Preparing New Teachers to Use Technology: a Comparative Study of Preservice Teacher Education Programs.

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PREPARING NEW TEACHERS
TO USE TECHNOLOGY:
A COMPARATIVE STUDY OF
PRESERVICE TEACHER EDUCATION PROGRAMS

A Dissertation

Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy

in

The Department of Curriculum and Instruction

by

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December 1999
DEDICATION

This dissertation is dedicated to the memory of my father, Truby Eric Duhon. His untimely death on January 2, 1992 was certainly a tragedy. However, he left his mark on my life which has remained indelible and ever-present. My father valued education and would be proud that I have completed this work. Thanks, Dad. I love you.
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ABSTRACT

The purpose of this descriptive study was to describe and analyze the technology components in three teacher education programs, and to investigate the technological preparedness of recently graduated first-year elementary (K-5) teachers. The research questions addressed were: (a) How are the teacher education programs at each university in this study preparing students to integrate technology into their classrooms and instruction, and how do the programs compare? (b) How do recently graduated first-year teachers at each university rate their skills in using technology, and how do their ratings compare? (c) How and to what extent do recently graduated first-year teachers at each university use technology in their classrooms, and how do their responses compare? (d) How do recently graduated first-year teachers evaluate their preservice preparation for integrating technology into their classrooms, and how do their evaluations compare?

Qualitative case studies conducted at Georgia State University, Southeastern Louisiana University, and the University of North Texas provided detailed information about how each university's teacher education program was preparing students to integrate technology into their own classrooms. Additionally, the results of a survey completed by 87 first-year elementary (K-5) teachers who were recent graduates of the universities provided quantitative and qualitative data to triangulate the findings of the case studies. Data from the 98-item questionnaire included information on the teachers' personal and professional background, self-rated skills for using technology, classroom use of technology, and evaluation of their preservice preparation to use technology.
Five major components related to the use of technology within the teacher education programs emerged during the course of this study. These components included program design, expectations, facilities, support, and use of technology. Each component, as well as the perceptions of the recent graduates, provided a mechanism for making comparisons between and among the three participating universities. Based on the comparative analysis, several recommendations for revising and improving the way that teacher education programs prepare new teachers to use technology are suggested.
CHAPTER ONE
INTRODUCTION

There is strong support among business leaders, politicians, researchers, and the general public for the integration of technology in our nation's public schools. These educational reformers view technology as the key to improve learning and to prepare students to live, work, and compete in today's more global society. In response to initiatives and pressure from these various groups, K-12 public schools across the nation have experienced dramatic growth in the acquisition of computer-based technologies. Estimated expenditures for the 1997-98 school year are $4.8 billion, and are expected to rise to $5.4 billion in 1998-99 (Quality Education Data [QED], 1998b). As a result of this lofty investment in technology, United States public schools now possess approximately 4.4 million computers, with the average school owning 86 computers for student instruction (QED, 1996; QED, 1997a).

Teachers in today's classrooms are expected not only to integrate technology in their own instruction but also to teach their students how to use technology. Over the next decade America's public schools will need to hire an estimated two million new teachers to replace a generation of educators that will retire. Additionally, student enrollment is expected to reach 50 million by the year 2007 (Greene, 1997). The realities of the future require a professional teaching force that is well prepared to integrate technology in their own instruction to support and to improve their students' learning (Pellegrino and Altman, 1997).
Statement of the Problem

Preparing new teachers to effectively use technology in their teaching practices has become a crucial role for teacher education programs. Yet, colleges of education are often criticized for failing to equip their students with the skills, attitudes, and experiences that will enable them to integrate technology into their future classrooms (U.S. Congress, 1995; National Council for the Accreditation of Teacher Education [NCATE], 1997). Citing studies conducted by the Office of Technology Assessment (OTA), Barksdale (1996) reports that over 50% of recent teacher education graduates stated that they were either not prepared or poorly prepared to use technology in their classrooms and only 3% indicated that they were "very well prepared." These findings are supported by Topp's (1996) survey of recent graduates of a midwestern university who rated their preservice preparation for using technology as inadequate. Therefore, the focus of this study was undergraduate teacher education programs. The problem to be studied was preservice preparation for using technology in elementary or early childhood programs at three southern universities.

The Purpose of the Study

This descriptive study used a combination of qualitative and quantitative methods to: (a) describe and analyze the technology components in the teacher education programs at each university and (b) investigate the technological preparedness of recently graduated, first-year elementary (K-5) teachers. The results of these two investigations allowed for a comparative analysis in order to gain valuable insight into which components of the programs were most effective in preparing new teachers to incorporate technology into their own classrooms.
The Universities

Georgia State University

Georgia State University (GSU), located in downtown Atlanta, is the state’s second largest institution of higher learning. Each year nearly 35,000 students from across the United States and 113 countries attend day or evening classes in full-time or part-time study. With a 32% minority enrollment, the university represents the most diverse student population in the state.

The College of Education at Georgia State is one of the southeast’s largest teacher education programs. The college is composed of six departments: Counseling and Psychological Services; Early Childhood Education; Educational Policy Studies; Educational Psychology and Special Education; Kinesiology and Health and Middle-Secondary Education; and Instructional Technology. While the college is concerned with preparing students for a wide variety of educational positions, special emphasis is placed on preparing students for urban settings. The college is accredited by the National Council for Accreditation of Teacher Education (NCATE) and the Southern Association of Colleges and Schools (SACS).

The department of Early Childhood Education offers a Bachelor of Science degree to students preparing to become pre-kindergarten through fifth grade teachers. Early Childhood Education majors enter the program in their Junior year after completing all required course work in the undergraduate general education core. The program does not offer specific technology courses. Instead, technology seminars are held in conjunction with methods courses. The seminars provide opportunities for preservice teachers not only to learn to use various technological tools but also to learn
how to develop lessons integrated with technology. In addition, students are intentionally assigned to technology-rich schools for field experiences and student teaching (Georgia State University, 1998; Weinburg, Smith, and Smith, 1997).

Southeastern Louisiana University

As one of the fastest growing universities in the nation, Southeastern Louisiana University (SLU) has experienced an 81% increase in enrollment within the last 10 years. With a current enrollment of approximately 15,000 students, SLU is ranked as the fourth largest university in Louisiana. The university also offers the fourth highest percentage of accredited academic programs in the state.

The College of Education is administratively composed of the departments of: Teacher Education; Kinesiology and Health Studies; Special Education and Communication Sciences and Disorders; Counseling, Family Studies, and Educational Leadership; the Laboratory School; and the Office of Field Experiences. The college offers programs that prepare individuals for a wide variety of educational positions in schools, business, and governmental agencies.

The Department of Teacher Education offers a bachelor of arts degree in Elementary Education and a Master of Education in Education. In addition, the department provides professional courses for Secondary Education majors and core education courses to non-majors. The teacher education program is approved by Louisiana’s Department of Education and NCATE.

Students enter the professional program in teacher education no later than the end of their sophomore year. The curriculum utilizes the latest developments in instructional approaches and technology is integrated into some methods courses. At
least 90 semester hours, including one three-hour technology course, must be completed before a student is eligible for student teaching. Although public schools are used for field experiences and student teaching assignments, the availability of technology is not a consideration in making placements (Southeastern Louisiana University, 1998).

University of North Texas

The University of North Texas (UNT) is the leading university in the Dallas-Fort Worth metropolitan area and is designated as a Doctoral I institution by the Carnegie Foundation. With over 25,500 students, UNT is the fourth largest university in Texas. UNT is recognized as one of America’s 100 Most Wired Colleges and provides more computers per student than comparable Texas institutions.

The university also ranks fourth in the nation in the number of professional educators graduated each year. UNT’s College of Education is divided into four departments: Counseling, Development and Higher Education; Kinesiology, Health Promotion and Recreation; Teacher Education and Administration; and Technology and Cognition. Undergraduates seeking state certification for elementary grades pursue a bachelor of science degree with a major in Interdisciplinary Studies.

Students must formally apply to the Department of Teacher Education and Administration before taking any education courses. Successful completion of the university’s core curriculum is one of the requirements for admission to the professional program. This core curriculum includes a separate three-hour technology course which is taught by the college’s Technology and Cognition faculty. In addition, technology is integrated throughout the undergraduate teacher education curriculum (University of North Texas, 1999).
Significance of the Study

As we approach the 21st century, there is an increasing demand for technology-trained teachers in our nation's elementary schools. To meet this demand, many colleges of education are evaluating their preservice teacher preparation programs and are committed to instituting changes to make technology an integral part of their curriculum. The findings of this study provide valuable insight into the effectiveness of the technology components that were required as either prerequisite and/or were integrated into the professional teacher education program.

Research Questions

The following questions were investigated in this study:

1. How are the teacher education programs at each university in this study preparing students to integrate technology into their classrooms, and instruction and how do the programs compare?

2. How do recently graduated first-year teachers from each university rate their skills in using technology, and how do their ratings compare?

3. How and to what extent do recently graduated first-year teachers at each university use technology in their classrooms, and how do their responses compare?

4. How do recently graduated first-year teachers from each university evaluate their preservice preparation for integrating technology into their classrooms, and how do their evaluations compare?
Limitations of the Study

This study was conducted within the parameters of the following limitations:

1. Random sampling was not used in this study; therefore, generalization to a larger population of teacher education programs was limited.

2. There was a discrepancy between the time in which the case studies were conducted and when the first-year teachers attended each university. In addition, the colleges of education continually evaluated their undergraduate teacher education programs and instituted changes in the curriculum. This was addressed through interviews with education faculty at each university.

3. Personal experiences during the first year of teaching may have affected current behavior. These experiences were not addressed in this study.

4. Some of the recently graduated first-year teachers may be employed in schools that lack technological equipment and resources.

Definitions

The following provides the reader with a basic understanding of some of the terms used in this study:

Field Experiences: Program components that are conducted in off-campus settings, such as a school, and include observations, tutoring, and assisting teachers and school administrators, student teaching, and internships.

Foundations Courses: Courses to teach students the historical, economic, sociological, philosophical, and psychological foundations of schooling and education.
Methods Courses: Courses in the academic or professional area that the student plans to teach.

Preservice: Experiences of undergraduate education majors before they complete their programs of study and receive their teaching certificates.

Student teaching: An in-depth, direct teaching experience conducted in a school setting that is usually a culminating field-based experience for the initial teacher education program.

Technology: Computers and other related technologies used to create, manipulate, or transmit data.

Technology-rich schools: Schools where computers and other related technologies are readily available.
CHAPTER TWO
REVIEW OF THE LITERATURE

This chapter includes a review of the literature that provided the foundation for a comprehensive approach to investigating: (a) how technology was integrated into the teacher education programs participating in this study and (b) teachers’ perceptions about their preservice training to utilize technology in their own classrooms. The findings of this review were addressed within the following topics: (a) technology in teacher education and (b) technology in K-12 schools.

Technology in Teacher Education

The rapid growth of technology and the demands for technology-trained teachers in public schools “has created the need for all teacher education faculty to be proficient in the use and integration of technology into mainstream teacher education program delivery” (Northrup and Little, 1996, p. 214). Although some progress has been made, the majority of teacher education programs are lagging behind in meeting the needs of new teachers to develop competencies for effective use of instructional technology. In summarizing the 1995 Office of Technology Assessment report, “Teachers and Technology: Making the Connection,” Faison (1996) reports that:

For the most part, in current teacher preparation programs, technology is not central. Most instruction is about technology, rather than providing experiences in using and integrating technology into the curriculum. Coverage of information technologies is generally isolated and relegated to a single course. New teachers graduate with limited knowledge about using technology in professional practice (p. 57).

These criticisms of higher education institutions are echoed in the 1997 report, “Technology and the New Professional Teacher—Preparing for the 21st Century
Classroom," published by the National Council for Accreditation of Teacher Education (NCATE). The report states:

. . . a majority of teacher preparation programs are falling far short of what needs to be done. Not using technology much in their own research and teaching, teacher education faculty have insufficient understanding of the demands on classroom teachers to incorporate technology into their teaching. Many do not fully appreciate the impact technology is having on the way work is accomplished. They undervalue the significance of technology and treat it as merely another topic about which teachers should be informed (p.6).

**Obstacles to Technology Use**

The deficiencies in teacher education programs are the result of a number of factors. These obstacles include a lack of: equipment and technical support, training and expertise with computers, time, value for the impact of technology, and clear program expectations.

**Lack of Equipment and Technical Support**

Many colleges of education lack adequate hardware and software, as well as, technical support to maintain a high quality program. Faison (1996) points out that many K-12 schools have better equipped facilities than those in colleges of education. High costs and inadequate funding are the major contributing factors to this dilemma. Many universities often give low priority to budgetary requests for technology expenditures for colleges of education (NCATE, 1997).

**Lack of Training and Expertise**

The apparent reluctance of college faculties to effectively integrate technology into their instruction appears to stem from their lack of training and expertise with computers (Strudler, McKinney, and Jones, 1995). Faison (1996) notes that teacher educators are consistently failing to model the use of technology in their courses.
because of their inadequate technological skills and knowledge. This conclusion is supported by Queitzsch's survey (1997) of six colleges of education in the northwest in which 64% of the respondents indicated a need for technology training.

Lack of Time

Another barrier to faculty use of technology is time (Northrup and Little, 1996). Hill and Somers (1996) report that approximately twenty hours a week are needed to convert course material into an electronic presentation. Under the present tenure and promotion guidelines at most universities, few faculty feel that they can afford the time to learn new software programs, hardware configurations, and new instructional techniques integrating technology (Northrup and Little, 1996; Seminoff and Wepner, 1995).

Lack of Value for the Impact of Technology

It appears that most faculty tend to undervalue the impact of technology and view it as an isolated course requirement in teacher preparation programs (NCATE, 1997). Hazari (1991) states "... that the degree to which computers are used in the classroom depends on the extent to which higher education faculty themselves accept and use computers" (p. 48). In addition, many universities tend to value more traditional forms of work than technology-based projects for tenure and promotion (Seminoff and Wepner, 1997).

Lack of Clear Program Expectations

Topp, Mortensen, and Grandgenett (1995) identify the lack of clear program expectations as another hindrance to technology use in teacher education programs. "Faculty members need to feel that effective use of technology is expected for all
appropriate courses and situations” (p.11). Faison (1996) points out that visionary leadership from college of education deans is essential to improving the technological literacy of teacher educators.

**Increasing Faculty Use of Technology**

Topp et al. (1995) identify three essential elements for increasing faculty use of technology in teacher education programs: equipment, training, and expectations. Faculty should have access to up-to-date equipment, adequate training and support to use the equipment, and the expectation to implement technology into their teaching. According to the authors, providing every faculty member with their own computer is a primary step towards encouraging the use of technology in teaching.

To successfully integrate technology into teacher education, Barker (1993) suggests the following key components: (a) electronic classrooms equipped with such devices as computers, televisions, VCRs, and LCD projection systems; (b) portable technology/learning stations to transport equipment from location to location; (c) multimedia computer labs for faculty and students; (d) a distance learning center utilizing telecommunications to transit instruction from remote or distant locations; and (e) instructional video equipment for on-site video productions.

**Technology and the Accreditation Process**

Two prominent organizations, the National Council for Accreditation of Teacher Education (NCATE) and the International Society for Technology in Education (ISTE), are providing leadership and support to promote changes in teacher education programs. Through their collaborative efforts, these two organizations are impacting the role of technology in preparing preservice and inservice teachers.
The Constitution of the United States grants each state the power to establish and monitor graduation requirements and teacher certification guidelines. Without uniform national standards, teacher training programs vary from state to state. NCATE was founded in 1954 for the purpose of establishing high quality teacher education programs. As the only official organization that accredits professional teacher education programs in the United States, the organization wields considerable power in dictating the policies governing schools, colleges, and departments of education (NCATE, 1995; Taylor and Wiebe, 1994).

NCATE accreditation of teacher education programs is mandatory in some states and optional in others. However, when given the option, most noteworthy educational institutions seek accreditation as a means of gaining recognition for their programs. Taylor and Wiebe (1994) note that since NCATE accreditation is either required (in many states) or highly desirable (in states where it is not required), the accreditation standards and guidelines established by NCATE have a profound effect on course offerings and practice in teacher preparation and graduate education programs (p. 21).

ISTE Recommended Foundations in Technology for All Teachers

In 1989, NCATE joined with ISTE, the leading educational technology organization, to promote the integration of technology into teacher preparation programs. This alliance paved the way for major policy changes in the NCATE accreditation process related to the technology within teacher education (Wiebe and Taylor, 1997).
The latest set of curriculum standards developed by ISTE and adopted by NCATE in 1996 include five different areas:

1. **Recommended Foundations in Technology for All Teachers**
2. **Educational Computing and Technology Literacy Endorsement**
3. **Secondary Computer Science Education Endorsement**
4. **Secondary Computer Science Education Bachelor's Degree**
5. **Educational Computing and Technology Leadership Advanced Program**

(Ley, 1997).

The first set, Recommended Foundations, provides a list of skills that are needed by all preservice and inservice teachers to use technology in their instructional practices and for their professional needs. The Foundations are organized into three categories: basic technology operations and concepts, personal and professional use of technology, and application of technology in instruction. Each category contains a goal and a set of performance indicators related to the goal. The ISTE Recommended Foundations in Technology for All Teachers are listed below:

**A. Basic Technology Operations and Concepts.**

Candidates will use computer systems to run software; to access, generate and manipulate data; and to publish results. They will also evaluate performance of hardware and software components of computer systems and apply basic troubleshooting strategies as needed.

1. Operate a multimedia computer system with related peripheral devices to successfully install and use a variety of software packages.
2. Use terminology related to computers and technology appropriately in written and oral communications.

3. Describe and implement basic troubleshooting techniques for multimedia computer systems with related peripheral devices.

4. Use imaging devices such as scanners, digital camera, and/or video cameras with computer systems and software.

5. Demonstrate knowledge of uses of computers and technology in business, industry, and society.

B. Personal and Professional Use of Technology

Candidates will apply tools for enhancing their own professional growth and productivity. They will use technology in communicating, collaborating, conducting research, and solving problems. In addition, they will plan and participate in activities that encourage lifelong learning and will promote equitable, ethical, and legal use of computer/technology resources. To indicate proficiency in meeting this standard, candidates will:

1. Use productivity tools for word processing, database management, and spreadsheet applications.

2. Apply productivity tools for creating basic multimedia presentations.

3. Use computer-based technologies including telecommunications to access information and enhance personal and professional productivity.

4. Use computers to support problem solving, data collection, information management, communications, presentations, and decision making.
5. Demonstrate awareness of resources for adaptive assistive devices for student with special needs.

6. Demonstrate knowledge of equity, ethics, legal, and human issues concerning use of computers and technology.

7. Identify computer and related technology resources for facilitating lifelong learning and emerging roles of the learner and the educator.

8. Observe demonstrations or uses of broadcast instruction, audio/video conferencing, and other distant learning applications.

C. Applications of Technology in Instruction

Candidates will apply computers and related technologies to support instruction in their grade level and subject areas. They must plan and deliver instructional units that integrate a variety of software, applications, and learning tools. Lessons developed must reflect effective grouping and assessment strategies for diverse populations.

1. Explore, evaluate, and use computer/technology resources including applications, tools, educational software and associated documentation.

2. Describe current instructional principles, research, and appropriate assessment practices as related to the use of computers and technology resources in the curriculum.

3. Design, deliver, and assess student learning activities that integrate computers/technology for variety of student group strategies and for diverse student populations.
4. Design student learning activities that foster equitable, ethical, and legal use of technology by students.

5. Practice responsible, ethical and legal use of technology, information, and software resources (ISTE, 1998, no page number).

All schools, colleges, and departments of education undergoing initial or continuing accreditation evaluation must ultimately demonstrate compliance with the Foundation standards. Failure to address the standards can result in denial or revocation of accreditation (NCATE, 1995; Powers, 1998).

**Models for Preservice Training in Technology**

As institutions face the challenge of meeting these standards, they must also grapple with the problem of how to make technology an integral part of their teacher education programs. Although most leaders in the field of education agree that more technology training is needed, the best method for providing the training is an issue of debate. Some teacher educators believe that separate technology courses are essential to teach prospective teachers to use technology (Wiebe, 1995). Others argue that the technology course should be eliminated and that technology should be integrated within the teacher education curriculum. Rather than choosing between the separate technology course or an integration paradigm, Wetzel (1993) “suggests that both a core course and effective integration are important components of a preservice program” (p. 4). Several colleges have taken a lead in developing program models that incorporate one, or in some cases, variations of these perspectives. Some of these models include: redesigned educational technology courses, integrating technology into specific
methods courses, incorporating technology into field-based experiences, and coordinated college-wide initiatives (Handler and Strudler, 1997).

**Redesigned Educational Technology Courses**

A common method for training preservice teachers to use technology is to offer an educational technology or computer literacy course. Although the content of such a course varies from program to program, the more traditional courses focus on the mechanics of computer use rather than on ways to integrate computers into the curriculum (Johnson, 1996). In a study involving preservice teachers enrolled in a traditional educational computer course at a large Eastern university, Drazdowski (1994) found that

> . . . present course offerings in computer use of educators present too narrow a technical focus—too much time is focused on learning about computers and not enough time is spent learning how to teach with computers—and do not question the broader educational and social implications of computer use (p. 251).

Based on these findings, the researcher concluded that although the course provided a necessary foundation it did not adequately prepare preservice teachers to integrate technology into the curriculum.

To better train prospective teachers to use technology, many colleges are revising and restructuring their educational technology courses. For example, the University of Central Florida has recently redesigned their introductory course, Technology for Educators. The revised course incorporates innovative strategies to help preservice teachers learn how to use technology, to teach with technology, and to integrate technology into the curriculum. Approximately 40% of the class instruction is conducted in a non-traditional lecture format with the remaining 60% in a non-
traditional computer lab. All lectures are held in a state-of-the-art multimedia classroom equipped with a large projection screen system. In addition, the lectures incorporate multimedia presentations created by the instructors. This method allows the instructor to consistently model the use of technology during teaching. Immediately following each lecture, the instructor accompanies the students to the computer lab where they practice the skills and concepts demonstrated during the lesson (Gunter, Gunter, and Wiens, 1998).

Other universities are attempting to address the needs of future teachers by either adding an optional second course or replacing the one required course with two courses. Valdosta State University in Georgia has developed a new intermediate level educational computing course. All education majors are required to take an entry level course, “Introduction to Educational Computing” and can elect to take the intermediate level course, “Applied Educational Computing.” While the first course introduces the basics of word processing, spreadsheet, database, presentation, e-mail, and the Internet, the second course challenges students to expand their computer literacy experiences through practical, instructional projects (Thomerson, 1997).

The University of Northern Colorado recently restructured the technology component of their teacher preparation curriculum. The original required educational technology course was split into two courses. Students take one course in their first or second year of training and the second course during the latter part of their training. The first course emphasizes basic computer skills and a variety of software packages, and the second course focuses on more advanced applications and ways to integrate technology into the classroom (Sindt, Summerville, and Persichitte, 1997).
Integrating Technology Into Methods Courses

Some teacher educators believe that technology should be integrated into methods courses in order to provide preservice teachers with the skills and concepts for using technology within specific content areas. Halpin (1998) reports on the efforts of the College of Education at Mississippi State University to institute a model for technology training that emphasizes integration within methods courses across the curriculum. A unique feature of this model was the pairing of preservice and inservice teachers across the K-12 grade levels. The pairs worked on ways to effectively incorporate technology within the existing curriculum as opposed to incorporating the curriculum into technology.

At Georgia State University, the Department of Early Childhood Education has recently combined their mathematics and science methods classes with technology. During the first two weeks of the semester, students receive instruction geared towards integrating technology into the teaching of math and science. For the following eight weeks, students attend the methods class one day a week and are assigned to an elementary classroom three days a week. During their time in the schools, students are required to develop and present math and science lessons which are integrated with technology (Weinburg et al., 1997).

Integrating Technology into Field-based Experiences

Another variation of technology integration involves providing prospective teachers with authentic classroom experiences. Brett, Lee, and Sorhaindo (1997) describe the implementation of the field-based technology laboratory at the University of Miami. The technology laboratory is an introductory education course which
includes 6 hours of training in the use of computers and related technologies and 12 hours of actual classroom experience. The laboratory is held at a public school near the campus to provide students with the opportunity to make the connection between technology and the classroom setting.

The University of Northern Colorado features a field-based model that integrates technology-related experiences throughout all stages of the teacher preparation program. Students enrolled in technology courses are required to complete projects that correlate with the curriculum of their other course work and include field experience components (Persichitte, 1997).

Coordinated College-wide Initiatives

As recommended by NCATE (1997), many teacher education programs are developing comprehensive plans "for integrating technology across the curriculum, for providing faculty development, and for building the support structure the program will require" (p.10). The College of Education at Iowa State University is one such example. Over the last few years, the college has instituted initiatives to make technology an integral part of their teacher education program. The initiatives include a required computer literacy course, integrating technology into foundation, methods, and field experience courses, and offering an optional minor in educational technology (Thompson, Schmidt, and Hadjiyianni, 1995).

East Carolina University established an interdisciplinary team to develop a framework for integrating technology into the entire elementary education program. The components of the framework include professional development for college
faculty, modeling the use of technology by teacher educators, field-based experiences for students to transfer theory into practice, and competency testing of seniors to determine their proficiency levels (Ledford and Peel, 1997).

Another example is the Technology Initiative within the College of Education at the University of Georgia. The Initiative incorporated input from the entire college and led to the development of technology standards that address competencies for graduates, learning and work environments within the college, and K-12 schools that serve as training facilities for education majors (Hill and Somers, 1996).

Technology in K-12 Schools

According to the Office of Technology Assessment report, Teachers and Technology: Making the Connection, “teachers use new technologies for the same reason they use books, worksheets, and other teaching tools—to help students learn” (U.S. Congress, 1995, p. 57). However, before teachers and students can effectively use technology to improve teaching and learning they must have access to hardware and software. The availability and use of technology in American schools will be discussed in the following sections: (a) hardware and (b) software.

Hardware

Computers

Use of computers in K-12 schools has dramatically increased since personal computers were first introduced in the early 1980's (Morrison and Lowther, 1998). Means (1994) notes that in 1981 only about 18% of public schools in the United States had at least one computer for educational purposes. Currently, approximately 98% of
schools are using computers and the typical public school owns 86 computers for educational purposes (QED, 1996; QED, 1997a).

While the number of computers in schools has risen, the ratio of students to computers has decreased from 125 students per computer in 1984 to the present ratio of 10 students per computer. In relation to grade levels, elementary schools have the highest average of 11.1 students per computer. Junior high/middle schools average 9.7 students per computer. Senior high schools have the lowest average at 8.4 students per computer (Coley, Cradler, and Engel, 1997; QED, 1996).

Although there are hundreds of companies that manufacture personal computers, only three basic types of computers are generally found in today's schools. These computers are the Apple II series, the Apple Macintosh, and the IBM-compatible personal computers (PCs). Although the Apple II series is considered outdated, large numbers of Apple II+, IIe, IIGS, and IIC are still in use. However, schools are gradually replacing these older models with Apple Macintosh and PCs (Maddux, Johnson, and Willis, 1997).

Until recently, schools have housed most of their computers in one room known as the computer lab (Maddux, Johnson, and Willis, 1997). Although computer labs are useful for large group instruction, the current trend is to place more computers in individual classrooms. Recent surveys indicate that in the average school, 45% of the school's computers are housed in a lab, while 43% are housed in classrooms (QED, 1997a). However, researchers (Maddux et al., 1997; Roblyer et al., 1997) do not advocate dismantling labs in order to place computers into classrooms. Instead, the
researchers contend that schools should ideally provide access to both classroom and lab resources.

Multimedia Computers

QED (1996) estimates that more than half of the new computer purchases during the 1994-95 school year were to replace outdated equipment. As schools retire older models, many are opting for the newer and more powerful multimedia computer systems that incorporate sound, text, graphics, video, and animation. A multimedia system is a high-speed computer that includes a large hard disk drive, a CD-ROM drive, a high resolution video monitor, and specialized audio devices such as a microphone, sound card, and speakers. These systems may also use videodiscs, a camcorder, a television, or a VCR (Maddux et al., 1997; Meyer and Baber, 1997). In addition to providing a multisensory experience, multimedia systems are in demand because of their ability to take advantage of the learning opportunities on the Internet and the World Wide Web (Coley et al., 1997).

Although the U.S. Department of Education recommends a ratio of five students per multimedia computer, QED (1996) found that the national average in 1995-96 was about 24 students per multimedia computer. In addition, Coley et al. (1997) point out that schools with large numbers of poor and minority students are more likely to have even less access to multimedia computers than other students.

CD-ROM

As an essential component of almost any multimedia system, the use of CD-ROM (compact disc-read only memory) drives for student instruction has increased at a phenomenal rate (Coley et al., 1997). QED (1996) estimates that 54% of the schools in
the United States have CD-ROM technology. However, as with multimedia computer systems, poor schools are less likely to have access to this technology than average or wealthier schools (Coley et al., 1997).

Standard CD-ROM drives can only read compact discs, or CDs; however, the availability of drives that can read and record are slated to increase as prices continue to decline. CD-ROM discs look similar to musical CDs but are different in the kinds of information that they can store and how the disks are used. Musical CD's can only store music in digital form, while CD-ROMs can store text, graphics, animations, video, and sound (Roblyer, Edwards and Havriluk, 1997).

As the number of school-based multimedia systems continues to rise so does the number of educational programs available on CDs. QED (1997a) estimates that 59% of the total software purchases in 1997-98 will be on CD-ROM.

Digital Video Disc (DVD)

The Digital Video Disc-ROM, or DVD, is the latest CD-ROM alternative. DVDs look similar to CDs but can store 7 to 12 times more data. In addition, DVD drives can transfer data faster, read CDs and PhotoCDs, and write data (Meyer and Baber, 1998). Sealy (1997) predicts that DVD-ROM drives will eventually become standard on new computers, however, he cautions schools that it will be at least a year before software in this new format is readily available.

Videodisc

Although videodisc technology has been around for almost twenty years, videodiscs are not as popular as the smaller, less expensive CDs (Maddux et al., 1997). In fact, only about 35% of the nation's schools own videodisc players (QED, 1996).
Most videodiscs, or laser discs, measure about 12 inches in diameter and are used to store text, high quality audio, video, and graphics.

**Networks**

In 1996, approximately 38% of the schools in the United States were using networks for instruction (Coley et al., 1997). A local area network, or LAN, is a network that connects computers within one location, such as a computer lab or a school building. The two major advantages to operating a LAN is that (a) expensive hardware and software can be shared and (b) the computers can communicate with each other and share information on the network (Maddux et al., 1997).

A wide area network, or WAN, is a network that connects across a larger geographic area, such as a city, county, or state. A school district network that connects computers at each school site to a file server in the district office is a common example of how a WAN is used in education (Maddux et al., 1997).

**Modems**

Telecommunications has become a valuable teaching tool that allows teachers and students to communicate with others in remote locations and to access online services (Meyer and Baber, 1997). Telecommunication connections are accomplished with the use of a computer and a modem. A modem is a device that allows the computer to establish a link to another computer over the phone system. The use of modems for student instruction has steadily increased from 14% during the 1990-91 school year to 47% in 1995-96 (QED, 1996).
Online Services

Over the last few years, classroom access to online services, including the Internet and the World Wide Web, has steadily increased. As of February 1998, 82% of public schools in the United States have access to the Internet, up from 65% in 1997. Estimates are that by the end of the 1998-99 school year, 96% of the nation’s public schools will be connected (QED, 1998).

For classrooms currently on-line, teachers are incorporating this powerful resource into their daily curriculum. The most common instructional use of the Internet is for research, with 49% of schools reporting student use of the Internet for research at least once a week. Other educational uses include e-mail, online projects, and electronic field trips (QED, 1998a).

Distance Learning

Distance learning refers to a learning situation in which the students and their instructor are separated by distance but interact through some form of electronically transmitted (phone lines, satellite, broadcasting, cable, or Internet) audio and/or video conferencing (Roblyer et al., 1997; U.S. Congress, 1995). Historically, distance learning programs have been used mostly at the high school level. However, the use of this technology in elementary and secondary schools has increased dramatically over the last five years (QED, 1996). Recent surveys indicate that 35% of the school districts are implementing distance learning programs (QED, 1997a).

In contrast to other technologies, the use of distance learning programs is comparatively high in small school districts (Coley et al., 1997). This technology provides these school districts with a cost-effective means of sharing teachers who have
special training in particular fields and providing quality learning experiences to students in remote locations (Meyer and Baber, 1998; U.S. Congress, 1995).

Peripherals

A number of peripherals, or additional computer devices, are commonly recognized as essential instructional tools. According to QED’s 1997 report, “Educational Technology Trends,” the three most commonly school-owned peripherals are printers, scanners, and digital cameras. Printers produce a paper copy, or hard copy, of the information displayed on the monitor. Scanners are designed to read printed information, such as photos or text, and transfer the data to the computer system for storage and processing (Maran, 1996; Roblyer et al., 1997). Digital cameras capture and digitize images and store the images as digital files that can be used in hypermedia projects (Grabe and Grabe, 1998).

Software

A computer system consist of two basic parts: hardware and software. Hardware includes all of the physical components, or equipment, in the computer system. Software is a program, or set of instructions, that allows users to communicate with the hardware. System software and applications software are the two kinds of programs required by hardware. System software provides instructions for the basic operations of the computer system. Applications software are programs that allow the user to accomplish specific tasks, such as word processing, desktop publishing, or telecommunications (Meyer and Baber, 1998; Roblyer et al., 1997). The following is
an overview of the types of applications software that are commonly used in today's classrooms. The applications are organized into five major categories:

1. Instructional Software
2. Productivity Software
3. Technology Support Tools
4. Internet Tools
5. Multimedia and Hypermedia

**Instructional Software**

Instructional software are programs designed to deliver instruction or support learning activities. The U.S. Department of Education estimates that over 20,000 instructional software programs have been developed (Coley et al., 1997). These software learning tools are generally classified as drill and practice, tutorials, simulations, instructional games, and problem-solving software (Roblyer et al., 1997).

