FAMILY AND CONSUMER SCIENCES PRESERVICE TEACHERS' COMPUTER TECHNOLOGY PREPARATION

by

Kathy C. Croxall

A dissertation submitted in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

in

Family Life
Copyright © Kathy C. Croxall 2002

All Rights Reserved
The purpose of this study was to investigate and analyze the preparation of Family and Consumer Sciences (FACS) preservice teachers to teach FACS content using computer technology, a study that had not previously been undertaken. The focus of the study was FACS methods classes and activities, as reported by FACS teacher educators. A survey instrument was developed to determine how computer technology is incorporated into, modeled by the teacher, and required of students in FACS methods courses. The support FACS teacher educators receive from their college or university for teaching with technology, teacher educators' perceived computer skill and comfort levels, and importance placed by teacher educators on technology in secondary and college methods courses were also investigated. Respondents were asked their knowledge of the International Society for Technology
in Education technology standards for teachers and their perceptions of preservice students' abilities to meet those standards.

The survey was prepared in both printed/mailed and on-line formats to investigate the reliability of using the Internet to conduct survey research with this population. The survey was sent to 208 teacher educators nationwide and information was obtained from 86 respondents for a 41% response rate.

Eleven research questions were answered. FACS teacher educators felt the inclusion of computer technology in both secondary classrooms and their own classrooms was important. While the majority reported average computer skills, they expressed confidence in their ability to teach and demonstrate technology in the classroom. FACS teacher educators were not aware of the ISTE standards but still rated their preservice students high on most standards.

Four hypotheses were tested. No differences were found in reported preservice student computer technology abilities and characteristics of the college or university, FACS department, or teacher educator characteristics. There were no differences in responses and characteristics of teacher educators who completed the survey in the print/mailed format and those completing it on-line. Statistically significant differences were found in response rates for printed/mailed versus on-line surveys. FACS teacher educators were more likely to return surveys they received through the mail than complete surveys available on-line. Implications for teacher educators, administrators, and professional organizations are drawn.

(190 pages)
ACKNOWLEDGMENTS

I would like to express appreciation to my major professors and mentors, Dr. Nancy Thompson and Dr. Barbara Rowe, for all of their valuable professional direction, personal support, and encouragement. I would also like to thank the other members of my committee for their encouragement and direction: Dr. Randy Jones, Dr. Tom Peterson, and Dr. Charles Stoddard.

To the American Association of Family and Consumer Sciences and the Family and Consumer Sciences Division of the Association for Career and Technical Education, I give my thanks for the student fellowship awards that helped to fund my project. I would also like to thank Lee Brilliant and Stephen Funk with their valuable assistance in preparing and implementing the on-line survey for this study. They found a way when I was ready to give up. I express appreciation to Roxane Pfister for her help with statistical analysis.

Finally, I give special thanks to my family. I express deep appreciation to my husband, Gary Croxall, for his understanding and patience throughout this endeavor. His encouragement and faith kept me going when discouragement set in. I also thank my children for their support and encouragement during this time. I also thank my parents for instilling in me a desire to learn, the confidence to succeed, and the confidence that I could accomplish whatever I set out to do. I would not have been able to finish this endeavor without help from all of them.

Kathy C. Croxall
# CONTENTS

<table>
<thead>
<tr>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABSTRACT .......................................................... iii</td>
</tr>
<tr>
<td>ACKNOWLEDGMENTS .................................................. v</td>
</tr>
<tr>
<td>LIST OF TABLES .................................................... ix</td>
</tr>
<tr>
<td>CHAPTER</td>
</tr>
<tr>
<td>1. INTRODUCTION ......................................................... 1</td>
</tr>
<tr>
<td>Definitions and Acronyms .......................................... 4</td>
</tr>
<tr>
<td>Problem Statement .................................................. 6</td>
</tr>
<tr>
<td>Research Questions ................................................ 7</td>
</tr>
<tr>
<td>Hypotheses ............................................................. 8</td>
</tr>
<tr>
<td>2. REVIEW OF LITERATURE ............................................. 10</td>
</tr>
<tr>
<td>Theoretical Foundation of Constructivism ....................... 11</td>
</tr>
<tr>
<td>Computer Technology in Schools .................................. 15</td>
</tr>
<tr>
<td>Teacher Use of Computer Technology ............................. 16</td>
</tr>
<tr>
<td>Preservice Teacher Education in Computer Technology .......... 19</td>
</tr>
<tr>
<td>Importance of Computer Technology in Preservice Education 20</td>
</tr>
<tr>
<td>Current Status of Computer Technology in Preservice Education Courses ........................................... 23</td>
</tr>
<tr>
<td>Computer Technology and FACS Courses .......................... 33</td>
</tr>
<tr>
<td>On-Line Surveys ....................................................... 35</td>
</tr>
<tr>
<td>Summary ................................................................. 46</td>
</tr>
<tr>
<td>3. METHODOLOGY .......................................................... 48</td>
</tr>
<tr>
<td>Introduction .......................................................... 48</td>
</tr>
<tr>
<td>Research Design ...................................................... 50</td>
</tr>
<tr>
<td>Subjects ................................................................. 51</td>
</tr>
<tr>
<td>Instrumentation ....................................................... 53</td>
</tr>
<tr>
<td>Development of the Instrument ..................................... 53</td>
</tr>
</tbody>
</table>
## LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mode and Median Comparison of Early, Late, and Nonrespondents</td>
</tr>
<tr>
<td>2</td>
<td>Results of $t$-Test Comparison of Early, Late, and Nonrespondents</td>
</tr>
<tr>
<td>3</td>
<td>Demographic Characteristics of Respondents</td>
</tr>
<tr>
<td>4</td>
<td>Spearman's rho Correlations of Age, Confidence Level, and Skill Level</td>
</tr>
<tr>
<td>5</td>
<td>Demographic Characteristics of Colleges and Universities</td>
</tr>
<tr>
<td>6</td>
<td>Demographic Characteristics of FACS Programs</td>
</tr>
<tr>
<td>7</td>
<td>Electronic Technologies Incorporated/Modeled/Required in FACS Methods Classes</td>
</tr>
<tr>
<td>8</td>
<td>Electronic Applications Incorporated/Modeled/Required in FACS Methods Classes</td>
</tr>
<tr>
<td>9</td>
<td>Support FACS Teacher Educators Receive from Their College or University for the Use of Computer Technology for Teaching</td>
</tr>
<tr>
<td>10</td>
<td>Spearman's Rho Correlations of Support and Age, Confidence Level, Skill Level, ISTE 1, and ISTE 2</td>
</tr>
<tr>
<td>11</td>
<td>Spearman's rho Correlations of ISTE 1 and ISTE 2</td>
</tr>
<tr>
<td>12</td>
<td>Mode and Median Comparisons of Mail and Internet Respondents</td>
</tr>
<tr>
<td>13</td>
<td>Results of $t$-Test Comparison of Mail and Internet Respondents</td>
</tr>
<tr>
<td>14</td>
<td>Results of $t$-Test Comparison of Mail and Internet Respondents and ISTE 1, ISTE 2, and Support</td>
</tr>
<tr>
<td>15</td>
<td>Relationship Between College or University Size and ISTE Scores</td>
</tr>
<tr>
<td>16</td>
<td>Relationship Between Private or Public College or University and ISTE Scores</td>
</tr>
<tr>
<td>17</td>
<td>Spearman's rho Correlations of FACS Program Size and ISTE Scores</td>
</tr>
</tbody>
</table>
18 Relationship Between Teacher Educator Characteristics and ISTE .......... 91
19 Independent Samples Test of Internet and Mailed Responses and ISTE 1 and 2 ................................................................. 92
CHAPTER 1
INTRODUCTION

Computers are quickly becoming a standard feature in American schools. As a result of encouragement by the Clinton administration in 1998 to connect all classrooms to the Internet and put computers into schools, the number of computers being used in education has grown substantially. The ratio of computers to students continues to rise.

With increasing numbers of computers in classrooms, teachers are being encouraged to teach with computer technology, rather than merely use it to improve their own productivity. The National Council for Accreditation of Teacher Education (NCATE) has adopted broad standards encouraging the use of technology in teaching. The International Society for Technology in Education (ISTE) published the third revision of their National Educational Technology Standards for Teachers in 2000. These standards cover six areas and list specific performance indicators, over one third of which deal specifically with using technology as a teaching aid. Many universities are going beyond the NCATE standards and are adopting those endorsed by ISTE (personal communication with Lajeane Thomas, ISTE project director, November 6, 2001). Family and Consumer Sciences (FACS) teachers are specifically encouraged to use computer technology as learning aids to deepen and enrich students' learning.

A literature search dealing with the preservice preparation of teachers in the use of computer technology as a teaching tool found no references to the preparation of FACS teachers. The literature review identified shortcomings in the preservice
preparation of teachers where teaching with technology is concerned. Preparation typically consists of a single course dealing with the basics of technology with little emphasis on teaching specific content. Still, efforts are being made to integrate technology into the entire preservice education program. After a basic technology course, methods classes are considered the second step of the integration process (Willis & Mehlinger, 1996).

Constructivist theory was used to frame this research. In constructivist classrooms, learning is structured around primary concepts. In turn, these concepts are best understood when they are presented as wholes rather than in isolated parts (Brooks & Brooks, 1993). Constructivist theory suggests that students learn best by observing computer technology use modeled by master teachers and then having the opportunity to practice its use, thus constructing their own meaning of computer technology as a teaching tool. A review of existing literature indicated the importance of teacher educators modeling the use of technology, not just as a productivity tool, but especially as an aid to teaching content. Both the ISTE and NCATE standards emphasize the necessity of integrating computer usage by both teacher educators and preservice students throughout the curriculum. Preservice FACS teachers receive instruction and practice in presenting content in their FACS methods classes, thus constructing their personal meaning of how computer technology can and should be integrated into their own teaching experience. It is important to know how computer technology is being presented and used in FACS methods classes before conclusions can be drawn about the preparation of preservice FACS teachers to utilize computer
technology in their teaching.

The literature review further showed that studies conducted to date were limited in the following areas: (a) Most studies were done on a regional basis only, often at one university or in one state. (b) The studies are dated. Many of the technologies teachers are now expected to use in their teaching were not common when the studies were conducted. (c) Administrators, rather than the actual classroom teachers, were the ones surveyed in most of the studies showing a high integration of computers in the classroom. (d) FACS teachers were not examined or polled in any of the current studies. Due to the lack of either general or specific knowledge about the use of computer technology to prepare preservice FACS teachers, it is imperative that FACS teacher educators be surveyed to determine the extent of computer usage to teach content in their classes.

Researchers have begun to utilize the Internet for data collection procedures. The advantages of time and money savings as well as the ease of contacting a broad geographic sample are cited for Internet research. Sampling procedures and population identification are the most recognized shortcomings with this mode of research. With increasing numbers of people utilizing the Internet and World Wide Web, it is important to know if research conducted via the Internet is as reliable as that conducted by more traditional methods. Few studies have compared Internet and print responses in the same study.

