, and communicate electronically	Modules 1, 2, 4, 8
2. The educator is able to identify, evaluate, and use appropriate computer and other current educational technologies to support the learning process for all students.	Modules 1, 4, 5
APPLICATION OF TECHNOLOGY IN INSTRUCTION	
3. The educator is able to: use computer platforms to run programs; search for, access, generate, and manipulate data; print, publish, and communicate electronically	All Modules
4. The educator is able to identify, evaluate, and use appropriate computer and other current educational technologies to support the learning process for all students.	Module 7, 8, 9
5. The educator is able to: use computer platforms to run programs; search for, access, generate, and manipulate data; print, publish, and communicate electronically	Module 7, 8, 9
6. The educator is able to identify, evaluate, and use appropriate computer and other current educational technologies to support the learning process for all students.	Module 7, 8, 9
7. The educator is able to: use computer platforms to run programs; search for, access, generate, and manipulate data; print, publish, and communicate electronically.	Module 1, 7
PROFESSIONAL USE OF TECHNOLOGY	
8. The educator is able to identify, evaluate, and use appropriate computer and other current educational technologies to support the learning process for all students.	Module 3 4, 6, 7, 8, 10, 11

9. The educator is able to: use computer platforms to run programs; search for, access, generate, and manipulate data; print, publish, and communicate electronically.	Module 10, 11
10. The educator is able to identify, evaluate, and use appropriate computer and other current educational technologies to support the learning process for all students.	Module 1, 8
11. The educator is able to: use computer platforms to run programs; search for, access, generate, and manipulate data; print, publish, and communicate electronically	Module 1, 8
SOCIETAL, ETHICAL AND HUMAN IMPACT OF TECHNOLOGY	
12. The educator is able to identify, evaluate, and use appropriate computer and other current educational technologies to support the learning process for all students.	Module 8
13. The educator is able to use computers and related technologies to accommodate lifelong learners and the emerging roles of learners and educators.	Module 8, 9

APPENDIX D

University of Nebraska

Institutional Review Board (IRB)
Office of Regulatory Affairs (ORA)
University of Nebraska Medical Center
Eppley Science Hall 3018
986810 Nebraska Medical Center
Omaha, NE 68198-6810
(402) 559-6463
Fax (402) 559-7845
E- mail: irbora@unmc.edu
http://info.unmc.edu/irb/irbhome.htm

July 29, 1999

Ann Marie Mudd
Kayser Hall, 326
Teacher Education, UNO
UNO - 0161

IRB#: 322-99-EX

TITLE OF PROTOCOL: Technology Preparation : Impact in a Preservice Education Program

Dear Ms. Mudd:

The IRB has reviewed your Exemption Form for the above-titled research project. According to the information provided, this project is exempt under 45 CFR 46:101b, category 2. You are therefore authorized to begin the research.

It is understood this project will be conducted in full accordance with all applicable sections of the IRB Guidelines. It is also understood that the IRB will be immediately notified of any proposed changes that may affect the exempt status of your research project.

Please be advised that the IRB has a maximum protocol approval period of five years from the original date of approval and release. If this study continues beyond the five year approval period, the project must be resubmitted in order to maintain an active approval status.

Sincerely,

Ernest D. Prentice, PhD
Co-Chair, IRB

lw