**Drill and practice.** One of the earliest instructional uses of computers was for drill and practice. These programs were developed for the purpose of providing extended practice to reinforce previously introduced concepts. Drill and practice activities provide repetitive exercises for which students are typically expected to provide a single correct response. These programs are often criticized for their emphasis on rote learning, rather than on higher-level thinking skills. Although this may be true, many teachers believe that such practice is needed to help students gain fluency and proficiency with certain basic skills before they can progress to more advanced concepts.
In spite of their narrow focus, drill and practice software is still used extensively in today’s classrooms, particularly as a supplement to worksheets and homework. The newer, more sophisticated versions offer several advantages over standard paper/pencil exercises. These benefits include providing immediate feedback, increasing student motivation, and saving time (Grabe & Grabe, 1998; Roblyer et al., 1997).

**Tutorials.** While drill and practice software is designed to practice skills previously taught, tutorial software is designed to teach the skills. Similar to a teacher tutoring a student, electronic tutorials present information in an ordered sequence, check the students’ level of understanding, and adapt instruction to meet the needs of the student. Most tutorials are designed for older students or adults with fairly good reading skills. However, there are a few programs that target younger students by using graphics and audio clips to provide instruction.

Tutorials function in either a linear or branching mode. In linear tutorials, instruction is presented in the same sequential format (explanation, practice, and feedback) to all students, regardless of their performance levels. In branching tutorials, students are directed along paths in accordance to their responses and levels of performance. Although branching programs vary in complexity, they all provide more individualization than linear programs (Grabe & Grabe, 1998; Roblyer et al., 1997).

**Simulations.** Computer simulations provide unique and rich learning experiences that may otherwise be too expensive, too dangerous, or inaccessible. These programs offer models of real or fictional situations such as lab experiments, journeys to exotic locations, or historical events. Regardless of their environment, all simulations require students to become actively involved in the learning process. This
participatory element is a major contributing factor to their effectiveness and appeal (Muddux et al., 1997; Roblyer et al., 1997).

**Instructional games.** The use of games as a teaching device is a common practice in schools. Instructional games provide students with highly motivating and often challenging opportunities for learning new skills or activating existing knowledge. Characteristics of game software include a set of rules that establish procedures for playing the game, competition or challenge against a task or opponent, and motivating or entertaining formats (Grabe and Grabe, 1998). Roblyer et al. (1997) point out that teachers can use instructional games instead of worksheets and exercises to provide needed practice in a specific area. In addition, games can help to foster cooperation and collaboration among students and serve as rewards for good work.

**Problem-solving software.** Educators generally view problem-solving activities from two different, yet somewhat overlapping, perspectives. The first is based on the assumption that problem-solving skills, in most cases, can be taught through direct instruction. The other view is that problem-solving is best taught by placing students in situations where, with some guidance and coaching, they must work out their own strategies for solving problems.

Software designed to develop problem-solving skills generally fall into two distinct categories: (a) software developed specifically for mathematics related content and (b) software that presents problem-solving skills in a content-free environment (Roblyer et al., 1997).
Productivity Software

Productivity software includes such applications as word processing, databases, and spreadsheets. In most schools these programs are readily available to classroom teachers as either a single application or as integrated packages that include all three applications (Roblyer et al., 1997). Teachers can use these programs to not only increase their own productivity but also to improve student learning. Grabe and Grabe (1998) found that the use of productivity software for instructional purposes results in students’

(1) learning to use the computer tools; (2) performing certain academic tasks more effectively and efficiently because of the tools and; (3) learning domain skills such as writing and problem solving or acquiring content-area knowledge through the application of computer tools to content-appropriate tasks (p. 159).

Word processing. Word processing programs allow users to enter, edit, format, store, and print text. In addition, many of today's versions are capable of integrating text with graphics. Many educators find word processing programs beneficial in helping students to develop writing skills. These programs “take the drudgery out of writing” (Maddux et al., 1997, p. 248) and offer more capability and versatility than paper and pencil or typewriters. High quality documents and other publishing tasks can be created quickly and efficiently.

As with any other application, the effectiveness of word processing programs to teach written composition depends on different factors: teacher and student expectations, effective instructional experiences, and the amount of time that students spend to fully understand and use the program. Although research has been
inconclusive, Roblyer et al. (1997) present the following summary of the literature on the benefits of word processing in education:

Generally, studies seem to conclude that students who use word processing software in the context of writing instruction programs tend to write more, revise more (at least on a surface level), make fewer errors, and have better attitudes toward their writing than students who do not use word processing software. Teachers who use word processing software with their students should not expect writing quality to improve automatically. Improvements of that kind depend largely on other factors such as the type of writing instruction. But the potential value of word processing has been established, making it one of the most validated uses of technology in education (p. 131).

**Spreadsheets.** An electronic spreadsheet is an application that allows the user to perform calculations, analyze data, and present information. Spreadsheets generate a grid of columns (designated by numbers) and rows (designated by letters). The columns and rows intersect to form cells that display numbers, formulas, titles, or labels. The programs use formulas to calculate and manipulate numerical data. They can add, subtract, multiply, divide, and perform a variety of other more complex mathematical functions, such as sums and averages, sines and tangents, and Boolean comparisons. In addition, most spreadsheet programs are capable of representing numerical data in a variety of chart and graph formats which can be copied and pasted into other applications (Grabe & Grabe, 1998; Roblyer et al., 1997).

The use of spreadsheet programs in classrooms is increasing at all grade levels. Holmes (1997) notes that these programs are often able to illustrate complex mathematical concepts better than many other instructional tools. "The opportunity to see data presented in a variety of ways enables students to make meaningful and important mathematical connections" (p. 7). Students perceive spreadsheets as fun and challenging and can use them to create time lines, charts, and graphs. In addition,
teachers find that spreadsheets can save valuable time in calculating grades, tracking attendance, and creating instructional materials for use in the classroom (Roblyer et al., 1997).

**Databases.** Databases are powerful tools that allow users to organize, store, and search collections of information. These programs operate by creating fields, records, and files. Each field holds a category of information defined by the user. A record is a collection of fields pertaining to a single person, place, or thing. A file is the total collection of records, such as all the names and addresses of students at a particular school.

After a database is created, the program allows the user to sort information alphabetically or numerically, to find specific information, or to create a query to locate information according to certain criteria. The information obtained from databases can be used to create reports and presentations (Grabe & Grabe, 1998; Maran, 1996).

Grabe and Grabe (1998) note that the instructional use of databases provide challenging and highly motivating opportunities for students to become active participants in the learning process. In addition, through the process of creating and working with databases, students are required to use higher-order thinking skills.

**Technology Support Tools**

Technology support tools are special programs that can assist teachers and students with a variety of tasks. Some of these tools include desktop publishing, paint and draw programs, presentation software, electronic gradebooks, and portfolio assessment systems.
**Desktop publishing.** Desktop publishing programs are designed to integrate text and graphics and are used to produce a variety of classroom projects such as newsletters, flyers, posters, and banners. Although many of today's word processing programs offer the same capabilities, Roblyer et al. (1997) point out that the primary difference between the two applications is the way they display documents. Word processing programs were designed to automatically wrap text from one page to the next, while desktop publishing programs were designed to display documents one page at a time. In addition, desktop publishing programs allow more flexibility over page setup, text format, and graphics on individual pages.

**Paint and draw programs.** Within the last few years there has been an increase in the number of paint and draw programs for children (Catchings and MacGregor, 1998). These programs allow students to create original artwork which can then be imported into desktop publishing or multimedia projects (Roblyer et al., 1997).

**Presentation software.** The emergence of presentation software has created an alternative to the use of overhead projectors for presentations and lessons. These programs allow teachers and students to use a computer to create electronic presentations that incorporate color, text, graphics, sound, and animation. The presentations can be viewed on the computer monitor or projected on a large viewing screen using a projection system (Maddux et al., 1997).

**Electronic gradebooks.** Although many teachers use spreadsheets to track student grades, electronic gradebooks were designed specifically for that purpose. These programs can be used to store a variety of data including student names, daily and weekly test grades, project grades, daily attendance, and discipline reports.
Gradebooks will also analyze the data, generate graphs, and print out reports (Maddux et al., 1997; Roblyer et al., 1997).

**Portfolio assessment systems.** A portfolio is an organized and selected collection of student work that has been accumulated to demonstrate the student’s achievement levels and academic progress. Portfolio assessment systems, or electronic portfolios, are programs designed to help teachers create, organize, and evaluate student portfolios. These programs operate like a database storing and organizing scanned images of writing samples and artwork, audio recordings, and video clips. Stored documents can then be evaluated using modifiable checklists generated by the program (Grabe and Grabe, 1998). Although portfolio assessment systems are rarely found in today’s schools, Maddux et al. (1997) contend that these programs may become more common in the near future.

**Internet Tools**

Instructional uses of the Internet include communicating with people around the world, accessing files and information, and browsing the World Wide Web. The following is a brief discussion of each of these categories.

**Communication.** The Internet offers a variety of communication options: e-mail, listservs, newsgroups, and chat rooms. Electronic pen-pals is one of the most common e-mail projects used in classrooms. A student in one classroom will communicate with another student usually in a classroom at a distant location. Recent e-mail applications allow users to attach files to messages. This advancement has paved the way for even more creative uses of e-mail such as sharing creative writing projects or newsletters (Grabe and Grabe, 1998).
Listservs are another function of the Internet that appeals to educators. Listservs are essentially discussion groups that use e-mail to communicate about a specific topic of interest. Teachers and students subscribe to a listserv to have their name and e-mail address added to the group's mailing list. When any member of the listserv sends a message, a copy of the message is forwarded to everyone on the mailing list (Leshin, 1998; Maran, 1996).

Newsgroups, like listservs, are discussion groups that allow users with common interests to communicate and share information. However, newsgroups differ from listservs in several ways. First, listservs require users to subscribe in order to participate and receive information. Active listservs can generate an overwhelming number of messages each day. On the other hand, newsgroups are open to any Internet user. Articles posted to the newsgroup reside on a main server and are organized by topic. A newsreader is used to view articles and replies to the article which are displayed as threads. This means that users can select the messages of interest without having to read every posting (Bull, Bull, and Sigmon, 1997; Maran, 1996; Milheim, 1997).

Internet relay chat (IRC), or chat rooms, are particularly popular with teenagers. Chat rooms provide an intriguing and anonymous way for students to communicate with others without face-to-face contact. Chat participants type messages to other chat members using a nickname or screen name. Many students, if given the opportunity, will sit and chat for hours. In order to avoid these problems, many schools choose not to provide an IRC client. However, many browsers now offer chat services (Grabe and Grabe, 1998).
Accessing files. Teachers and students can use the Internet to download, or copy, files contained in company or governmental archives. These files can include such items as lesson plans, scientific information, photographs, sound clips, or programs. Files are transferred through a special method called file transfer protocol (FTP) (Leschin, 1998).

The World Wide Web. The World Wide Web (WWW or Web) is a source of information accessed through the Internet. The information consists of documents, or web pages, that contain text, graphics, sound, and video. Web pages are designed using a computer language called hypertext markup language (HTML). An HTML web page contains highlighted text that links to other pages. Web pages are located by a special address called the Uniform Resource Locator (URL) and are accessed by a computer program called a browser (Leschin, 1998; Williams, 1996).

Multimedia and Hypermedia

The terms multimedia and hypermedia are often used interchangeably and can be quite confusing. Grabe and Grabe (1998) offer the following definitions:

... multimedia describes a communication format implemented with a computer and involving the integration of several media, such as text, audio, video, still images, sound, and animations. Hypermedia is an interactive nonlinear form of multimedia in which the units of information are connected to each other in multiple ways. The hypermedia user has considerable freedom to choose which possible links to pursue and in what order (p.260).

Recent educational applications often incorporate multimedia and hypermedia into traditional computer-based learning tools such as drill and practice, tutorials, and simulations. Other educational applications include talking books, collections of data, multimedia references, and hypermedia tools.
**Talking books.** Most talking books feature popular, award-winning children's literature. These products are characterized by rich illustrations, optional narrations of expert readers, hypertexted words linked to pronunciations and definitions, sound effects and music, and objects, or hot spots, that perform simple actions when clicked with a mouse. Grabe and Grabe (1998) note that talking books can be an effective way to introduce quality books to a child, to practice 'reading while listening,' to develop fluency, and to review a book a student has already read and enjoyed. Talking books may also provide some unique benefits for children whose second language is English (p. 240).

**Collections of data.** Extensive collections of photographic images, video clips, sounds, text, and graphics are now available on CD-ROMS and videodiscs. Teachers and students can use these collections to create presentations, school publications, or non-instructional materials (Grabe and Grabe, 1998).

**Multimedia references.** Multimedia encyclopedias, almanacs, globes, and atlases are also available on CD-ROMS. These CD-ROM versions are less expensive than their paper counterparts and present information in a variety of formats, including speech, music, sound effects, video clips, and virtual reality. In addition, these references may also include built-in dictionaries, timelines, on-screen help, and links to the Internet (Dyrli, 1998).

**Hypermedia tools.** Hypermedia programs combine the characteristics of hypertext and the capabilities of sound, video, and animation. These programs use a nonlinear format which allows users to move around and choose pathways that are linked (Maddux et al., 1997). Roblyer et al. (1997) note that "hypermedia authoring
offers one of the most exciting and promising areas of instructional technology currently available to educators and students" (p. 196).

**Summary**

Preparing new teachers to effectively use technology in today's classrooms is a critical role for colleges of education. The dramatic growth in the acquisition of computer-based technologies in our nation's schools has created a need for technology-proficient teachers. Over the next ten years, two million new teachers will be needed to fill vacancies due to attrition. These new teachers will be expected not only to utilize technology in their own instruction but also to teach their students how to use technology. However, technology is not an integral part of most teacher education programs.

The National Council for Accreditation of Teacher Education and the International Society for Technology in Education have written standards that describe essential skills for all teachers to use technology in their instructional practices and for their professional needs. Colleges of education seeking NCATE accreditation must demonstrate compliance with these standards.

As more and more education institutions strive to incorporate technology into their programs a variety of models have been developed. Some of these models include: the computer literacy course, integrating technology into methods courses, integrating technology into field-based experiences, and college-wide initiatives.
CHAPTER THREE
METHODOLOGY

Research Design and Methods

The purpose of this study was two-fold: (a) to describe and analyze the technology components in three teacher education programs; and (b) to investigate the technological preparedness of recently graduated first-year elementary (K-5) teachers.

The research questions posed by this study were:

1. How are the teacher education programs at each university in this study preparing students to integrate technology into their classrooms and instruction, and how do the programs compare?

2. How do recently graduated first-year teachers at each university rate their skills in using technology, and how do their ratings compare?

3. How and to what extent do recently graduated first-year teachers at each university use technology in their classrooms, and how do their responses compare?

4. How do recently graduated first-year teachers evaluate their preservice preparation for integrating technology into their classrooms, and how do their evaluations compare?

Based on the purposes and the questions being investigated, this study was guided by a descriptive research design that incorporated a combination of qualitative and quantitative methods. Gall, Borg, and Gall (1996) note that descriptive research designs involve “the description of natural or man-made phenomena” (p.374) and are applicable to both qualitative and quantitative approaches. In qualitative research,
descriptive studies involve "providing a detailed portrayal of one or more cases" (p. 757). While in quantitative research, descriptive studies involve "measuring the characteristics of a sample at one point in time" (p. 375).

Patton (1980) endorses the collection of both qualitative and quantitative data in the same study and states that

the advantage of a quantitative approach is that it’s possible to measure the reactions of a great many people to a limited set of questions, thus facilitating comparison and statistical aggregation of the data. . . . By contrast, qualitative methods typically produce a wealth of detailed information about a much smaller number of people and cases. . . . Because qualitative and quantitative methods involve differing strengths and weaknesses, they constitute alternative, but not mutually exclusive, strategies for research (p. 14).

Therefore, in this study qualitative case studies were conducted at each teacher education program in order to gain detailed information about how these programs were preparing students to integrate technology into their classrooms. In addition, quantitative and qualitative data were collected from a survey administered to first-year teachers who were recent graduates of the participating universities.

Selection of the Universities

Utilizing Patton’s purposeful sampling for selecting information-rich cases (1990), twenty universities in the southern region of the United States were chosen as potential participants in this study. These universities have prestigious reputations and/or were known to incorporate technology into their teacher preparation programs:

Auburn University, University of Alabama, University of Southern Alabama, Florida State University, University of Florida, University of Southern Florida, Georgia Southern University, University of Georgia, Georgia State University, Valdosta State University, Louisiana Tech, Northeast Louisiana University, Southeastern Louisiana
University, University of New Orleans, University of Southwestern Louisiana, Mississippi State, University of Southern Mississippi, University of Houston, University of North Texas, and University of Texas.

First, information about each university’s college of education was gathered through a website search. At the same time, the colleges were contacted by e-mail and/or telephoned to find out how their undergraduate elementary education programs prepare students to use technology in instruction.

Based on the information gathered from the sixteen colleges that responded to the initial contacts, three sites were chosen utilizing criterion sampling. Patton (1980) defines criterion sampling as a procedure to review and study cases which meet some predetermined criterion. In this case, the criterion was that each university integrated technology into their teacher education programs by a different means or to a different extent. Because of their distinctive models in integrating technology into their teacher education programs, this study focused on Georgia State University, Southeastern Louisiana University, and the University of North Texas.

Procedures for Human Subject Protection

A critical step in any research project is obtaining the necessary permissions for entry to the site. Applications for approval of this study were sent in accordance with the procedures and timelines established by each university’s Institutional Review Board (IRB). Copies of the IRB approvals from each university are included in Appendix A. Gall et al. (1996) note that “the purpose of the board’s review is to ensure that the rights of research participants to confidentiality and freedom from harm are protected” (p. 62). Therefore, in adherence to the IRBs’ policies, every effort was made
to address issues in a professional and ethical manner. Participation in this study was strictly voluntary and the privacy and confidentiality of all participants was protected by replacing the names of individuals with pseudonyms.

**Selection of Case Study Participants**

The two groups of subjects in this study were the participants in the case studies and the participants in the survey. The participants in the case studies were teacher education faculty at each university. These individuals included the lead administrator and two to six instructors in the elementary or early childhood education units.

**Selection of Survey Participants**

The participants in the survey were elementary (K-5) teachers who recently completed their undergraduate teacher education program at one of the three participating universities. According to the college of education at each university, Georgia State University had 58 graduates, Southeastern Louisiana University had 78 graduates, and the University of North Texas had 141 graduates. However, since the grade levels for elementary certification ranged from Pre/K to eighth grade across the sites not all of the recent graduates met the criteria for this study. To participate in this study, the graduates had to have graduated in Spring 1998 or Summer 1998 from one of the three participating universities and be currently employed as a first-year elementary school (K-5) teacher.

**The Case Studies**

Gall et al. (1996) define case study research as “the in-depth study of a phenomenon in its natural context and from the perspectives of the participants involved in the phenomenon” (p. 545). For the purposes of this study, the phenomenon
was technology and the cases were the teacher education programs at the three participating universities. This investigation focused on how the teacher education programs at each university prepared preservice teachers to integrate technology into their classrooms.

The Survey Instrument

The “Survey of Technology Preparation and Use” (Appendix B) was developed for this study to survey the perceptions of first-year teachers, who were recent graduates of the three participating universities. Survey instruments designed by Chiero (1998), Grau (1995), Handler (1993), and Topp (1996) were reviewed during the initial layout and construction. The written questionnaire contained 98 items designed to collect data on the teachers’ personal and professional background, self-rated skills for using technology, classroom use of technology, and evaluation of their preservice preparation to use technology. Responses to the items were primarily Likert-type ranges or multiple choice, and included four open-ended questions. The first draft of the instrument was revised several times based on comments from several educators, including one faculty member from each participating university and the past president and current board member of the International Society for Technology in Education’s (ISTE) Special Interest Group for Teacher Educators (SIGTE).

The second draft of the survey was piloted by thirteen recently graduated first-year teachers who were not included in the study. A final revision incorporated minor changes based on the responses and written comments of the teachers.

The survey was composed of four main sections entitled: “Section I. Personal and Professional Background,” “Section II. Your Skills for Personal and Professional
Use of Technology, "Section III. Your Use of Technology," and "Section IV. Your Teacher Education Program."

The first section contained a set of seven general information questions written in multiple choice format. The questions asked about the respondent, including the name of the graduating college/university, age, gender, grade level assignment, and the community location of their school. The final question in this set required the respondent to rate their overall technology skills and served as a validation mechanism for the proceeding section.

The second section contained a set of 26 items relating to the respondents' skills for personal and professional use of technology. Eight items pertained to skills using equipment, thirteen items pertained to skills using various applications, and five items pertained to skills using telecommunications. Responses used a four-point range from "unskilled" to "above average." The 26 items were based on the literature on technology skills for teachers, particularly NCATE (1996), and Northrup and Little (1996).

The third section focused on the respondents' use of technology and was comprised of two parts. Part A contained six questions pertaining to access and use of computers. The first two questions asked about the number of computers available in the classroom and computer lab. Question number 36 pertained to the respondents' access to a home computer. The last three multiple-choice questions measured computer experience and the extent of computer use by the teacher and students in the classroom.
Part B of section three contained 33 items pertaining to the instructional use of equipment, educational software, networking, and the Internet and telecommunications. Responses were based on a six-point range from “I don’t know what this is” to “use extensively.” In addition, the respondents had the opportunity to add an “other” item to the equipment, educational software, and the Internet and telecommunications lists.

The fourth section focused on the respondents’ undergraduate teacher education program and included four parts. Part A contained 15 questions pertaining to the respondents’ preparation to use technology within methods courses, foundations or professional courses, and technology courses. Responses to questions 76-87 were based on a four-point range from “no courses” to “3 or more courses.” Questions 88 and 89 required respondents to answer “yes” or “no” to questions pertaining to introductory educational technology courses. Question 90, the last item in Part A, used an open-ended format to encourage the subjects to state the reasons for their responses to question 89.

Part B of section four contained four questions relating to the integration of technology in field experiences and student teaching. Responses to questions 91-94 were made by selecting from a five-point scale ranging from “not at all” to “extensively.”

Part C of section four contained one item. Respondents were asked to evaluate their teacher education program using a four-point response range from “unsatisfactory” to “very satisfactory.”

Part D of section four, contained three open-ended questions. Space was provided for written responses. In question 96, the respondents were asked to explain
the reasons for their rating in Part C. In question 97, the respondents were asked to identify the most effective component of their teacher education program in helping them to acquire the skills to use technology in their classrooms. Finally, question 98, asked how the respondents would redesign their teacher education program to improve technology training for preservice teachers. The items in section four are based on the literature on technology in teacher preparation programs.

Data Collection

The Case Studies

Patton (1990) cites three methods of collecting data in qualitative studies: (a) in-depth, open ended interviews, (b) direct observation, and (c) written documents. Therefore, visits to each university provided the opportunity to collect data using: (a) one-on-one interviews, (b) facilities/classroom observations, and (c) general catalogues, course syllabi, lab schedules, and other documents related to the teacher education program.

Interviews

At each site, the lead administrator in the elementary or early childhood education unit and two to four teacher preparation faculty were interviewed. The interviews were conducted using the interview guide (Appendix C). “An interview guide is a list of questions or issues that are to be explored in the course of an interview” (Patton, 1990, p.283). Use of this approach insured consistency among the participants but “allows individual perspectives and experiences to emerge” (p.283). The informed consent (Appendix D) of the individuals agreeing to participate in the
interviews was obtained and documented. Interactions during the interview contributed to the convergence of multiple sources of evidence and the triangulation process.

Observations

During the site visits, observations included college classrooms, computer/media lab facilities, and two or three methods, foundations, and/or technology classes. Spradley’s (1980) Developmental Research Sequence (DRS) protocol was implemented while observing and recording information about the nine major dimensions of a social situation: space, actor, activity, object, act, event, time, goal, and feelings (p.79). Multidimensional grand and mini-tours provided opportunities to investigate the research questions and document quotes from the participants.

Archival Data

The following are examples of archival and current documents that were requested and analyzed during site visits: undergraduate catalogues, course syllabi, lab schedules, and related education program materials. As fieldwork progressed, additional information was requested as needed.

The Survey Instrument

Upon approval of the study by the Committee for the Protection of Human Subjects at each university, mailing labels were obtained from the respective alumni associations. On Monday, March 1, 1999, the “Survey of Technology Preparation and Use” (Appendix B) was mailed to 277 recent graduates, along with a cover letter (Appendix E) explaining the study and an informed consent form (Appendix F). Each survey was coded for every individual in the sample in order to monitor the rate of return. Respondents were instructed to complete the survey and then fold the
instrument in half and secure with tape for return mailing. The return address and prepaid postage was included. On Friday, March 5, 1999 a postcard reminder (Appendix G) was mailed to the 277 graduates. Five surveys were returned by the post office because the subjects had moved and had not left a forwarding address. Of the 45 (16%) subjects who returned their completed surveys, 29 (10%) met the criteria for participation in the study. After excluding the five undeliverable surveys and the 16 ineligible subjects, the total number of possible participants was reduced to 256.

Three weeks after the initial mailing, a second cover letter (Appendix H), including another copy of the survey and an informed consent form was mailed to the 227 nonrespondents. Nine surveys were returned by the post office because the subjects had moved and had not left a forwarding address. Of the 81 (32%) subjects who returned their completed surveys, 49 (19%) met the criteria for participation in the study. After excluding the nine undeliverable surveys and the 32 ineligible participants, the total number of possible participants was reduced to 215.

On April 17, 18, 19, 21, and 22, 1999, I attempted to contact the 137 nonrespondents by telephone to request their cooperation in this study and to verify their mailing addresses. I was informed by either a friend or former roommate, that ten of the subjects had moved and had not left a forwarding address or telephone number. These ten subjects were excluded as possible participants. Fifteen subjects indicated that they did not meet the criteria for participation in the study and were also excluded as possible participants. Twenty-three subjects had disconnected telephone lines or telephone numbers that were no longer in service. Based on the assumption that these 23 subjects had moved from their last address and had not received the survey due to
forwarding problems, they were also excluded as possible participants. Twenty-five subjects who agreed to participate were sent third copy of the survey, including a cover letter (Appendix I) and informed consent form. Nine subjects returned their completed surveys. Therefore, of the remaining 167 possible participants, 87 (52%) responded and their responses are included in the data analysis.

**Data Analysis**

**The Case Studies**

Data from the case studies were analyzed according to qualitative methodology. Bogdan and Biklen (1998) state that “analysis involves working with data, organizing them, breaking them into manageable units, synthesizing them, searching for patterns, discovering what is important and what is to be learned, and deciding what you will tell others” (p. 157). The Developmental Research Sequence (Spradley, 1980) was employed to analyze data from field notes, interviews, and archival documents gathered from each university. This procedure facilitated a systematic examination of data in order “to determine its parts, the relationship among parts, and their relationship to the whole” (p. 85). Through this process, I was able to provide a rich descriptive account of how each teacher education program is preparing preservice teachers to integrate technology into their classrooms.

**The Survey Instrument**

Descriptive statistics and analysis of variance (ANOVA) were used to address the research questions. These statistics included frequencies, proportions, and percentages. ANOVA (Gall et al., 1996) was used to determine differences across sites based on the teachers’ perceptions of their overall technology skills, specific technology
skills, and their preservice preparation for integrating technology in their classrooms. In addition, comparisons across schools, using ANOVA, were conducted on the integration of technology into methods, foundations, field experiences, and student teaching. These comparisons were in addition to the case studies and were used to triangulate the results of this investigation.

Comparative Analysis

Since the purpose of this study was to compare the technological components at each teacher education program, the individual qualitative and quantitative data analyses were contrasted and compared. The main focus was on determining similarities and differences across the sites based on: (a) how the teacher education programs integrate technology and (b) the perceptions of the recent graduates. This comparative analysis provided valuable insight into effective strategies for preparing preservice teachers to use technology in their classrooms and for instruction. Figure 3.1 provides an overview of the timeline and procedures followed for collecting and analyzing data.

Triangulation

According to Patton (1990), “one important way to strengthen a study design is through triangulation, or the combination of methodologies in the study of the same phenomena or programs” (p. 187). The validity of the findings of this study were augmented through the use of multiple data collection sources and multiple methodologies.
<table>
<thead>
<tr>
<th>Stage</th>
<th>Timeframe</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Field Experience</td>
<td>September 1998 -</td>
<td>Contact participants</td>
</tr>
<tr>
<td></td>
<td>February 1999</td>
<td>Secure approval and consent</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Write prospectus</td>
</tr>
<tr>
<td>Survey</td>
<td>February 1999</td>
<td>Contact Alumni Associations for mailing labels</td>
</tr>
<tr>
<td>Initial Mailing</td>
<td>March 1, 1999</td>
<td>Mail cover letters, consent forms and survey</td>
</tr>
<tr>
<td>Post card reminder</td>
<td>March 5, 1999</td>
<td>Mail post card reminder</td>
</tr>
<tr>
<td>2nd mailing</td>
<td>March 22, 1999</td>
<td>Mail cover letter and 2nd copy of survey</td>
</tr>
<tr>
<td>Telephone contacts &amp;</td>
<td>April 17, 18, 19, 21,</td>
<td>Telephone nonrespondents</td>
</tr>
<tr>
<td>3rd mailing</td>
<td>&amp; 22, 1999</td>
<td>Mail cover letter and 3rd copy of survey</td>
</tr>
<tr>
<td>Site Visits</td>
<td>February 15-17, 1999</td>
<td>Interview: teacher education faculty</td>
</tr>
<tr>
<td>Georgia State University</td>
<td>March 16-17, 1999</td>
<td>Observe: classes and facilities</td>
</tr>
<tr>
<td>Southeastern Louisiana University</td>
<td>March 29-30, 1999</td>
<td>Peruse written documentation</td>
</tr>
<tr>
<td>University of North Texas</td>
<td></td>
<td>Collect and review field notes</td>
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<tr>
<td></td>
<td></td>
<td>DRS Protocol</td>
</tr>
<tr>
<td>Data Refinement</td>
<td>February - May 1999</td>
<td>Analyze data continuously</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Confirm emerging themes</td>
</tr>
<tr>
<td>Report Composition</td>
<td>May - September 1999</td>
<td>Compose report</td>
</tr>
</tbody>
</table>

Figure 3.1
Data Collection and Analysis Plan
CHAPTER FOUR
CASE STUDIES

This chapter presents the case studies of the teacher education programs at Georgia State University (GSU), Southeastern Louisiana University (SLU), and the University of North Texas (UNT). The participants were members of the teacher education faculty and included the lead administrator and two to six instructors in the elementary or early childhood units. The identities of all individuals participating in the study are confidential and are reported through pseudonyms.

During the course of this qualitative investigation, two main themes emerged: profile and technology components. Profile encompasses background information about the university, the College of Education, and the teacher education program. Technology Components serves to outline the key elements related to the use of technology within the teacher education programs. These components included: program design, expectations, facilities, support, and use of technology. The following case studies are organized according to the themes of profile and technology components.

Georgia State University

Profile

The University

Nestled among the towering skyscrapers and concrete structures of Atlanta's busy downtown metropolitan area is Georgia State University (GSU). The 24-acre campus, located just east of Five Points, the center of downtown Atlanta, is an architectural conglomerate of academic buildings, parking decks, and support service...
facilities. The campus is served by the city’s modern mass transit system, MARTA (Metropolitan Atlanta Rapid Transit Authority). Each day over 10,000 students, faculty, and staff commute on MARTA’s electric rail cars through either the Georgia State Station, located on the southern end of the campus, or the Five Points Station, located just off the northwest edge of the campus.

Georgia State University has 50 accredited degree programs offered by the College of: (a) Arts and Sciences, (b) Business Administration, (c) Education, (d) Health Sciences, (e) Law, and (f) Public and Urban Affairs. As a leading urban research university, “the goal of the university is to develop, transmit, and utilize knowledge in order to provide access to quality education for diverse groups of students, to educate leaders for the state of Georgia and the nation, and to prepare citizens for life-long learning in a global society” (Georgia State University, 1998, p. 8).

With a total enrollment of 24,276 students and 1,437 faculty members, GSU ranks as the second-largest institution of higher learning in Georgia and the largest urban university in the southeast. The 9,450 full-time undergraduate students contribute to an undergraduate faculty ratio of 14 to 1.

Prior to 1997 student housing was unavailable. Today, more than 2,000 students reside at the Georgia State Olympic Village adjacent to the Georgia Tech campus. This complex, originally built for the 1996 Olympics, includes four dormitories, a post office, a gym and fitness center, and parking facilities. Village residents are provided 24-hour security and unlimited free access to MARTA (Cauley and Wantuck, 1998).

The university’s office of Information Systems and Technology (IS & T) administers centralized support and service for technology. Georgia State’s campus-
wide network is accessible from student residence rooms and from off-campus locations. This infrastructure includes more than 100 network file servers which link over 500 computers in labs located throughout the campus. Four of these labs, with a total of 286 computers, are open to all GSU faculty, staff, and students. Computers for student use in labs and classrooms provide access to the Internet, e-mail, and on-line class registration. The IS & T staff provide training for faculty and students and operate a telephone help-line. Additional information and support is provided through web pages, technical publications, and an on-line electronic mail box for reporting technical problems.

The College of Education

The College of Education is housed in a newly renovated building located in the northwest quadrant of the campus at the intersection of Decatur and Pryor Streets. Each of the college's six departments occupy one floor of the ten-story building with the other floors reserved for administrative offices, classrooms, and centers. The departments of Early Childhood Education, Kinesiology and Health, and Middle-Secondary Education and Instructional Technology offer undergraduate and graduate degree programs. While the departments of Counseling and Psychological Services, Educational Policy Studies, and Educational Psychology and Special Education offer only graduate degree programs. The college is accredited by the National Council for Accreditation of Teacher Education (NCATE) and the Georgia Professional Standards Commission.