This study seeks to establish baseline information regarding technology use in FACS methods courses throughout the United States and to investigate the impact of
Internet data collection. A census of FACS teacher educators in the U.S. was done. The extent to which they utilize technology in training preservice FACS teachers, FACS teacher educators' familiarity with ISTE standards, and their perception of preservice teachers' compliance with the ISTE standards were investigated. The study also examined what support for technology integration FACS methods instructors feel they receive from their university or college. The relationships between technology use in FACS methods courses and public or private school, college or university student body enrollment, FACS teacher education program size, access to technology, age and gender of the FACS teacher educator, the highest degree obtained by the FACS teacher educator, and the number of years of teaching FACS methods courses were examined.

To understand the feasibility of conducting on-line research with this population, the varying response rates between those receiving on-line and print surveys were a focus of this study. The profiles of those responding to on-line versus print surveys were examined. Differences in the responses received from the two forms of assessment were identified.

Definitions and Acronyms

**FACS**—*Family and Consumer Sciences*

The unique focus of Family and Consumer Sciences is on the functioning of families and their interrelationships with work, community, and society. The profession seeks to empower individuals and families to manage the challenges of
living and working in a diverse, global society. The recurring, practical problems of individuals and families are addressed through an integrative approach that helps individuals and families identify, create, and evaluate goals and alternative solutions to significant problems of everyday life, and to take responsibility for the consequences of their actions (Redick, 1998).

ISTE—International Society for Technology in Education

The International Society for Technology in Education is a nonprofit, worldwide professional organization in educational technology. The organization seeks to promote appropriate uses of information technology to support and improve learning, teaching, and administration in K–12 education and teacher education. They provide information, networking opportunities, and guidance to assist in the challenge of incorporating computers, the Internet, and other new technologies into schools (International Society for Technology in Education [ISTE], 2001a). The first two profiles of the ISTE standards are found in Appendix A.

NCATE—National Council for Accreditation of Teacher Education

The National Council for Accreditation of Teacher Education is the professional accrediting organization for schools, colleges, and departments of education in the United States. It is a coalition of over 30 organizations representing teachers, teacher educators, policymakers, and the public (National Council for
Accreditation of Teacher Education [NCATE], 2001b). The NCATE standards are found in Appendix B.

**NETS--National Educational Technology Standards**

The National Educational Technology Standards Project is an ongoing initiative of ISTE along with a consortium of partners and co-sponsors. The primary goal of the project is the development of national standards for educational uses of technology that facilitate school improvement in the United States (International Society for Technology in Education [ISTE], 2001b).

**Productivity Software**

Productivity software consists of programs designed for a practical purpose to save a user's time or achieve pragmatic ends efficiently. Examples include word processing, spreadsheets, file managers, grading programs, graphics programs, and desktop publishing (Geisert & Futrell, 1990).

**Computer Technology**

Computer technology includes computer hardware and software, the networks that tie computers together, and the devices that convert information (text, images, sounds, and motion) into common digital formats (Moursund & Bielefeldt, 1999).

**Problem Statement**

This research seeks to determine how computer technology is being used in
preparing Family and Consumer Sciences (FACS) preservice teachers. The use of computer technology in methodology courses and the ability of students to meet current International Society for Technology in Education (ISTE) standards were examined. The feasibility of the use of on-line surveys to gather research data from this population was investigated.

Research Questions

The following research questions were addressed in this study:

1. How much importance do FACS teacher educators place on the use of computer technology in the secondary classroom?
2. How much importance do FACS teacher educators place on the use of computer technology in their own classrooms?
3. How do FACS teacher educators rate their own computer skills?
4. Which types of electronic technology are incorporated/modeled/required in FACS methods classes?
5. Which types of electronic applications are incorporated/modeled/required in FACS methods classes?
6. How much support do FACS teacher educators feel they receive from their college or university for using computer technology in their courses?
7. Are FACS teacher educators aware of the International Society for Technology in Education (ISTE) standards?
8. How do FACS teacher educators perceive their students' ability to meet the ISTE
standards at two different and distinct points in their education?

9. Is the profile of Internet respondents different than that of print respondents?

10. Do response rates differ between Internet and print respondents?

11. Are the results obtained from Internet respondents different than the results obtained from print respondents?

Hypotheses

The following null hypotheses were investigated:

1. There will be no significant difference between the preparedness of FACS preservice students to meet the ISTE standards and the
   a. type of college/university (public or private)
   b. size of the college/university
   c. size of the FACS program

2. There will be no significant difference between the preparedness of FACS preservice students to meet the ISTE standards and the FACS teacher educators'
   a. years of teaching FACS methods courses
   b. highest degree earned
   c. gender
   d. age

3. There will be no significant difference between the response rate of teachers to an on-line survey versus a print format.

4. There will be no significant difference between the responses of those replying on-
line versus those replying by mail.
CHAPTER 2
REVIEW OF LITERATURE

This review of literature presents the theoretical foundation provided by constructivist theory for the integration of computer technology into Family and Consumer Sciences (FACS) methods courses. The application of constructivist theory in teacher education is presented. Next, the usage of computer technology in the school setting and teacher use of computer technology are briefly discussed. The use of computer technology in preservice teacher education is examined extensively. A specific focus of this section concerns how technology is included in methods classes and whether or not preservice teachers are required to actually prepare for and teach with computer technology. Most of the studies in this review involved a form of survey research. With the increasing accessibility of the Internet, it is becoming an additional tool for survey research. Manley, Sweaney, and Valente (2000) found that the majority of FACS professionals are using both the Internet and e-mail. Consequently, the role of the Internet in conducting survey research is investigated. Comparisons between Internet and print survey research are highlighted.

The characteristics of each study are noted and are compared and contrasted. The methodology is described to allow for future replication. Prospective studies were located through systematic searches of electronic databases (Ebsco, ERIC, Academic Search Elite, Wilson Web, and Dissertation Abstracts) and reference lists of review articles, primary studies, and conference proceedings. Keywords used in the searches included combinations of constructivist, technology, computers, preservice, education,
Theoretical Foundation of Constructivism

Constructivist theory "assumes that students cannot be told how to become professional educators; they must build or construct their own knowledge base, and their own professional skills, instead of being given the knowledge of someone else" (Willis & Mehlinger, 1996, p. 989). Constructivist theory views learning as an internal process (Black & Ammon, 1992; Brooks & Brooks, 1993; Fosnot, 1989; Nicaise & Barnes, 1996; Parsons, Hinson, & Sardo-Brown, 2001). It is more concerned with achieving understanding through relevant experience rather than accumulated facts, more situation specific, and more influenced by social and cultural contexts. "Understanding, not rote learning, is important in education, and to understand is to invent" (Black & Ammon, p. 324).

Constructivist theory begins with how students learn. It posits that students actively construct knowledge and understanding of the world by continually assimilating and accommodating information (Black & Ammon, 1992; Brooks & Brooks, 1993; Fosnot, 1989; Nicaise & Barnes, 1996; Parsons et al., 2001). Constructivists believe that learning is the discovery and transformation of information (Nicaise & Barnes). Constructivist practices help learners internalize and transform new information. Deep understanding, rather than imitative behavior, is the
goal. Learners need to be empowered to think and learn for themselves with learning conceived of as something a learner does (Fosnot). Nicaise and Barnes found that social interaction, discourse, and dialogue are essential in guiding student thinking, learning, and concept formation. Growth occurs when students and teachers share different viewpoints and develop understanding as they respond to new perspectives and experiences. Black and Ammon (1992) reported that peers play an important role in providing novel perspectives and cognitive conflict that promotes intellectual development. Preservice education courses should be designed from an experiential base with an emphasis on concrete, active exploration and investigation in the content area (Fosnot).

Fosnot (1989) identified four principles that define constructivism. First, knowledge consists of past constructions which evolve as we interact with our environment and make sense of our experiences. Second, constructions come about through assimilation and accommodation. As we interpret or organize information we adapt and alter our old concepts. Third, learning is an organic process of invention, rather than a mechanical process of accumulation. A learner-centered, active instructional model is mandated. The learner must construct knowledge while the teacher serves as a creative mediator. Lastly, meaningful learning occurs through reflection and resolution of conflict and thus serves to negate earlier, incomplete levels of understanding. This must stem from a construction of the learner, facilitated with feedback from the teacher and peers.

In a constructivist classroom, the role of the teacher changes from a provider,
sequencer, and tester of information to a guide, scaffolder, and problem or task presenter (Nicaise & Barnes, 1996). The student's behavior is all that is discernible. In a constructivist approach, teachers look for what students can generate, demonstrate, and exhibit rather than what they can repeat (Brooks & Brooks, 1993). Students are encouraged to think, explore, and construct meaning in an information-rich environment. Social collaboration with peers and teachers is critical. Equally important are authentic activities in which students have control and self-initiated direction (Black & Ammon, 1992; Nicaise & Barnes). Fosnot (1989) found that reflection on the part of the preservice teachers was critical in helping them assimilate the concepts inherent in a teacher education program.

The knowledge base preservice students construct is built under the guidance of master teachers, often beginning in the methods courses. Constructivist theory encourages the integrated use of computer technology as a teaching aid throughout the preservice education program (Willis & Mehlinger, 1996). Technology can create an information-rich classroom and facilitate deep understanding. Technology also assists students in storing information and enables them to reorganize, consolidate, and share that information (Nicaise & Barnes, 1996). Under a constructivist theory of practice, preservice teachers need to see technology being used before integrating technological practice into their own teaching repertoire (Willis & Mehlinger, 1996). In addition, they need practice in creating lesson plans and activities that utilize technology (Halpin, 1999; Vannatta, 2000; Vannatta & Beyerbach, 2000).

In supporting a constructivist vision of technology integration, Vannatta (2000)
and Vannatta and Beyerbach (2000) reported that while students in a technology-specific course developed basic computer skills, they were not prepared after those courses to use technology in a variety of instructional settings. What was needed was an infusion of technology into the teacher education curriculum so that preservice teachers could experience technology-rich instruction both as students and as teachers. At the conclusion of the first year of their study, Vannatta and Beyerbach proposed that technology integration activities must be connected to course content, objectives, and assignments. They identified three constructivist activities that were essential in helping students develop a constructivist vision of technology. The first of these involved observing instructors model technology integration. Next, it was vital that students develop technology-rich lesson/unit plans. Finally, it was important for students to have the experience of completing several assignments using technology. With the integration of these activities in their education courses, preservice teacher attitudes were extremely positive about the use of technology.

In addition, Vannatta and Beyerbach (2000) found that a constructivist approach helped teacher educators as they worked to integrate computer technology into their courses. Professional development should create learning communities where participants have an active voice in determining the goals and activities. "Proficiency in instructional methods, not overall proficiency in numerous applications" (p. 135) was the best predictor of technology integration among education faculty. Vannatta and Beyerbach concluded that computer technology is an instructional tool that can engage students in meaningful learning, understanding, and
exploration at all levels.

Computer Technology in Schools

Computers are found in increasing numbers in public school classrooms. The United States leads the world in the number of computers in schools as well as the number of computers per student (U. S. Congress, 1995). The total number of students using computers in school has risen from 27.3% in 1984 to 68.8% in 1997. Student use of computers in Grades 9 to 12 has risen from 58.2% in 1993 to 70.5% in 1997 (U.S. Department of Education, 1999). Market Data Retrieval (2000) recently released its annual survey of technology in public education. The student per computer ratio was 9.1 in 1995. Market Data Retrieval has reported that that ratio improved to 5.7 students per computer in 1998-99 and was 4.9 students per computer in 1999-2000. These ratios are based on total computer inventory, not necessarily up-to-date multimedia computers. Senior high schools report 6.6 students per multimedia computer, while all schools report 7.9 students per multimedia computer for the year 2000, up from 21.2 in 1997. Internet access in the nation's K-12 public schools reached 94% during the 1999-2000 school year, compared with 85% in 1998.