As one of the state's major instructional centers, the college is committed to preparing graduates to work in a variety of educational settings, including inner-city
areas. GSU's unique location in the great international city of Atlanta contributes to the accomplishment of this objective. Through collaboration with the metro area schools, all programs within the college require extensive field-based experiences in many types of school settings.

Undergraduate students seeking certification for pre-kindergarten through fifth grades major in early childhood education and pursue a bachelor of science in education (BSE) degree. The four-year BSE program consists of 120 total credit hours.

The Teacher Education Program

The Department of Early Childhood Education (ECE), located on the fifth floor of the Education Building, is responsible for the elementary teacher education program. Students must meet certain requirements before applying for admission to the teacher education program. These requirements include: (a) successful completion of all required course work in the undergraduate general education core (60 credit hours); (b) passing score on the Regents' Tests, an examination prescribed by the Board of Regents to measure reading and writing competency; (c) a minimum overall grade point average (GPA) of 2.75; (d) passing scores on all three sections of the PRAXIS I assessment; (e) passing a basic speech and hearing screening; and (f) an interview with the ECE faculty. When asked about the screening criteria for the interview, one participant explained that not all the applicants are accepted into the program. "We think by next fall's admission that we will have about 100 applicants for about 45 positions. . . . Part of what we look for are some character traits that make the teachers a little bit more prone to understanding urban settings."
Technology Components

Program Design

GSU's teacher education program employs a total integration model to train prospective teachers to use technology. Prior to the final semester of student teaching, students accepted to the program complete required course work that is organized into blocks. Each block consists of six to fourteen hours of course work and includes structured field experiences in particular types of school settings. The field-based methods blocks are:

1. The Pre-Kindergarten/Child Development Block includes six semester hours in pre-school curriculum and child development. Students are placed in pre-kindergarten classrooms for field-based experiences.

2. The Instructional Methods I Block includes fourteen semester hours in Reading and Language Arts, Mathematics and Technology, and Science. Students are placed in technology enhanced schools for field-based experiences.

3. The Instructional Methods II Block includes twelve semester hours in Reading and Language Arts, Mathematics and Technology, and Social Studies. Field-based placements are at urban/inner city schools where at least 75% of the student population is on free or reduced lunch.

4. The Diversity Block includes ten semester hours in cultural diversity, art, and music. Students are assigned to urban schools with diverse populations for field experiences. Schools with at least ten different languages spoken by the children are identified as multicultural sites.
Through this curricular framework, technology is intensively incorporated into classes, blocks, and field experiences. Students are not required to complete a separate three-hour technology course.

When questioned about the importance of requiring preservice teachers to take an introductory course, the responses of the participants were mixed. The lead administrator indicated that a separate technology course was not an effective means of training teachers and stated, “It’s much more effective to infuse it into the courses.” She explained that when technology is taught in conjunction to a unit or theme, students have the advantage of learning technology skills at the same time that they need to apply the skill. This allows students to “attach relevancy to what they’re doing.”

Although the instructors agreed with the concept and benefits of integrating technology into the professional courses, they felt that a separate technology course would allow students to enter the methods courses better prepared. In addition, one instructor noted the difficulty in trying to teach both the course content and technology. However, the instructors cautioned that the content of a separate technology course would need to introduce the different technologies as well as how those technologies relate to students in various grade levels.

Expectations

The administrative leaders within the college have made technology integration a priority. As one participant explained, “... it’s the Dean’s vision that Georgia State take a lead position statewide and nationally in the area of technology.” Guided by this
vision, the college organized the Technology Liaison Team, developed a technology plan, and established technology standards for teacher candidates.

The Technology Liaison Team is comprised of sixteen representatives from the College of Education, the College of Arts and Sciences, Continuing Education, and the local public school system. As an advisory board, the Team meets twice a year to assist in the efforts of the college to realize the Dean’s technology vision.

The College of Education’s Technology Plan outlines a three-year agenda for technology growth. Goals and objectives within the plan address support for the use of technology for teaching and learning, faculty training, recognition of faculty using technology, and technology infrastructure. The plan also includes the college’s Technology Standards for Educators (see Appendix J). These standards establish criteria for assuring that education graduates are adequately prepared to use technology in their classrooms.

The ECE department has also established high expectations and provided encouragement for the use of technology. As listed in the Bachelor of Science in Education Program Manual, the integration of technology is one of the six main objectives of the program. Each semester ECE classes and field-based visits are scheduled on Mondays through Thursdays. Fridays are reserved for faculty meetings. “We include a technology training meeting when something new is added to our general system or when someone indicates that they wish the whole department knew more about,” explained one instructor. In addition, at the beginning of each year the department holds a three-day faculty retreat in the mountains.
Facilities

In March 1997, the college established the Instructional Technology Center (ITC) to encourage and support the use of technology. The ITC, covering the entire second floor and three rooms on the first floor, is open to education faculty and students as well as local area teachers. The facilities include an instructional resource library, state-of-the-art video studio, model electronic classrooms, and computer labs.

In addition to an up-to-date collection of K-12 teaching materials and journals, the center also houses over 150 computer programs and a variety of high-tech equipment. Many of the software titles were obtained through partnerships with such companies as Microsoft, EdMark, and Tom Synder. Visitors to the center have access to state-of-the-art computers, laptops, scanners, digital cameras, laser printers, laser color printers, projection systems, video cameras, a recordable CD-drive, and video-editing equipment. Faculty and students with faculty permission can also check out a variety of portable technology to use in schools and other off-campus sites. This equipment includes laptops with modems and CD-drives, Liquid Crystal Display (LCD) projection systems, laser disc players, external drives, and video cameras.

The ITC has a total of 135 computers housed in five computer labs and four work rooms. Each of the three labs on the first floor are equipped with 21 IBM-compatible personal computers (PCs) and an LCD projection system. On the second floor, the open area of the ITC is equipped 35 PC computers and an LCD projection system and a smaller lab contains ten PC computers. There are also two small software evaluation rooms, each with six PC computers, a scanning room with seven Macintosh computers (MACs) and scanners, and an animation room with four MACs and two PCs.

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In addition, the building's infrastructure includes a wireless portable computer network. This networking capability allows any classroom to be easily converted into a lab with full Internet access. The radio frequency based system uses one phone line and a standard 56K modem to connect up to 20 laptop computers. Three rolling cabinets, each with ten laptop computers equipped with radio based receiver transmitters, are available for this purpose.

Each of the five electronic classrooms located on the second floor are wired for eight computers, connected to a two-way, audio-visual interactive distance learning system, and equipped with a television monitor, video recorder, laser disc player, projection system, and two ceiling-mounted video cameras. The video cameras are connected to the video studio.

All ECE faculty offices are equipped with an up-to-date, networked computer and printer. Instructors are also provided an additional laptop computer upon request. These laptops are routinely upgraded every two years. Other equipment housed in the department include a large laser printer, a color laser printer, two digital cameras, a scanner, and a portable LCD projection system, VCR, and laser disc player.

Support

Through the efforts of the Dean, the college sought and hired a Director of Instructional Technology (see Appendix K for job description) to coordinate all efforts within the college to improve teaching and learning through the use of technology. This individual reports to the Associate Dean and Director of Teacher Education and is responsible for: (a) developing and implementing a systemic, college-wide approach to professional development in the area of technology; (b) collaborating with the faculty to
redesign courses to incorporate technology, and (c) overseeing the operation and management of the college’s technology center and related classrooms and labs.

Under the supervision of the Director of Instructional Technology, the ITC’s five full-time staff members provide technical assistance, checkout equipment, schedule labs, and conduct a variety of regularly scheduled two-hour technology workshops on such topics as creating electronic presentations, designing web pages, scanning pictures, and using a digital camera. The workshop schedule and on-line registration forms are posted to the ITC web page. In addition, three to four graduate research assistants (GRAs) and eleven to twelve student assistants are assigned each semester to work in the ITC. These students assist the full-time staff by manning the computer labs, providing technical assistance, and serving as one-on-one mentors.

Technical assistance is available on a daily basis by the department’s computer support person. This individual is assigned to another department in the mornings and to the ECE in the afternoons. As one participant explained, whenever a problem occurs she simply e-mails or pages the support person. “Within twenty-four hours, it’s either fixed or you know why it can’t be fixed."

Use of Technology

Within the college, the participants noted that faculty attitudes towards technology range from reluctant to enthusiastic. “We have several faculty members who have authored anti-technology publications. So I know that not everybody agrees with what we’re doing,” explained the lead administrator. However, the overwhelming majority of ECE faculty are willing to incorporate technology in their teaching. “I can count on two thumbs, the number of people who are not comfortable with technology
and do not at least use a PowerPoint presentation as part of their instruction... or e-mail to keep students informed about what's going on,” stated one participant.

The participants provided the following overview of how technology is integrated into classes, blocks, and field experiences. The block instructors collaboratively plan their lessons and schedule their classes to meet in the ITC’s electronic classrooms. Throughout the duration of the course, the instructors consistently model a variety of technology resources, including laser discs, digital cameras, scanners, electronic presentations, e-mail, the Internet, and distance learning. Technology seminars, held in conjunction with the methods classes, are structured to allow students to rotate to different centers for “hands-on” experiences with a variety of tools and software. According to a class syllabus provided by one of the participants, students must complete the following course requirements and assignments:

1. Plan and teach portions of a five-day integrated unit of study. At least one lesson each day must include the use of technological hardware and software.

2. Demonstrate proficiency in the utilization of at least two different types of technology in a minimum of two of the four observed lessons at the field-based school site.

3. Communicate with each other and the block instructors through an e-mail journal. Reflect and respond to at least eight questions posted by the instructors as well as students.

4. Review and evaluate at least four software programs designed for the early childhood level.
5. Create a technology portfolio of products for use in the classroom. Each entry must be accompanied by a brief description of the software and/or hardware used and how the product was applied in the classroom for teaching and learning.

ECE majors are permitted to select their choice of an urban, suburban, or multicultural school site for their student teaching experience. Regardless of the technology resources available at their school locations, ECE majors are encouraged to use technology in their practice teaching. A variety of software and portable equipment is available from the ITC for students to use at off-campus locations.

During my visit, I observed a science methods class held in one of the ITC electronic classrooms. As mentioned earlier, these model classrooms are equipped with an LCD projection system, television, VCR, laserdisc player, and two video cameras. The students sat in groups of four or five at five tables. The instructor began the class by using the LCD projection system to display the day’s agenda. After a few announcements, the instructor showed the students how to operate a laserdisc player and then demonstrated how the player could be used in a classroom setting using the Super Sleuths series. This software uses humorous science mysteries to engage students in the process of solving problems. After viewing the introduction to each episode, the students were challenged to work collaboratively at their tables to solve the mystery. Throughout the lesson, the instructor generated discussion among the students by asking open-ended questions related to the use of the equipment, classroom management techniques, and the effectiveness of the activity. The class concluded with
students sharing information on female minority scientists obtained through an Internet search.

In the follow-up interview, the instructor discussed her techniques for modeling technology and stressed the importance of continuously pointing out the type of technology used during the lesson. Otherwise, stated the instructor, the students “just know the lesson was fun . . . or different.”

All the participants rated Georgia State’s teacher education program as very successful in preparing new teachers to use technology in their classrooms. One instructor noted that ECE graduates are often hired for teaching positions based on their technology portfolios. In fact, the instructor added, “We’ve had at least five students who were not hired as early childhood teachers but were hired immediately into a technology spot.”

Southeastern Louisiana University

Profile

The University

Southeastern Louisiana University (SLU) is located in the northwest section of the city of Hammond, Louisiana. This small town of 20,000 residents is conveniently situated at the junction of two major thoroughfares, Interstate 12 and Interstate 55. The historic city of New Orleans is 45 miles to the south; the capital city of Baton Rouge is 42 miles to the west; and the scenic beaches of the Mississippi Gulf Coast lie 75 miles to the east. In contrast to the crowded, urban setting of Georgia State University, SLU’s sprawling 365-acre campus is graced with buildings dating from the Art Deco style of the 1930's to the more contemporary architecture of the 1990's. The spacious grounds

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are covered with majestic, moss-covered oaks, long-leaf pines, and flower-bearing magnolias, camellias, and azaleas.

Southeastern is classified by the Carnegie Foundation as a Master’s I university. As an open-admission, state-supported institution, SLU offers eleven undergraduate and graduate degree programs. The university consists of: the College of Arts and Sciences, the College of Basic Studies, the College of Business, the College of Education, and the School of Nursing.

As the fourth largest university in Louisiana, Southeastern has achieved steady growth in size and curriculum since its founding in 1925. The current enrollment of 15,000 students reflects an 81% increase over the last ten years and has earned SLU recognition as one of the fastest growing universities in the nation. Southeastern’s convenient location, friendly atmosphere, small size, beautiful campus, and quality degree programs probably account for this phenomenal growth.

The Office of Technology provides campus-wide assistance in developing technology resources. SLU’s information infrastructure connects all academic and administrative buildings and provides for video conferencing, remote data transmission, and complete telephone services. Of the 34 computer labs on campus, some are housed in departments and are used by students enrolled in those departments. However, the labs in McClimans Hall, Tinsley Hall, and the University Center are open to all SLU students, faculty, and staff.

**The College of Education**

SLU’s College of Education is housed in the Charles Emery Cate Teacher Education Center (TEC), located in the northwest end of the campus. Professional
education programs are offered through the departments of: (a) counseling, family studies and educational leadership; (b) teacher education; (c) special education; and (d) kinesiology and health studies. The college's teacher education programs are accredited by NCATE and approved by the Louisiana Board of Elementary and Secondary Education.

Undergraduates preparing for elementary school positions, major in elementary education and pursue a bachelor of arts degree. Upon successful completion of the four-year program (138 total semester hours), graduates may apply for state certification for grades 1-8. Additional courses are required for add-on certifications for kindergarten and nursery school teachers.

The Teacher Education Program

The college's Department of Teacher Education is responsible for the development of the undergraduate curriculum in elementary education. Students must apply for admission to the Professional Program in Teacher Education. To qualify for full status admittance, students must: (a) maintain an overall grade point average of 2.5 or better, (b) obtain a passing score on the General Knowledge (644) and Communication Skills (645) sections of the National Teachers Examination, and (c) complete a speech and hearing screening.

Technology Components

Program Design

At SLU, technology is integrated into the methods and professional courses. In addition, undergraduates are required to complete a three-hour introductory technology course entitled Computer Applications in the School Setting (EDUC 305). With
emphasis on the use of technology in the school setting, the course is designed to provide students with a basic working knowledge of hardware, operating systems, productivity software, the Internet, telecommunications, and evaluation and application of educational software. In addition, students are required to develop classroom activities utilizing the computer as an integral tool.

Although the participants felt that the introductory course is important in training preservice teachers, they also indicated that the course alone is insufficient. As one instructor commented, "I think the technology class is very important in that it levels the playing field for all students that are in the methods courses. But unless technology is implemented in the methods courses as well then it's not going to be enough."

Expectations

Expectations for the use of technology has been established at the college and department levels. SLU's College of Education has developed a strategic plan to direct the implementation of the latest state and national standards through the year 2006. This comprehensive plan includes a mission statement, goals, and objectives which incorporate the use of technology throughout the college's professional programs.

The college's Technology Planning Committee has recently drafted a technology action plan that contains specific expectations pertaining to technology that address the goals and objectives listed in the strategic plan. The plan addresses funding for state-of-the-art hardware and software, assessing a student technology fee, establishing distance learning/multi-media classrooms, assigning liaisons to provide specialized technical assistance, and providing faculty development.
In preparation for next year's NCATE's accreditation review visit, the Department of Teacher Education established an eight-member technology task force. The task force is in the process of correlating the NCATE/ISTE standards with the teacher education curriculum. According to the lead administrator, a draft of the committee’s efforts has allowed the department to evaluate their program in terms of technology and to determine the areas that need improvement.

Facilities

According to the participants, the primary challenges to integrating technology into the curriculum are the availability and accessibility of equipment. Although all faculty offices are equipped with a networked computer, the majority of these computers are older models purchased more than three years ago. In commenting on the problems with equipment, one instructor stated, “…I don’t even have a monitor on my desk right now . . . I have to go down the hall to use a computer and half the ones down the hall don’t work.” Another instructor noted problems with the network and stated, “at least once a week . . . I am not able to get my e-mail.”

In an effort to provide the faculty with access to the latest technological tools, the Dean established the Faculty Technology Center. This small workroom, known as the Dean’s Lab, is located on the second floor and contains two high-powered multimedia PC’s, two Power MACs, two scanners, a laser printer, and a color laser printer.

Although there are no electronic classrooms in the teacher education center there is one distance learning room. The faculty does have access to LCD projection systems, digital cameras, and five mobile learning stations. Each station includes a
large screen television, multimedia computer, video cassette recorder, and a printer. One participant revealed that the faculty commonly refer to the stations as COWs (Computers On Wheels). Although the COWs are frequently used by the faculty, two of the participants complained about the difficulty in moving the large, bulky carts. These instructors noted the need for “stand-alone classrooms” equipped with an LCD projection system, screen, television, and a “top-grade computer” on every professor’s desk. The lead administrator explained that the college has received approval to expand the building and that the plans include equipping each classroom with televisions, VCRs, and LCD projection systems.

To further enhance the undergraduate Elementary Teacher Education Program, the department received grant funds to establish Project Create (Collaboration for Reform in the Education of Aspiring Teachers). This reading and mathematics literacy resource center is housed in a converted TEC classroom. The center’s two support teachers assist the faculty, mentor teachers, and students with the integration of technology into the undergraduate reading and mathematics methods course and site classrooms.

In addition to the open labs in McClimans Hall, Tinsley Hall, and the University Center, education students and faculty also have access to two computer labs located in the Teacher Education Center. Each lab contains approximately twenty networked multimedia PC’s as well as scanners, printers, and an LCD projection system. Much of the available software is obtained through partnerships with such companies as Microsoft, Tom Synder, and Inspiration. Although the labs are often scheduled for classes, open lab times are posted throughout the building and on the college’s web
page. During open hours, the labs are staffed with graduate assistants and student workers to provide assistance to other students and faculty.

Faculty Productivity Services (FPS) provides the university’s faculty with access to state-of-the-art technological tools for teaching and research as well as support for using the tools. The facility, housed in Tinsley Hall, includes three multimedia PCs, two Power Macs, CD recorders, scanners, a color copier, and a color laser printer. Four full-time employees assist all university faculty with research projects, creating course content, and producing multimedia instructional material. Throughout the year, FPS staff also conduct training sessions on the use of technological tools and basic strategies for integrating technology. Although one participant acknowledged the helpful staff and up-to-date equipment, she also noted the inconvenience of the facility’s location.

Support

Although the college has provided some inservice opportunities within the last few years, there is not a consistent staff development plan. However, most of the participants expressed an interest in enhancing their technological skills. In commenting on the need for technology training one instructor said, “I need professional development . . . because even though I’ve got ideas and I know the curriculum . . . I don’t have enough people that are experts to help me take that next step.” Another instructor stated, “I think those of us that really love technology would like to have more opportunity to develop it for our class.”

According to the lead administrator, each semester several instructors enroll in graduate level classes to increase their technological skills. “We have faculty members
who are in their thirtieth or fortieth year of teaching, and they are taking courses and using computers in their classrooms."

Technical support for the college is provided through the university’s Office of Technology. Faculty can telephone or e-mail the office’s computer help desk for assistance with hardware and software problems. According to the lead administrator, the office is understaffed, and there is often a delay in resolving problems.

The university’s Office of Technology has appointed a liaison to advise the college on equipment and software purchases. The lead administrator pointed out that although, “it’s not his job to run around and fix things,” this individual does occasionally provide some technical support.

Use of Technology

When asked about the overall feeling among the faculty concerning integration of technology into their instruction, the participants indicated that although the faculty is generally “very enthusiastic” and “open to the concept,” there are also feelings of hesitancy and frustration. “I think a lot of us feel sort of overwhelmed that maybe we don’t have the facilities or the training that we need to use technology as adequately as we would like to, or the time,” explained one participant. Another instructor commented, “I don’t feel like I’m doing nearly as much as I should be, but I think I’m doing more than a lot of people.” Despite these feelings of inadequacy, the lead administrator estimated that approximately 90% of the full-time teacher education faculty are attempting to integrate technology to some extent into their instruction. One instructor noted, “We all have certain objectives within our courses that address
technology; however, many of us are still at an implementation stage where some instructors are more comfortable with technology and therefore are doing more.”

The lead administrator noted that the use and integration of technology within the teacher education program has greatly increased over the past few years. Most of the instructors have created web pages to provide class information and use e-mail on a daily basis to communicate with students and other faculty. Also, a large number of faculty routinely use software, such as PowerPoint, to create class presentations, access resources on the Internet, and schedule classes to meet in the one of the college’s two computer labs.

In providing an overview as to how technology is integrated into the teacher education program, one participant noted that the faculty makes a “conscience effort” to use and model technology in their own teaching and to make sure that their “students utilize it in their practice settings.” For example, one participant described how small hand-held computers, acquired through a cooperative project with the Casio Corporation, were used by student teachers to teach writing to fourth graders. Due to the success of the program, the department recently purchased thirteen additional hand-held computers. Another instructor explained how she maintains an ongoing dialogue with her students by having them e-mail reports of their weekly field experiences. At the end of the semester, the students submit a journal containing copies of their messages and responses from the instructor.

Due to increases in the number of students requiring field placement assignments and the lack of qualifying mentor teachers, technology is not a priority for site selection. The lead administrator expressed regret that all students could not be
placed in technology-rich environments. However, she noted that the local public schools are gradually increasing their technology resources.

During my visit, I observed one of the undergraduate technology classes (EDUC 305) which met in one of the TEC’s computer labs. The instructor began the lesson by dividing the sixteen students into three groups and assigning each group to a prearranged center. Moving to the first group, the instructor taught the students to use the scanner to digitize photographs. While these students practiced scanning photographs brought from home, the instructor moved to the second group and demonstrated how to use a photo editor to make changes to graphic files. Following this same procedure, the instructor moved to the third group and demonstrated how to download images from the Internet. After allowing all the students sufficient time to practice their newly acquired skills, the instructor reorganized the groups to include at least one “expert” at each skill. As the students rotated to the different center, the student experts taught the other members of the group to perform the required skill. The instructor moved from group to group assisting the students.

I also observed a reading methods class that was held at an elementary school located two miles from the campus. Students sat at tables in groups of five or six. The instructor began the class by telling the students about an e-mail she had received from a student inquiring about a grade on a test. The report of the incident prompted a class discussion about privacy issues relating to e-mail.

Using the television monitor and computer located on the mobile learning station in the front of the room, the instructor projected an electronic slide show titled, “Setting Our Sites On Content Literacy,” as she discussed the day’s lesson. As the
lesson ended, the instructor questioned the students about how they could incorporate an electronic presentation to enhance their own lessons with their students.

Effortlessly switching connections from the computer to the VCR, the instructor played a video tape on the television monitor. The video showed images of various technology-related projects used with students in local area classrooms. Following the video, the instructor continued to discuss how technology can be used to enhance classroom instruction. Some of the students shared how they had observed technology used in their visits to school sites while other students complained about the lack of computers at their sites. As the class ended, the instructor assigned the students to find out exactly what technology resources were available at their school sites.

When asked to rate SLU's teacher education program in terms of preparing students to use technology in their own classrooms, the responses from the participants were mixed. The lead administrator rated the program as highly successful. A second participant felt that SLU was "definitely in the forefront." A third participant qualified her response by stating that in comparison to other small universities, SLU is probably good; in comparison to larger, more technologically advanced institutions SLU would rate very poorly. A fourth participant gave the program a low rating.

The University of North Texas

Profile

The University

The University of North Texas (UNT) is a comprehensive research university in Denton, Texas. This city of more than 70,000 people is located 37 miles northwest of Dallas, 35 miles northeast of Fort Worth, and 27 miles from the Dallas-Fort Worth
International Airport. The UNT campus covers 465 acres and is comprised of 134 structures.

UNT offers 126 undergraduate and graduate degree programs and is organized into four colleges and five schools. The colleges are (a) arts and sciences, (b) business administration, (c) education, and (d) music. The schools are: (a) community service, (b) library and information sciences, (c) merchandising and hospitality management, (d) visual arts, and (e) the Toulouse School of Graduate Studies. The university is classified as a Doctoral I institution by the Carnegie Foundation and ranks as fourth in the nation in the number of professional educators graduated each year.

With a total enrollment of 25,013 students and 979 faculty members, UNT is the fourth largest university in Texas and the largest university in the northern region of the state. With an undergraduate student enrollment of 19,000, the student to faculty ratio is nineteen to one.

UNT maintains an intensive computer environment and is recognized as one of America’s 100 Most Wired Colleges. The university’s computing services include a central support unit, distributed support units, general access labs, and a maintenance shop. The Computing Center provides centralized communications, network, and microcomputer support for the entire campus. Distributed support units, housed within various colleges and departments, provide on-site technical support. UNT’s fourteen General Access Labs (GALs), equipped with more than 500 computers, are strategically located throughout the campus. These labs are funded through a student technology fee of $3.25 per semester hour. Although UNT faculty and staff are allowed to use the labs, priority is given to the students. There are also 35 special-purpose labs with 650
computers housed in colleges and departments. All IBM-compatible personal computers (PCs) used by the university’s faculty, staff, and students are built and maintained by the Microcomputer Maintenance Shop. In comparison to similar Texas universities, UNT has a higher computer to student ratio.

The College of Education

UNT’s College of Education is housed in Matthews Hall located near the center of the campus. The college is composed of four departments: (a) Counseling, Development and Higher Education; (b) Kinesiology, Health Promotion and Recreation; (c) Teacher Education and Administration; and (d) Technology and Cognition. Each department occupies a separate suite of offices within the building. UNT’s teacher education program is accredited by NCATE and the Texas Education Agency.

Undergraduates planning to teach in elementary schools enroll in the Bachelor of Science program with a major in Interdisciplinary Studies. At UNT, all undergraduates, regardless of their major, are required to complete the University Core Curriculum. However, the teacher education program requires specific courses that exceed the university core requirements. The core curriculum for interdisciplinary studies majors consist of 55 semester hours of general courses.

The state of Texas offers four options for elementary certification:

1. Option I certifies the student to teach in grades 1-6.

2. Option II certifies the student to teach in grades 1-8 in one area of academic specialization. The specializations include biology, earth
science, English, French, geography, health, history, kinesiology, mathematics, music, Spanish, speech, and theater.

3. Option III certifies the student to teach generic special education in grades 1-8.

4. Option IV certifies the student to teach in grades K-6 with specialization in early childhood.

Elementary teaching certificates are awarded to students who satisfactorily complete the four-year baccalaureate degree program (132-135 total semester hours) and achieve a passing score on the Elementary Professional portion of the Examination for Certification of Educators in Texas (ExCET).

The Teacher Education Program

The Department of Teacher Education and Administration, located on the second floor of Matthews Hall, is responsible for the undergraduate and graduate programs in elementary and secondary education. Prior to taking education courses, students must formally apply for admittance to the professional program. The requirements for official admission into teacher education include: (a) completion of at least 60 semester hours, including the university core curriculum; (b) 2.75 overall GPA; and (c) passing scores on all parts of the Texas Academic Skills Program (TASP).

Technology Components

Program Design

In addition to primarily integrating technology into methods and foundations courses, UNT also requires students to complete a separate technology course. This three-hour course, Computer Applications (CECS 1100), is taught by the college's
Technology and Cognition faculty and provides an introduction to computers and software applications such as word processing, data-base management, spreadsheets, graphics, and communications. According to one of the CECS 1100 instructors, the course is strictly a computer literacy class with emphasis on productivity software.

When asked about the importance of an introductory computer class in training new teachers, the participants’ responses were divided between the administration and the faculty. The lead administrator felt that the importance of the course is “diminishing” because more and more students are entering the teacher education program with “a great deal of experience with technology.” Therefore, he felt the most appropriate means of training undergraduates to effectively use technology in their classrooms is through methods and professional courses as well as field-based placements in technology-rich schools. The instructors, on the other hand, stated that the introductory class was a necessary component of the program. They felt the course trained new teachers to use the latest technology found in today’s classrooms.

Expectations

According to one participant, within the last two years, the administration and faculty recently adopted a motion to include a technology component in every education course. However, I experienced difficulty in obtaining copies of any planning documents. After my faculty sponsor was unsuccessful in acquiring a copy of the college’s strategic plan, she suggested that I contact the Dean’s Office personally. When I didn’t receive a reply from my e-mail request, I followed up with a phone call and left a message with the dean’s assistant. Two days later the Dean returned my call and agreed to mail me a copy of the college’s goals and objectives related to
technology. However, several days later I received a one page memo briefly listing ten "planning initiatives related to technology."

During my telephone conversation, the Dean also stated that the college did have a technology plan and referred me to the person that I should contact to obtain a copy. I was somewhat surprised by this revelation, since one participant had previously informed me that the college did not have a technology plan. Adding that he had talked, "with the person who would initiate that, and she verified that we do not." My telephone call to the person suggested by the Dean was not returned nor did I receive a copy of the technology plan.

Facilities

When asked about equipment or technology resources available within the college or the department, participant responses were vague and inconsistent. For instance, one participant stated, "I don't know because I'm not a person that's really into hardware a whole lot, but I know that we have pretty sophisticated kinds of things for our students to use." Although all the participants described the computer labs, each participant gave varying responses regarding the available resources.

The department’s only computer lab, located on the third floor of Matthews Hall, is restricted to teacher education faculty and students. The lab is equipped with 25 Macintosh computers, two scanners, a laser printer, a color ink jet printer, a high intensity overhead projector, and a LCD projection panel.

One of the university’s fourteen general access labs (GALs) is also housed on the third floor of the building. This lab is equipped with 74 PCs, four Macintosh computers, two laser printers, and over 300 individual software programs. As part of
the campus-wide computer system, the lab is open to the general student population and the use of the lab for classroom instruction is restricted to not more than 15% of the lab’s open time. Three oversight committees, comprised of faculty, staff, and students, monitor the university’s GAL’s to ensure that the labs meet the needs of the students. Due to the university rules governing the use of the GAL’s, the faculty avoids scheduling classes to meet in this lab.

Every faculty office is equipped with a networked printer and state-of-the-art computer. As mentioned above, these PCs are built and maintained by the university’s Microcomputer Maintenance Shop (MMS). The faculty also has access to a large laser printer, color laser printer, and scanner which are located in the department’s main office.

Although there are no electronic classrooms, the college does have a video studio, two distance learning rooms, and a library media room. One participant stated that the media room contains books, video cassettes, laser disks, software programs, two media carts, and approximately twenty state-of-the-art laptops that are available for faculty to check out. The laptops are purchased at below retail cost through a partnership agreement with the locally-based Dell Computer Corporation. When asked if there were ever any problems checking out a laptop, the participant replied, “No, as you will see there’s quite a few still there.”

The college’s Office of Technology (COETECH), located on the first floor of the education building, is part of the university’s distributed support system. COETECH staff run the General Access Lab on the third floor and provide technology assistance for office, lab, and classroom computers within the College of Education.
According to the lead administrator, the COETECH staff are “very good and usually very prompt and ready to get to the problem and fix it right away.”

When asked about faculty development, one participant stated, “Not really. Although, let’s put it this way, there are times we have a professional institute.” However, she added that the presentations are “so general that they’re not really beneficial.” The participant acknowledged that her own hesitancy was a major barrier to integrating technology into her classes and she felt frustrated that she didn’t, “know all the ways it can be used.” Another participant stated that most faculty training is offered in the “late afternoon and on your time. If you’re teaching an evening class or all day, it’s really hard.”

**Use of Technology**

Although I was initially told that technology was integrated throughout the teacher education program, I experienced some difficulty in finding participants for this study. Two of the three instructors contacted were not using technology in their undergraduate classes at the time of my visit, therefore, I was not able to observe their classes. However, the two instructors were interviewed.

When asked about the overall feelings among the faculty towards integrating technology into the teacher education program, the lead administrator stated, “I think people feel that it’s important.” However, he noted that the faculty varied in their levels of expertise and their willingness to learn and use technology in their teaching.

A second participant stated, “My general opinion is that we ought to be doing a lot more than what we are doing.” Yet, in comparing UNT’s College of Education to other colleges, she concluded that “this is one time that we are leading rather than
following.” At the end of the interview, this participant revealed that she and several of her colleagues are “struggling with” certain philosophical issues related to the instructional use of technology. “Just because you can do it better and faster with the technology, does that mean you should?” she asked. The participant then continued, “... teaching is more than just acquiring information and so I think there’s a reluctance on the part of a lot of teachers who say, look, I got into teaching because I wanted to work with kids not because I wanted to work with kids who are working on computers.”

A third participant began her response by stating that many of the faculty have the desire to integrate technology into their instruction but are frustrated with the time that they need to acquire proficiency. However, as the interview progressed, the instructor confided that some of the faculty continue to employ traditional instructional methods and are reluctant to make changes. She attributed this reluctance to several factors. First, the state’s ExCET test has placed enormous pressure on the college’s faculty. As the instructor explained, students “must pass this test or they are not certified to teach. It doesn’t matter if they’ve made a 4.0... If they don’t pass; they don’t get certified.” Within the last year, the ExCET test has also become tied to accountability in higher education. Texas universities are now rated according to the number of prospective educators that pass the ExCET. Teacher education programs not meeting the standards are rated “Accredited Under Review.” These programs are assigned an assistance team to help the university meet state standards within a three-year period. When asked how UNT rated, the instructor replied, “Accredited Under Review.” She added that changes have been instituted in the hopes of improving the university’s rating on the next test.
Second, the instructor explained, that the college experienced “a big turnover in Deans for awhile. . . . Things would go forward and then it would take a step back and go in a different direction.” However, she noted that under the leadership of the current Dean the program has “started to move forward.”

Third, some of the faculty have been “around for a long time, doing it one way for so long, and are going to continue to do it that way.” Referring to this group as the "paradigm settlers" the instructor added, “they’re comfortable and change is frightening.” She concluded by stating, “I think the rest of us need to show them that it’s not scary and just give them time to switch over.”

In providing an overview of how technology is integrated into the teacher education program, the participants noted that the majority of the faculty communicate with students through e-mail, use presentation software to create class presentations, and access information on the Internet. In addition, many instructors require students to create technology-enhanced lesson plans and to evaluate software programs as well as Internet sites.

One instructor stated that students in her undergraduate social studies class are required to complete a series of technology-related assignments comprising forty percent of their final grade. The activities include locating information and lesson plan sites on the Internet, evaluating software, developing lesson plans incorporating the Internet, and creating an Internet scavenger hunt. During the course of the semester, students are given three hours of class time to complete the assignments. The instructor added that she occasionally schedules classes to meet in the computer lab so that she or the lab assistant can demonstrate software programs. However, the instructor stated,
“With only one lab, I have to schedule it ahead of time so I can’t always get the lab when I want it.” She added, “I will tell them, if nothing else, here are some ways in which you can do this.” As the conversation continued, the instructor explained, “I could with a lot of effort . . . bring down one of the monitors and so forth . . . but that is probably more complicated than what I want to do.” In conclusion, she noted that she would like to have the equipment that she needed in every classroom.

One class that I observed was held in Wooten Hall, directly across from Matthews Hall. As the instructor and I entered the room, we were met by a young man who was checking the laptop computer and LCD projection system on top of a media cart. I sat in the back of the room as the instructor walked over and handed a computer disk to the man. After a brief discussion, the first slide was projected onto a wall-mounted screen in the front of the room. Assured that everything was in working order, the young man left the room.

As the students entered the room, they sat in desks arranged in straight rows. In the front of the room, a projection screen hung to the left side opposite a wall-mounted television and VCR. At the beginning of the class the instructor introduced me to the students and asked me to tell the class about my study. When I finished, the instructor explained that the students had been assigned to find at least one Internet site about a thinking or memory activity. Several students volunteered to orally present their findings. Some of the presenters were asked to provide the addresses of their sites. Interested students rapidly jotted down the URLs as they were called out. With only twenty minutes remaining, the instructor had the students turn in a one-page copy of
their website. She then began discussing information processing using computer-generated slides to enhance her lesson.

During the follow-up interview, the instructor stated that she would like to have the students actually use the equipment. However, she noted, “That’s not easy to do with 33 students and one piece of equipment.” The instructor also stated that due to the lack of computer labs, she has to provide class time for the students to complete their technology-related assignments.

In order to complete a second observation, another instructor obligingly allowed me to observe her undergraduate class. I arrived at the building a few minutes before class and went upstairs to meet the instructor. As I entered the department’s suite, the secretary looked at me in panic as she desperately attempted to set up an LCD projection system on a media cart. Laughing nervously, the secretary said, “You would have to show up now. Dr. White needs this for her class, and I can’t get it to work.” After struggling with the equipment a few more minutes, the secretary abruptly turned and went down the hall. She quickly returned with another professor who got the projector working just as Dr. White entered the office. While I looked on, the professor gave Dr. White a quick lesson on how to use the projector and then unplugged the electrical cords so that the cart could be moved downstairs. The three of us, Dr. White, the professor, and myself, then rolled the cart down the hall, into the elevator, and into to the classroom on the first floor. Positioning the cart in front of the wall-mounted screen, the professor attached the cables and tested the equipment for Dr. White. As the professor finished, she turned to me and whispered, “I’m going to stay for awhile, just
in case she needs me." The professor went to the back of the room and stood by the door.

Students entering the room sat in desks arranged in eight rows of four. Dr. White began the class by introducing me and briefly describing my study. She then proceeded with the lesson which included an on-screen presentation summarizing Payne's Children of Poverty. At the end of the class, Dr. White asked how many of the students knew how to use presentation software. Out of the 41 students in the class only 13 raised their hands.

When asked about the school sites selected for field experiences and student teaching, one participant noted that all the schools in the surrounding areas have technology. In concurrence, the lead administrator explained that during the last five years, the college has collaborated with the surrounding school districts to create professional development schools (PDS). The program is currently being expanded to include more schools and he stated that, "we'll be looking for sites that are doing a good job with technology."

When asked to rate the teacher education program at UNT, the participants’ responses were again mixed. The lead administrator stated, "I only know one other university that I've been at since . . . modern technology has been on the scene. . . . I can say we are much better than they are, unless something drastic has changed in the last few years." One instructor responded, "I don't have a basis for making that decision." She added, "I would like to think just from informal discussions with colleagues . . . that we rank fairly favorably." She continued, "I think we probably outshine a lot of other places. On the other hand, I'm sure there are places that are
much more sophisticated than we are." A third participant stated, "on a scale of one to five, around a two. They're getting there. Actually they should have been there by now."
This chapter analyzes the data collected from the qualitative and quantitative methods used in this study. The first section analyzes the case studies conducted at Georgia State University (GSU), Southeastern Louisiana University (SLU), and the University of North Texas (UNT). The second section reports the results of the surveys of first-year teachers who were recent graduates of the universities.

The Case Studies

Qualitative data analysis is the process of systematically examining and organizing information collected through interviews, observations, and archival data. Analysis involves breaking data into parts; determining the relationships among the parts; searching for patterns; and discovering what is significant, what can be learned, and what can be reported to others (Bodgdan and Biklen, 1998).

Following Spradley’s (1979) Developmental Research Sequence (DRS) protocol, I began the process of analysis by closely examining my field notes to search for cultural patterns. These identified patterns led to the descriptions of cultural behavior, cultural artifacts, and cultural knowledge. Through this process, I was able to produce a rich descriptive account of each university’s teacher education program and to document specific quotes made by the participants. These research reports facilitated the creation of cultural domains, structural questions, taxonomic analysis, contrast questions, and componential analysis.
Domain Analysis

Cultural domains are categories of meaning that include smaller, related categories. The domains are made up of cover terms, included terms, and their semantic relationships. Each cover term names a cultural domain while the included terms name the smaller categories that are related to that specific domain. The semantic relationship identifies how the cover term is linked to the included terms.

After sorting, organizing, comparing, and contrasting data from all of the sources, I identified two cultural domains and constructed lists of included terms related to each domain. The semantic relationship of the cover terms to the included terms is displayed on the Domain Analysis Chart (see Appendix L). An abbreviated domain analysis for each domain is presented as a figure in the body of Chapter Five.

The cultural domain profile (see Figure 5.1.1) encompasses background information about each university. Some of the terms used to describe this domain include geographical location, campus, infrastructure, departments, accreditation, degree program, admission criteria, and certification.

<table>
<thead>
<tr>
<th>Cover Term/Domain: Profile</th>
<th>Semantic Relationship: is/are a part of the</th>
</tr>
</thead>
<tbody>
<tr>
<td>Included Terms:</td>
<td>geographical location</td>
</tr>
<tr>
<td></td>
<td>campus</td>
</tr>
<tr>
<td></td>
<td>infrastructure</td>
</tr>
<tr>
<td></td>
<td>departments</td>
</tr>
<tr>
<td></td>
<td>accreditation</td>
</tr>
<tr>
<td></td>
<td>degree program</td>
</tr>
<tr>
<td></td>
<td>admission criteria</td>
</tr>
<tr>
<td></td>
<td>certification</td>
</tr>
</tbody>
</table>

Figure 5.1.1
Cover Term/Domain: Profile
The cultural domain, *technology component*, (see Figure 5.1.2) describes the key elements related to technology use within the teacher education programs. Some of the terms that describe this cultural domain are technology course, course integration, vision/mission statement, equipment, training, support, faculty attitudes, and modeling.

<table>
<thead>
<tr>
<th>Cover Term/Domain: Technology Component</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Semantic Relationship:</strong> is/are a kind of</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Included Terms:</th>
</tr>
</thead>
<tbody>
<tr>
<td>technology course</td>
</tr>
<tr>
<td>course integration</td>
</tr>
<tr>
<td>vision/mission statement</td>
</tr>
<tr>
<td>equipment</td>
</tr>
<tr>
<td>training</td>
</tr>
<tr>
<td>support</td>
</tr>
<tr>
<td>faculty attitudes</td>
</tr>
<tr>
<td>modeling</td>
</tr>
</tbody>
</table>

Figure 5.1.2
Cover Term/Domain: Technology Components

The process of organizing the data into cultural domains leads to the identity of the cultural categories and to a fuller understanding of the cultural scene as a whole. Careful study of the domains helped in posing structural questions in order to discover how all of the included terms are organized and how they relate to the whole.

**Taxonomic Analysis**

From each cultural domain, a detailed taxonomy was created to show the relationships among the included terms (see Appendix M). Each taxonomy revealed different levels of subsets that were organized on the basis of a single semantic relationship. An abbreviated taxonomy for each domain is presented in the body of Chapter Five.
The included terms within the cultural domain *profile* were categorized under the headings of the university, the college of education, and the teacher education program (see Figure 5.1.3). The university subset addressed those attributes which described general information about the institution. Location provided geographical information including the city, state, and region as well as the size and composition of the campus. Colleges and schools identified the administrative organization of the university and the degree programs offered by the university. Students and faculty gave details about the size of the institution based on the numbers of students and faculty.

![Figure 5.1.3](image)

**Figure 5.1.3**
Taxonomy: Profile

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The college of education subset provided an overview of the professional education unit within the university. Location described the building which houses the college and its campus location. Departments gave details about the administrative organization of the college. Degree program described the baccalaureate degree and major leading to elementary education certification. Accreditation listed endorsements from national and state accrediting organizations.

The teacher education program subset described the department responsible for training undergraduates to work with students at the elementary level. This information included the program's location within the college and the admission criteria for the professional program.

The technology components domain served to outline the key elements related to the use of technology within the teacher education programs. This domain was divided into the five subsets of program design, expectations, facilities, support, and use of technology. These subsets were further divided into other levels of subsets for responding to the structural question which asks, "What is the relationship among all the included terms in this cultural domain?" The abbreviated taxonomy for this domain (see Figure 5.1.4) displays the subsets and how they relate to the whole.

The first subset shows the variations in the program designs used by the teacher education programs to achieve computer competencies. The second subset shows the different ways the colleges and the departments responsible for the programs established high expectations and incentives for the faculty to actively use technology for teaching and learning. Leadership and planning specified the role of technology and provided an agenda for the implementation of technology within the program.
The third subset identifies the different kinds of facilities at the universities. Equipment describes the hardware and software resources. Space describes the availability of adequate rooms to use the equipment. The fourth subset shows the two main types of support for the use of technology. Training provides support for technology through professional development opportunities. Technical support provides reliable maintenance of existing equipment and assistance with software applications. The fifth and final subset shows how the teacher education faculty used technology within the teacher education program. Faculty acceptance of technology directly impacted the extent of technology use within the program. Methods identifies the instructional strategies used by the faculty to teach about and with technology.
Componential Analysis

As stated earlier, the case studies were designed to describe and analyze how the teacher education programs at each university are preparing students to integrate technology into their classrooms and instruction. The two domains which emerged during the course of this investigation provided the mechanism for making comparisons between and among the cases. For each domain, contrast questions were posed in order to search for contrasts among the cultural categories, or attributes. The dimensions of contrast were represented on a componential analysis chart. Spradley refers to this chart as a paradigm. A description of the contrasts as well as conformity among the attributes are included in the body of Chapter Five.

The componential analysis for the profile domain shows eighteen dimensions of contrast by institution site (see Figure 5.1.5). With the exception of those related to technology, these attributes are neutral in meeting the purpose of this study but provide a deeper understanding of the cultural scenes under investigation. At the university level differences were noted in location, size, Carnegie classification, degree programs, and enrollments.

GSU and UNT are situated in urban areas, while SLU is located in a small town. UNT has the largest campus, while GSU has the smallest campus. GSU and UNT are classified by the Carnegie Foundation as Doctoral I universities, and SLU is classified as a Master’s I university. UNT’s nine colleges and schools offer more than twice as many (126) degree programs as GSU’s six colleges (50). SLU’s five colleges offer only eleven degree programs. With regard to student and faculty populations, GSU and UNT are larger than SLU.
### Componential Analysis Domain: Profile

<table>
<thead>
<tr>
<th>Dimensions of Contrast</th>
<th>GSU</th>
<th>SLU</th>
<th>UNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community location</td>
<td>Urban</td>
<td>Small Town</td>
<td>Urban</td>
</tr>
<tr>
<td>Campus size</td>
<td>57 acres</td>
<td>365 acres</td>
<td>465 acres</td>
</tr>
<tr>
<td># Campus buildings</td>
<td>20</td>
<td>50</td>
<td>134</td>
</tr>
<tr>
<td># Colleges and Schools</td>
<td>6</td>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td># Degree programs</td>
<td>50</td>
<td>11</td>
<td>126</td>
</tr>
<tr>
<td>Carnegie classification</td>
<td>Doctoral I</td>
<td>Master's I</td>
<td>Doctoral I</td>
</tr>
<tr>
<td>Student enrollment</td>
<td>24,276</td>
<td>15,058</td>
<td>25,038</td>
</tr>
<tr>
<td># of Faculty</td>
<td>1,437</td>
<td>645</td>
<td>979</td>
</tr>
<tr>
<td># Open access labs/Computers</td>
<td>4/286</td>
<td>4/106</td>
<td>14/575</td>
</tr>
<tr>
<td>Student technology fee</td>
<td>No</td>
<td>No</td>
<td>Yes-$3.25/ per semester hour</td>
</tr>
<tr>
<td># College of Education Departments</td>
<td>6</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Degree programs/Total credit hours</td>
<td>BSE/120</td>
<td>BA/138</td>
<td>BS/132-135</td>
</tr>
<tr>
<td>Major</td>
<td>Early Childhood</td>
<td>Elementary Education</td>
<td>Interdisciplinary Studies</td>
</tr>
<tr>
<td>Certification</td>
<td>Pre/K - 5</td>
<td>1 - 8</td>
<td>K - 8</td>
</tr>
<tr>
<td>Core Curriculum hours</td>
<td>60</td>
<td>46</td>
<td>55</td>
</tr>
<tr>
<td>Minimum GPA</td>
<td>2.75</td>
<td>2.5</td>
<td>2.75</td>
</tr>
<tr>
<td>Assessment test/Scores</td>
<td>Praxis I - pass all 3 sections</td>
<td>NTE - General Knowledge (644) Communication Skills (645)</td>
<td>TASP- pass all parts</td>
</tr>
<tr>
<td>Hearing/ Speech Screening</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Required Interview</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

**Figure 5.1.5**

Componential Analysis Domain: Profile

Contrasting technology services across these sites produced an interesting analysis. All three universities have campus-wide networks and provide free access to
the Internet and e-mail accounts to all enrolled or active students, faculty, and staff. UNT has the most computer intensive environment with fourteen open access labs located throughout the campus. Funded through a student technology fee, the labs are equipped with 575 state-of-the art PCs which are built and maintained by the university's technology staff. GSU and SLU each have four open access labs, yet GSU provides more than twice as many computers (286) as SLU (106).

Two dimensions of contrast are shown at the college of education level. The colleges at SLU and UNT are administratively composed of four departments while the college at GSU is composed of six departments. Graduates of the teacher education program at GSU earn a bachelor of science in education degree (BSE) in early childhood and are certified to teach in grades Pre/K-5. Graduates of SLU earn a bachelor of arts degree in elementary education and are certified to teach in grades 1-8. Graduates of UNT earn a bachelor of science degree in interdisciplinary studies and are certified for grades K-8. The professional education programs at all of the colleges are accredited by NCATE and their respective state boards.

Seven dimensions of contrast are shown as part of the teacher education program subset. Although students must apply and be accepted into the teacher education program at each university, the requirements for admission varied across sites. GSU's core curriculum included more semester hours (60) than SLU (46) and UNT (55). GSU and UNT required a higher grade point average (2.75) than SLU (2.5). All three programs required different assessment tests. Undergraduates at GSU and SLU had to pass a hearing and speech screening. Only GSU required students to pass a formal interview.
Since one of the purposes of this study was to compare the technology components of the teacher education programs, the componential analysis for the technology component domain is presented in five separate parts. Each part represents a major subset of the domain, including program design, expectations, facilities, support, and use of technology.

Two models for training new teachers to use technology are the separate, introductory technology course and the integration model (Wetzel, 1993). Most researchers agree that the single course approach is of limited value if it is taught in isolation from the rest of the teacher education curriculum (Drazdowski, 1994; Willis and Mehlinger, 1996). Some researchers believe that the course should be eliminated in favor of integrating technology across all stages of undergraduate teacher preparation. Other researchers argue that a separate, introductory technology course is essential in providing a foundation for integration in other classes (Wiebe, 1995). After careful examination of both approaches, Wetzel (1993) concluded that neither model worked alone and endorsed the use of both approaches in preservice programs. Although none of the teacher education programs rely solely on a separate course in their program designs, SLU and UNT use a combination of the two methods, while GSU has eliminated the technology course in favor of the integration model (see Figure 5.1.6).

The teacher education programs at SLU and UNT required students to complete a separate, three-hour introductory technology course. At SLU, the technology course is included in the professional program and is taught by teacher education faculty. Also, the redesigned course was structured to train students to use technology, to teach with technology, and to integrate technology into their future classrooms. In contrast, at
UNT, the technology course was included in the university core curriculum which students must complete prior to entering the professional program. Course instructors were technology specialists from the Department of Technology and Cognition, and the content of the course focused solely on computer literacy and basic application programs such as word processing, spreadsheets, and databases.

<table>
<thead>
<tr>
<th>Dimensions of Contrast</th>
<th>GSU</th>
<th>SLU</th>
<th>UNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required, separate technology course</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Technology course content</td>
<td>N/A</td>
<td>Redesigned</td>
<td>Traditional</td>
</tr>
<tr>
<td>Course position in program of study</td>
<td>N/A</td>
<td>Professional Curriculum</td>
<td>Core Curriculum</td>
</tr>
<tr>
<td>Intentionally assign students to technology-rich schools for field experience</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Technology course instructors</td>
<td>N/A</td>
<td>Teacher Ed Faculty</td>
<td>Technology Specialists</td>
</tr>
<tr>
<td>Blocked courses</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Opinions for required technology course</td>
<td>Split</td>
<td>Same</td>
<td>Split</td>
</tr>
</tbody>
</table>

Figure 5.1.6
Componential Analysis: Technology Components Domain Program Design Subset

When questioned about the importance of requiring preservice teachers to take an introductory course, the responses of the GSU and UNT participants were split between the lead administrators and the instructors. Although the GSU instructors acknowledged the importance of integrating technology into their own disciplines, they also noted the difficulty in trying to teach both the content of their courses and technology. The instructors at all three sites felt that a separate technology course
should be required as a foundation for later integration into other courses. However, these participants stressed that the course must be structured to include basic computer literacy skills as well as educational applications of technology.

In addition to a separate, required technology course, SLU and UNT also incorporated the integration model into their preservice programs. However, technology was primarily infused into the methods and foundations courses. GSU is the only site that intentionally assigned students to technology-rich schools for field experiences.

GSU's teacher education program employed a total integration model that does not include a separate, required technology course. The curriculum is organized into four field-based methods blocks and one semester of student teaching. In each block, students completed six to fourteen hours of coursework, including structured assignments in a variety of school settings. During one of the blocks, students were intentionally placed in technology-rich schools for field experiences. The design of the program facilitated instruction in the use of technology throughout the classes, blocks, and field experiences.

According to Topp et al. (1995), clear program expectations are an essential component to insuring that technology is an integral part of the teacher education curriculum. In concurrence, Faison (1996) noted the importance of leadership from the college's administration in establishing high expectations for faculty use of technology in teacher education programs. Strong leadership and high expectations were clearly evident at GSU and SLU (see Figure 5.1.7). Several of the participants at each of these sites openly commented on the encouragement and support they received from their

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dean or department chair in their efforts to use technology in their teaching. This was not the case in my interviews with the participants at UNT. In fact, the only comment made about leadership was when one participant explained that the program was just beginning to move forward after undergoing a period of frequent administrative changes and lack of direction.

<table>
<thead>
<tr>
<th>Dimensions of Contrast</th>
<th>GSU</th>
<th>SLU</th>
<th>UNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evidence of support and encouragement from Dean/Chair</td>
<td>High</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Technology Standards</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Department Technology Task Force</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Department technology objectives</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Department Manual</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Weekly Department planning meetings</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

Figure 5.1.7
Componential Analysis: Technology Components Domain
Expectations Subset

Through the strategic planning process, all three sites addressed the role of technology within their college through their respective mission statements, goals, and objectives. Each site also formed a technology advisory committee and developed a technology action plan to assist the college in meeting its technology goals. GSU and SLU provided written copies of their strategic plans and technology plans. Even after repeated requests, UNT did not provide written documentation. GSU was the only site that had established technology standards to assure that education graduates were adequately prepared to use technology in their classrooms.
At two of the universities, high expectations and encouragement were also clearly evident at the department level. SLU's teacher education department appointed an eight-member technology task force. The task force developed program objectives addressing technology and was working to correlate the NCATE/ISTE standards with the present teacher education curriculum. According to the lead administrator, the efforts of this committee provided the impetus for improving the integration of technology throughout the curriculum. At GSU, the ECE department has identified technology as one of six main objectives of the program. The objectives as well as an overview of the program and description of the faculty were published in the department's manual, which is distributed to students and interested parties. In addition, the department reserved every Friday for planning meetings. Undergraduate faculty met for three hours in the morning, and graduate faculty met for three hours in the afternoon. These departmental meetings served to encourage and inspire the faculty to share ideas about effective computer-based learning and to plan creative ways to infuse technology into teaching and learning.

The facilities subset of the technology component domain shows dimensions of contrast regarding the available equipment and the space to use the equipment across the sites (see Figure 5.1.8). Several researchers (Barker, 1993; Faison, 1996; Means, 1994; and Topp et al., 1995) note the importance of providing faculty and students with adequate and convenient facilities and up-to-date equipment in order to encourage and support the use of technology in teacher education programs.
Componential Analysis: Technology Components Domain
Facilities Subset

<table>
<thead>
<tr>
<th>Dimensions of Contrast</th>
<th>GSU</th>
<th>SLU</th>
<th>UNT</th>
</tr>
</thead>
<tbody>
<tr>
<td># Restricted labs/Computers</td>
<td>5/135</td>
<td>2/40</td>
<td>1/25</td>
</tr>
<tr>
<td># Electronic classrooms</td>
<td>4</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Video Studio</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td># Distance learning rooms</td>
<td>4</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Evidence of adequate equipment for instruction</td>
<td>High</td>
<td>Medium</td>
<td>Low</td>
</tr>
<tr>
<td># On-site faculty workrooms</td>
<td>4</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Faculty provided state-of-the-art computer/printer</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Faculty provided state-of-the-art laptop, if requested</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Wireless networking capabilities</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Wireless laptops</td>
<td>Yes -30</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Mobile Learning Stations</td>
<td>If needed</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Evidence of adequate equipment for instruction</td>
<td>High</td>
<td>Medium</td>
<td>Low</td>
</tr>
</tbody>
</table>

Figure 5.1.8
Componential Analysis: Technology Component Domain
Facilities Subset

Of the three sites, GSU's College of Education provided the largest and most advanced technology environment as well as the most extensive collection of state-of-the-art hardware and software. The Instructional Technology Center (ITC), located in the Education Building, covered the entire second floor and three rooms on the first floor. The center housed a resource library, video studio, electronic classrooms, computer labs, and workrooms. Education faculty and students had access to a total of 135 state-of-the-art computers in five computer labs, over 150 software programs, and a variety of other high tech equipment such as laptops, scanners, digital cameras, laser
printers, color laser printers, LCD projection systems, video cameras, a recordable CD-drive, and video-editing equipment. Each of the five electronic classrooms were wired for distance learning and were equipped with a large screen television, video recorder, laser disc player, LCD projection system, and two mounted video cameras. GSU was the only site with wireless networking capabilities and 30 wireless laptops that allowed any classroom to be quickly and easily converted to a computer lab. Although the ITC lacked mobile learning stations, the staff indicated that they have several media carts which allowed them to set up a variety of portable equipment configurations.

Each faculty member was provided an up-to-date computer and printer and can obtain an additional laptop upon request. In addition, faculty had convenient access to a variety of equipment housed within the department, including laser printers, digital cameras, scanner, LCD projection system, VCR, and laser disc player.

Lack of access and availability to up-to-date equipment as well as electronic classrooms were major problems at SLU. Although all faculty offices were equipped with a computer and printer, most of the hardware was over three years old. The faculty did, however, have access to a limited variety of state-of-the-art equipment housed in a small technology workroom within the building or the university's Faculty Productivity Center, which was located off-site.

SLU also had a small instructional resource center with limited technology resources and a distance learning room; however, the college lacked a video studio and electronic classrooms. In order to incorporate technology into their teaching, the instructors used one of five mobile learning stations or scheduled classes to meet in one
the college’s two computer labs. Each lab contained 20 state-of-the-art computers, a scanner, a printer, and a LCD projection system.

In spite of UNT’s outstanding technological reputation and the fact that the university builds and maintains all of the PCs used on campus, the teacher education department appeared to be lacking in adequate equipment and facilities. The department did not have access to electronic classrooms and supported only one computer lab equipped with 25 Macintosh computers. This lack of facilities was best explained in a passage from the faculty handbook, Computer Support for the College of Education, that states

Since some departments saw the need for computer training earlier than others, use of computers in the curriculum grew at various rates within the College of Education departments. Therefore, some departments have computer classrooms or laboratories that are in part funded by course fees from that department’s classes (p.9).

While all of the participants at GSU and SLU provided consistent and detailed descriptions of the facilities at their respective sites, this was not the case at UNT. The UNT participants gave inconsistent and vague descriptions of their facilities and appeared to be unsure of exactly what kind of equipment was available. With the exception of the computer lab and faculty computers, each of the three participants identified different types of technology resources. For example, only one participant mentioned the university’s general access lab, the department’s computer lab, and faculty computers and printers, while another participant listed two distance learning rooms and “lots of telecommunications.” A third participant noted that the department does have a color laser printer, scanner, and two media carts. However, she also stated that the equipment must remain in the building, and since her classes were in another
building she had to order equipment from the media center. This same participant explained that she would really like to have her students work in groups and use technology, “but that’s not easy to do with 33 students and one piece of equipment.” Instead of providing opportunities for students to work on technology projects during class she stated, “I have to send them out to do it because I don’t have the proper equipment.”

As a result of my observations, I noted that all of the classrooms were equipped with wall-mounted televisions, video cassette recorders, and overhead projectors. In addition, every teacher education faculty member was provided a state-of-the-art computer and printer. Twenty laptops were available for check-out; however, one participant noted that the laptops were rarely used.

The subset support includes questions about training and technical support (see Figure 5.1.9). GSU’s was the only site that employed a full-time director for instructional technology to coordinate the college’s efforts to integrate technology. As a result, the college provided consistent, and on-going technology training for faculty and students. A wide variety of regularly scheduled two-hour workshops were conducted by five full-time staff members. The workshop schedule and on-line registration form was easily accessible on the center’s web page. The staff also consulted on individual projects, made presentations to individual classes, and provided technical assistance. In addition, a part-time computer-support person was assigned to the department to assist ECE faculty on a daily basis.
Neither UNT nor SLU had a consistent professional development plan. However, UNT provided high quality on-site technical assistance while at SLU the level of technical support was low.

<table>
<thead>
<tr>
<th>Dimensions of Contrast</th>
<th>GSU</th>
<th>SLU</th>
<th>UNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Director of Instructional Technology</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Consistent training program for faculty and students</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Evidence of quality technical assistance</td>
<td>High</td>
<td>Low</td>
<td>High</td>
</tr>
</tbody>
</table>

Figure 5.1.9
Componential Analysis: Technology Components Domain
Support Subset

Use of technology is the final subset in the technology component domain. This subset shows seven dimensions of contrast (see Figure 5.1.10). In spite of ranges in faculty attitudes towards technology, the teacher education programs at GSU and SLU demonstrated the highest level of enthusiasm and commitment for integrating technology into their curriculum. The participants at both sites noted that the use of technology had greatly increased within the last few years. However, the SLU participants also expressed a great deal of frustration resulting from a lack of training and access to up-to-date equipment.

In appraising the overall attitude among the faculty towards the integration of technology into the teacher education program, the UNT participants appeared guarded and somewhat cautious. The lead administrator stated that the faculty generally regarded technology as important, however he also noted that the faculty varied in their levels of expertise and their willingness to learn and use technology. Another
participant stated that the faculty had the desire to use technology but later revealed that some faculty continued to employ traditional instructional practices and were reluctant to make changes. She noted that the factors which appeared to contribute to this situation were the state’s certification test, frequent administrative changes, lack of faculty training, and lack of clear expectations.

Componential Analysis: Technology Components Domain

Use of Technology Subset

<table>
<thead>
<tr>
<th>Dimensions of Contrast</th>
<th>GSU</th>
<th>SLU</th>
<th>UNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evidence of faculty willingness to integrate technology into the curriculum</td>
<td>High</td>
<td>High</td>
<td>Medium</td>
</tr>
<tr>
<td>Evidence of faculty frustration in attempting to integrate technology into the curriculum</td>
<td>Low</td>
<td>High</td>
<td>Medium</td>
</tr>
<tr>
<td>Faculty models the use of technology</td>
<td>High</td>
<td>High</td>
<td>Medium</td>
</tr>
<tr>
<td>Faculty discuss/demonstrate use of technology, equipment, and/or software</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Faculty provides hands-on technology practice</td>
<td>High</td>
<td>Medium</td>
<td>Medium</td>
</tr>
<tr>
<td>Require professional practice using technology</td>
<td>High</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Faculty program rating</td>
<td>Very Successful</td>
<td>Mixed</td>
<td>Mixed</td>
</tr>
</tbody>
</table>

Figure 5.1.10
Componential Analysis: Technology Components Domain
Use of Technology Subset

The report Teachers and Technology: Making the Connection identifies three levels of technology integration: (a) discussion/demonstration, (b) hands-on technology practice, and (c) professional practice (U.S. Congress, 1995). At the first level of integration, instructors discuss and/or demonstrate how a certain kind of software or hardware could be used to enhance classroom instruction. At the second level of integration, students are provided opportunities to actually practice using the software
and/or equipment. At the third and highest level of integration, students practice using technology in their field experiences and student teaching.

At GSU, technology was purposefully integrated into classes, blocks, and field experiences using all three methods. The instructors consistently modeled the use of a variety of technology resources in their classes and used e-mail to communicate with students. Mandatory seminars, held in conjunction with methods courses, afforded hands-on practice using a variety of hardware and software. Students were also provided opportunities to preview and evaluate a variety of educational software programs. Portfolios containing samples of technology-created products for use in the classroom assessed student progress. GSU was the only site that intentionally placed students in technology-rich schools for at least one semester of the program. In addition, during this time students were required to develop and teach technology-enhanced lessons for at least two of their four observations by GSU faculty.

According to the SLU participants, most instructors routinely communicated with students through e-mail, posted class information on the Internet, and delivered electronic class presentations. The lack of access to up-to-date equipment hampered faculty efforts to integrate technology at the second level. The participants stated that they occasionally schedule classes to meet in one of the two computer labs and incorporate the Internet, digital cameras, and hand-held computers into class activities. However, at SLU, technology integration at the professional practice level was limited. Due to the large number of students requiring field placement assignments and the lack of certified mentor teachers, technology was not a priority in selecting school sites.
The primary method for integrating technology into the curriculum at UNT appeared to be discussion and demonstration. The participants noted that most instructors routinely communicated with students through e-mail, used resources from the Internet, and created electronic class presentations. With access to only one lab, the participants noted that they have to schedule release time from class in order for students to complete technology-related assignments. Although technology was not a consideration in selecting sites for field experiences and student teaching, the participants stated that most of the surrounding schools have technology. However, students were not required to utilize technology in their lessons during observational visits.

In terms of preparing students to use technology in their own classrooms, all the GSU participants rated their program as very successful. In contrast, the SLU and UNT participants gave mixed responses ranging from highly successful to very poor.

The Survey Instrument

This section analyzes data gathered from the questionnaire “Survey of Technology Preparation and Use” (see Appendix B). The questionnaire was distributed to 277 elementary education graduates of the three participating universities. The sample included 57 graduates of Georgia State University (GSU), 78 graduates of Southeastern Louisiana University (SLU), and 141 graduates of the University of North Texas (UNT). Since the grade levels for elementary certification ranged from Pre-K to eighth grade across the sites not all of the graduates met the following criteria for participation in this study: (a) graduated in Spring 1998 or Summer 1998, and (b) currently employed as a first-year elementary school (K-5) teacher. The statistical
analysis program SPSS (Version 6.1) was used to analyze the data. The results summarized below includes a description of the 87 eligible respondents and the statistical findings that address the research questions presented in Chapter One.

**Description of Respondents**

The first section of the questionnaire provided general information about the respondents. This information included: (a) age, (b) gender, (c) current grade-level assignment, and (d) community location of their school.

**Georgia State University**

A total of 24 GSU respondents met the criteria for this study. Most of the teachers (58%) were 20 to 25 years old, with 33% indicating an age of 26 to 30 (see Figure 5.2.1). Eight percent of the teachers were older, with 4% indicating an age of 31 to 35 years old and 4% indicating an age of over 35. Ninety-two percent of the teachers were female and 8% were male.

Two-thirds (67%) of the teachers taught in the lower elementary grades (K-2), while one-third (33%) of the teachers taught in the upper elementary (3-5) grades (see Figure 5.2.1).
With regard to school location, 70% of the teachers worked at suburban schools, while 26% of the teachers worked at urban schools and 4% of the teachers worked at rural schools.