It is not the focus of this paper to discuss the merits of computer technology in the classroom. However, it is salient to note that most studies show that students using computers learn more in less time, like classes more, and have more positive attitudes towards computers in classes which include computer-based instruction (Kulik, 1994). Kulik first reviewed 12 separate meta-analyses on the effectiveness of computer-based
instruction. Kulik then conducted an additional meta-analysis of 97 studies that had
been carried out in elementary and high schools. This meta-analysis examined the
studies on three levels: overall effect sizes, subgroups of studies, and effects of a
homogeneous subgroup of studies. This in-depth review moved beyond the
generalization of earlier reviews and showed that some types of computer-based
instruction work better than others. There were few programs that allowed for level
three analysis.

Studies have repeatedly shown that students do better in school when computer
technology is used in the teaching process (Kulik, 1994). As a result, schools are
increasing the numbers of multimedia computers available for student use and Internet
access has improved dramatically. This increases the importance of the task facing
teacher educators: to help preservice teachers identify and utilize those uses that are
most effective in promoting learning. With the continued emphasis on technology in
education, it is critical to examine how teachers, particularly those just entering the
profession, are being trained in the use of computer technology.

Teacher Use of Computer Technology

In 2000, The International Society for Technology in Education (ISTE)
adopted new National Educational Technology Standards for Teachers. The standards
"define the fundamental concepts, knowledge, skills, and attitudes for applying
technology in educational settings. All candidates seeking certification or
endorsements in teacher preparation should meet these educational technology
standards" (ISTE, 2000, p. 8). Four of the six standards (II, III, IV, and IV) deal specifically with teaching with technology, as opposed to merely using technology as a teacher. The six ISTE standards are technology operations and concepts; planning and designing learning environments and experiences; teaching, learning, and the curriculum; assessment and evaluation; productivity and professional practice; and social, ethical, legal, and human issues. The National Educational Technology Standards (NETS) for teachers project suggests "ways educational programs can incrementally examine how well candidates meet the standards" (ISTE, 2000, p. 10).

Four profiles were developed covering four phases in teacher preparation. All of the standards were incorporated into and formed the basis for the profiles. The four profile areas are general preparation, professional education, student teaching/internship, and first-year teacher. This research dealt with the first two profiles, which may be found in Appendix A.

The National Council for Accreditation of Teacher Education (NCATE) expects all teachers graduating from an accredited program to be able to utilize technology as a teaching tool to promote student learning (NCATE, 1997). NCATE standards are broader that those established by ISTE and focus on the entire school or college of education, not just technology (personal communication, Pam Magasich, accreditation associate for NCATE, April 13, 2001). In Family and Consumer Sciences: A Chapter of the Curriculum Handbook, Fedje (1998) emphasized that computers are "tools used for deepening and enriching students' conceptual understandings" (p. 80). Croxall (1998), in a census of FACS teachers in New Mexico,
found that a majority (73.4%) would like training in how to teach FACS content with technology. Over half (57.8%) requested a course focusing on using computers in teaching. One way to strengthen the technology preparation of preservice FACS teachers is to include technology components and experience teaching with computers in their FACS methods courses.

Jinkerson (1995) surveyed an undisclosed number of school administrators in the Upper Peninsula of Michigan as to what technology new teachers should be prepared to utilize in the classroom. As a minimum, "future teachers are expected to be comfortable with word processing, databases, and spreadsheets" (p. 762). The administrators expressed the desire for teachers to know how to incorporate the use of technology into their classroom instruction. One administrator emphasized that:

Future teachers should demonstrate overall technology skills, incorporate technology into lesson plans, be flexible learners, and be interested in cooperative learning environments and an interdisciplinary curriculum, as well as be familiar with accessing telecommunications and researching topics through the global community. (p. 762)

In addition, responding administrators felt it was important that new teachers be exposed to various software products and have a working knowledge of how to evaluate software for educational use. Responding administrators also felt that preservice teachers should have exposure to a myriad of technologies such as high density TV, virtual reality, voice recognition, cellular technology, adaptive technologies for special needs students, optical media, integrated learning systems,
distributed learning systems, cable and satellite access, and distance learning during their preservice training. Finally, administrators stressed that it was vitally important that colleges and universities model how to teach with technology in content areas.

Recognizing the need for technologically trained teachers, both the ISTE and NCATE standards focus on preservice education. They also stress that technology should be integrated throughout the preservice preparation of new teachers (ISTE, 2000; NCATE, 1997). Administrators are looking for technology-literate teachers (Jinkerson, 1995) and teachers themselves recognize the need for training in using computer technology to teach content (Croxall, 1998).

Preservice Teacher Education in Computer Technology

Computers are relatively useless in the classroom unless a teacher scripts careful lesson plans and guides students along the way (Bulkeley, 1997). Willis and Mehlinger (1996) reached four conclusions regarding technology and teacher education. First, preservice education students believe computers are important in education and they want to learn to use them during their preservice program. Second, students are not learning to use technology in their preservice programs, a fact that will not change without significant modifications in teacher education. Third, most surveys conducted do not ask pertinent questions that illuminate the details of what is happening in teacher education. Many focus on attitudes and equipment availability rather than on "what is taught in which classes using what methods" (p. 1020). Fourth, the cutting-edge uses of technology for teachers differ greatly, depending on the
subject they teach. Technology is increasingly more content-area specific, which has major implications for how it should be integrated into teacher education. In this section the importance of computer technology in the education of preservice teachers will be examined. Following that, the current status of computer technology in preservice teacher education will be broken down into three areas: stand alone technology courses, general education courses, and methods courses. Finally, computer technology in FACS courses will be discussed.

Importance of Computer Technology in Preservice Education

Willis, Willis, Austin, and Colón (1995) found that teacher educators feel technology is an important element in both K-12 education and teacher education. Falba, Strudler, and Boone (1999) reported that nearly two thirds of surveyed teacher education faculty believed technology integration in teacher education was very important. Shareholders in education (parents, community members, experienced teachers, teacher educators, beginning teachers, and preservice teachers) believe that preservice teachers must demonstrate high levels of technological competence and demonstrate an ability to infuse technology into practice (Kemp et al., 2000). Colón, Willis, Willis, and Austin (1995) found that the majority of recent graduates of teacher education programs responding to their survey felt that computer technology is important in education. At least 74% of the respondents selected either "very important" or "extremely important" when asked about the use of technology now, as well as in 10 years' time. Despite the importance of technology preparation for
teachers, the majority of recent graduates of teacher education programs responding to a survey did not feel that technology was a factor in their preservice program (Colón et al.). Only 20% of the respondents felt that they were either "adequately prepared," "well prepared," or "very well prepared" to use computer technology in the classroom.

The Office of Technology Assessment (OTA) reported that the most direct and cost-effective way to educate teachers about technology is through the preservice education they receive as they prepare to become teachers (U.S. Congress, 1995). The OTA also discovered that "teachers teach as they have been taught," making it important that effective teaching, "including teaching with technology," is modeled in preservice teacher preparation (U.S. Congress, p. 181).

Willis and Mehlinger (1996) reviewed the literature on information technology and teacher education. They wrote that most of it could be "summarized in one sentence: Most preservice teachers know very little about effective use of technology in education and leaders believe there is a pressing need to increase substantially the amount and quality of instruction teachers receive about technology" (p. 978). They continued: "The idea may be expressed aggressively, assertively, or in more subtle forms, but the virtually universal conclusion is that teacher education, particularly preservice, is not preparing educators to work in a technology-enriched classroom" (p. 978).

The National Council for Accreditation of Teacher Education (NCATE) expects all teachers graduating from an accredited program to be able to utilize
technology as a teaching tool to promote student learning. "There is no longer a question about whether the new technology will be used in schools" (NCATE, 1997, Impact of Technology on Teaching section, ¶4). The new accreditation standards include the infusion of computer technology throughout the preservice education program. Preservice teachers are expected to know how to use computer technology to plan and deliver instruction (personal communication with Antoinette S. Mitchell, associate director of accreditation operations, NCATE, July 19, 2001). NCATE has adopted six new standards, most of which involve technology (Novak, 1999). The current standards focus on performance assessment of preservice teachers rather than an assessment of the program and what is being taught and "seat time" (NCATE, 2001a; Novak). The standards, as published by NCATE, are found in Appendix B.

The International Society for Technology in Education (ISTE) received a grant from the U.S. Department of Education to prepare technology standards for both students and teachers (ISTE, 2000). Major functions of the National Educational Technology Standards for Teachers (NETS•T) project are: (a) Develop a set of performance-based technology standards for all teachers. These standards should reflect fundamental concepts and skills for using technology to support teaching and learning. (b) Define the essential conditions for teacher preparation as well as the learning environments necessary for effective use of technology to support teaching, learning, and instructional management. (c) Develop performance assessment tools for measuring the achievement of the standards. These tools could serve as a basis for certification, licensing, and accreditation. (d) Identify and disseminate effective
models of teacher preparation. (e) Establish a National Center for Preparing Tomorrow's Teachers to Use Technology, which could provide coordination, leadership, and support as well as dissemination of the results (ISTE, 2001c). The resulting standards for teachers "focus on preservice teacher education, define the fundamental concepts, knowledge, skills, and attitudes for applying technology in educational settings" (ISTE, 2000, p. 8). Many states have adopted the ISTE standards for both students and preservice teachers (personal communication with Lajeane Thomas, NETS project director, November 6, 2001). The standards, as published by ISTE, are found in Appendix A.

Recent studies suggest that despite the efforts of these organizations, little progress has been made since the OTA report in 1995. Today, less than half of the teacher education programs require students to design and deliver instruction using technology. Even fewer require technology use in student teaching experiences. Less than half of the faculty in teacher preparation programs incorporate effective use of technology in their own courses. As a result, in the current technology-oriented society, many new teachers are entering classrooms without an understanding of how computer technology can support their teaching or their students' learning (CEO Forum, 2000).

Current Status of Computer Technology in Preservice Education Courses

While most preservice teachers are required to take at least one course in computer technology, they seldom see technology modeled in their college courses. In
addition, they spend the majority of their time learning about technology rather than with technology. Rosenthal (1999) reported that preservice students are seldom asked to practice teaching with technological tools, and most go into the field with a limited view of how technology can be used in the classroom. While 38 states have technology requirements for teacher preparation programs, only two require actual evidence of proficiency in the use of technology in teaching (Rosenthal). Yildirim (2000) found that while most states require preservice teachers to take a computer literacy course as they fulfill the requirements for a teaching credential, significant research indicates that teachers are more hesitant and less likely to use computer technology than other professionals. Yildirim has suggested this raises questions about the effectiveness of preservice teachers' technology training. In most teacher education programs, computer-specific courses are offered as an attempt to prepare a preservice teacher in computer technology usage (Rosenthal; U.S. Congress, 1995; Yildirim).