![GSU Teaching Assignments](image)

<table>
<thead>
<tr>
<th>Grade Levels</th>
<th>GSU Teaching Assignments</th>
</tr>
</thead>
<tbody>
<tr>
<td>K 1 2 3 4 5</td>
<td>17% 17% 17% 17% 8% 0%</td>
</tr>
</tbody>
</table>

Figure 5.2.2

**Southeastern Louisiana University**

The number of SLU respondents that met the criteria for this study was 21.

Over half (57%) of these graduates were 20 to 25 years old, with 29% ranging in age from 26-30 (see Figure 5.2.3). Four percent of the teachers indicated an age of 31-35 and 10% indicated ages of over 35. All of the teachers (100%) were female.

Over half of the teachers (53%) taught in the upper elementary (3-5) grades, while 38% of the teachers taught in the lower elementary (K-2) grades (see Figure 5.2.4). Two percent of the teachers indicated that they taught in multi-grade level special education classes. Forty-eight percent of the teachers worked in rural schools, while 24% worked in urban schools and 28% worked in suburban schools.
University of North Texas

Of the 42 UNT respondents who met the criteria for the study, 55% were 20 to 25 years old, with 31% indicating an age of 26 to 30 (see Figure 5.2.5). Two percent were 31 to 35 years old and 12% were over 35. Most of the graduates (88%) were female.
Figure 5.2.5
Age of UNT Respondents

Forty-three percent of the teachers taught in the lower elementary (K-2) grades, while 50% taught in the upper elementary (3-5) grades (see Figure 5.2.6). The remaining 7% of the teachers indicated that they taught in special multi-grade level programs. Most of the teachers (60%) taught in suburban schools, while 24% of the teachers were assigned to urban schools and 16% were assigned to rural schools.
Skills for Personal and Professional Use of Technology

In the first section of the questionnaire, question seven asked each of the respondents to rate their overall technology skills. The likert-type scale was as follows: 1 = Very Skilled, 2 = Above Average, 3 = Average, 4 = Below Average, and 5 = Unskilled. Over half of the GSU graduates (63%) rated their overall technology skills as “above average” or “highly skilled,” while the remaining 33% of the graduates rated their skills as “average” (see Figure 5.2.7). Forty-three percent of the SLU graduates rated their technology skills as “above average,” while 48% rated their skills as “average” and 9% rated their skills as “below average.” Fifty-two percent of the UNT respondents rated their technology skills as “very skilled” or “above average,” while 38% rated their skills as “average” and 9% rated their skills as “below average” or “unskilled.”

Figure 5.2.7
Overall Technology Skills

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The mean score for the GSU graduates was 2.29, while the average score for the SLU graduates was 2.67, and the average score for the UNT graduates was 2.55. An Analysis of Variance was performed and results revealed that there is no significant difference in the average rating of technology skills between the three schools (F(2,84)=1.50, p=.229). Therefore, on average, the graduates from the three universities rated their overall technology skills similarly.

In the second section of the questionnaire, the respondents were asked to rate their expertise with specific technology skills. Responses for the 26 items in this section used the following four-point range: 0 = Unskilled, I do not know how to do this task; 1 = Below average, I have little proficiency on this task; 2 = Average, I have some proficiency on this task; and 3 = Above average, I am highly proficient on this task. For each respondent, the scores of questions 8-33 were totaled and averaged. The average score for the GSU graduates was 2.20, while the average score for the SLU graduates was 1.45, and the average score for the UNT graduates was 1.57 (see Figure 5.2.8).
An Analysis of Variance was conducted and the results revealed a significant difference in the average scores between schools (F(2,77)=6.43, p=.0026). Scheffe tests indicated that the average score for GSU was significantly higher than both SLU and UNT. There was no significant difference between the average scores of the SLU and UNT graduates. Hence, GSU graduates rated themselves as better skilled in various areas of technology than the graduates from SLU and UNT.

Use of Technology

In section three, Part A of the questionnaire contained a series of questions pertaining to access and use of computers. In question number 34, the respondents were asked to indicate the number of computers available in their classroom using the following scale: 1 = None, 2 = One, 3 = Two, 4 = Three, 5 = Four, and 6 = Five or more. Over three-fourths (79%) of the GSU graduates indicated that they had one or two classroom computers, while 13% indicated they had three classroom computers and 8% reported that they had four classroom computers (see Figure 5.2.9). Thirty-eight percent of the SLU graduates reported that they did not have classroom computers, while 43% indicated that they had one or two classroom computers and 19% indicated that they had three or more classroom computers (see Figure 5.2.10). Seven percent of the UNT graduates indicated that they did not have classroom computers, while 46% reported that they had one or two classroom computers and 46% reported that they had three or more classroom computers (see Figure 5.2.11).
Figure 5.2.9
GSU Graduates - Classroom Computers

Figure 5.2.10
SLU Graduates - Classroom Computers
GSU graduates averaged 2.84, or 1-2 computers, while SLU graduates averaged 2.43, or 1-2 computers, and UNT graduates averaged 3.51, or 2-3 computers. An Analysis of Variance revealed a significant difference in the average number of computers in the respondents’ classrooms across school (F(2,84)=4.22, p=.018). Scheffe tests indicated that UNT graduates had significantly more computers in the classroom than the graduates of SLU and GSU.

In question 35, each respondent was asked how many computers were in his or her school’s computer lab. The responses used the following scale: 1 = None, 2 = 1-4, 3 = 5-10, 4 = 11-15, 5 = 16-20, and 6 = More than 20. Almost 13% of the GSU graduates reported that they had no computers in their school labs, while the other 87.5% indicated that they had eleven or more computers in their school labs. Ten percent of the SLU graduates reported that they had no computers in their school labs, while 48% indicated that they had twenty or more computers in their school labs.
Twenty-four percent of the UNT graduates reported that they had no computer in their school labs, while 51% indicated that they had twenty or more computers in their school labs. Table 5.2.1 shows the distribution of the number of computers in the respondents' school computer labs.

Table 5.2.1
Computers in School Lab

<table>
<thead>
<tr>
<th></th>
<th>None</th>
<th>1-4</th>
<th>5-10</th>
<th>11-15</th>
<th>16-20</th>
<th>20 or &gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N (%)</td>
<td>N (%)</td>
<td>N (%)</td>
<td>N (%)</td>
<td>N (%)</td>
<td>N (%)</td>
</tr>
<tr>
<td>GSU</td>
<td>3 (12.5)</td>
<td>0</td>
<td>0</td>
<td>3 (12.5)</td>
<td>3 (12.5)</td>
<td>15 (62.5)</td>
</tr>
<tr>
<td>UNT</td>
<td>2 (9.5)</td>
<td>1 (4.7)</td>
<td>2 (9.5)</td>
<td>2 (9.5)</td>
<td>4 (19.0)</td>
<td>10 (47.6)</td>
</tr>
<tr>
<td>SLU</td>
<td>10 (24.3)</td>
<td>0</td>
<td>0</td>
<td>1 (2.4)</td>
<td>9 (21.9)</td>
<td>21 (51.2)</td>
</tr>
</tbody>
</table>

An Analysis of Variance revealed no significant difference in the average number of computers in computer labs across schools (F(2,84) = 0.615, p=0.54). The average score for the Georgia graduates is 5.04, or 16-20 computers in computer labs. The average for the SLU graduates is 4.66, or between 11-15 and 16-20 computers in computer labs, and the average score for the UNT graduates is 4.51, or between 11-15 and 16-20 computers in computer labs.

In question 36, the respondents answered “Yes” or “No” to a question about whether or not they owned a home computer. All of the GSU graduates (100%) indicated that they owned a home computer, whereas 81% of SLU graduates indicated that they owned a home computer and 83% of UNT graduates reported that they owned a home computer.
In question 37, the respondents were asked about their years of experience in using a computer to enhance their personal and/or professional productivity. The responses used the following scale: 1 = I don’t use a computer; 2 = Less than one year; 3 = 1 - 2 years; 4 = 3 - 4 years; 5 = 5 - 6 years; and 6 = More than 7 years. The average score for the GSU respondents was 4.92, or about 5-6 years. The average score for the SLU respondents was 4.43, or about 3 - 4 years. The average score for the UNT respondents was 4.61, or 6-5 years. An Analysis of Variance revealed that on average, there is no significant difference in average scores across schools (F(2.84)= 1.17, p=.316). Therefore, on average, the respondents have used the computer to enhance their personal and/or profession productivity for the same number of years.

In question 38, the respondents were asked how many hours per day they use a computer for work-related activities. The responses used the following scale: 1 = None; 2 = Less than 1 hour; 3 = 1 hour; 4 = 2 hours; 5 = 3 hours; and 6 = 4 or more hours. The averages for GSU and UNT respondents were 2.92 and 2.93, respectively, indicating that they used the computer for work-related activities for about one hour per day. The average score for the SLU respondents was 2.57 indicating that they used the computer for work-related activities between less than one hour and one hour per day. An Analysis of Variance revealed that on average, there is no significant difference across the sites. Therefore, on average, all of the respondents used the computer for the same amount of time for work-related activities.

In question 39, respondents were asked how many hours per day their students use computers for instructional activities. The likert-type scale used by the respondents was: 1 = None, 2 = Less than 1 hour, 3 = 1 hour, 4 = 2 hours, 5 = 3 hours, 6 = 4 or more
hours. Four percent of the GSU graduates indicated that their students do not use computers for instructional purposes, while 96% of the graduates indicated that their students use computers for instructional purposes for up to three hours per day. Ten percent of the SLU graduates reported that their students do not use computers for instructional purposes, while 90% indicated that their students use computers for instructional purposes for up to one hour per day. Five percent of the UNT graduates indicated that their students do no use computers for instructional purposes, while 92% reported that their students use computers for instructional purposes for up to one hour per day and 2% reported that their students use computers for instruction purposes for four or more hours per day. Table 5.2.2 shows the distribution of responses to this item by university.

An Analysis of Variance revealed a significant difference in the average time students use computers across schools. The average scores of the GSU graduates was 2.76, or approximately one hour, while the average scores of the SLU graduates was 2.14, or approximately less than one hour, and the average score of the UNT graduates was 2.29, or less than one hour. Scheffe tests indicate that the average of the GSU graduates is significantly higher than the average score of the SLU graduates and the average score of the UNT graduates. Therefore, on average, students of GSU graduates use computers more often for instructional activities than students of SLU and UNT graduates.
Table 5.2.2
Hours of Student Computer Use

<table>
<thead>
<tr>
<th></th>
<th>None N (%)</th>
<th>&lt;1 hour N (%)</th>
<th>1 hour N (%)</th>
<th>2 hours N (%)</th>
<th>3 hours N (%)</th>
<th>4 &gt; hours N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GSU</td>
<td>1 (4.1)</td>
<td>12 (5.0)</td>
<td>6 (25.0)</td>
<td>1 (4.1)</td>
<td>4 (16.6)</td>
<td>0</td>
</tr>
<tr>
<td>SLU</td>
<td>2 (9.5)</td>
<td>14 (66.6)</td>
<td>5 (23.8)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>UNT</td>
<td>2 (4.8)</td>
<td>28 (68.2)</td>
<td>10 (24.3)</td>
<td>0</td>
<td>0</td>
<td>1 (2.4)</td>
</tr>
</tbody>
</table>

Other Related Technologies

In section three, Part B of the questionnaire, respondents were asked to describe their instructional use of various items in the categories: Equipment, Educational Software, and the Internet and Telecommunications. The likert-type scale used by the respondents was: 0 = I don’t know what this is; 1 = Not available; 2 = Available, but I don’t use; 3 = Use occasionally (1-3 times a month); 4 = Use routinely (4-8 times a month); and 5 = Use extensively (more than 8 times a month). However, within this scale, the number 1 represents “Not available,” and as a result, the availability of technology at a respondent’s school is confounded by his or her instructional use score. In an attempt to address this problem, the following scale was used: 0 = I don’t know what this is, Not available, or Available but I don’t use; 1 = Use occasionally (1-3 times a month); 2 = Use routinely (4-8 times a month); and 3 = Use extensively (more than 8 times a month). In each of the categories, the scores for each respondent were totaled and averaged.

Equipment. The mean scores for GSU and UNT respondents were .96 and .83, respectively, indicating that on an average they use related technology equipment.
occasionally, or 1-3 times a month (see Figure 5.2.12). The average score for the SLU graduates was .46, indicating that either the graduates are not familiar with a variety of equipment, and/or the equipment is not available, and/or the equipment is available but not used.

![Related Technology Equipment](image)

Figure 5.2.12
Related Technology Equipment

An Analysis of Variance revealed a significant difference in the average equipment use scores between the schools ($F(2,78)=6.68, p=.0021$). Scheffe tests indicate that the averages for GSU and UNT are significantly different from that of SLU. There is no significant difference between the averages for GSU and UNT. Therefore, on the average, GSU and UNT graduates tend to have more access to equipment and use it more often than SLU graduates.

Educational Software. In relation to the instructional use of educational software, the average score for GSU respondents was 1.35, while the average score for SLU respondents was .66 and the average score for the UNT respondents was .85 (see Figure 5.2.13). Based on these scores, GSU respondents use educational software occasionally (1-3 times a month) to routinely (4-8 times a month). The average scores
for the SLU and UNT respondents indicate that these graduates were not familiar with a variety of educational software, and/or educational software was not available, and/or educational software was available but not used.

![Educational Software](image)

**Figure 5.2.13**
Average Educational Software Use

An Analysis of Variance revealed that there is a significant difference in the average educational software instructional use scores between the universities. (F(2, 78) = 8.48, p = .0005). Scheffe tests indicated that the average for GSU is significantly higher than that of SLU and UNT, and the scores for SLU and UNT are not significantly different. Here, it is very clear that GSU graduates have access to and use educational software more than SLU and UNT graduates.

The Internet and Telecommunications. In relation to the instructional use of the Internet and Telecommunications, the average score for the GSU graduates was .70, while the average score for the SLU graduates was .21, and the average score for the UNT graduates was .47 (see Figure 5.2.14). These scores indicated that GSU graduates use the Internet and telecommunications occasionally (1-3 times a month). On the other hand, SLU and UNT respondents indicate that the graduates are either not
familiar with the Internet and telecommunications, do not have access to the Internet and telecommunications, or they do not make use of their access to the Internet and telecommunications.

![Graph showing Internet and Telecommunications scores](image)

**Figure 5.2.14**

**Internet and Telecommunications**

An Analysis of Variance revealed that there is a significant difference in the average Internet and telecommunications instructional use scores between the schools ($F(2,77)=7.40$, $p=0.0011$). Scheffe tests indicate that the average for Georgia is significantly higher than that of SLU and there is no significant difference between the SLU and UNT scores. So, on average, Georgia students tend to have more access to the Internet and telecommunications and use these resources more often than SLU and UNT graduates.

**Teacher Education Program**

In the fourth section, Part A, of the questionnaire, the respondents were asked to rate their preparation to use technology within the following components of their undergraduate program: methods courses, foundations or professional studies, and technology courses. The likert-type scale the respondents used was: 0 = No courses,
1 = One course, 2 = Two courses, and 3 = Three courses. In each section, the scores for each respondent were averaged.

Methods courses. In relation to their preparation to use technology within their methods courses, the average score for the GSU respondents was 2.13, or approximately two courses (see Figure 5.2.15). In order, the average scores for the SLU and the UNT respondents were 1.63 and 1.51, or approximately one to two courses.

![Figure 5.2.15](methods_courses.png)

To determine whether there was a difference in average Methods Courses scores among the schools, an Analysis of Variance was conducted. The results revealed there is a significant difference ($F(2,83)=5.37$, $p=.006$), and the average score for GSU was significantly higher than that of SLU and UNT. The scores of SLU and UNT were not significantly different from each other. Therefore, on average, GSU graduates indicated that they had more methods courses integrated with technology than the graduates of SLU or UNT.
Foundations or professional studies. In relation to their preparation to use technology within the foundations or professional courses, the average score for the GSU respondents was 1.30, or between one and two courses. The average score for the SLU graduates was 1.03, or approximately one course. The average score for the UNT respondents was .93, or approximately one course.

![Foundations or Professional Studies](image)

Figure 5.2.16
Foundations or Professional Studies

An Analysis of Variance revealed that there is no significant difference in average Foundation/Professional Studies scores among the schools (F(2,83)=1.18, p=.313). Hence, on average, the students reported having a similar number of foundations or professional studies courses that included the preparation to use technology.

Technology courses. GSU’s teacher education program does not require undergraduate students to take a technology course; however, technology seminars are held in conjunction with the methods courses.Apparently the GSU students considered the seminars as technology courses in responding to the questions.
Therefore, because of these improper responses, the results of this section are not thoroughly analyzed.

In item 89 on the questionnaire, the respondents answered “Yes” or “No” to the question, “Do you think an introductory educational technology course should be a requirement for undergraduate education majors?” Seventy-nine per cent of the GSU respondents, 100% of the SLU respondents and 97% of the UNT respondents indicated that they do think that an introductory educational technology course should be a requirement for undergraduate education majors.

Item 90 was an open-ended question designed to encourage respondents to state their reasons for their responses to question 89. The respondents comments are provided in Appendix N. After reading all of the responses, I noted that most of the respondents indicated that they feel that technology has become an important part of everyday life; therefore, as educators, they need to be prepared to effectively teach their students to use technology.

In section four, Part B of the questionnaire, the respondents were asked to circle the response that best describes the integration of technology into their undergraduate field experiences or student teaching. The likert-type scale for this question was as follows: 0 = Not all at (0% of the time), 1 = Rarely (less than 25% of the time), 2 = Occasionally (26 - 50% of the time), 3 = Routinely (51 - 75% of the time), and 4 = Extensively (76 - 100% of the time). The average score for the GSU respondents was 1.94, indicating that technology was occasionally integrated into their undergraduate field experiences or student teaching (see Figure 5.2.17). The average scores for the SLU and UNT respondents were 1.04 and 1.29, respectively, indicating that technology
was rarely integrated into their undergraduate field experiences or student teaching.

An Analysis of Variance revealed that there was a significant difference in the average scores across the sites (F(2, 81)=7.41, p=.0011). Scheffe tests indicated that the average score for GSU (1.94) is significantly higher than that of SLU (1.04) and UNT (1.29), and the scores for SLU and UNT are not significantly different from each other. Hence, on average, the GSU respondents felt that technology was occasionally integrated into their field experiences or student teaching, whereas the SLU and UNT respondents tended to report that technology was rarely integrated into their field experiences or student teaching.

In section four, Part C of the questionnaire, the respondents were asked to rate their teacher education program in terms of their training to use technology in their classrooms and to teach their students how to use technology. The following likert-type scale was used: 1 = Very inadequate, 2 = Inadequate, 3 = Satisfactory, 4 = Very satisfactory, and 5 = Outstanding. The average score for the GSU respondents was 3.79, indicating that the graduates rated their teacher education program as “Very
satisfactory” (see Figure 5.2.17). The average scores for the SLU and UNT respondents were 2.48 and 2.10, respectively, indicating that these graduates rated their teacher education programs as “Inadequate.”

![Teacher Education Program Evaluation](image)

**Figure 5.2.17**
Teacher Education Program Evaluation

An Analysis of Variance was conducted and the results revealed a significant difference ($F(2,81)=31.05$, $p=0.00$). Scheffe tests indicated the average score for GSU (3.79) is significantly higher than SLU (2.48) and UNT (2.10). Therefore, on average, GSU respondents rated their teacher education programs higher than the SLU and UNT respondents rated their respective programs.

The last three questions of the survey were open-ended questions designed to encourage the respondents to state their opinions about their preservice preparation to use technology. Question 96 asked the respondents to explain their answers to question 95. Question 97 asked, “What component of your teacher education program was most effective in helping you to acquire the knowledge and skills to use technology, and how did it impact instruction in your classroom?” Question 98 asked, “If you were responsible for redesigning your teacher education program to improve technology
training for preservice teachers what components would you add or delete? Why? The complete answers for these three open-ended questions are provided in Appendix N.
CHAPTER SIX
FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

Through a combination of qualitative and quantitative methods, this study sought to: (a) describe and analyze the technology components of the undergraduate teacher education programs at three universities and (b) investigate the technological preparedness of first-year elementary (K-5) teachers who were recent graduates of the participating universities. Qualitative case studies conducted at Georgia State University (GSU), Southeastern Louisiana University (SLU), and the University of North Texas (UNT) afforded me the opportunity to gain detailed information about how each university's teacher education program was preparing students to effectively use technology in their own classrooms. The results of a survey completed by 87 first-year elementary (K-5) teachers who were recent graduates of the universities provided quantitative and qualitative data to triangulate the findings of the case studies. The data included information on the teachers' personal and professional background, skills for using technology, classroom use of technology, and evaluation of their preservice program related to their technology training. Four questions served to structure and guide this investigation. The findings are presented below in response to each of the four questions.

Findings

Question 1

How are the teacher education programs at each university in this study preparing students to integrate technology into their classrooms and instruction, and how do the programs compare?
In responding to the first question, five major themes related to the use of technology within the teacher education programs emerged during the course of this investigation. These themes or components included program design, expectations, facilities, support, and use of technology. Each component provided a mechanism for making comparisons between and among the three participating universities.

**Program Design**

Wetzel (1993) identifies two models for preparing prospective teachers to use technology in their own classrooms: the separate, introductory technology course or the integration model. As stated earlier, the choice of methods is an issue of debate among teacher educators (Wiebe, 1995).

The teacher education programs at SLU and UNT incorporated a combination of the two models (see Figure 5.1.6). In addition to integrating technology across the curriculum, undergraduates were also required to complete a separate, three-hour, introductory technology course. However, the content, organization, and management of the courses differed between the two programs.

It is important to note that the instructors at all three sites were in general agreement about the importance of requiring undergraduates to take a separate technology course. However, these participants emphasized two important aspects of the requirement alternative. First, the course content must provide opportunities for students to learn to use technology and to teach with technology. Second, the course requirement must be accompanied by the integration of technology throughout the teacher education program.
Data from the survey instrument, indicated that the majority of the respondents from GSU (79%), SLU (100%), and UNT (97%) supported a separate technology course requirement for undergraduate education majors. Below are selected comments from the respondents regarding the value of an introductory technology course:

GSU graduate - “The use of technology is a skill that should be developed due to the extensive use and progress of technology in today’s society. A teacher should be more than functionally proficient in technology mainly because his/her students will be.”

SLU graduate - “I think that an introductory course in technology is very important because in today’s world almost everything is being geared to computers. Everyone, regardless of their profession, should have a working knowledge of computers.”

UNT graduate - “Yes, an introductory educational technology course should be a requirement for undergraduate education majors. It is essential that teachers know the basics of computers, e-mail, turning computers on and off, getting on the Internet, and using programs such as Microsoft Word. This is the way that most school districts communicate with their teachers, as well as, how teachers communicate with the rest of the district.”

Although all three universities attempted to integrate technology within their preservice programs, the extent of the integration varied across the sites. GSU’s undergraduate teacher education curriculum was organized into four field-based methods blocks and one semester of student teaching. Each block consisted of four to sixteen hours of coursework and structured field experiences in a variety of school settings, including one semester in a technology-rich school. Through this program design, the instructors consistently modeled the use of technology and the students were provided numerous opportunities to practice using technology under the guidance and supervision of experienced practitioners.
At SLU and UNT technology was primarily integrated into the methods and foundations courses. Although neither school intentionally placed students in technology-rich schools for field experiences, the UNT participants noted that most of the local schools did have technology.

The findings of the case studies regarding the extent of technology integration into the teacher education programs are supported by the survey data. The data showed that, on average, GSU respondents indicated that technology was integrated into approximately two methods courses, while the SLU and UNT respondents reported that technology was integrated into approximately one to two methods classes. On average, the respondents from all three sites indicated that technology was integrated into approximately one foundations or professional studies course. GSU respondents reported that, on average, technology was occasionally (26 - 50% of the time) integrated into their field experiences or student teaching, while SLU and UNT respondents indicated that technology was rarely (less than 25% of the time) integrated into their field experiences or student teaching. Therefore, based on analysis of this data, technology was integrated into more methods courses and field experiences at GSU than at SLU and UNT, and the integration of technology into foundations or professional studies courses was similar across the sites. The following selected comments of the respondents address the integration of technology within their respective teacher education programs.

GSU graduate - “We had a technology block of classes that taught us a lot, however, the technology did not stop there. We were trained to use technology in every block, and constantly taught new things.”
SLU graduate - “Many of my methods classes encouraged the use of technology in the classroom setting.”

UNT graduate - “My teacher education program required me to take an introductory educational technology course. However, my teacher education program did not continue to emphasize the importance of technology use in the classroom consistently. I learned very little of how to use technology in the classroom and how to teach my students how to use technology through my foundations and methods courses.”

Expectations

The level of expectations for the use of technology across the three sites was a revealing find. Topp et al. (1995) note that clear program expectations are vital to insuring that the faculty will actively include technology in their teaching and learning. In agreement, Faison (1996) emphasized that education deans are the key to providing visionary leadership. Clear program expectations and strong leadership from the deans and department chairs was evident at GSU and SLU. According to the participants, the administrative leaders of these two colleges actively supported and encouraged the faculty to incorporate technology into their teaching and learning. GSU was the only site that had established technology standards for education graduates. At the department level, GSU was also the only site that published a teacher education manual. The manual provided an overview of the teacher education program and communicated the department’s efforts to integrate technology throughout the curriculum. In addition, weekly department meetings provided the opportunity for the faculty to share ideas and to plan collaboratively to integrate technology into their classes.
Facilities

In order to encourage and support the use of technology in teacher education programs, students and faculty must have access to the up-to-date equipment as well as adequate and convenient facilities to use the equipment (Barker, 1993; Faison, 1996; Means, 1994; and Topp et al., 1995). Of the three sites, GSU's College of Education provided students and faculty with the largest and most advanced technology environment as well as the most extensive collection of state-of-the-art hardware and software (see Figure 5.1.8). Lack of access and availability to up-to-date equipment and electronic classrooms were major barriers to the use of technology in the preservice programs at SLU and UNT.

Also, it is important to note that the participants at GSU and SLU provided fairly consistent accounts of the equipment and facilities at their respective sites. In contrast, the UNT participants gave inconsistent and vague descriptions of their facilities and appeared to be unsure of exactly what kinds of equipment were available. Their apparent lack of awareness and complacency reminded me of NCATE's (1997) criticisms of higher education institutions:

A majority of teacher preparation programs are falling far short of what needs to be done. Not using technology much in their own research and teaching, teacher education faculty have insufficient understanding of the demands on classroom teachers to incorporate technology into their teaching. Many do not fully appreciate the impact technology is having on the way work is accomplished. They undervalue the significance of technology and treat it as merely another topic about which teachers should be informed (p.6).

Support

In addition to immediate access to up-to-date hardware and software, Strudler et al. (1995) note that the successful integration of technology into teacher preparation
programs requires adequate staff development and on-site technical support. Of the three sites, GSU provided the highest level of support for education faculty, staff, students, and K-12 teachers (see Figure 5.1.9). College-wide technology initiatives were coordinated by the Director of Instructional Technology. This individual, along with a staff of five full-time employees, provided consistent on-site training and technical assistance. Several graduate assistants and student workers assisted the full-time ITC staff in their efforts. In addition, a computer support person was available on a daily basis to assist the teacher education faculty.

Lack of training and technical support was clearly evident at SLU. Although the participants expressed their desire to use technology in their classes, they also stated their concerns for more training and technical support for equipment and networking problems. UNT’s College of Education provided outstanding technical support through the on-site Office of Technology (COETECH); however, the UNT participants emphasized the need for more training.

Use of Technology

The participants at GSU and SLU demonstrated the highest level of enthusiasm and commitment for integrating technology into their preservice programs (see Figure 5.1.10). However, the lack of access to up-to-date equipment and facilities resulted in a great deal of frustration among the SLU participants.

According to Strudler et al. (1995), teacher educators have to “venture away from the familiar and take risks with new technologies and teaching methods” (p. 20). The UNT participants were cautious and guarded in their comments about their use of technology, and their responses were often inconsistent and vague. Although the
university, as well as other departments within the college, is committed to making
technology an integral part of academic activities, UNT's teacher education program for
the most part, appeared to be mired in tradition and unwilling to abandon old practices
and accept new innovations. In concurrence with this finding, one UNT respondent
wrote:

I only had a few professors who talked about technology of any kind. There are
so many ways to integrate technology into education now and I believe that
education professors should discuss and model the use of technology in an
instructional setting. There were also few courses offered in which current
technology was used. I had one class where I was shown how to use a film
projector and an 8mm film projector which I have yet to use in my classroom.

In an attempt to gauge the use of technology within the teacher education
programs, I categorized the participants' comments into three levels of technology
integration: (a) discussion/demonstration, (b) hands-on technology practice, and
(c) professional practice (U.S. Congress, 1995). Of these three levels of engagement,
several researchers (Drazdowski, 1994; Handler, 1993; and Wetzel, 1993) cite the
importance of professional practice.

The participants at GSU indicated that technology was integrated at all three
levels within their undergraduate curriculum. Although all of the components
previously mentioned contribute to the ability of the instructors to integrate technology,
it is important to note that through GSU's program design students were: (a)
intentionally assigned to technology-rich schools for one semester of their program and
(b) required to develop and teach technology-enhanced lessons for at least two of their
four observations by GSU faculty. The use of technology within the GSU curriculum
was verified in the following two survey statements written by recent graduates:
GSU graduate - “During my method courses, we were required to implement technology into each theme or unit. We were also required to demonstrate our knowledge of technology in most observed lessons and portfolio.”

GSU graduate - “Georgia State’s education program revolves around the use of technology. Technology use was always a component when producing units and lessons. They provided experiences with using and demonstrating technology and provided classroom field experiences as well.”

At SLU and UNT the use of technology was fairly similar. The participants at both sites indicated that instruction in the use of technology is primarily through discussion/demonstration methods with some hands-on technology practice and limited emphasis on professional practice. The following survey statements by recent graduates of these programs support these conclusions:

SLU graduate - “If the professor was interested in technology, then we were introduced to it. Most professors are in their middle ages and get by without the technology and don’t demand any sort of teaching or use or demonstration of technology.”

SLU graduate - “I feel we were taught and exposed to computers a lot as far as how we could use them to develop our lessons, such as lesson plans, ideas from the Internet, making tests, etc. However, no one ever demonstrated/explained how to teach a lesson on a computer or using a computer w/ [sic] 21 students in the room. How do you let 21 get on one computer? How do you keep the rest busy with only 1 computer?”

UNT graduate - “I can recall one class period in college when we went to the computer lab and messed around with the Macs. There was never any explanation or instruction about the Macs or the educational software, let alone how to actually use technology to teach.”

UNT graduate - “My school did not require any technology training. Some of my education classes had us look for Internet lessons and view software - but nothing was applicable to actual use of lessons with all students on-line. I feel unprepared to keep up with the advances in technology and I feel sorry for older teachers who have a difficulty time even turning on the computer!”
When asked to rate the success of their program with regard to preparing students to use technology in their own classrooms, the GSU participants felt that they were very successful and cited examples of students who were hired based on their expertise with technology. The faculty’s appraisal of their program is evident in the following survey response written by a recent GSU graduate:

Since I have started teaching, I have found that I am so much more knowledgeable about the use of technology compared to teachers who have been teaching longer. I have used my experience to teach other teachers new ideas on lesson plans and new and exciting lessons.

The SLU and UNT participants rated the success of their program with mixed responses ranging from highly successful to very poor.

**Question 2**

How do recently graduated first-year teachers from each university rate their skills in using technology, and how do their ratings compare?

Items on the survey regarding teachers’ proficiency were divided into parts. In the first part (question 7) the teachers were asked to rate their overall technology skills. In general, GSU graduates rated their overall technology skills as “above average,” while SLU and UNT graduates rated their overall technology skills as “average.” However, further analysis revealed that there is no significant difference in the average rating of technology skills between the three schools.

In the second part (questions 8-33) the teachers were asked to rate their proficiency on a variety of technological skills. The scores in this section were totaled and averaged. Based on an average of the total scores for each site, GSU graduates rated their skills as “average,” while the SLU and UNT graduates rated their skills as
"average" to "below average." Further analysis of the scores revealed that GSU graduates scored significantly higher than both SLU and UNT and that there was no significant difference between the SLU and UNT averages. Hence, GSU graduates tend to rate themselves as better skilled in various areas of technology than SLU and UNT graduates. Although no attempt was made to identify the exact skills, these results indicate that GSU's teacher education program appears to expose students to a greater variety of technology skills than the programs at either SLU or UNT.

Question 3

How and to what extent do recently graduated first-year teachers at each university use technology in their classrooms, and how do their responses compare?

The purpose of this question was twofold: (a) to identify whether or not the teachers had access to technology and (b) to determine if the teachers transferred acquired knowledge about using technology into their classrooms. Items on the survey dealing with the teachers use of technology were divided into four sections: computers, other related equipment, educational software, and the Internet and telecommunications.

Computers

In responding to the question about the number of computers in their classrooms, GSU and SLU graduates indicated that they had an average of one to two computers, while the UNT graduates indicated that they had an average of two to three computers. Further analysis revealed that UNT graduates had significantly more computers in their classrooms than the GSU and SLU graduates. However, GSU graduates reported that their students use computers for instructional activities for more hours per day than either the UNT graduates or the SLU graduates. This is particularly
interesting in light of the fact that the UNT graduates reported greater access to computers in the classrooms than either the GSU or SLU graduates.

As stated in Chapter Two, the U.S. Department of Education recommends a ratio of five students per computer (QED, 1996). Assuming a pupil to teacher ratio of 20:1, it is interesting to note that the average number of classroom computers reported by the respondents from each site falls below the national recommendation. In addition, there appears to be a relationship between the respondents’ school locations and their access to technology. According to Coley et al. (1997), schools with large numbers of poor and minority students are more likely to have less access to computers than other students. The majority of GSU (70%) and UNT (60%) respondents were assigned to suburban schools, while the majority (72%) of SLU respondents were assigned to urban or rural schools. The GSU and UNT respondents also reported significantly higher access to computers than the SLU respondents.