Kent and McNergney (1999) discovered a notable lack of modeling for technology use in teacher education programs. Slightly more than half (58%) of preservice students had attended classes in which computers were discussed. The majority of those discussions took place in technology classes. The majority (91%) of the preservice teachers stated a preference for integrating computer applications that involved lower-order learning, such as drill and practice. As a result, preservice teachers believed their lack of training would pose problems for them in their professional careers.

There are three types of education courses in which preservice teachers might
learn about technology and its role in the classroom. These include stand-alone technology courses, general education courses (dealing with topics as varied as diversity, discipline, classroom management, assessments, reading, health, etc.), and methods courses in which the teaching of specific content is emphasized. Each of these three types of education courses and how computer technology fits into them will be discussed next.

Stand-alone technology courses. The computer technology training often provided preservice teachers, is "about computers, not learning with computers" (Willis, 1997, p. 142). Studies conducted for the OTA report found that most instruction in preservice education is actually teaching about technology, rather than teaching with technology. The majority of students are required to pass only a single course centered around the use of technology. That course generally covers basic computer skills such as word processing, spreadsheet manipulation, hypermedia usage, and presentation software. It also teaches how to operate various technologies such as overhead projectors, videodisks, and general computer operation (U.S. Congress, 1995; Yildirim, 2000).

In discussing the results of a nonrepresentative survey, Poftak (1999) reported that of the 122 schools responding, most (72%) require "technology courses" as part of their general teacher certification program. When topics covered in those courses are examined, many deal with learning about technology while others stressed the integration of technology into professional use and teaching. Queitzsch (1997) noted that 64% of responding 4-year colleges and schools of education in the Northwest
region required students to complete specific course work in educational technology. An additional 5% of the colleges required demonstration of computer literacy prior to admission to the education program. None of this second group cite specific computer coursework requirements. Most of the coursework appeared to cover hardware and software rather than how to actually teach with computer technology (Queitzsch).

Yildirim (2000) examined a mandated educational computing course required of all California teachers prior to receiving their professional teaching credential, regardless of prior computer knowledge and experience. The course covered personal productivity software as well as familiarity with general hardware, software and system components. Application and use of technologies within appropriate subject areas and grade levels were also objectives of the course. Yildirim found that while teachers' attitudes significantly improved after the technology course, due to increased confidence and awareness of computers and their applications, the course was seen as an introductory course for those with no prior knowledge of computers. The course, consequently, did not prepare teachers to actually teach with computer technology.

Moursund and Bielefeldt (1999) reported that "formal, stand-alone IT [instructional technology] coursework does not correlate well with scores on items dealing with technology skills and the ability to integrate IT into teaching" (p. 3). Kemp et al. (2000) concluded that one media technology course is not sufficient to prepare preservice teachers with the knowledge and skills necessary to infuse technology into their classrooms. Instruction provided to preservice teachers tends to
focus more on older and simpler instructional applications of computer technology (computer assisted instruction, word processing) and less on exposure to and practice with newer, more sophisticated tools (integrated media, problem-solving applications), which support higher-order skills ("Infusing Technology", 2001). Wetzel (1993) examined the ISTE and NCATE standards for preservice teachers and concluded that while a knowledge of and competence with hardware and software could be taught in a core technology course, it was unlikely the standards dealing with the instructional process would be met through such a course alone.

General education courses. Depending upon their program, preservice students may take many courses that are described as general education courses. These include instruction in teaching students with diverse needs (special education, gifted, disabled), classroom management and discipline, teaching reading and health in the content area, assessment, school law, and various other topics depending on the school or college of education. The OTA reported that students seldom see the use of technology modeled in their preservice education classes, are not required to practice teaching with or even evaluate technology, and they infrequently use it during their student teaching experiences (U.S. Congress, 1995). Wetzel (1993) concluded that colleges of education should provide faculty models who integrate technology into their classrooms so that education majors will be prepared to do the same. Teacher educators do not sufficiently model the use of computer technology for instructional purposes and preservice education programs do not, typically, incorporate technology across the curriculum ("Infusing Technology", 2001). Willis (1997) reminded all
teacher educators that they "must recognize and accept the computer and its software, not as replacements for the content of the disciplines at the core of the curriculum, but as extensions complementary to that content" (p. 142).

Omoregie and Coleman (1997) found that when preservice education students were given instruction on the use of computer technology in the classroom and then required to practice integrating it into their teaching, both the preservice students and the students they were teaching benefited. Di, Dunn, and Lee (2000) looked at the benefits of integrating computer technology into educational foundations courses. The technology used in these courses was the Internet, with a focus on its use as a research tool. Preservice students' confidence and comfort levels and the frequency of their use of computers increased. The perception of technology as a teaching tool also improved.

McCoy (1999) examined the use of computer technology by teacher educators and concluded that teachers need more support to successfully shift from the use of computers for personal productivity to integration of technology into their teaching. At the same time, teacher educators need opportunities to increase their own knowledge and skills to allow them to better train their preservice students. McCoy also found that a greater emphasis should be placed on the impact of computer technology on society and its implications for education during the preservice education program. Technology standards (such as ISTE) must be incorporated into teaching practice if they are to have an impact on preservice students, but this cannot happen without a systemic effort involving "all parties: administrators, faculty, support personnel, and
The American Association of Colleges for Teacher Education (AACTE) held a conference on technology in 1999. They found that teacher educators have a particular responsibility to educate preservice teachers regarding the potential that technology holds for student learning and prepare them to use technology effectively in the classroom. This should be done through both modeling and direct instruction (AACTE, 1999). In addition, NCATE expects institutions to fully integrate technology into instruction for prospective teachers, so that they are able to use it effectively as an instructional tool (NCATE, 2001a).

Methods courses. The education courses in which preservice teachers receive instruction and practice in teaching specific content are called methods courses. Students traditionally spend time in specific curriculum development (block, unit, and lesson plans) and in refining the skills necessary for the discipline they will be teaching. Peterson (1989) found that the majority (75%) of education departments placed a medium to high priority on the integration of computers into all methods courses. Moursund and Bielefeldt (1999) reported that about half of the technology instruction preservice teachers receive is delivered as part of other classes such as methods and curriculum. The hours in these courses were more highly correlated with improved technology skills and an increased ability to integrate computer technology into teaching than were hours spent in technology courses. Kent and McNergney (1999) stressed that educators need to concentrate on learning how to use technology in context. This, they explain, means matching hardware and software combinations to
both the needs and abilities of the target learners and to the objectives of the instruction.

Prior to the integrated use of computer technology in their methods courses, preservice teachers had "very limited visions of technology integration" and were unsure how technology could be used in their future classrooms (Vannatta & Beyerbach, 2000, p. 144). Hoelscher (1997) and Vannatta and Beyerbach identified two key elements that increased technology proficiency among preservice teachers. First of all, the instructors model computer technology in their own teaching, demonstrating their personal commitment to using technology. Secondly, teacher educators guide students' continued learning by assigning tasks that require the use of computer tools to communicate, process information, and produce finished products.

Vannatta and Beyerbach (2000), Green and Cohen (1998), and Johnson-Gentile, Lonberger, Parana, and West (2000) examined changes in specific computer technology proficiencies following technology infusion in methods courses. The abilities of the preservice students increased in every proficiency they examined (N = 16, 14, and 6, respectively). Proficiency in instructional methods showed one of the largest increases (from 15.9% to 68.9%) in the study by Vannatta and Beyerbach. Green and Cohen found that multimedia integration showed the most significant growth (from 9.1% to 72.7%) and preservice teachers were able to articulate in detail ways in which technology would impact their performance as a teacher. Johnson-Gentile et al. reported the greatest increase in the ability of students to access the Internet to prepare reports or lessons for class (from 21% to 100%). By supporting
students in having meaningful encounters with technology, teacher educators are "guiding future teachers able to support similarly relevant uses of technology in their own classrooms" (Hoelscher, 1997, p. 72).

Three hours of instruction in the use of the World Wide Web was sufficient to improve students' competence in that area (Ropp, 1999). In addition, students reported that hands-on sessions helped them become more confident in their ability to locate Internet resources. A significant finding in this study was that, with even limited computer training in their methods course, preservice teachers who were initially less competent made greater strides in computer technology proficiency than their more computer literate peers (Ropp). In a qualitative study, Owens (1999) also investigated the use of the Internet by preservice teachers, with the main conclusion that online experiences were both positive and negative. It is important that methods teachers arrange enough technological and human support to ensure the most positive online experience possible, especially for computer novices. Owens determined it is equally important that teacher educators not assume every preservice teacher is familiar with using the Internet, even after completing required technology courses.

Halpin (1999) compared the acquisition and transfer of spreadsheet and graphing skills through both an integrated (constructivist) and an isolated learning approach. Preservice students exposed to the integrated approach were more likely to began teaching with the confidence and knowledge to incorporate technology into the classroom as both an instructional and professional tool. Halpin concluded that it is "important to integrate the use of computer applications into the preservice methods
courses already in existence to give the teachers the opportunity to experience exactly how technology can be an integral part of the daily operations of the classroom" (Halpin, Conclusions section, ¶1).

Kent and McNergney (1999) emphasized that the intent of technology integration should be to promote the acquisition of technology skills as a secondary rather than a primary instructional objective. Computer literacy should be used as a teaching tool for the subject content (Halpin, 1999). This occurs when computer technology is used in pursuit of other educational goals. Kent and McNergney concluded:

No single model, no one software application, no solitary course can help students fully appreciate these relationships. By working within an environment that models the effective use of technology, by learning technical and instructional skills in context, and by having opportunities to apply those skills in their own teaching, students have a chance to adapt and transfer their learning to other situations. (pp. 56-57)

Abbott and Faris (2000) determined that teacher education programs should not only teach preservice teachers how to use hardware and software, but also teach them how to incorporate computers into their teaching strategies and activities. This results from the integration of technology skills and strategies into the existing curriculum.

In comparing two different methods courses and their technology integration, Vannatta (2000) found that when the teacher implements and models the technology,
preservice students show greater gains in their abilities to teach with and use computers. The "connectedness of the activities to the instructor, the course, and the assignments" was the key to students' gaining both technology proficiency and a vision of technology-rich classrooms in which computers are used as tools (Vannatta, p. 12).

*Computer Technology and FACS Courses*

Quilling (1999) concluded that when the strong history of student leadership development in FACS courses was combined with an ability to use software to solve organization and family problems, individuals were better equipped to manage their own personal environment. In addition, they were able to transfer those skills to multiple employment settings and respond to both economic- and business-based problems. Cheek, Hastings, and Lokken (2001) found that an exciting, high-tech, interactive FACS curriculum can be part of the solution for teens growing up at risk in today's changing world. Fratianni, Decker, and Korver-Baum (1990) reported that school administrators "believe that they will propose and encourage" more use of computer technology in home economics (FACS) courses (Fratianni et al., p. 20). In addition, 72% of the administrators felt that a teacher's knowledge of technology was a factor in new hires.

Technology-based activities can be used to facilitate or enhance course objectives in a college nutrition education course (Rodriguez, 1999). Objectives related to the development of materials, evaluation, synthesis, and critical thinking skills were especially strengthened. Sanders, Deal, and Myers-Bowman (1999)
emphasized that family life educators need to be familiar with the types of materials available on the Internet as well as the options parents and other adults have to monitor and educate children in its use. Devaney (1999) reported on the successful integration of computer-based assignments into a college course on Retirement Planning and Employee Benefits.