Other Related Equipment

In this section of the questionnaire, the respondents indicated their use of other related equipment, such as scanners, printers, projection systems, and digital cameras. On average, GSU and UNT graduates reported that they use other related equipment 1-3 times a month, while SLU graduates indicated less access to and use of other related equipment. Further analysis of these results showed that GSU and UNT graduates tend to have more access to equipment and use it more often than SLU graduates.
Educational Software

On average, GSU graduates reported that they use educational software approximately 1-3 times a month. The SLU and UNT graduates indicated that they have less access to educational software and/or use educational software less frequently. Further analysis of these results clearly indicated that GSU students have more access to educational software programs and use the programs more frequently than the SLU and UNT graduates.

The Internet and Telecommunications

Disappointingly, the survey results indicated limited access and use of the Internet and telecommunications in the respondents' elementary school locations. However, the GSU respondents reported more access to the Internet and telecommunications and used these resources more than the SLU and UNT respondents.

Based on the findings of the two previous questions, there also appears to be a relationship between the self-rated skills of the respondents and the extent of classroom use of technology by the respondents. GSU respondents rated themselves as better skilled in various areas of technology and used technology in their classrooms more than the UNT and SLU respondents.

Question 4

How do recently graduated first-year teachers from each university evaluate their preservice preparation for integrating technology into their classrooms, and how do their evaluations compare?

On average, GSU graduates rated their program as “Very Satisfactory,” whereas SLU and UNT graduates rated their program between “Satisfactory” and “Inadequate.”
In comparing these responses, further analysis revealed that GSU graduates rated their teacher education program significantly higher than SLU and UNT students rated their respective programs. The following selected quotes summarize comments of the respondents regarding their undergraduate training to use technology in their classrooms and to teach their students how to use technology:

GSU graduate - “Georgia State provided [sic] an entire quarter devoted to the development of technology skills. They also used it and demonstrated it in other quarters. Supervisors and a technology resource lab specifically for education majors were always available. The staff was dedicated to the advancement of technology skills in their students. It has made me feel very comfortable using tech.[sic] in my class.”

SLU graduate - “My teacher education program very adequately prepared me to use technology in my classroom. I was required to do different activities and projects using technology in different mediums. My instructors exposed us to different new and old ideas using the computer and gave us sources and addresses to use for new ideas. The school was also equipped with labs for our use.”

UNT graduate - “As far as teaching lessons using technology, I did not observe it much, nor was I taught all the ways to teach using technology. However, I was hired at the school I student taught in, and the district requires all in coming teachers to take 30 hrs. of technology courses, offered by the district within their first 2 yrs. In these courses, we are taught how to teach with computers. I am still working on completing the hrs. The school district requires this because they know what inadequate training we are receiving in our undergrad. studies.”

Conclusions and Recommendations

The findings of this study are valuable for revising and improving the way that teacher education programs prepare new teachers to use technology as well as contributing to the growing body of literature on technology in education. My conclusions of this investigation and recommendations for improvements and further research are presented below.
Acknowledging my support of Wetzel’s (1995) position that both a separate, required technology course and effective integration are necessary components of an undergraduate teacher program, it is important to note that the findings from this study are inconclusive in identifying the most effective approach to program design. Although GSU’s program was outstanding in many respects, the comments of the instructors and the results of the survey regarding the importance of a separate technology course cannot be ignored. Further study into the most effective program design is needed.

Clear program expectations and strong administrative leadership directly impacted faculty attitudes regarding technology as well as their efforts to integrate technology into their classes. In order to improve communication concerning program expectations for the use of technology, teacher education departments might consider developing a program manual and establishing technology standards or benchmarks for graduates. In addition, teacher education departments should provide frequent and consistent opportunities for faculty members to share ideas about effective computer-based learning and to plan collaboratively creative ways to infuse technology into the curriculum. According to Faison (1996) such supportive networks are beneficial in building enthusiasm and acceptance for technology as well as cohesiveness among the faculty.

The lack of equipment and support continue to present barriers to the infusion of technology into teacher preparation programs. Convenient access to up-to-date equipment and facilities must be available to all faculty and students (Topp et al., 1995). Colleges and departments also need to provide consistent professional
development as well as on-site technical support. A full-time technology director is recommended for developing and coordinating such college-wide efforts.

Teacher educators, regardless of their disciplines, should adopt and consistently model the use of various technologies. Courses should also be redesigned to provide opportunities for students to have hands-on experiences using technology during class as well as assignments requiring the use of technology. In addition, colleges need to identify technology-rich schools and to develop a plan so that all undergraduates are required to: (a) observe practical applications of technology within elementary classrooms and (b) develop and teach technology-enhanced lessons.
REFERENCES


Holmes, E. D. (1997). The spreadsheet absolutely elementary! Learning and Leading With Technology, 24(8), 6-12.


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HSSC accession #:_________ LSU Proposal #:_________

LSU Office of Sponsored Research/OSR 388-1492; FAX 6792
117 David Boyd Hall

LSU: HUMAN RESEARCH SUBJECTS

APPLICATION FOR EXEMPTION FROM INSTITUTIONAL OVERSIGHT

Unless they are formally qualified as meeting the criteria for exemption from Institutional Review Board (IRB) oversight, ALL LSU research/projects using living humans as subjects, or samples or data obtained from humans, directly or indirectly, with or without their consent, must be approved in advance by the LSU IRB. This Form helps the PI determine if a project may be exempted, and is used to request an exemption.

NOTE: Even when exempted, the researcher is required to exercise prudence in protecting the interests of research subjects, obtain informed consent if appropriate, and must conform to the Ethical Principles and Guidelines for the Protection of Human Subjects (Belmont Report) and LSU Guide to Informed Consent; (Available from OSR or http://www.osr.lsu.edu/osr/comply.html)

Instructions: Complete checklist, pp 2-4; if exemption appears possible, see instructions on p. 4. Otherwise apply to the IAB

Principal Investigator Patricia Ann Duohon Student? Y/N

Department/Unit Curriculum and Instruction Ph: 753-7103/388-6017

Project Title Preparing New Teachers To Use Technology: A Comparative Study of Preservice Teacher Education Programs

Agency expected to fund project N/A

Subject pool (eg. Psychology students) Recently graduated first-year elementary (K-5) teachers (survey participants) and teacher education faculty (case studies). Circle any ‘vulnerable populations’ to be used: (children <18; the mentally impaired, pregnant women, the aged, other). Projects with incarcerated persons cannot be exempted.

I certify my responses are accurate and complete. If the project scope or design is later changed I will resubmit for review. I will obtain written approval from the Authorized Representative of all non-LSU institutions in which the study is conducted.

PI Signature Patricia Ann Duohon Date 12/15/98 (no per signatures)

Screening Committee Action: Exempted X Not Exempted

Reviewer B. Rozoff  Signature B. Rozoff  Date 12/15/98

Comments cc PI (signed face page only); OSR Director (application with protocol) 117 David Boyd Hall, LSU.

Help available from Karen Baiamonte 388-1492; karenb@lsu.edu

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4. Is this a taste or food evaluation or food acceptance study?

YES____ Go to 4.1

NO_X____ Skip to 5: (criterion not applicable)

4.1 Will only wholesome foods without additives be consumed? OR any food ingredients (including additives) consumed will be demonstrably at or below the level, and for a use found to be safe; are agricultural chemicals or environmental contaminants demonstrably at or below the level found to be safe by the Food and Drug Administration or approved by the Environmental Protection Agency or the USDA Food Safety and Inspection Service?

YES ____ Check C1 & Go to 5: Exemption criterion satisfied

NO, or unsure____ Check C2 & go to 5: IRB review may be required

5. Does the project include ANY research activity with human subjects not exempted under one or more of the above criteria?

YES____ Check C2: IRB review required

NO_X____ Check C1; Go to Part C and proceed accordingly

Part C: PRELIMINARY EVALUATION of EXEMPT STATUS by Investigator:

C1_X C2 ____ If C1, or C1 AND C2 are checked, seek an exemption. If only C2 is checked, IRB review is required: obtain instructions from Sponsored Research or Web address on p 1.

Exemption Applicant: Send 2 copies of completed form, a brief project protocol (adequate to evaluate risks to subjects and to explain your responses to Parts A & B), instruments, and the consent form to ONE member in the most closely related department/discipline or to IRB office.

HUMAN SUBJECTS SCREENING COMMITTEE MEMBERS:

COLLEGE OF ARTS AND SCIENCES: MASS COMMUN/SOC Wk/AG:
Dr. Baumeister* (Psych) 388-4663 Dr. Nelson (Mass C) 358-6556
Dr. Williamson* (Psych) 388-1494 Dr. Archambeault(Soc Wk) 8-1374
Dr. Geiselman * (Psych) 761-2695 Dr. Kim (Soc Wk) 388-1109
Dr. Deseran (Socio) 388-1113 Dr. Rose (Soc Wk) 388-1015
Dr. Honeycutt (Speech) 388-6676 Dr. Biswas (Marketing) 388-8818
Dr. Dixit (Comm Sc./Dis) 388-3938 Dr. Bedelian (Mgmt) 388-6141
Dr. Keenan* (Hum Ecol) 388-1708
Dr. Kleiner (Middleton) 388-4016
Dr. Taylor (Admin&Fnd) 388-2193 Dr. Munro* (Curric & Ins) 388-2352
Dr. Sala (Lab Sch) 388-3221 Dr. Wandersee (Curric) 388-2348
Dr. Landin* (Kinesiol) 388-2036 Dr. Paskoff (Lib/Sci) 388-1480

(* = IRB member)

irbexam.txt(09/25/95)
2.1 Will minors (<18y) be subjects AND does this research use survey procedures, interview procedures, or observation of public behavior in which the observer participates?

YES___ Check C2, and skip to 3: IRB review probably required

NO X Go to 2.2

2.2 Is the information recorded in such a manner that human subjects can be identified directly, or indirectly through identifiers (such as a code) linked to the subjects?

YES X Go to 2.3

NO___ Skip to 3: This exemption criterion is satisfied

2.3 Will any inadvertent disclosure of individual human subjects' responses have the potential to place the subjects at risk of criminal and civil liability, or be damaging to the subjects' financial standing, employability or reputation?

(The collection of sensitive data regarding the subjects' (or relatives' or associates') possible substance abuse, sexuality, criminal history or intent, medical or psychological condition, financial status, or similarly compromising information are examples of instances which will require an answer of YES):

YES___ Go to 2.4

NO X Skip to 3: This exemption criterion is satisfied

2.4 Are the human subjects elected or appointed public officials or candidates for public office?

YES___ Check C1, go to 3: Exemption criterion satisfied

NO___ Check C2 and go to 3: IRB review probably required

3. Does this research involve the collection or study of existing* data, documents, records, pathological or diagnostic specimens? (**existing** implies a retrospective study)

YES X Go to 3.1

NO___ Skip to 4: (Criterion not applicable)

3.1 Is this material or information publicly available, or will it be recorded in such a manner by the investigator that the subjects cannot be identified directly, or indirectly through identifiers linked to the subjects?

YES X Check C1 & go to 4: Exemption criterion satisfied

NO___ Check C2 & go to 4: IRB review probably required.
Part A: DETERMINATION OF "RESEARCH" and POTENTIAL FOR RISK

This section determines whether the project meets the Department of Health and Human Services definition of "research" and if not, whether it nevertheless presents more than "minimal risk" to humans that makes IRB review prudent and necessary.

1. Is the project a systematic investigation designed to develop or contribute to generalizable knowledge?

(Note "systematic investigation" includes "research development, testing and evaluation"; therefore some instructional development and service programs will include a "research" component).

YES  X  Go to Part B: Project constitutes research
NO  ______  Go to 2

2. Does the project present physical, psychological, social or legal risks to the participants reasonably expected to exceed those risks normally experienced in daily life or in routine diagnostic physical or psychological examination or testing? You must consider the consequences if individual data inadvertently become public.

YES  ______  Check C2 and stop here: IRB review required
NO  ______  Check C1: Apply for exemption from IRB oversight

Part B: EXEMPTION CRITERIA FOR RESEARCH PROJECTS

This Part establishes whether the project is confined to research activities that may be exempted from IRB oversight.

Please answer each question 1-5; although a single exemption criterion may be sufficient to exempt a project, some projects contain several elements that may be met by different criteria.

1. Is this research conducted in established or commonly accepted educational settings, AND does the research involve normal educational practices (e.g. research on regular and special education strategies or research on the effectiveness of, or comparison among instructional techniques, curricula or classroom management methods)? (NOT exempt, merely because conducted at LSU)

YES  X  Check C1 & go to 2: This exemption criterion is satisfied
NO  ______  Go to 2: This exemption criterion is not applicable

2. Will this research use educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior?

YES  X  Go to 2.1
NO  ______  Skip to 3: (Criterion not applicable)
MEMORANDUM

TO: Ms. Patricia Ann Duhon
   Early Childhood Education

FROM: James M. Dabbs, Chairman
       Institutional Review Board

RE: Approval of Human Subjects Application No. H99168
   Type of Review: Amendment of Protocol
   Approval Period: 03/01/99 - 02/29/2000

The Georgia State University Institutional Review Board reviewed and approved your amendment to your proposal entitled "Preparing New Teachers to Use Technology: A Comparative Study of Pre-Service Teacher Education Programs," and your informed consent. This approval period is listed above and must be renewed at least 30 days before 02/29/2000 if research is to continue beyond that time frame. Renewal proposals may be resubmitted in abbreviated form.

Any adverse reactions or problems resulting from this investigation must be reported immediately to the University Institutional Review Board.

For more information, see the hand out on IRB procedures available from the Research Office.

JMD:ddp

cc: Dr. Brenda Galina
    Dr. Laura H. Smith

Multiple Project Assurance Number: 1549-01
TO: Ms. Patricia Ann Duhon
FROM: Dr. John Cavendish, Chair
DATE: January 27, 1999

RE: IRB Action on Proposed Project

This memo is to inform you of the IRB action with regard to your proposal:

Title: "Preparing New Teachers to Use Technology: A Comparative Study of Preservice Teacher Education Programs"

This proposal was given:

- Expedited Review: X
- Full Committee Review: _____
- Exempt: _____

The result was:

- Full Approval: X
- Conditional Approval: _____
- Emergency Approval: _____
- Provisional Approval: _____
- Denied Approval: _____

If anything other than Full Approval is recommended, it is your responsibility, as investigator, to submit changes/corrections or plans to accommodate conditions listed below to the Office of Sponsored Research and Contracts prior to initiating the project.

Failure to acquire full approval by IRB before implementation for any project which involves humans or live vertebrate animals means that the PI is not acting in "good faith" with university policy and is not, therefore, guaranteed the protection of the university.

Committee Comments: OIRAC 797
February 17, 1999

Patricia Duhon
1352 Knollhaven
Baton Rouge, LA 70810

RE: Human Subjects Application No. 99-022

Dear Ms. Duhon:

Your proposal entitled "Preparing New Teachers to use Technology: A comparative Study of Preservice Teacher Education Programs," has been approved by the Institutional Review Board and is exempt from further review under 45 CFR 46.101.

The UNT IRB must re-review this project prior to any modifications you make in the approved project. Please contact me if you wish to make such changes or need additional information.

Sincerely,

Sandra L. Terrell, Chair
Institutional Review Board

P.O. Box 305250 • Denton, Texas 76203-5250
(940) 565-3940 • Fax (940) 565-4277 • TDD (800) 735-2989
e-mail: lanx@alum.unt.edu

162
1352 Knollhaven  
Baton Rouge, LA 70810  
April 12, 1999  

James M. Dabbs, Chair  
Institutional Review Board  
Georgia State University  
University Plaza  
Atlanta, GA 30303-3083  

RE: Human Subjects Application No. H99168  

Dear Dr. Dabbs,  

Due to a 38% response rate after the second mailing of my survey, I am requesting approval for  
a modification in my research project entitled, "Preparing New Teachers to Use Technology: A  
Comparative Study of Preservice Teacher Education Programs."

In addition to the approved procedures, I would like to contact 37 nonrespondents (GSU  
graduates) by telephone to request their cooperation in this study and to verify their mailing  
addresses. Those who agree to participate will be mailed the attached cover letter along with  
two copies of the informed consent procedures and a third copy of the survey.  

Thank you for your consideration of this request. If you have any questions or need additional  
information, you can reach me at the numbers listed below or my Committee Chair, Dr. Earl  
Cheek, at (225) 388-6017.  

Sincerely,  

Pat Duhon  
Work: (225) 383-2611  
FAX: (225) 338-0471  
E-mail: pduhon@sprynet.com
MEMORANDUM

TO: Ms. Patricia Ann Duhon
    Early Childhood Education

FROM: James M. Dabbs, Chairman
      Institutional Review Board

RE: Approval of Human Subjects Application No. H99168
    Type of Review: Amendment of Protocol
    Approval Period: 03/01/99 - 02/29/2000

The Georgia State University Institutional Review Board reviewed and approved your amendment to your proposal entitled “Preparing New Teachers to Use Technology: A Comparative Study of Pre-Service Teacher Education Programs,” and your informed consent. This approval period is listed above and must be renewed at least 30 days before 02/29/2000 if research is to continue beyond that time frame. Renewal proposals may be resubmitted in abbreviated form.

Any adverse reactions or problems resulting from this investigation must be reported immediately to the University Institutional Review Board.

For more information, see the hand out on IRB procedures available from the Research Office.

JMD:ddp

cc: Dr. Brenda Galina
    Dr. Laura H. Smith

Multiple Project Assurance Number: 1549-01
1352 Knollhaven  
Baton Rouge, LA 70810  
April 12, 1999  

James Cavendish, Chair  
Institutional Review Board  
Southeastern Louisiana University  
Sponsored Research and Contracts  
Hammond, LA 70402  

RE: Human Subjects Application  

Dear Dr. Cavendish,  

Due to a 38% response rate after the second mailing of my survey, I am requesting approval for 
a modification in my research project entitled, “Preparing New Teachers to Use Technology: A 
Comparative Study of Preservice Teacher Education Programs.”  

In addition to the approved procedures, I would like to contact 44 nonrespondents (SLU graduates) by telephone to request their cooperation in this study and to verify their mailing addresses. Those who agree to participate will be mailed the attached cover letter along with 
two copies of the informed consent procedures and a third copy of the survey.  

Thank you for your consideration of this request. If you have any questions or need additional 
information, you can reach me at the numbers listed below or my Committee Chair, Dr. Earl Cheek, at (225) 388-6017.  

Sincerely,  

Pat Duhon  
Work: (225) 383-2611  
FAX: (225) 338-0471  
E-mail: pduhon@sprynet.com
TO:        Pat Dubon
FROM:    Michelle Hall, Interim Chair,
          Institutional Review Board
DATE:      April 26, 1999

We have received changes to your proposal and have given the proposal Full
Approval.
Dear Dr. Terrell,

Due to a 38% response rate after the second mailing of my survey, I am requesting approval for a modification in my research project entitled, “Preparing New Teachers to Use Technology: A Comparative Study of Preservice Teacher Education Programs.”

In addition to the approved procedures, I would like to contact 98 nonrespondents (UNT graduates) by telephone to request their cooperation in this study and to verify their mailing addresses. Those who agree to participate will be mailed the attached cover letter along with two copies of the informed consent procedures and a third copy of the survey.

Thank you for your consideration of this request. If you have any questions or need additional information, you can reach me at the numbers listed below or my Committee Chair, Dr. Earl Cheek, at (225) 388-6017.

Sincerely,

Pat Duhon
Work: (225) 383-2611
FAX: (225) 338-0471
pduhon@sprynet.com
April 13, 1999

Patricia Duhon
1352 Knollhaven
Baton Rouge, LA 70810

Institutional Review Board for the Protection of Human Subjects in Research (IRB)
RE: Human Subject Application #99-022

Dear Ms. Duhon,

The UNT IRB has received your request for modification of your project titled “Preparing New Teachers to Use Technology: A Comparative Study of Preservice Teacher Education Programs.” As required by federal law and regulations governing the use of human subjects in research projects, I have examined the proposed change. The risks inherent in this research are minimal, and the potential benefits to the subjects outweigh those risks. The submitted modification to your project is hereby approved for the use of human subjects on this project.

The UNT IRB must re-review this project annually and/or prior to any other changes you make in the approved project. Please contact me if you wish to make additional modifications or need additional information.

Sincerely,

Sandra L. Terrell, Chair
Institutional Review Board

P.O. Box 305350 • Denton, Texas 76203-5350
(940) 565-3940 • Fax (940) 565-4277 • TDD (800) 735-2989
e-mail: intm@unt.edu
APPENDIX B
SURVEY OF TECHNOLOGY PREPARATION AND USE

Survey of Technology Preparation and Use
developed by
Patricia Ann Duhon, Louisiana State University

For the purpose of this study, technology includes computers and other related technologies used to create, manipulate, or transmit data. Thank you for your time to complete (approximately 15 minutes) and return this survey to:

Dr. Earl Cheek
223 Peabody Hall
Louisiana State University
Baton Rouge, LA 70803

Section I. Personal and Professional Background

Directions: Please print the name of the institutional on the line for Question 1 and respond to the following questions by circling one number which most closely represents your situation.

1. From what college/university did you graduate?____________________________

2. Are you currently teaching in an elementary school?
   1. Yes
   2. No

   If you answered No to Question 2, you are finished. Please fold the survey, secure with tape, and return it. This will allow us to check your name off our list. Thank you for your assistance.

3. What is your age?
   1. Under 20
   2. 20-25
   3. 26-30
   4. 31-35
   5. Over 35

4. What is your gender?
   1. Male
   2. Female

5. What grade level are you currently teaching?
   1. Kindergarten
   2. First
   3. Second
   4. Third
   5. Fourth
   6. Fifth
   7. Other (Please specify)

6. What is the location of your school?
   1. Urban
   2. Suburban
   3. Rural

7. How would you rate your overall technology skills?
   1. Very skilled
   2. Above average
   3. Average
   4. Below average
   5. Unskilled
Section II. Your Skills for Personal and Professional Use of Technology

Directions: Please circle the response that best describes your proficiency on each item below:
0 - unskilled - I do not know how to do this task.
1 - below average - I have little proficiency on this task
2 - average - I have some proficiency on this task.
3 - above average - I am highly proficient on this task.

8. Operate a multimedia computer system with peripherals 0 1 2 3
9. Install software 0 1 2 3
10. Create and print a word processing document 0 1 2 3
11. Create and search a database with multiple fields and records 0 1 2 3
12. Merge a form letter with a database 0 1 2 3
13. Create a spreadsheet with rows, columns, and headings 0 1 2 3
14. Create a graph from spreadsheet data 0 1 2 3
15. Use desktop publishing to produce newsletter or brochure 0 1 2 3
16. Use a paint/draw program to create a graphic 0 1 2 3
17. Import clipart into text or desktop publishing 0 1 2 3
18. Use a scanner to import graphics, photos, and/or text 0 1 2 3
19. Create a hypermedia presentation or stack (e.g. Hyperstudio, Hypercard, etc.) 0 1 2 3
20. Use images from a digital camera in computer applications 0 1 2 3
21. Use images from a video recorder in computer applications 0 1 2 3
22. Input and digitize sound from microphone and audiocassette player/recorder 0 1 2 3
23. Use presentation software to create a lesson or lecture 0 1 2 3
24. Use an electronic gradebook 0 1 2 3
25. Use a computer-based portfolio assessment system 0 1 2 3
26. Use a laser video disk to show information 0 1 2 3
27. Access and send email 0 1 2 3
28. Access bulletin boards, newsgroups, and/or listservs 0 1 2 3
29. Find specific information on the World Wide Web 0 1 2 3
30. Create a page on the World Wide Web 0 1 2 3
31. Use distance learning and/or desktop video conferencing 0 1 2 3
32. Identify quality instructional software 0 1 2 3
33. Diagnose and correct common hardware/printing problems 0 1 2 3
Section III. Your Use of Technology

Part A: Computers

34. How many computers do you have in your classroom?
   1. None
   2. 1
   3. 2
   4. 3
   5. 4
   6. 5 or more

35. How many computers do you and your students use in your school's computer lab?
   1. None
   2. 1-4
   3. 5-10
   4. 11-15
   5. 16-20
   6. More than 20

36. Do you currently own a home computer?
   1. Yes
   2. No

37. How long have you been using a computer to enhance your personal and/or professional productivity?
   1. I don't use a computer
   2. Less than one year
   3. 1-2 years
   4. 3-4 years
   5. 5-6 years
   6. More than 7 years

38. On the average, how many hours per day do you currently use a computer for work-related activities?
   1. None
   2. Less than 1 hour
   3. 1 hour
   4. 2 hours
   5. 3 hours
   6. 4 or more hours

39. On the average, how many hours per day do your students use computers for instructional activities?
   1. None
   2. Less than 1 hour
   3. 1 hour
   4. 2 hours
   5. 3 hours
   6. 4 or more hours
Part B. Other Related Technologies
Directions: Please circle the response that best describes your instructional use of each item below:

<table>
<thead>
<tr>
<th>0 - I don't know what this is</th>
<th>1 - Not available</th>
<th>2 - Available, but I don't use</th>
<th>3 - Use occasionally (1-3 times a month)</th>
<th>4 - Use routinely (4-8 times a month)</th>
<th>5 - Use extensively (more than 8 times a month)</th>
</tr>
</thead>
</table>

**Equipment**

40. Scanner
41. Printer
42. CD-ROM player
43. Large screen display or projection device
44. Digital camera
45. Video camera
46. Fax/Modem
47. Laserdisc player
48. Sound card and speakers
49. Digital Video Disc (DVD) player
50. Other: Specify

**Educational Software**

51. Drill and practice
52. Simulation
53. Tutorial
54. Instructional games
55. Problem solving/Higher order thinking skills
56. Word processor
57. Spreadsheet
58. Database
59. Desktop publishing
60. Electronic presentation
61. Graphics/drawing programs
62. Hypermedia (e.g. Hypercard, Hyperstudio, Linkway, etc.)
63. Web authoring
64. Reference (e.g. encyclopedia, atlas, etc.)
65. Other: Specify

**Networking**

66. Local Area Network (LAN)
67. Wide Area Network (WAN)

**The Internet and Telecommunications**

68. E-mail
69. Listservs, newsgroups, and/or chat rooms
70. Collaborative projects
71. Electronic field trips
72. Research/reference
73. Audio/Videoconferencing
74. Distance learning
75. Other: Specify
Section IV. Teacher Education Program
Part A. Methods, Foundations, and Technology Courses

Directions: Circle the response that best describes your preparation to use technology within the following components of your undergraduate program: (1) methods courses, (2) foundations or professional studies, and (3) technology courses.
0 - No courses
1 - 1 course
2 - 2 courses
3 - 3 or more courses

Methods Courses (i.e., math, literacy, science, social studies, etc.)
76. In how many methods courses did your instructors model the use of technology to present course material? 0 1 2 3
77. In how many methods courses did your instructors discuss and demonstrate how a certain type of technology or software could be used in a classroom setting? 0 1 2 3
78. In how many methods courses did your instructors provide you with opportunities to practice using a certain type of technology or software? 0 1 2 3
79. In how many methods courses were you required to evaluate software and/or Internet sites? 0 1 2 3
80. In how many methods courses were you required to develop units or lessons incorporating technology? 0 1 2 3

Foundations or Professional Studies (i.e., foundations, introduction to education, etc.)
81. In how many foundations courses did your instructors model the use of technology to present course material? 0 1 2 3
82. In how many foundations courses did your instructors discuss and demonstrate how a certain type of technology or software could be used in a classroom setting? 0 1 2 3
83. In how many foundations courses did your instructors provide you with opportunities to practice using a certain type of technology or software? 0 1 2 3
84. In how many foundations courses were you required to evaluate software and/or Internet sites? 0 1 2 3
85. In how many foundations courses were you required to develop units or lessons incorporating technology? 0 1 2 3

Technology Courses
86. How many technology courses were you required to take in your undergraduate program? 0 1 2 3
87. How many technology courses did you elect to take in your undergraduate program? 0 1 2 3
### Part A. Methods, Foundations, and Technology Courses (Continued)

88. Were you required to take an introductory educational technology course as part of your undergraduate program?  
   - Yes  
   - No

89. Do you think an introductory educational technology course should be a requirement for undergraduate education majors?  
   - Yes  
   - No

90. Please give your reasons for your response to question # 89.

### Part B. Field Experiences and Student Teaching

Directions: Circle the response that best describes the integration of technology into your undergraduate field experiences or student teaching.

<table>
<thead>
<tr>
<th>Response</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all (0% of the time)</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Rarely (less than 25% of the time)</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Occasionally (26-50% of the time)</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Routinely (51-75% of the time)</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Extensively (76-100% of the time)</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

91. Considering all the classrooms that you visited during your field experiences, what percentage of the time did you observe teachers using technology in an instructional setting?

92. Considering all the classrooms that you visited during your field experiences, what percentage of the time did you practice teaching a lesson using technology?

93. Considering your overall time student teaching, what percentage of the time did you observe your supervising teacher using technology in an instructional setting?

94. Considering your overall time student teaching, what percentage of the time did you teach a lesson using technology?

### Part C. Program Evaluation

95. How would you evaluate your teacher education program in terms of your training to use technology in your classroom and to teach your students how to use technology?  
   - Very inadequate  
   - Inadequate  
   - Satisfactory  
   - Very satisfactory  
   - Outstanding

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Part D. Open Ended Questions

Directions: This is your opportunity to tell us more about your opinions of your teacher education program. The answers you give will help us further understand the integration of technology in preservice teacher education. (If you need more space, please feel free to enclose another piece of paper.)

96. Please explain your reasons for your response to question #95.

97. What component of your teacher education program was most effective in helping you to acquire the knowledge and skills to use technology and how did it impact instruction in your classroom?

98. If you were responsible for redesigning your teacher education program to improve technology training for preservice teachers what components would you add or delete? Why?

Thank you for completing this survey!
Please insert your signed consent form, fold the survey in half, secure with tape, and return to:
Dr. Earl Cheek, 223 Peabody Hall, Louisiana State University, Baton Rouge, LA 70803
APPENDIX C
INTERVIEW QUESTIONS

General Questions:

1. How many years have you been in the teaching profession?
2. How long have you taught at the university level? At this university?
3. What is your current position?
4. What is your major area of teaching responsibility?
5. How many courses do you teach each semester? About how many students are in each class?

Technology Related Questions:

6. What is your general opinion about technology and how important do you think technology is in teacher preparation?
7. What is the overall feeling among the faculty in your department towards integrating technology into the preservice curriculum?
8. Are you familiar with NCATE’s Recommended Foundations in Technology for All Teachers? What impact, if any, has the Foundations had on the preservice program at this university?
9. Can you give me a quick sketch of how your teacher education program is preparing students to integrate technology into their own classrooms?
10. How important do you think it is for preservice teachers to take a required introductory course in technology?
11. How many technology courses are required in your program? How many technology courses can elementary/early childhood majors elect to take?
12. Is technology a consideration in selecting sites for field experiences or student teaching?
13. Within the College of Education/your department, what equipment/resources are available to faculty? To students?
   • Do faculty have individual computers?
   • Are computers networked?

14. What equipment/resources are available to students?
   • Do students have access to a computer lab in the building?
   • Do students have Internet access and e-mail accounts?
   • Do students have access to educational software to preview and evaluate?

15. Is technical support staff available?

16. What do you see as the biggest challenge to integrating technology into the curriculum in this department?

17. Describe your current efforts to integrate technology into your instruction? To what extent and in what ways do you integrate technology into your instruction?

18. In a typical semester how often do you...
   • model the use of technology to present course material?
   • discuss and demonstrate how a certain type of technology or software could be used in a classroom setting?
   • provide opportunities for students to practice using a certain type of technology or software?
   • require students to develop units or lessons incorporating technology?

19. How would you rate the teacher education program at this university in terms of preparing students to use technology in their own classrooms and to teach their students to use technology?

20. Is there anything else you would like to tell me about the how your teacher education program is preparing students to use technology?
APPENDIX D
INFORMED CONSENT - CASE STUDIES

Preparing New Teachers to Use Technology: A Comparative Study of Preservice Teacher Education Programs

Consent Form

I am being asked to participate in the above-mentioned project. The purpose of this research is to: a) investigate the technological preparedness of recently graduated first-year elementary (K-5) teachers; and b) describe and analyze the technology components in teacher education programs. If I choose to participate, I will be asked questions during a one-on-one interview and/or observed in a classroom setting. The interview questions and the observation will focus on how the teacher education program at Georgia State University is preparing students to integrate technology into their own classrooms and instruction. The interview will take about 20-30 minutes and will be tape recorded and later transcribed. The duration of the observation will vary from 30 to 90 minutes depending on the activities involving technology and the time frame of the class.

I have been advised that I should not experience any risks as a result of my participation in this project. I have also been advised that I will not receive any direct, personal benefit as a result of my participation in this project; however, my participation will help the researchers to gain insight into which components of teacher education programs are most effective in preparing new teachers to incorporate technology into their own classrooms and instruction.

The information obtained from the interview and/or the observation will be coded so as to protect my privacy and confidentiality. The list, pairing subject names and subject pseudonyms, will be kept separate from the data and will only be available to the principal investigator. I have been advised that the data collected from the study will not be reported to anyone outside the research project in a manner that personally identifies me.

If I have additional questions about this project, I may contact the Principal Investigator, Pat Duhon, or her advisor, Dr. Earl Cheek of the Department of Curriculum and Instruction at Louisiana State University, (225) 388-6017. I may also contact the Georgia State University (GSU) Faculty Sponsor, Dr. Laura Smith of the Department of Early Childhood Education, ((404) 651-2584. The GSU Research Office (Room 1-76 Alumni Hall) can provide me with general information about the rights of human subjects in research.