While some (Milles, 1999; Quilling, 1999) have reported a gender bias in computer technology, a study done by Fratianni et al. (1990) at the University of Northern Iowa did not substantiate that fact among college students. Their study examined students' comfort levels with technology. Although they found no gender-related differences among the students in their study, there were differences when field of study was included in the analysis. Students majoring in science, math, and home economics (the precursor to FACS) were more comfortable using technology than were those majoring in language arts, social science, music, and physical education (Willis & Mehlinger, 1996).

In the recent redefining of the FACS profession, one of the points outlined as a concern for the profession as a whole was "the design of, use of, and accessibility to current and emerging technologies" (Simerly, Ralston, Harriman, & Taylor, 2000, p. 80). According to Way and Montgomery (1995) FACS education needs little or no adjustment to include the natural connection between technology and the FACS curriculum. It is essential that FACS educators be prepared to be visionary, visible, and influential with a practical focus on discovery, integration, and application of knowledge (personal communication with Denise Musick, December 11, 2001).
The visionary application of knowledge begins for preservice students in their methods courses. It is advanced when they are instructed with a program that integrates current technologies with the teaching of FACS content. "Only when teachers are fully empowered to make appropriate decisions about technology within the contexts of curriculum and learning theory will the potential benefits of technology really be realized in Family and Consumer Education" (Way & Montgomery, 1995, p. 12).

Preservice teachers receive instruction and teaching experience in a variety of courses and settings. Among these are technology courses, general education courses, and methods courses. It is important that the use of technology be integrated and modeled in each type of course (AACTE, 1999) but most specifically in methods courses where preservice students begin to integrate content into their teaching (Vannatta & Beyerbach, 2000; Willis & Mehlinger, 1996). "Teachers, teacher educators, administrators, and educational policymakers concerned about families would be wise to keep the teacher-technology circle of interaction clearly in mind" (Way & Montgomery, 1995, p. 12).

On-Line Surveys

With the increasing availability of the Internet, many researchers are turning to either e-mail or the World Wide Web (WWW) to research and collect data (Harris & Dersch, 1999). Smith and Leigh (1997) stated that the value of a new research technique lies in its capacity to offer new opportunities for research, deal with
questions previously too difficult to answer, or to explore questions that take advantage of its unique strengths. E-mail surveys are the simplest form of interviewing over the Internet and were used even before the Internet was introduced in its current form (Batagelj & Vehovar, 1998).

Manley et al. (2000) found that the majority of FACS professionals are using the Internet and e-mail. Their survey of FACS professionals in the state of Georgia found that over three fourths of FACS professionals are using the Internet (82%) and e-mail (77%). FACS educators were found to be much more likely to use both, with 94% using the Internet and 86% using e-mail. Those professionals over age 60 were somewhat less likely to use either the Internet (69%) or e-mail (69%), as were non-White professionals (71% and 57%, respectively). These findings correlate with those of Handwerk, Carson, and Blackwell (2000) who found that Internet users were generally young and White. With high numbers of FACS educators making use of the Internet and its applications, FACS teacher educators are a prime group to involve in Internet research.

Many advantages to using the Internet for research have been identified. One frequently cited advantage is the reduction in cost associated with an Internet survey (Coan, 1992; Handwerk et al., 2000; Pitkow & Recker, 1995; Schmidt, 1997; Smith & Leigh, 1997; Thach, 1995; Watt, 1997, 1998). Printing, mailing, keying, and interviewer costs are eliminated (Watt, 1997). Schmidt reported that Internet use for survey research can eliminate the need for paper resources, saving the money associated with feedback publishing costs, distribution costs, and survey collection
costs. Schmidt also reported that data entry costs are eliminated since the survey respondents carry out that task as they complete the survey. Pitkow and Recker found the use of Web technologies minimized costs by enabling point-and-click responses, providing structured responses, using electronic mediums for data transfer and collation, presenting questions visually for review, imposing loose time constraints, and utilizing adaptive questions to reduce the complexity of the survey. The use of adaptive questions may prove to be the greatest advantage to the participant since it allows nonpertinent questions to be totally skipped. Questions not relevant for a particular respondent never appear in their survey, thus reducing the time required to complete the survey as well as increasing the reliability (Pitkow & Recker). Watt (1997) explained further that cost savings vary depending on which type of survey is used as a comparison. He concluded that Internet surveys were substantially cheaper than telephone interviewing, only slightly more expensive than mail surveys for fewer than 500 respondents, and were increasingly less expensive than mail for more than 500 respondents.

A second advantage identified by many researchers is the ease and resultant timesavings involved with an Internet survey (Coan, 1992; Handwerk et al., 2000; Hewson, Laurent, & Vogel, 1996; Schmidt, 1997; Thach, 1995; Watt, 1997, 1998). Watt (1998) mentioned the speed with which data is transmitted via the WWW. Thach identified several areas where Internet surveys could save the researcher time. One way is that questionnaires can be delivered in virtually seconds, rather than days as with traditional mail. Similarly, participants can answer in quicker response time.
Invitations to participate can also be sent and responded to in a very short time, providing an estimate of participation in the survey. The ease of editing questionnaires after pretesting also saves the researcher time (Thach, 1995; Watt, 1997). Additional timesaving comes with the elimination of the data entry stage (Handwerk et al., 2000; Schmidt, 1997). Hewson et al. (1996) listed the ability to interact with the survey at the participant’s leisure as an advantage.

Watt (1997) and Handwerk et al. (2000) mentioned the possibility of making surveys more visually pleasing with the addition of attractive fonts and graphics. Audio and video may be added to questionnaires. "This multimedia ability of Web-delivered questionnaires is unique" (Watt, 1997, Should you use the Internet section, ¶5). Handwerk et al. and Thach (1995) reported the advantages of global coverage since the Internet is not bound by geography.

An additional advantage of using the Internet to conduct survey research is the anonymity it offers. Smith and Leigh (1997) found that it offers an opportunity for people to adopt alternative personas, which allows them to interact in ways which are quite different from either face-to-face or telephone interviews. Hewson et al. (1996) found that the anonymity of the experimenter common with Internet surveys reduces possible effects of subjects responding differently based on the biosocial attributes (e.g., sex, age, race, etc.) of the experimenter. They also found it was possible to nullify gender and race effects through the medium of the Internet while maintaining fairly direct contact with the participants. Coomber (1997) used an Internet survey to obtain information from drug dealers with the finding that responses were more likely
when anonymity was assured. An advantage of Internet surveys is the honesty with which respondents will reply based on the confidentiality of those responses. This is particularly important with sensitive subject matter (Coomber, 1997; Handwerk et al., 2000; Thach, 1995).

There are disadvantages to using the Internet for research, and they need to be outlined as well. Weisberg, Krosnick, and Bowen (1996) found that there are clear biases about the types of people who have access to computer technology as well as about what types of people are likely to respond to such polls. This becomes a sampling issue if access to technology affects the types and numbers of people available and likely to participate in on-line research. Much has been written about the problem of sampling when conducting research over the Internet (Coan, 1992; Handwerk et al., 2000; Schmidt, 1997; Thach, 1995; Watt, 1997, 1998; Weisberg et al., 1996). On-line sampling can best be described as haphazard (Weisberg et al.). The majority of Internet users have been reported to be young, White, educated, males (Handwerk et al., 2000) and sampling is limited to those with access to a computer and on-line network (Thach, 1995).

Hewson et al. (1996) speculated that tests of logical reasoning might be affected by the fact that a large percentage of the networked population consists of computer scientists who tend to have extensive training in symbolic logic. Survey results will be biased toward the views of a technological elite (Weisberg et al., 1996). One additional confounding issue is the difficulty of knowing who actually answered
the survey. Was it an adult giving serious answers or children just punching buttons (Weisberg et al.)?

Pitkow and Recker (1995) and Scheffelmaier (1999) reported on problems encountered when conducting surveys through the medium of e-mail. Scheffelmaier found that one problem with an e-mail survey was the prevalence of computer viruses. Participants may be reluctant to open a survey e-mail or visit a web site with which they are unfamiliar. Pitkow and Recker mentioned that e-mail surveys require the user to enter text in some way and then send the message to the researcher, all of which only functions well if the "right" respondents receive the survey and are inclined to answer it. In addition, there is little or no consistent structure in the way in which questions may be answered. For example, "What is your age?" could be answered on the same line, above or below the line, contain fractions or integers (Pitkow & Recker).

While Coomber (1997) found anonymity to be an advantage to Internet research, some view it as a potential problem (Harris & Dersch, 1999). When a respondent sends a survey back through e-mail, generally the respondent’s e-mail address is attached to the message. If the raw data is downloaded from a web site and archived on a server, anyone who knows the URL or passwords could have access to the information. Scheffelmaier (1999) was able to address this problem by conducting research using a web site with the respondents sending the survey back through an anonymous e-mail. (No e-mail addresses were attached to the answers as they came in.) However, he experienced a low usable return rate (29%) with this method. Given
the inability to solicit a second or third response from the participants, he found this an acceptable return rate.

Since the method used to send and receive the questionnaires was electronically limited to preserve the respondent’s anonymity. Because the questionnaire was sent through electronic mail and the option for a second or third mailing to the same person was not available, the rate of return could not increase as it often does using conventional methods to deliver the questionnaire. (p. 30)

Hewson et al. (1996) contend that the return rate for Internet surveys compares favorably with face-to-face interviews, leading one to assume they sent repeat surveys to achieve these results.

If the survey is accessible through a web site, anyone could access a questionnaire or experiment. There are few ways to limit the number of people who can log on to a site. One way to limit participants is to supply the relevant population with a password necessary to access and complete the survey (Harris & Dersch, 1999). Another way to weed out unqualified participants taking the survey is to include questions that would alert the researcher to “impostors.” By allowing for the input of contradictory yet reasonable answers, those not in the population of interest would be expected to answer at least one incorrectly, thus allowing for their replies to be identified and rejected.

Pitkow and Recker (1995) highlighted another potential problem with an Internet survey, that of multiple responses. They were able to identify duplicate
submissions to their survey using special software. In their November 1994 survey they had 3.8% of the submissions removed because they were duplicates. It would be important to allow for identification of duplicate submissions with a broadcast survey. The use of a targeted survey population should reduce, though possibly not eliminate this problem. Pitkow and Recker also reported that unstructured responses were a problem with their survey, much as they are with traditional surveying methods. Transforming entries into uniform structured data is a subjective process that can be difficult even for an experienced researcher.

"GVU's 7th WWW User Survey" (1997) addressed the problem of self-selection as it occurs with Internet survey research. This is most common with Internet surveys that are posted on a site and participation is solicited through various newsgroups or other sites. Self-selection reduces the ability to generalize the results to the entire population. They point out that self-selection also occurs when users do not respond to telephone or mail surveys. Watt (1997) identified three categories of Internet samples: unrestricted, screened, and recruited. Unrestricted samples are non-probabilistic samples that allow anyone on the Internet who desires to complete the survey. This is they type of survey research done by GVU. Screened samples are the a form of quota sampling. Recruited samples are used for targeted populations. They allow for more control over the makeup of the sample. Respondents are sent the questionnaire by e-mail or are directed to a web site that contains a link to the questionnaire. Since the makeup of the sample is known, follow-up messages can be sent to improve the participation rate. Schmidt (1997) found that the validity of Internet survey research
was likely to be strongest for research that targets specific populations. Batagelj and Vehovar (1998) found that surveys directed toward specific target populations selected with probability mechanisms were the most promising. They found that professional associations, firms, and organizations comprised populations that would be likely targets for Internet research. Coomber (1997) found that, even with unrestricted, self-selected populations, data suitable for exploratory analysis can be obtained. Batagelj and Vehovar also addressed the issue of multiple e-mail addresses. If e-mail addresses are already known for the target population, it is even more convenient to access respondents. They found that direct promotion of Internet surveys by e-mail had a decisive influence on the response rate.