I understand that I may refuse to participate in this study, and if I do choose to participate I may stop at any time. If I refuse to participate or decide to stop, I will not be penalized and will not lose any benefits to which I am entitled.

I have read and understand the above, and I agree to participate in this study.

Print Name

Signature Date
Preparing New Teachers to Use Technology: A Comparative Study of Preservice Teacher Education Programs

Consent Form

I am being asked to participate in the above-mentioned project. The purpose of this research is to: a) investigate the technological preparedness of recently graduated first-year elementary (K-5) teachers; and b) describe and analyze the technology components in teacher education programs. If I choose to participate, I will be asked questions during a one-on-one interview and/or observed in a classroom setting. The interview questions and the observation will focus on how the teacher education program at Southeastern Louisiana University is preparing students to integrate technology into their own classrooms and instruction. The interview will take about 20 to 30 minutes and will be tape recorded and later transcribed. The duration of the observation will vary from 30 to 90 minutes depending on the activities involving technology and the time frame of the class.

I have been advised that I should not experience any risks as a result of my participation in this project. I have also been advised that I will not receive any direct, personal benefit as a result of my participation in this project; however, my participation will help the researchers to gain insight into which components of teacher education programs are most effective in preparing new teachers to incorporate technology into their own classrooms and instruction.

The information obtained from the interview and/or the observation will be coded so as to protect my privacy and confidentiality. The list, pairing subject names and subject pseudonyms, will be kept separate from the data and will only be available to the principal investigator. I have been advised that the data collected from the study will not be reported to anyone outside the research project in a manner that personally identifies me.

If I have additional questions about this project, I may contact the Principal Investigator, Pat Duhon, or her advisor, Dr. Earl Cheek of the Department of Curriculum and Instruction at Louisiana State University, (225) 388-6017. I may also contact the Southeastern Louisiana University (SLU) Faculty Sponsor, Dr. Noel Bitner, (504) 549-5234. The SLU Office of Sponsored Research and Contracts (SLU 10508) can provide me with general information about the rights of human subjects in research.

I understand that I may refuse to participate in this study, and if I do choose to participate I may stop at any time. If I refuse to participate or decide to stop, I will not be penalized and will not lose any benefits to which I am entitled.

I have read and understand the above, and I agree to participate in this study.

Print Name

Signature Date
Preparing New Teachers to Use Technology: A Comparative Study of Preservice Teacher Education Programs

Consent Form

I am being asked to participate in the above-mentioned project. The purpose of this research is to: a) investigate the technological preparedness of recently graduated first-year elementary (K-5) teachers; and b) describe and analyze the technology components in teacher education programs. If I choose to participate, I will be asked questions during a one-on-one interview and/or observed in a classroom setting. The interview questions and the observation will focus on how the teacher education program at the University of North Texas (UNT) is preparing students to integrate technology into their own classrooms and instruction. The interview will take about 20-30 minutes and will be tape recorded and later transcribed. The duration of the observation will vary from 30 to 90 minutes depending on the activities involving technology and the time frame of the class.

I have been advised that I should not experience any risks as a result of my participation in this project. I have also been advised that I will not receive any direct, personal benefit as a result of my participation in this project; however, my participation will help the researchers to gain insight into which components of teacher education programs are most effective in preparing new teachers to incorporate technology into their own classrooms and instruction.

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If I have additional questions about this project, I may contact the Principal Investigator, Pat Duhon, or her advisor, Dr. Earl Cheek of the Department of Curriculum and Instruction at Louisiana State University, (225) 388-6017. I may also contact the University of North Texas Faculty Sponsor, Dr. Frances van Tassell of the Department of Teacher Education and Administration, (940) 565-4420. The UNT Office of Research Administration, (940) 565-3940, can provide me with general information about the rights of human subjects in research.

I understand that I may refuse to participate in this study, and if I do choose to participate I may stop at any time. If I refuse to participate or decide to stop, I will not be penalized and will not lose any benefits to which I am entitled.

I have read and understand the above, and I agree to participate in this study.

Print Name

Signature Date

This project has been reviewed by the University of North Texas Committee for the Protection of Human Subjects (904) 565-3940.
March 1, 1999

Dear Teacher:

We are requesting your participation in a research project entitled: “Preparing new Teachers to Use Technology: A Comparative Study of Preservice Teacher Education Programs.” Participation will require you to complete the enclosed survey which will take approximately 15 minutes. The purpose of this research is to: (a) investigate the technological preparedness of recently graduated first-year elementary (K-5) teachers; and (b) describe and analyze the technology components in teacher education programs. The results of this study will provide valuable insight into which components of teacher education programs are most effective in preparing new teachers to use technology in their own classrooms.

Participation in this study is strictly voluntary. To guarantee anonymity, please do not write your name on any part of the survey. An identification number has been assigned to the back of your survey. This number will allow us to check your name off the mailing list when the survey is returned. To insure your privacy and confidentiality, the mailing list will be kept separate from the completed surveys and will only be available to the principal investigator. At no time will there be an attempt to match your completed survey with your name.

In addition to the enclosed survey are two copies of informed consent procedures for this study. Please read and return one signed copy of the procedures with your survey by Friday, March 12, 1999. For your convenience, the return address and pre-paid postage are included on the back of the last page of the questionnaire. When you have completed the survey, simply insert the signed consent form, fold the survey in half, and secure with tape for return mailing.

We realize how many demands you have on your time and we appreciate your willingness to participate in this research project. If you have any questions about this study, or related problems, please contact the principal investigator, Pat Duhon, at (225) 388-6017 or e-mail at pduhon@sprynet.com. A summary of the survey results will be posted to the web at http://home.sprynet.com/sprynet/pduhon.

Sincerely,

Pat Duhon
Doctoral Candidate
Curriculum and Instruction
Louisiana State University
(225) 388-6017

Earl Cheek, Ph.D.
Committee Chair
Curriculum and Instruction
Louisiana State University
(225) 388-6017

Laura Smith, Ph.D.
Faculty Sponsor
Early Childhood Education
Georgia State University
(404) 651-2584
March 1, 1999

Dear Teacher:

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Sincerely,

Pat Duhon
Doctoral Candidate
Curriculum and Instruction
Louisiana State University
(225) 388-6017

Earl Cheek, Ph.D.
Committee Chair
Curriculum and Instruction
Louisiana State University
(225) 388-6017

Noel Bitner, Ph.D.
Faculty Sponsor
Teacher Education
Southeastern Louisiana University
(504) 549-5234

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March 1, 1999

Dear Teacher:

We are requesting your participation in a research project entitled: “Preparing New Teachers to Use Technology: A Comparative Study of Preservice Teacher Education Programs.” Participation will require you to complete the enclosed survey which will take approximately 15 minutes. The purpose of this research is to: (a) investigate the technological preparedness of recently graduated first-year elementary (K-5) teachers; and (b) describe and analyze the technology components in teacher education programs. The results of this study will provide valuable insight into which components of teacher education programs are most effective in preparing new teachers to use technology in their own classrooms.

Participation in this study is strictly voluntary. To guarantee anonymity, please do not write your name on any part of the survey. An identification number has been assigned to the back of your survey. This number will allow us to check your name off the mailing list when the survey is returned. To insure your privacy and confidentiality, the mailing list will be kept separate from the completed surveys and will only be available to the principal investigator. At no time will there be an attempt to match your completed survey with your name.

In addition to the enclosed survey are two copies of informed consent procedures for this study. Please read and return one signed copy of the procedures with your survey by Friday, March 12, 1999. For your convenience, the return address and pre-paid postage are included on the back of the last page of the questionnaire. When you have completed the survey, simply insert the signed consent form, fold the survey in half, and secure with tape for return mailing.

We realize how many demands you have on your time and we appreciate your willingness to participate in this research project. If you have any questions about this study, or related problems, please contact the principal investigator, Pat Duhon, at (225) 388-6017 or e-mail at pduhon@sprynet.com. A summary of the survey results will be posted to the web at http://home.sprynet.com/sprynet/pduhon.

Sincerely,

Pat Duhon
Doctoral Candidate
Curriculum and Instruction
Louisiana State University
(225) 388-6017

Earl Cheek, Ph.D.
Committee Chair
Curriculum and Instruction
Louisiana State University
(225) 388-6017

Frances van Tassell, Ed.D.
Faculty Sponsor
Teacher Education and Administration
University of North Texas
(940) 565-4420
APPENDIX F
INFORMED CONSENT - SURVEY

Preparing New Teachers to Use Technology: A Comparative Study of Preservice Teacher Education Programs

Survey Consent Form - Georgia State University

I am being asked to participate in the above-mentioned project. The purpose of this research is to: a) investigate the technological preparedness of recently graduated first-year elementary (K-5) teachers; and b) describe and analyze the technology components in teacher education programs. If I choose to participate, I will complete a survey instrument that includes questions about my technological skills, how I use technology in my classroom, and my preservice training for utilizing technology in my classroom. The time required will be about 15 minutes.

I have been advised that I should not experience any risks as a result of my participation in this project. I have also been advised that I will not receive any direct, personal benefit as a result of my participation in this project; however, my participation will help the researchers to gain insight into which components of teacher education programs are most effective in preparing new teachers to incorporate technology into their own classrooms.

The information gathered in this study will be coded so as to protect my privacy and confidentiality. This will be done through a procedure whereby the data I will provide will be referred to by my subject number alone. The list, pairing subject names and subject numbers, will be kept separate from the data and will only be available to the principal investigator. I have been advised that the data collected from the study will be summarized and reported only in group form. Information that is gathered about me will not be reported to anyone outside the research project in a manner that personally identifies me.

If I have additional questions about this project, I may contact the Principal Investigator, Pat Duhon, or her advisor, Dr. Earl Cheek of the Department of Curriculum and Instruction at Louisiana State University, (225) 388-6017. I may also contact the Georgia State University (GSU) Faculty Sponsor, Dr. Laura Smith of the Department of Early Childhood Education, (404) 651-2584. The GSU Research Office (Room I-76 Alumni Hall) can provide me with general information about the rights of human subjects in research.

I understand that I may refuse to participate in this study, and if I do choose to participate I may stop at any time. If I refuse to participate or decide to stop, I will not be penalized and will not lose any benefits to which I am entitled.

I have read and understand the above, and I agree to participate in this study.

______________________________
Print Name

______________________________    ________________
Signature                      Date

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Preparing New Teachers to Use Technology: A Comparative Study of Preservice Teacher Education Programs

Survey Consent Form - University of North Texas

I am being asked to participate in the above-mentioned project. The purpose of this research is to: a) investigate the technological preparedness of recently graduated first-year elementary (K-5) teachers; and b) describe and analyze the technology components in teacher education programs. If I choose to participate, I will complete a survey instrument that includes questions about my technological skills, how I use technology in my classroom, and my preservice training for utilizing technology in my classroom. The time required will be about 15 minutes.

I have been advised that I should not experience any risks as a result of my participation in this project. I have also been advised that I will not receive any direct, personal benefit as a result of my participation in this project; however, my participation will help the researchers to gain insight into which components of teacher education programs are most effective in preparing new teachers to incorporate technology into their own classrooms.

The information gathered in this study will be coded so as to protect my privacy and confidentiality. This will be done through a procedure whereby the data I will provide will be referred to by my subject number alone. The list, pairing subject names and subject numbers, will be kept separate from the data and will only be available to the principal investigator. I have been advised that the data collected from the study will be summarized and reported only in group form. Information that is gathered about me will not be reported to anyone outside the research project in a manner that personally identifies me.

If I have additional questions about this project, I may contact the Principal Investigator, Pat Duhon, or her advisor, Dr. Earl Cheek of the Department of Curriculum and Instruction at Louisiana State University, (225) 388-6017. I may also contact the University of North Texas Faculty Sponsor, Dr. Frances van Tassell of the Department of Teacher Education and Administration, (940) 565-4420. The UNT Office of Research Administration, (940) 565-3940, can provide me with general information about the rights of human subjects in research.

I understand that I may refuse to participate in this study, and if I do choose to participate I may stop at any time. If I refuse to participate or decide to stop, I will not be penalized and will not lose any benefits to which I am entitled.

I have read and understand the above, and I agree to participate in this study.

Print Name

Signature Date

This project has been reviewed by the University of North Texas Committee for the Protection of Human Subjects (904) 565-3940.
Preparing New Teachers to Use Technology: A Comparative Study of Preservice Teacher Education Programs

Survey Consent Form - Southeastern Louisiana University

I am being asked to participate in the above-mentioned project. The purpose of this research is to: a) investigate the technological preparedness of recently graduated first-year elementary (K-5) teachers; and b) describe and analyze the technology components in teacher education programs. If I choose to participate, I will complete a survey instrument that includes questions about my technological skills, how I use technology in my classroom, and my preservice training for utilizing technology in my classroom. The time required will be about 15 minutes.

I have been advised that I should not experience any risks as a result of my participation in this project. I have also been advised that I will not receive any direct, personal benefit as a result of my participation in this project; however, my participation will help the researchers to gain insight into which components of teacher education programs are most effective in preparing new teachers to incorporate technology into their own classrooms.

The information gathered in this study will be coded so as to protect my privacy and confidentiality. This will be done through a procedure whereby the data I will provide will be referred to by my subject number alone. The list, pairing subject names and subject numbers, will be kept separate from the data and will only be available to the principal investigator. I have been advised that the data collected from the study will be summarized and reported only in group form. Information that is gathered about me will not be reported to anyone outside the research project in a manner that personally identifies me.

If I have additional questions about this project, I may contact the Principal Investigator, Pat Duhon, or her advisor, Dr. Earl Cheek of the Department of Curriculum and Instruction at Louisiana State University, (225) 388-6017. I may also contact the Southeastern Louisiana University Faculty Sponsor, Dr. Noel Bitner, (504) 549-5234. The SLU Office of Sponsored Research and Contracts (SLU 10508) can provide me with general information about the rights of human subjects in research.

I understand that I may refuse to participate in this study, and if I do choose to participate I may stop at any time. If I refuse to participate or decide to stop, I will not be penalized and will not lose any benefits to which I am entitled.

I have read and understand the above, and I agree to participate in this study.

Print Name

Signature Date
March 5, 1999

Dear Teacher,

We would very much like to include your responses in our study of the technological preparedness of recently graduated first-year elementary (K-5) teachers. If you have mailed the survey recently, we want to express our thanks to you.

If you have not completed the survey, please do so and return it to me before Friday, March 12, 1999.

Sincerely,

Earl Cheek, Ph.D.
Committee Chair
Department of Curriculum and Instruction
Louisiana State University
APPENDIX H
SECOND COVER LETTERS

LOUISIANA STATE UNIVERSITY
AND AGRICULTURAL AND MECHANICAL COLLEGE
Department of Curriculum and Instruction

March 22, 1999

Dear Teacher,

Three weeks ago we sent you a survey and asked for your help in a study that we are conducting. The purpose of our research is to: (a) investigate the technological preparedness of recently graduated first-year elementary (K-5) teachers and (b) describe and analyze the technology components in teacher education programs.

Since we have not heard from you, we thought you would appreciate this reminder. Your participation is voluntary, but very important to ensure that the information collected truly represents the experiences of recent graduates of Georgia State University.

For your convenience, we have enclosed another stamped, self-addressed copy of the “Survey of Technology Use and Preparation.” The survey will take about 15 minutes to complete. To guarantee anonymity, please do not write your name on any part of the survey. An identification number has been assigned to your survey. This number will allow us to check your name off the mailing list when the survey is returned. At no time will your completed survey be matched to your name. A summary of the survey results will be posted to the web at http://home.sprynet.com/sprynet/pduhon.

Also enclosed are two copies of the informed consent procedures for this study. After reading, please sign and return one copy with your completed survey before Thursday, April 1, 1999. If you have any questions, we can be reached at (225) 388-6017. Your time and assistance are greatly appreciated.

Sincerely,

Patricia Ann Duhon
Doctoral Candidate
Curriculum and Instruction
Louisiana State University
(225) 388-6017
E-mail: pduhon@sprynet.com

Earl Cheek, Ph.D.
Committee Chair
Curriculum and Instruction
Louisiana State University
(225) 388-6017

Laura Smith, Ph.D.
Faculty Sponsor
Early Childhood Education
Georgia State University
(404) 651-2584
E-mail: ecells@langate.gsu.edu
Dear Teacher,

Three weeks ago we sent you a survey and asked for your help in a study that we are conducting. The purpose of our research is to: (a) investigate the technological preparedness of recently graduated first-year elementary (K-5) teachers and (b) describe and analyze the technology components in teacher education programs.

Since we have not heard from you, we thought you would appreciate this reminder. Your participation is voluntary, but very important to ensure that the information collected truly represents the experiences of recent graduates of Southeastern Louisiana University.

For your convenience, we have enclosed another stamped, self-addressed copy of the “Survey of Technology Use and Preparation.” The survey will take about 15 minutes to complete. To guarantee anonymity, please do not write your name on any part of the survey. An identification number has been assigned to your survey. This number will allow us to check your name off the mailing list when the survey is returned. At no time will your completed survey be matched to your name.

Also enclosed are two copies of the informed consent procedures for this study. After reading, please sign and return one copy with your completed survey before Thursday, April 1, 1999. If you have any questions, we can be reached at (225) 388-6017. Your time and assistance are greatly appreciated.

Sincerely,

Patricia Ann Duhon
Doctoral Candidate
Curriculum and Instruction
Louisiana State University
(225) 388-6017
E-mail: pduhon@sprynet.com

Earl Cheek, Ph.D.
Committee Chair
Curriculum and Instruction
Louisiana State University
(225) 388-6017

Noel Bitner, Ph.D.
Faculty Sponsor
Teacher Education
Southeastern Louisiana University
(504) 549-5234
E-mail: dmoel@selu.edu
March 22, 1999

Dear Teacher,

Three weeks ago we sent you a survey and asked for your help in a study that we are conducting. The purpose of our research is to: (a) investigate the technological preparedness of recently graduated first-year elementary (K-5) teachers and (b) describe and analyze the technology components in teacher education programs.

Since we have not heard from you, we thought you would appreciate this reminder. Your participation is voluntary, but very important to ensure that the information collected truly represents the experiences of recent graduates of the University of North Texas.

For your convenience, we have enclosed another stamped, self-addressed copy of the "Survey of Technology Use and Preparation." The survey will take about 15 minutes to complete. To guarantee anonymity, please do not write your name on any part of the survey. An identification number has been assigned to your survey. This number will allow us to check your name off the mailing list when the survey is returned. At no time will your completed survey be matched to your name. A summary of the survey results will be posted to the web at http://home.sprynet.com/sprynet/pduhon.

Also enclosed are two copies of the informed consent procedures for this study. After reading, please sign and return one copy with your completed survey before Thursday, April 1, 1999. If you have any questions, we can be reached at (225) 388-6017. Your time and assistance are greatly appreciated.

Sincerely,

Pat Duhon
Doctoral Candidate
Curriculum and Instruction
Louisiana State University
(225) 388-6017
pduhon@sprynet.com

Earl Cheek, Ph.D.
Committee Chair
Curriculum and Instruction
Louisiana State University
(225) 388-6017

Frances van Tassel, Ed.D
Faculty Sponsor
Teacher Education and Administration
University of North Texas
(940) 565-4420
Dear Teacher,

Thank you for agreeing to help us with our research project when we contacted you by telephone a few days ago. As fellow teachers we appreciate your willingness to take the time from your busy schedule to complete the enclosed survey.

The "Survey of Technology Use and Preparation" will take approximately 15 minutes to complete. Your experiences as a recent undergraduate student and current first year teacher will provide valuable information to help schools of education prepare new classroom teachers to use technology. Your responses will be kept confidential and at no time will your completed survey be matched to your name.

In addition to the enclosed survey are two copies of informed consent procedures for this study. Please read and return one signed copy of the procedures with your survey by May 1, 1999. If you have any questions, we can be reached at (225) 388-6017 or by e-mail at pduhon@sprynet.com.

Sincerely,

Pat Duhon
Doctoral Candidate
Curriculum and Instruction
Louisiana State University
(225) 388-6017
E-mail: pduhon@sprynet.com

Earl Cheek, Ph.D.
Committee Chair
Curriculum and Instruction
Louisiana State University
(225) 388-6017

Laura Smith, Ph.D.
Faculty Sponsor
Early Childhood Education
Georgia State University
(404) 651-2584
Dear Teacher,

Thank you for agreeing to help us with our research project when we contacted you by telephone on Saturday. As fellow teachers we appreciate your willingness to take the time from your busy schedule to complete the enclosed survey.

The “Survey of Technology Use and Preparation” will take approximately 15 minutes to complete. Your experiences as a recent undergraduate student and current first year teacher will provide valuable information to help schools of education prepare new classroom teachers to use technology. Your responses will be kept confidential and at no time will your completed survey be matched to your name.

In addition to the enclosed survey are two copies of informed consent procedures for this study. Please read and return one signed copy of the procedures with your survey by May 1, 1999. If you have any questions, we can be reached at (225) 388-6017 or by e-mail at pduhon@sprynet.com.

Sincerely,

Pat Duhon
Doctoral Candidate
Curriculum and Instruction
Louisiana State University
(225) 388-6017
E-mail: pduhon@sprynet.com

Earl Cheek, Ph.D.
Committee Chair
Curriculum and Instruction
Louisiana State University
(225) 388-6017

Noel Bitner, Ph.D.
Faculty Sponsor
Teacher Education
Southeastern Louisiana University
(504) 549-5234
April 19, 1999

Dear Teacher,

Thank you for agreeing to help us with our research project when we contacted you by telephone a few days ago. As fellow teachers we appreciate your willingness to take the time from your busy schedule to complete the enclosed survey.

The “Survey of Technology Use and Preparation” will take approximately 15 minutes to complete. Your experiences as a recent undergraduate student and current first year teacher will provide valuable information to help schools of education prepare new classroom teachers to use technology. Your responses will be kept confidential and at no time will your completed survey be matched to your name.

In addition to the enclosed survey are two copies of informed consent procedures for this study. Please read and return one signed copy of the procedures with your survey by May 1, 1999. If you have any questions, we can be reached at (225) 388-6017 or by e-mail at pduhon@sprynet.com.

Sincerely,

Pat Duhon
Doctoral Candidate
Curriculum and Instruction
Louisiana State University
(225) 388-6017
E-mail: pduhon@sprynet.com

Earl Cheek, Ph.D.
Committee Chair
Curriculum and Instruction
Louisiana State University
(225) 388-6017

Fances van Tassell, Ed.D.
Faculty Sponsor
Teacher Education
University of North Texas
(940) 565-4420
APPENDIX J
TECHNOLOGY STANDARDS FOR EDUCATORS

Attachment B
Technology Standards For Educators

Goal  Integrating Technology (i.e. video, software, transparencies, displays, video-conferencing, Internet)

Objective  Design, create and implement a lesson using integrated media.

Skills Needed

Platform/Hardware
A. Computer
   1. Know the use of the individual components and features of a typical computer.
   2. Navigate at least one desktop environment.

B. Other
   1. Know the components and features of VCR, scanner, LCD, modem, etc.
   2. Use video-conferencing software and camera.
   4. Use a camcorder and VCR.
   5. Use optical scanner.
   6. Use data projection system.
   7. Use modem.
   8. Use audio recorder.
  10. Use editing equipment.
  11. Use wireless technology.
  12. Demonstrate troubleshooting ability.

Software

A. Instructional (simulation, games, drill, encyclopedias, story books, interactive programs)
   1. Select, and evaluate instructional software.
   2. Write activities using instructional software.
   3. Know how to support students in the selection and use of software.
   4. Know the appropriate teaching environment and adaptive strategies necessary for effective instruction.
5. Model strategy using software.
6. Incorporate software into existing curriculum.

B. Telecommunication (On-line services and Internet)
   1. Participate in one-way and two-way interactive classes including simultaneous file sharing.
   2. Use networks to FTP, E-mail, and interact on list servers.
   3. Know the differences between a LAN and WAN.
   4. Evaluate telecommunication services.
   5. Identify method of accessing information.

D. Productivity and Management (word processor, database, spreadsheet, publishing, graphics,
   presentation, test generator, management, grade books)
   1. Use one of each of the productivity packages.
   2. Design and create a unique product used in instruction.
   3. Use software to create handouts, displays, tests, slide shows and videos.
   4. Participate in and produce a video.
   5. Develop a website.

E. Troubleshooting
APPENDIX K
JOB DESCRIPTION FOR DIRECTOR OF INSTRUCTIONAL TECHNOLOGY

DIRECTOR OF INSTRUCTION TECHNOLOGY

The College of Education seeks a Director of Instructional Technology to facilitate, coordinate, and improve all efforts within the college related to preparing faculty, other instructors, and students in the area of improved teaching with a special emphasis on instructional technology. This person will report to the Associate Dean/Director of Teacher Education and will have the following responsibilities:

1. Design and coordinate with appropriate faculty and dean's office staff all efforts toward building and Instructional Technology Center, Instructional Resource Center, and related classrooms within the first and second floors of the College of Education Building.

2. Design, coordinate, and implement with appropriate faculty and the curriculum committee of the PEC all efforts in what are now the laboratories of the Educational Microcomputing Center on the first floor of the College of Education Building. This will include working with relevant faculty to redesign courses at all degree levels which are designed for pre- or in-service teachers in which instructional technology should be taught or infused.

3. Design, coordinate, and implement with appropriate faculty a systemic, college-wide approach to Faculty Development in the area of instructional technology. This will allow all faculty in Teacher Education to infuse appropriate skills in instructional technology into their classes, blocks, and student teaching.

4. Design, coordinate, and implement with appropriate faculty and dean's office staff experiences for faculty, GTAs, and PTIs through the proposed GSU/CofE Teaching Center. This effort will also be coordinated with the ongoing efforts of the other colleges and the GSU Computing Center.

Requirements:

1. A doctorate in an area of education.
2. Administrative experience in a school system or university.
3. Experience with and understanding of instructional technology as it is currently being used by teachers in schools in all K-12 academic areas.
4. Experience in planning a systemic approach to incorporating instructional technology in educational institutions such as school systems or colleges of education.
5. Experience with planning faculty/staff development for pre- and in-service teachers, college professors, and other school personnel in the area of instructional technology.

Send applications including a letter of application specifying expertise for this position, a complete resume, evidence of past work which supports the candidate's ability to complete this effort, and three letters of recommendation to Personnel.

Salary Range: $60,000 - $70,000
Deadline for Applications: January 31, 1994
Starting Date: January 15, 1994
APPENDIX L
DOMAIN ANALYSIS

Profile

is/are a part of the

university
city/state
population of city/town
urban
metropolitan
region
geographical location
campus
grounds
acreage
buildings/structures
architecture
landscape
administrative organization
colleges/schools
degree programs
faculty
student enrollment
campus-wide technology services
infrastructure
e-mail accounts
Internet resources
computers
computer labs
training
technical support
technology fee
central support unit
distributed support units
College of Education
departments
accreditation
campus location
building
teacher education program
admission criteria
program of study
certification
major
graduation requirements
elementary education

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Technology Component

is/are a kind of

required 3-hour technology course
integration into methods courses
integration into professional courses
field-based placements in technology-rich schools
blocked courses
seminars
equipment
mobile learning stations
electronic classrooms
hardware
software
instructional technology center
media resource center
Director of Instructional Technology
technology plan
professional development
training workshops
computer support person
liaison
attitude/acceptance
technology grants
technology standards
technology committee
leadership
allocation of funds for technology
faculty training
workshops
technical support
expectations for technology use
weekly department meetings
collaborative planning for technology
portfolios
e-mail journal
electronic presentations
discussion/demonstration
hands-on practice
professional practice
modeling the use of technology
mission/vision statement
technology goals/objectives
program manual
technology
APPENDIX M
TAXONOMIC ANALYSIS

I. Cultural Domain: Profile
A. The University
  1. Location
     a. City/State
     b. Community Location
     c. Campus
  1. Organization
     a. Colleges and schools
     b. Degree programs
        (1) Undergraduate
        (2) Graduate
     c. Carnegie classification
  3. Students and faculty
     a. Student enrollment
     b. Number of faculty
     c. Size by enrollment
     d. Undergraduate student/faculty ratio
  4. Technology services
     a. Infrastructure
     b. Facilities
        (1) General access labs/number of computers
        (2) Special purpose labs
     c. Support
     d. Student technology fee
B. The College of Education
  1. Location
     a. Building
     b. Campus location
  2. Organization
     a. Departments
     b. Degree programs
     c. Elementary education degree program
        (1) Major
        (2) Certification
  3. Accreditation
     a. National
     b. State
C. The Teacher Education Program
  1. Location
  2. Admission criteria
     a. Core curriculum
     b. Required GPA
     c. Assessment tests
     d. Interview
     e. Hearing/speech screening
II. Cultural Domain: Technology Components
A. Program Design
   1. Integration
      a. Methods courses
      b. Professional courses
      c. Field-based placements
   2. Required 3-hour introductory technology course
      a. Core computer literacy course
      b. Redesigned technology course
B. Expectations
   1. Leadership
      a. COE Dean and Associate Dean
      b. Department Chair
      c. Faculty
   2. Planning
      a. Vision/Mission Statement
      b. College/Department goals and objectives addressing technology
      c. Technology advisory committee
      d. Technology plan
      e. Technology standards for educators
      f. Department meetings
C. Facilities
   1. Space
      a. Faculty and students
         (1) Center
         (2) Classrooms
            (a) Electronic
            (b) Regular
         (3) Computer labs
            (a) Open Access
            (b) Restricted
         (4) Video studio
         (5) Distance learning room
         (4) Workrooms
            Software evaluation room
            (a) Scanning room
            (b) Animation room
      b. Faculty
         (1) Office
         (2) Workroom
   2. Equipment
      a. Faculty and students
         (1) Hardware
            (a) Computers
            (b) Laser printers
(c) Color laser printers
(d) Digital cameras
(e) Scanners
(f) LCD projection systems
(g) Video cameras
(h) Laserdisk player
(i) Recordable CD drive
(j) Video-editing equipment
(k) Television
(l) VCR
(m) Laptops
(n) Wireless laptops
(o) External drives

(2) Software

b. Faculty

(2) Hardware
(a) Computer
(b) Printer
(c) Laptop
(d) Laser printer
(e) Color laser printer
(f) Digital cameras
(g) Scanner
(h) LCD projection system
(i) VCR
(j) Laserdisk player

(2) Software

A. Support
1. Training
2. Technical

E. Use of Technology
5. Faculty Acceptance
   a. High
   b. Medium
   c. Low

2. Methods
   a. Discussion/demonstration
   b. Hands-on practice
   c. Professional practice
APPENDIX N
RESPONDENTS' WRITTEN RESPONSES

Included below are the responses to the following open-ended questions:

Question 90  Please give your reasons for your response to question # 89. (Question 89 - Do you think an introductory course should be a requirement for undergraduate majors?)

Question 96  Please explain your reasons for your response to question # 95. (Question 95 - How would you evaluate your teacher education program in terms of your training to use technology in your classroom and to teach your students how to use technology?)

Question 97  What component of your teacher education program was most effective in helping you to acquire the knowledge and skills to use technology and how did it impact instruction in your classroom?

Question 98  If you were responsible for redesigning your teacher education program to improve technology training for preservice teachers what components would you add or delete? Why?

Georgia State University

90  By the time you get to your technology placement, many people are unfamiliar w/ [sic] computer terminology. Fortunately [sic], children/youth are using technology frequently so this might not be necessary in upcoming years.

96  We had an integrated technology, math, science, field experience where we were to create a technology portfolio and use ideas in the classroom. Most of my knowledge gained was self-taught. I do not feel like there were adequate courses on integrating technology.

97  Math/Science/Technology quarter

98  Using school/counties that are sufficiently equipped with technology resources would be the most beneficial component. Using supervising teachers that actually use technology in their curriculum other than Math Blasters, Reading Rabbit, etc...Also a course on Children’s software would be beneficial in place of the Pre-K field experience, which is not.

90  Technology is a helpful tool in many lessons but teachers don’t use it because they are afraid of it or don’t know how to use it.

96  I feel that my technology experience helped me use many of the high-tech device our there today. Many teachers I work with do not know how to use these wonderful things.

97  We had to show the use of technology in almost everything we did. That pushed you to learn more to try and improve your presentation.

98  I would make a technology component manadotory [sic] in every field experience setting that GA State requires you to take.

90  Many people are not computer literate, and an introduction to basics might be useful for this type of individual.
I was taught a variety of techniques for incorporating technology into the classroom. Prior to GA State, I really had little knowledge of scanners, lasers, digital cameras, email, Internet usages, etc.

We had a technology block of classes that taught us a lot, however, the technology did not stop there. We were trained to use technology in every block, and constantly taught new things.

I would place all student teachers in schools with an abundance of technology resources. Other than that, the technology component of my college education was wonderful.

Technology is a part of everyday life, everyone needs to be educated on this.

I can't think of anything I would change. Unfortunately, in the "real world" schools are not equipped w/ the necessary equip./technology to teach whole class style.

Technology is used everyday especially in a school setting. Teachers must be prepared to meet the questions, instructions, and challenges of using technology. Most of the students already know how to use technology therefore it is important for a teacher to take that knowledge and enhance it.

I knew more about technology and how to use it than most anyone on staff. I gave workshops on how to use the technology in the school to other teachers and this is only my first year teaching! I was teaching teachers things that use to be my teachers in elementary school! What a hoot!

Just introducing various technology tools and explaining them was important. Then showing how to take that knowledge and creatively intertwine technology into lessons in the classroom.

Show how to hook-up classroom computer to TV in classroom so teacher can teach from computer and whole class can see the computer screen on TV. Other than that nothing, because I am and was prepared!

It is important for students to get better background in technology and become familiarized with it.

I was required to take a technology course in which required you to incorporate technology (such as scanner, digital camera, computer, laser disc) into all my lessons. The course last 2 1/2 months.

The technology block was the most effective because for 2 1/2 months it focuses specifically on incorporating technology into all your lessons.

I wouldn't. I was very pleased with the program.

Through project related technology use students naturally learn how to use the computer. GA State had one full quarter of technology instruction, which finely tuned my already learned skills.

G.A. State has a very impressive computer lab for teachers to use at all times. The professors modeled using computers often.

Practice and taking the time to integrate technology into children's school day.

I did not have a computer of my own in the beginning of my college days. I was constantly running all around Atlanta borrowing friends computers. I think G.A. State should lease computers to students who don't have computers yet.

The more you know, the more you know you'll use.

Too few college computers, too many students, bad access. Current teachers just beginning to integrate tech in the classroom - no good role models.

Own computers at home and required tech course at GSU.

Have the student teachers ask their mentor teachers how they use computers in the classroom. Teach mentor teachers tech pluses or pros. Integrate computers distance learning into core classes every semester.
This is the technology age and teachers need to be familiar with different forms of technology.

I was exposed to, and taught to use "cutting-edge" equipment which enhanced lessons that I taught.

The method courses were most effective.

Schools, as well as most daily interactions require the use of technology. Employers seek out new teachers who have a strong foundation in technology.

Please see below ques [sic] #95.

Technology block - also GA State's vast resources provided unique opportunities to go beyond the required coursework w/o [sic] intimidating or overwhelming me. Impacted the quality of my teaching materials = prof. [sic] appearance.

The only change would be to have been placed w/ a supervising teacher who truly embraced the use of technology in the classroom. Most of the schools simply had the equipment but the teachers were "afraid" of it. I would have also liked to have evaluated/used skill-specific programs used in classrooms.

Because some people already have these skills in this day/time.

Because I had a 10 week (3 days per week) internship at a school were all I focused on was integrating technology. I was exposed to the latest technology and had to use it.

The 10 week block quarter mentioned above.

I would make technology part of every quarter instead of only putting a big focus on it in one internship.

So much information can be found using technology. This could be beneficial for research in undergraduate courses.

Since I have started teaching, I have found that I am so much more knowledgeable about the use of technology compared to teachers who have been teaching longer. I have used my experience to teach other teachers new ideas on lesson plans and new and exciting lessons.

I took a math, science, and technology block where I was trained in technology. I was required to use technology in every course or subject that I taught.

I would like to learn more about creating tests from item data banks and creating electronic grade books.

Teachers should be aware of what is out there to help students.

They provided experience and awareness with technology. They did not go very deep but they did expose us to the opportunities.

Having the experience and exposure to technology that was available. I know what was out there and could look for it when I taught.

I would make sure they have more exposure and hands-on experience with technology. Have them do presentations, lessons, etc. Infuse it into every class, not a separate one. Make it real experiences w/ [sic] a purpose, not as an isolated class.

I don't feel this course would be needed considering the extensive use in the method courses.

I'm able to use technology in my classroom. However, I don't feel comfortable teaching my students how to use technology efficiently. We have an opportunity to explore technology during a guided technology class. Class time is one hour a week. Instruction is provided by a "technology" teacher.

During my method courses, we were required to implement technology into each theme or unit. We were also required to demonstrate our knowledge of technology in most observed lessons and portfolio.
I would add a component that enables teachers to teach the uses of technology to children.

Because our society involves every aspect of technology.

Technology courses enable me to use various software and equipment such as scanner, digital camera, laserdisc player and etc...

Various technology courses, because it has enhanced my teaching. I am able to bring in images and information live to my students.

More hands on and availability of equipment.

The use of technology is a skill that should be developed due to the extensive use and progress of technology in today’s society. A teacher should be more than functionally proficient in technology mainly because his/her students will be.

Georgia State’s education program revolves around the use of technology. Technology use was always a component when producing units and lessons. They provided experiences with using and demonstrating technology and provided classroom field experiences as well. It was always involved throughout the program.

Georgia State provided an entire quarter devoted to the development of technology skills. They also used it and demonstrated it in other quarters. Supervisors and a technology resource lab specifically for education majors were always available. The staff was dedicated to the advancement of technology skills in their students. It has made me feel very comfortable using tech. in my class.

I would not delete anything. Perhaps an extension of technology throughout all quarters. By this I mean, a tutorial session monthly be required of students for all technology uses throughout the program instead of an intense focus for one quarter.

Provides many learning opportunities for beginning teachers. They can share this information with their cooperating teacher.

All instructors were very educated in technology and they showed us how valuable it can be to use it in a classroom. They used it with us and it was exciting and different.

I wanted to use technology in all areas in my classroom. They students loved it and my field teacher also responded very well to it.

None.

In this day and age, people have already had basic technology by the time they get to college. I think if it was a requirement then many people would be repeating information they are already proficient with. Maybe if people must test out or fulfill a requirement.

I feel I am prepared for using technology in the classroom. I could be better prepared if I was required to use the technology more.

My technology component - I know how to use Internet, power point, word, corel draw, digital scanner, and scanner.

More practice.

Technology is a part of our everyday lives. Many students are very knowledgeable about computers. It is a necessary tool for teaching.

I feel that I have a good overall understanding of technology. GSU gives its students a useful overview of various types of technology. However, I find it easier to learn individual components as needed.

We were required to take a course on technology and create units using various types of technology such as the Internet, scanner, laserdisc, and digital camera.

I would have liked more experience with e-mail and using the Internet as a teaching device.

Unless the student has not computer experience at all.
We were taught to send attachments w/ [sic] email, video disc, digital [sic] camera, and looked at educational software.

Video disc and digital camera.

Children are very interested in technology so very important you know how to use.

Introduced to digital camera, scanner required to design a project using both.

In the classroom and staff development at the schools.

Add more computer courses using digital cameras, scanners, video cameras, laser discs.

More time on how to set-up a system to give student computer time w/out [sic] missing important instruction time. Look at more software for teachers and students.

I only had computer skills before entering the technology course. I learned how to use a variety of technology.

See #90

The technology course and the modeling of the use of technology by my professors.

I would have the professors teach a few elementary lesson from an Internet site, since this is available in most schools.

Southeastern Louisiana University

I only took that class because it was required. I did not bother taking any more and I feel at a loss around computers. I feel I need to take more classes to keep up with the needs of my students and the changing society.

For one semester I had a computer class that was required. When the class was over I did not try to take any more classes. I remember what we did, but there is so much more out there to learn.

My computer class helped me not have a fear of computers. However, what I know and use was taught to me by a friend.

I would make sure students knew more about the Internet and how to use it. We only touched on this for a couple of days and I don’t remember how to use e-mail or searching for things. I think the students would benefit from this if I knew how.

We are living in the technology age. We need to be able to teach and interact with students using technology.

In my classes, our observations, papers, etc. had to be typed, but there was never any instruction as how to use different programs that students I see using in the classroom.

I really enjoyed Educ 305. I feel I learned a lot about different programs, etc. This course was very helpful in learning the components and programs on the computer.

I would add a computer class that lets the teacher view and experience different educational games/programs that can be integrated in the classroom.

I believe it is important because it really comes in handy in the classroom to be a great teacher (always give a little extra!).

Students get excited about using computers and can learn a great deal by working with some programs. Being computer literate helps with recording grades, writing lesson plans, and researching information.

I learned enough information to become computer literate. I can install software and use a variety of computer programs that are useful in the classroom setting.

My Educ 305 class benefitted me most. It was a class designed to teach education students how to use a computer and how to incorporate computers into the classroom.

I would like to have learned more about what types of lessons lend themselves to the use of a computer. Students benefit from using a computer only if the program they are working on pertains to what they are learning or need to learn.
It introduces you to all parts of a computer and how to use one.

Teachers should feel comfortable with using a computer in all aspects of the classroom. It is human nature to stay away from things we're afraid of. Teachers will not use the computer if they're afraid of it; therefore, their students will not use computers. This is an injustice to those students. Computers are more apart of their lives and future than anything else.

I feel my education program gave a base of understanding, but I feel a whole semester of using technology in the classroom would be great. That way they could teach teachers all ways to use computers in the classroom.

I learned where to go to find lesson plans. I have used these sights [sic] numerous times to prepare lessons.

I would add a course called "Teaching With Computers." A whole course on ways to use computers in lessons. Teachers would become comfortable with computers and would use them with their students and the students would be better prepared for their future.

So many educators are non-traditional students while in college. They have not been exposed to the daily use of technology required in schools.

None needed.

I am a new teacher. I have not had much time to implement technology since I am teaching Science. We visit the computer lab one hour a week.

More technology training and add this to methods courses! Get rid of music and add computer!

Yes, technology is advancing so much and it is important to know your options for methods of instruction.

We learned the basics - Internet access, document typing, spreadsheets, what you can accomplish by using computerized overheads and programs in your class.

Internet access - so many ideas for educators from web sites.

More practice with technology and computer programs.

Today's world is becoming more and more advanced with technology. Teachers who have a great influence over their students should be well prepared to teach technology and use technology, so that our students grow-up with a knowledge to use it.

Educ 305 forces future teachers to use the Internet and produce different types of documents. Sometimes ignorance best is cured by leaping right in (forced) and having to sink or swim.

Educ 305 - and me! I was determined to be knowledgeable!

Email a must! There should never be ignorance among educators.

I started our majoring in accounting and took an introductory computer course because it was required for that major. I learned things in that computer class that I still know and use today. If it wouldn’t have been required, I would not have taken it.

The professor I had for my computer course was not a good teacher. His expertise was in another field. He could use technology but could not explain how. I also think that too
much information was given in the class. Instead of going in depth on a select number
of topics, we quickly brushed over a lot of things. Most of the time he explained what it
was, not how to use it. I am unable to use a lot of it on my own.

I think that with all of the technology out there today, education majors should have one
general computer course on how to use the computer, Internet, scanner, etc. and one
course on specific educational technology and how to use it in a classroom.

Even though I had a technology course I still needed more instruction when I entered the
classroom.

I feel now that I am in the classroom and have things like a digital camera available I
wish I had more instruction. I was only taught the basics.

The basic information.

More emphasis on programs. Like what programs are good to use and why they are
good.

It is important to be aware of all the technology out there. Many new teachers do not
know how to use the technology. You could have more interesting lessons with the use
of technology.

Many of my methods classes encouraged the use of technology in the classroom setting.

I think it is more important to teach future teachers how to use the technology to better
their lessons than to teach how to put your grades and attendance on a computer.

Computers and technology is so much a part of today. Teachers need to be “up” on how
to use all this, so they can help their students by either using it in the classroom for
teaching or by using it to plan their lessons.

I feel we were taught and exposed to computers a lot as far as how we could use them to
develop our lessons, such as lesson plans, ideas from the Internet, making tests, etc.
However, no one ever demonstrated/explained how to teach a lesson on a computer or
using a computer w/ [sic] 21 students in the room. How do you let 21 get on one
computer? How do you keep the rest busy with only 1 computer?

Educ 305 - the computer class. It’s a basic class - but it taught me how to run software
and use the Internet. Very helpful in developing my computer skills.

I would a “Teaching Using Computers” class/program. Give them a semester or 1/2
semester of doing nothing but learning how to use the technology to teach and integrate
it, etc.

I say yes because I feel the education major should have the skills needed to use
technology in the classroom, home, and everyday life so the students will have
competent facilitators as teachers.

My teacher education program very adequately prepared me to use technology in my
classroom. I was required to do different activities and projects using technology in
different mediums. My instructors exposed us to different new and old ideas using the
computer and gave us sources and addresses to use for new ideas. The school also was
equipped with labs for our use.

My 400 level course which required planning using many different mediums equipped
me with the most experience in using technology. This could impact my classroom
instruction because I can assist my students in learning how to use the computer as a tool
to enhance learning styles on a broader level. Having something new to use enhances the
willingness to learn.

I would require at least 3 courses at different times in the curriculum in technological
study which would help the student to keep up with the changes which take place so
quickly in the course of their (the students) studies. The more competent the curriculum
the more competent the students/teachers.
Yes, because we need to be up to date on technology in order to prepare our students for the future. For example, jobs.

I had an older teacher, and she had not had any training on technology. At the school there were only about 2-3 computers in each room.

Using my own knowledge of the computer, I was able to find creative lessons on the Internet.

I would add more computer training. Technology is always changing so it would really be hard for teachers to really stay up to date with new technology. Some schools are not up with new tech. also so it is hard for teachers to utilize if the tech. is not in the room.

New teachers, along with veteran teachers, need to be aware of the opportunities to use technology and what is available. Some teachers need instruction too!

I was merely shown how to e-mail and access the Internet. I feel the educational software used in the classroom would have been a more useful tool to learn.

None, really. I do have to say that my supervising teacher did a great deal to introduce me to the used software.

I would add a course on Educational Software.

Technology is being used more and more. All students should be familiar with computers.

I feel that education of technology is inadequate. The reason is that I only had to take one class on this subject. I also understand that not all schools even have all of this technology. Mine doesn’t. So I’m really not behind.

The one class that I took was a great help.

I would add more classes on technology in the classroom. Have more use of the technology require [sic] by students.

Technology is the future. We are teaching the generation of the future. They go hand in hand!

I believe that an introductory course should be given because it is the wave of the future. Everything can be done using technology; therefore, preservice teachers need to be equipped with the necessary know how in order to perform proficiently.

There is only one required course using technology and it is focused around the computer itself. I was able to learn more about other instruments through a course I volunteered to take. I believe that if the way of living is involving more technology - teachers need to be educated in order to meet those demands.

The most effective component was “Using Technology in the Classroom” course. This course made me aware of the unlimited ways to introduce various subjects through the use of multi-media. I believe the knowledge that I have gained has helped me in my classroom today.

I would add an introductory technology course and an advanced technology course. The first course would introduce the various technology and ways to use it in the classroom. The second course would involve an actual lesson being created and taught using the various technology.

Technology is everywhere and will continue to be so.

If the professor was interested in technology, then we were introduced to it. Most professors are in their middle ages and get by without the technology and don’t demand any sort of teaching or use or demonstration of technology.

I learned basically everything on my own while doing papers for research papers or class assignments.

Add - 3 basic computer classes. 1. Intro to computers 2. Computers in the Classroom 3. Internet, software, advanced computer skills.
In today's world, we need to know as much as we can about technology. The only thing I learned about technology in my methods courses and my foundation course was how to surf the web.

Student teaching - experience.

I would teach how to use the many different pieces and aspects of technology. All of my answers for #8-#33 and #40-#75 have been learned since I have been teaching. Technology is essential in today's classroom. The extent to which it's used can vary greatly, but seems (at least in my case) to depend on the training I received in college.

As stated above - technology is necessary in today's classroom. Young children need to head start it provides them the preparation for the upper grades. The class I had taught me how to find lesson plans on the Internet, make overhead transparencies, make attractive presentations and use (limited amount) educational software.

I'd offer suggestions and practical solutions for incorporating a PC into daily lessons, using 1 PC in a class of 20 students. I think this would give more people reason to use this in class if they know more about a certain technology, they usually use it more.

We spent some time learning about using the internet and evaluating software. Most classes emphasized hands on materials. It seemed that the material taught about technology were thrown in because of necessity.

Most of my technology knowledge was self-taught at home. I did learn more about looking up lessons on the web as well as finding specific sights.

I would add more classes designed for classroom technology and its uses and possibilities. I took a class called Computers in the Classroom and all it was, was higher level programming. The class title was very misleading.

In my particular case, I was so far removed from technology. Some classes were available, but not required.

I am an exception.

Teachers need to know at least basic technology skills.

No materials or ideas were introduced or modeled by professors. I would incorporate more technology in the classroom if my school was on-line. Interactive web-sites are great!

I learned pretty much everything I know about computers on my own on my personal computer.

I would add at least two classes that focus specifically on training teachers to use computers for their own benefit (gradebook) and another class that focuses on implementation of softwares and Internet sites in the classroom.

I can recall one class period in college when we went to the computer lab and messed around with the Macs. There was never any explanation or instruction about the Macs or the educational software, let alone how to actually use technology to teach.

Student teaching was about the only time I was given any exposure to using technology in the classroom. It has had little or no impact on instruction in my classroom - except for the word processor I've had to learn as I go this year.

I would seriously add a semester long course devoted to incorporating technology into instruction. Our appraisal system for teachers in Texas has a technology component and those of us who don't know how to use these classroom computers for effective instruction are suffering in this area. So many of the education courses at UNT are
repetitive and therefore useless, but a course on using technology would be something we could actually utilize.

90 Teachers need to use all resources and expose students to current technology - we need the "know-how" to do this though!

96 My school did not require any technology training. Some of my education classes had us look for Internet lessons and view software - but nothing was applicable to actual use of lessons with all students on-line. I feel unprepared to keep up with the advances in technology and I feel sorry for older teachers who have a difficult time even turning on the computer!

97 I was involved in a Professional Development Program - a full year in the school instead of only a few weeks of student teaching (this included methods courses). It allowed me to experience more and see how teachers really performed - in all areas.

98 I would add a required technology course and an emphasis in all education classes on use of technology with any lesson. I have found myself glad that I took a basic tech class b/c many teachers still do not even know how to change the bulb in their overhead! Computers are becoming bigger an bigger and teachers need as much training as possible in this area.

90 Computers are taught in high school; I am afraid it will be redundant. Perhaps, offer a more advanced class to those who already know the basics.

96 I know how to use technology, I would like a better understanding of how it works.

97 It was most effective when I was required to create a week's thematic unit, using the Internet[sic]. I use the Internet[sic] often to research themes I currently am teaching.

98 I would like more technology classes offered.

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98 I would like more technology classes offered.

90 Technology is such an important thing in todays world. If teachers don't know how to use technology, they certainly can't teach it.

96 Technology was not emphasized at all. It would have been very easy to graduate with no exposure to technology. The little exposure I had was due to my own interest and efforts.

97 Intro to Computer Applications - my freshman year at junior college. That was the only really useful experience I had in college. Of course, I learned the most having and using a computer at home. The lab techs were a huge assistance.

98 I would require a minimum of 3 hours of applications and 3 hours of methods. Every teacher should be able to load software, use various programs, and utilize technology.

90 I think undergraduates should be introduced to technology they will use in the classroom. I have had a hard time using the Macintosh in my room. I have not found time to go to staff development workshops on technology [sic] since they are not required.

96 There are many technological peripherals I have never used or been taught how to use. I have peripherals in my room I do not know how to integrate into my curriculum.

97 I was encouraged to use the Internet to research unit topics and find lesson plans. I have looked for information to use in my classroom from the Internet.

98 I would add a course on how to use Macintoshes and PCs in the classroom as well as peripherals including TV monitor to computer hook up, Hypercard, Hyperstudio, and scanners.

90 An introductory educational technology course will provide the foundation of the importance for technology use in the curriculum and instruction of the classroom.

96 My teacher education program required me to take an introductory educational technology course. However, my teacher education program did not continue to emphasize the importance of technology use in the classroom consistently. I learned very little of how to use technology in the classroom and how to teach my students how to use technology through my foundations and methods courses.
My elementary curriculum methods course provided me with some insight on the availability of technology for classroom instruction. I have researched lessons and units to help impact the curriculum and instruction in the classroom.

I would add an emphasis of using technology in the classroom and teaching your students how to use technology throughout the teacher education program's foundation and methods courses. Technology is vital part of instruction and curriculum for the classroom. For example, the PDAS evaluation places an importance of the teacher's use of technology in the classroom. When technology is used developmentally appropriate, students improve in higher-level thinking.

It is important for teachers to know how to use a computer and programs!

I did not learn anything about technology at UNT that I did not already know.

See answer above.

Course on software and web sites that would benefit students by using them in the classroom.

In order to work in an advanced school district, it provides some knowledge.

It gives the basic information needed in today's technological society.

Again, I was given basic knowledge of how to integrate technology into my teaching, specifically how to incorporate the use of the Internet into my lessons. Beyond that I was not really provided with any other form of technology incorporation, such as use of digital cameras, smart boards, etc.

The use of an electronic gradebook during my student teaching experience helped me a great deal, since I use this now at the school I teach at. Mostly I use an overhead projector in my room, which is another way of presenting the material to my students other than the use of the chalkboard.

I would include an entire course devoted to the use of technology in the classroom, including the use of digital cameras/slide shows, smart board use (digital slide show and use of Internet for teaching), as well as various other technological training.

There should be a course that allows college students to become familiar with the software programs children are using in the schools (and how to evaluate if the programs are beneficial).

Most instructors talked about us using technology in the classrooms, but there was never an emphasis on software programs or how to implement a lesson using technology.

I used word processing only for presentation courses (skills I acquired through various jobs). However, the programs/software that were available in the computer labs helped me learn the most current versions of technology (which I am now using). (Windows 95 etc.)

I would require assignments in Power Point or more presentation-type formats. Too many people are afraid to experiment with computers, but when it's assigned, we all have to learn!!

It is the age of the computer! You are lost without a certain amount of skills.

I believe that more could have been offered. Possibly at the expense of other repeated material. However, enough was offered to familiarize.

The day to day need to perform assignments.

I would focus on deleting certain foundation classes that contained repeated material. It requires the enhancement of existing classes but that would be a positive [sic]. In its place I would add more technology classes.

We are entering the 21st century - the computer age. I wish I had taken many more technology courses. There are so many neat things you can present/use in your class if you know how. I really don't know how.

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I wish I were more comfortable with computers. Some of my courses would require us to provide web sites for a specific topic, but they did not show us how to use the Internet.

The introductory computer class I took was very basic. It was great for beginners, but it did not show us what to do with those skills and how to incorporate the skills into our classroom. One of my courses did have us evaluate children's software, which was good.

I would add several more required classes. Maybe an intro., intermediate and advanced using e-mail, Internet, Microsoft Word, Microsoft Excel and creating lessons/gradebook. Things that would be very useful. I took a class that had Logo and we wrote programs not useful! Thank goodness my school has an excellent Lead Technology teacher that holds bi-monthly workshops. I am learning more and more! We will be required to use Gradebook Plus next year.

Technology is an integral part of our society. I do think some people are extremely knowledgeable should be able to

As technology grows, we need to teach it to our kids in the classroom.

I was not required to take any technology courses, and I think we need it.

I taught myself how to use various computer programs. That's all the technology I currently use in my classroom.

Add more required technology courses so we can keep up with the growth of technology.

To make new educators aware of some of the materials available.

As future educators we were not introduced to any programs that might help us further. I was lucky because one of my profs. was really into the Internet [sic], so she made us aware of a lot of sites and software.

The only "training" I had was building social studies lesson plans using the Internet. I have not used that knowledge as of yet.

I would add a class design to teach elementary teachers all about (and how to use) the software programs used in local school districts. I am still learning what's available. I think (I know) that my 4th graders know alot more about the software than I do!

Because school districts are emphasizing technology across the curriculum.

We probably would have benefitted more if a technology foundation course was offered.

The methods courses I took always required research into different technology applications available, we were to evaluate and share our findings.

I would add technology as a required foundations type of class. Technology should be emphasized in the same manner as Social Studies, Science, and Math. It is important also to have technology span all of the methods courses as well.

It is expected in schools therefore it needs to be taught.

Unless you elect to take computer courses, they are not required. In my school district, technology is a major focus. I don't feel UNT prepared me to address this.

Seeing the use of technology in my field experience and student teaching was mostly helpful. I was able to take what I observed and use it in my classroom.

I would add courses in technology specific for the elementary classroom.

Technology is becoming so much more readily available. Teachers should use every tool available to them to ensure the best education for their students. This will soon include technology.

I elected to take more technology classes, so I felt fairly well prepared. As technology becomes more accessible, teacher preparation classes will need to deal with this aspect more.

The technology classes I took because it gave me both ideas and suggestions to use in the classroom, as well as hands-on experience.
I would definitely have a class on using computers as an instructional tool. It takes a while to figure out how to teach your class from one computer. Also, we need to be teaching our students about the web, which means we need to be educated ourselves.

Everyone should be computer literate.

I am computer literate, and my district sent me through extensive training. I am glad the districts training was not totally repetive.[sic]

None that I recall.

More training in software and classroom use.

Yes, an introductory educational technology course should be a requirement for undergraduate education majors. It is essential that teachers know the basics of computers, e-mail, turning computers on and off, getting on the internet, and using programs such as Microsoft Word. This is the way that most school districts communicate with their teachers, as well as, how teachers communicate with the rest of the district.

This year I learned how to use e-mail, Microsoft Powerpoint and Microsoft Excel. I was not taught how to use these programs in my undergraduate studies and in fact it is a requirement that you use Microsoft Powerpoint during your PDAS evaluation. You can imagine how upsetting it is to be counted off on your evaluation for something that you've never been exposed to.

During my undergraduate studies, we did have to evaluate educational software to use in the classroom. This has helped me decide what kinds of software I can and need to use with my fifth graders. I've been able to use software programs that they take an interest in. Also, they love it when I present a Powerpoint slide show - it's really fascinating to them.

Again, all teachers should be taught how to use e-mail, Microsoft Powerpoint, and Excel. These are great tools to use in the classroom and they are necessary facets of a teacher's daily routine.

Many teacher [sic] seem to be afraid of what they will do to the computer. Therefore, they are unlikely to use the computers because they can't "fix them".

I am more proficient [sic] than many of my student peers due to a change in majors. Many of my friends only used a computer to type up letters or reports. They did not see the potential of certain software programs or misinterpreted the use of others.

Made aware of certain tools I hadn't thought of use (i.e...laser disk).

I would add a unit on taking "open ended" software and teach the use of programs with a wide variety of purposes. Also, remind teachers to be more selective of programs they use which actually go against developmental philosophies we believe in, but do not practice when associated with software.

I think courses in PC (not Mac) literary would be beneficial, but not instructional education classes.

I do not believe technology should receive such a strong focus in the lower grades (PreK-4). Therefore, the absence of such training in my education program was satisfactory.

My teacher education program focused more on core/basic skill acquisition. Learning to love learning was more the focus. Technology was not scorned; rather, it was just not mentioned often. In my own experiences, I can teach a lesson 10X more efficiently without incorporating technology, at least within the confines of my current technology setup.

I believe the U.S. education system should follow the lead of Japanese [sic] (SP?) schools (at least in terms of technology) and remove focused technology instruction from the elementary grades.
It provides you with an opportunity to be more prepared for available technology. It might open outlets of instruction that a teacher might have available to him/her but is unable to use. Teachers with technological experience and knowledge are valued more by a district/school, and may be given more opportunities for employment and leadership positions within the school. Also, we must be able to use technology, in order to teach it. (My school has no separate computer teachers).

We were not required to take the educational technology class. I did not even know about it until my senior year was over. My knowledge and experience with technology comes from courses under my first major, as well as personal experience at home. Students need the opportunity through the education department.

In one course, we evaluated software programs which will help me to choose programs that will be beneficial to my students. Throughout college, I utilized word processing to prepare papers and other documents (Macintosh and IBM were available and I learned to use both). I am now proficient in preparing worksheets, tests, labels, signs, banners etc. for my classroom.

I would add a requirement to take the educational technology course available.

To better prepare for classroom.

I have mixed emotions about whether or not an introductory educational technology course should be required for undergraduate education majors. I had a great deal of experience using technology prior to my undergraduate education. I did however go to school with people with little or no background with technology. Technology is now part of the education field and all educators should be able to use technology with some degree of proficiency.

I only had a few professors which talked about technology of any kind. There are so many ways to integrate technology into education now and I believe that education professors should discuss and model the use of technology in an instructional setting. There were also few courses offered in which current technology was used. I had one class where I was shown how to use a film projector and an 8mm film projector which I have yet to use in my classroom.

The component of my teacher education program which was most effective in helping me acquire the knowledge and skills to use technology was my student teaching experience. It was only in my student teaching that I was shown how to use equipment such as a large monitor and a laser disc player. These two pieces of equipment are used in my classroom almost daily and I was not shown how to use them at the university level.

If I were responsible for improving technology training for preservice teachers I would make sure that students knew how to use equipment they were likely to find in a current classroom. Some of the equipment I would give students access to would be digital cameras, laser discs, presentational [sic] equipment and software. I would also make sure that instructors modeled the use of technology in their classrooms.

The students need to have a teacher who is computer literate and can use technology appropriately in the classroom.

I was student teaching in a Professional Development School. The teachers only had one computer per classroom. It was difficult to incorporate into a lesson.

None really, I figured out a lot of it on my own.

This is a difficult question because no matter how much training you receive, you may end up in an inadequately supplied room your first year. I am in a portable with limited technological resources.
Computers and technology are becoming more and more integrated into the education system. Teachers need to be better prepared to teach their students, as well as be aware of all that is available to them to use in preparing lessons and lectures.

As far as teaching lessons using technology, I did not observe it much, nor was I taught all ways to teach using technology. However, I was hired at the school I student taught in, and the district requires all incoming teachers to take 30 hrs. of technology courses, offered by the district within their first 2 yrs. In these courses, we are taught how to use and integrate technology into our lesson plans. We are taught how to teach computers. I am still working on completing the hrs. The school district requires this because they know what inadequate training we are receiving in our undergrad. studies.

We live in a society that is loaded with changing technology. It is essential in order to be exposed to different software available.

I had no training on how to use technology in my classroom. With such technology available today, I am very uneducated with education software. It's such an injustice. My student teaching experience in third grade opened my eyes as to what software is available to teachers. (As far as lesson plans, gradebooks, etc...).

I would make more technology courses a requirement. There is so much software available to teachers, but several of us aren't aware about how to use it and where to purchase it.

It is important to utilize technology in the classroom. Students need to be exposed to computers and taught how to use them. Educational technology course provide this training.

I feel that the training I received in the teacher education program overall very satisfactory. I was taught and given the opportunity to use various technology skills to use for classroom management (grades) and instructional use.

What I feel was most effective was the requirement to include and create technology for class assignments. I acquired knowledge and skills to complete class assignments. The impact in my classroom is that because of my skill my students of exposed.

I would add the implementation of more multimedia software in classes. I would do this because it would improve classroom instruction.

All teachers need to know how to use and teach technology - our world uses it extensively. If the children don't learn how to use it they will be poor job candidates. Also - a picture is worth 100 words and it promotes thinking - a lost art in elementary school.

While students were given an opportunity to evaluate software in a Mac lab (some were old), most schools now have television/presentation stations simply waiting to be utilized. There is no instruction in how to teach using technology, nor how to teach technology itself. No lesson plans were given as examples, no suggestions for use or integration.

None - I have prior training from 1st career. Evaluating software, and even using the Internet to complete projects doesn't help a teacher integrate technology, or teach it.

1. Equipment - how to set it up, what to do when something goes wrong, ways to use it
2. Software - what's available, how to get training
3. MS Office - students need more than a "little" knowledge of how these programs work.
4. How to use software for evaluation of student performance - i.e., spread sheet analysis, gradebooks, etc.

Yes, because you are basically thrown into it. Some people know a lot about it and some are totally lost. You don't want to admit it when you don't know what is going on.

I feel that I am prepared for the type of technology I use on a daily basis. Teaching in a low income, small school district, we do not have a lot of choices so I feel comfortable with the technology we do have.
Internet exploration. Some of my classes allowed us to explore the Internet. We found sites designed for teachers and sites that were great for students. I really didn't have free time (working and going to school) to do this on my own.

More practice! Everything was introduced to me and I understood it at the time, but I would always forget the information before it was time to use it again.

I feel technology is a much larger part of curriculum than I was aware of while attending college. Now that I am teaching I see that it would have been helpful to have a better understanding of various programs and uses of the computer in teaching curriculum. The one computer course I had to take has proved virtually unbeneftcial to my career.

I feel that computers as a tool for teaching lessons was never brought to my attention. I was taught about using computer basics and a variety of programs (world wide web incl) that could be used by children in the classroom but lessons were not addressed.

High school and college combined with my own desire to instruct myself on computer skills or other forms of technology has helped my instruction in the classroom, but I was never directly taught using technology in the classroom by the university.

I believe a class that models, and allows preservice teachers to practice using computers as a teaching tool in the classroom would be a good source of training. Perhaps this class could be in place of the basic computer class that is required. Another training option would be to have the professors address technology more often in their classes.

It will give future educators a chance for hands on technical experience.

I do not feel we were given enough training or hands on experience with the various educational multimedia devices available.

I was required to access the Internet for lesson plan ideas for the various units I was required to complete. This has helped me to come up with new or different activities to use on the various subjects I'm teaching.

I would add required classes on using all multimedia devices and software available to the educators. (i.e. laser discs, Internet, graphics, e-mail, word process, etc.)
VITA

Patricia Ann Duhon is the oldest of three children born to Truby and Evelyn Duhon. She attended first through third grades at Luling Elementary School in Luling, Louisiana. After her family moved to Lafayette, Louisiana, Patricia completed fourth and fifth grades at S.J. Montgomery Elementary School, sixth and seventh grades at Lafayette Middle School, and eighth through twelfth grades at Lafayette High School. She attended the University of Southwestern Louisiana, where she received her bachelor of arts degree in elementary education in 1973. While teaching in Lafayette, Patricia began taking classes at Louisiana State University in Baton Rouge, Louisiana. She received a master of education degree and a certificate of educational specialist in educational media in 1975 and 1977 respectively. After accepting an elementary teaching position with the East Baton Rouge Parish School System, Patricia moved to Baton Rouge in 1977. While continuing to work for the same school system, she obtained additional certification for supervisor of student teaching, principal, parish or city school supervisor of instruction, and academically gifted.

During her twenty-six year career, Patricia has taught regular education and academically gifted classes. She has also been employed as the Individual Education Program (IEP) Facilitator for East Baton Rouge Parish’s Gifted Program and for the last two years she has worked as the Teacher for Instructional Support at Polk Elementary. Since 1989, Patricia has also served as the director of LSU’s Camp Challenge, a summer day camp for gifted and high-achieving students. She has been actively pursuing the degree of Doctor of Philosophy since January 1997.
DOCTORAL EXAMINATION AND DISSERTATION REPORT

Candidate: Patricia Ann Duhon

Major Field: Curriculum and Instruction

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Approved:

[Signatures]

Dean of the Graduate School

EXAMINING COMMITTEE:

[Signatures]

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