Watt (1998) discussed the advantages and disadvantages of hiring someone to build and maintain an Internet survey. There are both hardware and software requirements to consider, as well as someone to do the actual work. There are costs involved in creating and maintaining Internet research sites. Depending on the size of the population and the frequency of conducting Internet research, these may or may not be offset by the cost savings associated with an Internet survey.

Handwerk et al. (2000) and "GVU's 7th WWW User Survey" (1997) included incentives for those completing their surveys. Respondents completing at least four questionnaires became eligible for one of several $250.00 awards. They found that the number of respondents did not increase, but the total number of completed questionnaires did increase significantly. Handwerk et al. offered a $100.00 cash prize that respondents were eligible for when the survey was completed and returned. The
incentive was discussed in focus groups. Some students in their population were not enticed by the chance for the monetary reward. They responded out of a sense of duty to their university. Others did not even notice the incentive. The students also suggested other incentives that would be more enticing for their particular population. The overall conclusion was that incentives that were more immediate and tangible than a cash lottery would increase response rates.

Handwerk et al. (2000) conducted research to evaluate the differences in e-mail and print survey responses. They looked at four questions: (a) Is the profile of e-mail respondents different than that of print respondents? (b) Do response rates differ between e-mail and print respondents? (c) Are the results obtained from e-mail respondents different than those obtained from print respondents? (d) Is there less burden on respondents with an e-mail survey than with a print survey? Coan (1992) conducted survey research via the Internet and compared the responses to previous print surveys of the same population. Handwerk et al. selected a random sample of 3,000 undergraduates to receive a designated survey. Half of the students were sent the survey and a cover letter by mail and half received an e-mail notification of the survey as well as a post card informing them of the web site. The print respondents received one follow-up mailing while the e-mail group received two follow-up e-mailings. Some surveys in each group were undeliverable. Notices of Coan’s survey were placed on the listserve of the target group, music educators. Respondents were self-selected.

Coan (1992) found that for this specific population, Internet research was
superior to mail or telephone in regard to ease, timeliness, and cost. Handwerk et al. (2000) found that response rates for the paper-and-pencil sample (33%) were significantly greater than for the on-line sample (26%). The two samples were similar to each other with respect to all demographic characteristics except for age. Reported results for the two groups were the same, with the following noted exceptions. The on-line sample had a significantly higher proportion of students age 18 to 24. Significantly more students volunteered written comments in the on-line sample and those comments were significantly more favorable than students in the paper-and-pencil group. A significant difference was also found between the groups regarding a preferred mode of survey. An overwhelmingly greater proportion of students from the on-line group stated a preference for on-line surveys (87% compared to 24%). Students completing the paper-and-pencil survey expressed only a 40% preference for print surveys.

The students comfortable with and having access to the Internet found the on-line surveys to be convenient. Other students had difficulty finding open computers in campus labs to complete the survey. Some students expressed an intentional avoidance of computers. One problem was the lack of access to students’ preferred e-mail address. University accounts were used for the initial contact and many students did not regularly check that account. In the focus groups, students responded that they were willing to spend 10-15 minutes completing a survey. There were no significant differences in reported times across survey method (Handwerk et al., 2000).
Summary

The body of research in the use of technology in preservice education is growing. Constructivist theory suggests that preservice teachers will better integrate technology into their teaching practice if given the opportunity to see technology modeled by methods teachers. In addition, preservice teachers need hands-on experience in creating materials and teaching with technology in order to create the knowledge base that will allow them to make computer technology an integral part of their teaching practice (Halpin, 1999; Vannatta, 2000; Vannatta & Beyerbach, 2000). Halpin found that a constructivist method of teaching computer technology along with methods promotes self-confidence in teachers to transfer their computer skills into the classroom. Vannatta and Beyerbach concluded that technology integration activities must be connected to content, objectives, and assignments rather than functioning as an "add-on."

Numerous studies have shown that students’ work improves when they are engaged with computer technology (Kulik, 1994). Both the International Society for Technology in Education (ISTE) and National Council for Accreditation of Teacher Education (NCATE) expect future teachers to be proficient in the use of technology as a tool to assist them in the non-teaching work of a teacher (test writing, grading, curriculum creation, etc.), but more especially as a teaching tool (ISTE, 2000; NCATE, 2002). Family and Consumer Science (FACS) teachers are expected to incorporate technology into their classrooms (Fedje, 1998) and, like other preservice educators, need to see technology use modeled in classes while receiving the
instruction and practice necessary to incorporate it into the teaching of content.

Computer technology must move from the isolated technology course into the mainstream curriculum of teacher education, beginning with methods courses (Colón et al., 1995; U.S. Congress, 1995; Willis & Mehlinger, 1996; Willis et al., 1995). The federal government has initiated a push for technology inclusion in teacher education programs. Recent studies, while they identified some problems with the use of technology, have all found that computer technology and its use should be included in classroom instruction as students prepare to become teachers. Over half of the studies (60%) found that technology should be integrated across the curriculum. Those studies in which technology was integrated into the methods courses rather than in stand-alone technology courses showed that preservice teachers were better prepared to integrate technology into practice.

The area of on-line survey research is expanding. The ease of use and lower costs will encourage more researchers to pursue this survey medium. As computer technology becomes more widespread, some of the constraints against its use will likely diminish. Harris and Dersch (1999) have reported that "the Internet is so new that we have not yet established the most efficient or effective way to conduct research with it, nor have we adequately assessed the potential that it offers researchers" (p. 65). Target populations, particularly those with known e-mail addresses, are prime populations for on-line research (Batagelj & Vehovar, 1998; "GVU's 7th WWW User Survey", 1997; Schmidt, 1997; Watt, 1997). Respondents react favorably to on-line survey research (Coan, 1992; Handwerk et al., 2000).
This research sought to gather baseline information about the computer technology preparation that preservice Family and Consumer Sciences (FACS) students receive in their FACS methods courses. Constructivist theory holds that in order for a student to gain knowledge or learn a skill, the student needs the opportunity to interact with and internalize that knowledge or skill (Black & Ammon, 1992; Brooks & Brooks, 1993; Fosnot, 1989; Nicaise & Barnes, 1996; Parsons et al., 2001). Integrated use of computer technology throughout the preservice education program is encouraged by constructivist theory (Willis & Mehlinger, 1996). This study was designed to investigate the degree of technology integration in FACS methods courses as well as the computer technology skills and knowledge possessed by FACS preservice students, based on the perceptions of FACS teacher educators.

This study addressed the limitations of previous research identified in the preceding review of literature. Identified limitations included limited populations, respondents other than classroom teachers, exclusion of emerging technologies, exclusion of specific technologies used to train preservice teachers to teach content, and exclusion of FACS teacher educators. The study investigated the importance that FACS teacher educators place on the inclusion of technology in FACS secondary classrooms as well as in their own methods courses. In addition, the study was
designed to ascertain FACS teacher educators' knowledge of the International Society for Technology in Education (ISTE) technology standards and their perceptions of FACS preservice students' ability to meet the ISTE performance standards.

The responses of FACS teacher educators to an on-line versus a print survey format were also investigated. E-mail and Internet-based research have gained in popularity. With reduced costs both in time and money, there is much to recommend the Internet for survey research. However, before Internet surveys can replace print surveys, it is important to understand if responses will differ based on the form of communication of the survey. The most recently published directory of FACS teacher educators, the 1999-2000 National Directory of the Family and Consumer Sciences Division of the Association for Career and Technical Education, lists e-mail address for the majority of the FACS teacher educators included in that directory. As a result, they were considered a good population to test the reliability of conducting research via the Internet versus mail. Should responses to the Internet survey and the print survey be comparable, it would indicate that, for this population, Internet survey research may be as valid as print surveys.

Once the extent of technology use in FACS methods classes is determined, steps can be taken to establish minimum standards for technology inclusion and prepare curriculum to assist FACS teacher educators in better employing computer technology. Future studies will have a benchmark to base additional research involving either FACS teacher educators or FACS preservice teachers.
This study used a descriptive survey research design. Surveys are often used to address four classes of questions: prevalence of attitudes, beliefs, and behavior; changes in them over time; differences between groups of people in their attitudes, beliefs, and behavior; and causal propositions about these attitudes, beliefs, and behaviors (Weisberg et al., 1996). This research examined the knowledge, attitudes, beliefs, and behavior of Family and Consumer Sciences (FACS) teacher educators; established a baseline of the knowledge, attitudes, beliefs, and behavior of FACS teacher educators which may be used in future research; and examined knowledge, attitudes, beliefs, and particularly the computer technology behaviors of FACS teacher educators in their methods courses. In addition, differences between the attitudes, beliefs, and behavior of established groups of FACS teacher educators were examined. No causal relationships were established. A survey was the best means of obtaining the data desired for this study. "The explanation of mass behavior often requires mass attitude data that can only be obtained by a survey. . . . When public attitudes and mass behavior are of interest, surveys play important roles in social science" (Weisberg et al., p. 20).

A survey, titled "Technology Survey for Family and Consumer Sciences Teacher Educators," (see Appendix C), was developed to examine the computer usage of Family and Consumer Sciences teacher educators throughout the United States. In addition, it examined what support FACS teacher educators feel they receive from their individual college or university concerning the inclusion of technology into their
methods courses. The relationships between technology use in FACS methods courses and the following characteristics were examined: public or private college or university, student body enrollment, FACS teacher education program size, access to technology, age and gender of the FACS teacher educator, the highest degree obtained by the FACS teacher educator, and the number of years of teaching FACS methods courses. The survey examined FACS teacher educators' familiarity with ISTE standards and their perception of preservice teachers' compliance with the ISTE standards. The population was randomly divided into two groups. The survey was administered in both printed/mailed and Internet versions, with each group randomly assigned to either the printed/mailed or the Internet version of survey administration. Nonrespondents in both groups were contacted by telephone. Response rates and responses to each type of instrument administration were compared, as were early, late, and nonrespondents.

Subjects

A census was done of current Family and Consumer Sciences (FACS) teacher education programs in the United States. In order to identify universities having FACS education programs, state department of education supervisors of FACS were contacted to identify FACS teacher education programs within their state. In addition, the 1999-2000 National Directory of the Family and Consumer Sciences Division of the Association for Career and Technical Education was used as a source of FACS
teacher educators. This directory contains a membership list of FACS teacher educators.

Initially, there were 163 identified FACS teacher education programs throughout the U.S. with 234 teacher educators working in those programs. During the study, 26 members of the population were removed from the database because they no longer qualified as part of the population. Five members of the initial population had moved and their surveys were returned as undeliverable. Eight were removed because the program had been shut down at their college or university. An additional 11 were no longer functioning as teacher educators in their respective departments. Two had retired and not been replaced. This left a population of 208 teacher educators for this census. This exclusion of respondents followed the recommendation of Bailey (1994) who stated:

A number of questionnaires will not be delivered to the respondent for various reasons (e.g., the house has been demolished, the address is incorrect, the respondent has moved or has died). Although this category of nonresponse may not be a random selection or the sample, these nonresponses are not refusals and are out of the researcher's control. (p. 170)

Babbie (1990) reported that "the accepted practice is to omit all questionnaires that could not be delivered" and then divide the number of completed questionnaires "by the net sample size to produce the response rate" (p. 183). Weisberg et al. (1996) have cautioned that "researchers must always be sure the group being sampled is drawn from the population they want to generalize about" (p. 65). Since the 26 above-
mentioned members no longer fit the population of FACS teacher educator, they were removed from the population total.

All but five states and the District of Columbia had active or semi-active FACS teacher education programs. An active FACS teacher education program was defined as one that employs a full FACS teacher preparation program, including subject matter methods courses. A semi-active FACS teacher education program was defined as one that provides supervision of FACS student teachers, but does not provide comprehensive FACS subject matter methods courses. As a result, some of the identified subjects in the study’s population have limited contact with FACS preservice teachers. None of the teacher educators from semi-active FACS programs returned the survey.

The population for this study was selected to ascertain the extent of computer technology usage in FACS methods courses as well as the preparation of FACS preservice teachers in meeting ISTE performance standards. Teacher educators were chosen as the primary information source because they determine what is occurring in methods courses. Working closely with preservice teachers, teacher educators observe students’ entire preparation for teaching, even when course work is taken in different disciplines or departments.

Instrumentation

*Development of the Instrument*

A survey instrument was developed for the study to collect information from
Family and Consumer Sciences (FACS) teacher educators about their current use of computer technology in FACS methods courses and the perceived ability of preservice FACS teachers to meet ISTE performance standards (see Appendix C). The survey consisted of two parts. Part A asked questions related to the specific college or university, the FACS program, the teacher educator program, and what computer technology was being used in their FACS methods classes. Part B addressed ISTE performance standards and how well the teacher educator perceives FACS preservice students can meet them. The survey was used to solicit answers to the research questions and to test the hypotheses. Questions for the survey were based on information obtained through the review of literature and upon the first two profiles of the National Educational Technology Performance Profiles for Teachers established by ISTE.

In part A of the questionnaire, questions were generated to gather information regarding college or university support of technology in FACS methods classes, FACS teacher educators' perceptions of the importance of technology in both secondary FACS classrooms and their own methods courses, and FACS teacher educators' computer technology ability. Other questions were included to determine which technologies are currently being incorporated into methods classes, modeled by the teacher educator, and required of preservice students. Demographic data fell into one of three categories: college or university, FACS program, and FACS teacher educator. The type (private or public) and size of college or university and size of the FACS teacher education program was requested. Information regarding age, gender, highest
college degree earned, and number of years teaching FACS methods courses was requested. At the end of part A, the FACS teacher educators were asked about their familiarity with the ISTE performance standards for preservice teachers.

Part B of the questionnaire dealt specifically with the ISTE standards. The teacher educators were asked to rate their students' perceived ability to meet the first two profiles of the National Educational Technology Performance Profiles for Teachers established by ISTE. Each of the standards from the first two profiles was included in part B. Several of the ISTE standards cover more than one related skill or competency. As a result, many standards were separated into more than one question on the survey. This was done for clarification and not to confuse the respondents. All new questions created from separating the original standards maintained the format of the standard.

Due to the lack of information regarding the reliability of Internet survey research in general and with this population specifically, the survey was developed as both an on-line instrument and a mail instrument. This facilitated testing of hypotheses three and four. Once the instrument was finalized, a database of the questions was created in Microsoft Access. This database was then linked to forms in Front Page to enable survey responses to be entered via the Internet. This allowed responses to automatically download into the database for statistical analysis.

*Validity Assessment of the Instrument*

The survey used the first two profiles, the general preparation performance profile and the professional preparation performance profile, of the National
Educational Technology Performance Profiles for Teachers established by ISTE. These are national standards developed as an ISTE initiative funded by the U.S. Department of Education's Preparing Tomorrow's Teachers to Use Technology (PT³) grant program.

The Joint Committee on Standards for Educational Evaluation (1994) defined a standard as "a principle mutually agreed to by people engaged in a professional practice, that, if met, will enhance the quality and fairness of that professional practice" (p. 2). The primary goal of the NETS Project that developed the NETS performance standards for teachers was to enable various stakeholders in education to develop national standards for the educational uses of technology and guide educational leaders in recognizing and addressing the essential conditions for effective use of technology to support education (ISTE, 2000).

In developing the NETS standards, ISTE began with a competitively selected group of 50 writers. This group was drawn from a broad range of segments in the teaching profession. Care was taken to include classroom teachers, as well as teacher educators. Others in the group represented librarians, special education specialists, subject area specialists, foreign language specialists, and early childhood specialists. The grade range, current role, subject area, and experience of the group were carefully balanced, based on a predetermined rubric. Following a lengthy process of review, the standards were adopted by this professional body (personal communication with Lajeane Thomas, project director, November 6, 2001).

Four university professors with current assignments in education, including
teacher education, adult education, and technology education reviewed the instrument for content and construct validity. This ensured that items dealing with current technology were included in the instrument and that the items were understandable to teacher educators. In addition, this panel was asked for suggestions relating to wording, clarity, ease of completion, and the style of the instrument. The panel of experts assisted in determining that the instrument allowed for accomplishment of the stated objectives and provided data to test the hypotheses.

**Reliability Assessment of the Instrument**

Reliability is a measure of how consistently respondents answer the questions. A group of questions that measure the same concept is considered to be reliable if a person’s answers to the questions are consistent with each other (Weisberg et al., 1996). One measure of internal consistency is Cronbach’s alpha. Vogt (1999) defined Cronbach's alpha as a measure of internal reliability or consistency of items in an index. It is a widely used form of Kuder-Richardson formula 20 (KR20) but, unlike KR 20, it can be used for test items that have more than two answers, such as Likert scales. Cronbach's alpha ranges from 0 to 1.0. Scores toward the high end of that range (e.g., above .70) suggest that the items in an index are measuring the same thing. (p. 64)

This procedure can be likened to a test of every possible split half of an instrument, comparing all the questions and the given responses with each other in a test for consistency. Cronbach’s alpha was used to test the reliability of the instrument.
Pretest of the Instrument

A field test of the instrument was conducted using seven agriculture teacher educators so as not to deplete the pool of respondents for the actual survey. The field test included participants from universities in Utah, Idaho, New Mexico, North Dakota, and Oregon. A copy of the letter sent to the agriculture teacher educators can be found in Appendix D. They were asked to complete the survey instrument, note the time necessary to complete it, and add any comments pertinent to the use of the instrument.

Finalization of the Instrument

Following the field test and input from the panel of experts, minor changes in wording were made to the instrument for clarification. The word gender replaced sex in one question. A middle category (somewhat) was added to the question regarding the ISTE standards. Categories were used for age and highest degree rather than asking respondents to fill in a blank. The category of "not used" was added to one section. The format of the instrument was modified to make it more readable and visibly presentable. Once these changes were made, the instrument was copied and ready for distribution. Personnel at the Faculty Assistance Center for Teaching at Utah State University were employed to prepare the survey for on-line distribution. A copy of the on-line version of the survey can be found in Appendix E.
Data Collection Procedure

Obtaining Approval

Utah State University procedures for obtaining approval to test human subjects were followed (see Appendix F). All subjects were notified that completion of the survey instrument indicated approval for their information to be used in statistical analysis. They were also notified that the results would be used in preparing papers and presentations to be shared within professional settings. All survey results were kept confidential. No university or college was identified in the reporting of data. Following the completion of the study, the code numbers in the database were erased, preventing the inadvertent linkage of results to individual persons at a later date.

Instrument Administration

The survey was prepared in both a "hard-copy" and an Internet-based format. The database of Family and Consumer Sciences (FACS) teacher educators was divided into two groups. Computer generated randomization was used to separate the population into two groups to allow for format comparison. The database for the survey participants was placed on an Excel spreadsheet and then a random number function was used to generate a random number for each participant. The random numbers generated by Excel are between .00000 and .99999. Finally, a function was entered into the Excel program to divide the random numbers into two groups. The point at which the numbers were broken was .475. All numbers below this target number were placed into one group and those above it were placed in the other.
Following this procedure, the 234 subjects were divided into one group of 118 and one group of 116. One group was randomly selected as the "on-line" group and one as the "hard copy" group.

Subjects were assigned a code number to include on their survey form as it was returned. These code numbers were used to identify individuals who returned the surveys and allow for follow-up. A cover letter explaining the purposes of the study accompanied both forms of the survey. An incentive of a $2.00 bill and a story about passing along a $2.00 bill within a family was mailed to respondents as well as the contacted nonrespondents.

The on-line survey (see Appendix E) was housed on a server located at Utah State University. Data were downloaded to a disk on a regular basis. The on-line survey was available from November 27, 2001 through the January 30, 2002.

The "Technology Survey for Family and Consumer Sciences Teacher Educators" was mailed to the hard-copy group on November 13, 2001. The Internet survey became operational on November 28, 2001 and e-mails were sent to the Internet group on November 29, 2001. A modified Dillman (1978) approach to the hard-copy group was used. The first contact consisted of a cover letter and the survey instrument. A copy of the cover letter sent with the printed/mailed survey is found in Appendix G. A copy of the cover letter sent with as the introductory e-mail is found in Appendix H. A postage-paid return envelope was also included in the mailing to the hard-copy group. Those not responding to the mailed survey 3 weeks were contacted a second time with a postcard reminder, which was mailed on December 6, 2001. A
copy of the postcard is found in Appendix I. Due to the holiday season, no further contact was made with the hard-copy population until January 2002. On January 11, 2002 all nonrespondents were again contacted, either by e-mail or with a second hard copy of the survey.

Before a second contact was made with the population, 40 hard copies of the survey had been returned and 19 had taken the survey on-line. Following the second contact, 13 more hard copies of the survey were returned and 18 additional on-line surveys were completed. In total, 53 mailed surveys and 33 Internet surveys were returned, for a response rate of 41.35%. A response was counted as valid if Part A of the survey was completed. Seven of the respondents only completed Part A of the survey. Late responses were compared with early responses to determine if there were any differences. There were no statistically significant differences between early and late respondents.

To control for nonresponse error, a random sample of 16 nonrespondents, eight each from the on-line and hard copy groups, was selected through the use of a random number table. All 16 were contacted by telephone. The nonrespondents were asked if they remembered receiving the survey and then whether or not they were currently teaching FACS methods courses. Nine of the nonrespondents reported that they were no longer teaching FACS methods courses. One reported that she "chose not to respond for a variety of reasons." The other six were asked the questions from part A of the survey. These responses were compared to those who had completed the survey.
to determine if their responses differed significantly from those who had previously responded.

Analysis of Data

The survey results returned by e-mail were downloaded into an Access database. Survey results returned by hard copy were entered into the computer by the researcher as if the respondent were replying by e-mail. This allowed for all data to be entered into the same Access database in the same format, reducing the risk of error in coding. The database was converted to both Microsoft Excel and SPSS 11 files and processed at Utah State University. Descriptive statistical measures such as frequencies and percentages were calculated in order to answer the research questions. All responses to open-ended questions were compiled by the researcher and frequencies and percentages were analyzed for content. The responses to part B of the survey were analyzed and regrouped to facilitate analysis. Hypotheses 1 and 2 were tested using one-way ANOVAs and Spearman's correlations. The third hypothesis was tested using a z test. The fourth hypothesis was tested using a t test. Values were considered significant at the .05 level or beyond.

Objectives

The following research questions were addressed:

1. Are FACS teacher educators aware of the International Society for Technology in Education (ISTE) standards?
2. How do FACS teacher educators rate their own computer skills?
3. How much support do FACS teacher educators feel they receive from their college or university for using computer technology in their courses?

4. How much importance do FACS teacher educators place on the use of computer technology in the secondary classroom?

5. How much importance do FACS teacher educators place on the use of computer technology in their own classrooms?

6. Which types of electronic technology are incorporated/modeled/required in FACS methods classes?

7. Which types of electronic applications are incorporated/modeled/required in FACS methods classes?

8. How do FACS teacher educators perceive their students' ability to meet the ISTE standards at two different and distinct points in their education?

9. Do response rates differ between Internet and print respondents?

10. Is the profile of Internet respondents different than that of print respondents?

11. Are the results obtained from Internet respondents different than the results obtained from print respondents?

**Hypotheses**

The following hypotheses were investigated.

1. There will be no significant difference between the type of college/university (public or private), size of the college/university, size of the FACS program, and the preparedness of their students to meet the ISTE standards.

2. There will be no significant difference between the number of years of teaching
FACS methods courses, the teachers' highest degree, gender, age, and the preparedness of their students to meet the ISTE standards.

3. There will be no significant difference between the response rate of teachers to an on-line survey versus a print format.

4. There will be no significant difference between the responses of those replying on-line versus those replying by mail.

Reporting of Data

Results will be reported to professional organizations and Family and Consumer Sciences (FACS) teacher educators through professional journals and presentations at conferences. In addition, a copy of the completed dissertation will be available through the Utah State University Library system and through Dissertation Abstracts International.
CHAPTER 4
FINDINGS AND DISCUSSION

Introduction

The purpose of this study was to investigate the preparation of Family and Consumer Sciences (FACS) preservice teachers in the use of computer technology during their FACS methods courses. The study was also designed to ascertain FACS teacher educators' knowledge of the International Society for Technology in Education (ISTE) technology standards and their perceptions of FACS preservice students' ability to meet the ISTE performance standards. A third purpose of the study was to evaluate the responses of the sample population to a mailed versus an on-line format of the survey instrument. The survey instrument, "Technology Survey for Family and Consumer Sciences Teacher Educators," was sent, either by mail or e-mail, to all members of the Teacher Educators of Family and Consumer Sciences membership list published by the Association for Career and Technical Education and all other FACS teacher educators identified by state supervisors in the United States in November 2001 and again in January 2002. Data were collected from a total of 86 teacher educators.

Comparison of Early, Late, and Nonrespondents

Those returning the survey after the first mailing or contact were compared to those who completed the survey after the second mailing or contact. The six non-
respondents were compared to both of these groups as well. Modes were used to compare type of college or university, advanced degrees offered in their department, and technology course requirements. There were no differences between the first and second respondents. Nonrespondents differed in that none offered advanced degrees at all while the mode for both early and late respondents was to offer a master's degree in their department.

Medians were used to compare early and late respondents on the highest degree received, respondent's age, knowledge of the ISTE standards, and student body size of the college or university. There were no differences between early and late respondents. Nonrespondents were slightly younger (median of 3.50 rather than 4.00) and equally likely to have a Ph.D. and an Ed.D. (median of 3.50 rather than 3.00). Modes and medians are summarized in Table 1.

A t test was used to compare continuous variables for early and late respondents. Due to the limited number of nonrespondents (six) they were not included in this analysis. While there were no statistically significant differences between early and late respondents, mean differences were noted in four areas that may indicate a trend for further study. Early respondents reported greater support and higher ISTE scores for their preservice students. In addition, early respondents were likely to have taught more years than were late respondents (mean of 11.68 compared to 9.44). The t test is summarized in Table 2.
Table 1

*Mode and Median Comparisons of Early, Late, and Nonrespondents*

<table>
<thead>
<tr>
<th>Variables</th>
<th>Early respondents</th>
<th></th>
<th>Late respondents</th>
<th></th>
<th>Nonrespondents</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$n$</td>
<td>Median</td>
<td>Mode</td>
<td>Median</td>
<td>Mode</td>
<td>Median</td>
</tr>
<tr>
<td>Type of university/ college</td>
<td>86</td>
<td>2.00</td>
<td>2.00</td>
<td>2.00</td>
<td>2.00</td>
<td>2.00</td>
</tr>
<tr>
<td>Master's offered</td>
<td>86</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Ph.D. offered</td>
<td>86</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Technology course required</td>
<td>83</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Highest degree of teacher</td>
<td>85</td>
<td>3.00</td>
<td>3.00</td>
<td>3.00</td>
<td>3.00</td>
<td>3.50</td>
</tr>
<tr>
<td>Age of teacher</td>
<td>85</td>
<td>4.00</td>
<td>4.00</td>
<td>4.00</td>
<td>3.00</td>
<td>3.50</td>
</tr>
<tr>
<td>ISTE knowledge</td>
<td>76</td>
<td>3.00</td>
<td>3.00</td>
<td>3.00</td>
<td>3.00</td>
<td>3.00</td>
</tr>
<tr>
<td>Enrollment (grouped)</td>
<td>83</td>
<td>2.00</td>
<td>2.00</td>
<td>2.00</td>
<td>2.00</td>
<td>--</td>
</tr>
</tbody>
</table>

*Note. $N = 86$*

Demographic Profile of Respondents

Each teacher educator answered questions on the "Technology Survey for Family and Consumer Sciences Teacher Educators" instrument for purposes of gathering demographic data and other information pertinent to the study's objectives. A copy of the instrument is found in Appendix C. A summary of demographic data for the respondents follows.
Table 2

Results of t Test Comparison of Early, Late, and Nonrespondents

<table>
<thead>
<tr>
<th>Variables</th>
<th>Early respondents</th>
<th></th>
<th></th>
<th>Late respondents</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>Mean</td>
<td>Standard deviation</td>
<td>n</td>
<td>Mean</td>
<td>Standard deviation</td>
<td>t</td>
</tr>
<tr>
<td>Student teachers</td>
<td>57</td>
<td>6.42</td>
<td>5.51</td>
<td>27</td>
<td>6.15</td>
<td>5.90</td>
<td>.21</td>
</tr>
<tr>
<td>Years teaching</td>
<td>54</td>
<td>11.68</td>
<td>9.99</td>
<td>25</td>
<td>9.44</td>
<td>8.56</td>
<td>.97</td>
</tr>
<tr>
<td>Comfort level</td>
<td>57</td>
<td>1.98</td>
<td>.74</td>
<td>28</td>
<td>1.82</td>
<td>.67</td>
<td>.97</td>
</tr>
<tr>
<td>Skill level</td>
<td>56</td>
<td>3.29</td>
<td>.76</td>
<td>28</td>
<td>3.43</td>
<td>.69</td>
<td>-.84</td>
</tr>
<tr>
<td>Support</td>
<td>57</td>
<td>12.14</td>
<td>2.37</td>
<td>28</td>
<td>12.00</td>
<td>2.14</td>
<td>.26</td>
</tr>
<tr>
<td>ISTE 1</td>
<td>55</td>
<td>100.16</td>
<td>25.65</td>
<td>24</td>
<td>109.67</td>
<td>18.37</td>
<td>-1.64</td>
</tr>
<tr>
<td>ISTE 2</td>
<td>54</td>
<td>91.07</td>
<td>27.98</td>
<td>24</td>
<td>101.79</td>
<td>21.89</td>
<td>-1.66</td>
</tr>
</tbody>
</table>

Note. N = 86

Respondent Characteristics

All respondents to the survey were female. Respondent characteristics are summarized in Table 3.

Age of respondents. Teachers ranged from 20 to 71 years of age. The majority of the participants in the study were between 40 and 59 years of age. This age range comprised 73.2% of the respondents.

Highest degree earned. The majority (61.6%) of the responding teacher educators had a Ph.D. An additional 15.1% had an Ed.D. None reported either post-
doctoral study or a fellowship. Every respondent had received degrees beyond their bachelors.

*Years of teaching.* The average length of time these teacher educators had been teaching FACS methods courses was 10.97 years with a range from zero to 35 years of experience. The majority of the respondents (53%) in this study had been teaching methods courses for 10 years or less. Ten teacher educators reported zero years experience. Sixteen teachers had taught from 11 to 20 years, and 17 reported having taught FACS methods course for over 20 years.

*Computer skills.* The majority (52.3%) of teacher educators responding to the survey rated their computer skills as average or adequate. While 37.3% rated their skills as advanced, only 8.2% rated their own skills as limited. There was no difference in reported computer skill level and years of experience in teaching FACS methods courses. There was a statistically significant correlation (Spearman’s rho of -.247) between age and reported skill level (see Table 4). Older respondents reported lower computer skills. As would be expected, there was a high correlation between confidence level and skill level (Spearman’s rho of .74). On a scale of 1 to 4, with 4 being "strongly agree" and 1 being "strongly disagree," the respondents reported an average (3.07) confidence level for teaching computer skills in the classroom.

*Familiarity with the ISTE standards.* The majority (48.8%) of the respondents reported no familiarity with the ISTE standards. Only 15.1% responded that they were familiar with the standards. Slightly less than one fourth (24.4%) reported being somewhat familiar with the standards.
### Table 3

**Demographic Characteristics of Respondents**

<table>
<thead>
<tr>
<th>Respondent characteristics</th>
<th>n</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Female</td>
<td>85</td>
<td>98.8</td>
</tr>
<tr>
<td>Missing</td>
<td>1</td>
<td>1.2</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20-29</td>
<td>1</td>
<td>1.2</td>
</tr>
<tr>
<td>30-39</td>
<td>5</td>
<td>5.8</td>
</tr>
<tr>
<td>40-49</td>
<td>29</td>
<td>33.7</td>
</tr>
<tr>
<td>50-59</td>
<td>34</td>
<td>39.5</td>
</tr>
<tr>
<td>60-69</td>
<td>14</td>
<td>16.3</td>
</tr>
<tr>
<td>70+</td>
<td>1</td>
<td>1.2</td>
</tr>
<tr>
<td>Missing</td>
<td>2</td>
<td>2.3</td>
</tr>
<tr>
<td><strong>Highest degree earned</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Masters</td>
<td>19</td>
<td>22.1</td>
</tr>
<tr>
<td>Ph.D.</td>
<td>53</td>
<td>61.6</td>
</tr>
<tr>
<td>Ed.D.</td>
<td>13</td>
<td>15.1</td>
</tr>
<tr>
<td>Missing</td>
<td>1</td>
<td>1.2</td>
</tr>
<tr>
<td><strong>Years of teaching</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 years and under</td>
<td>46</td>
<td>53.4</td>
</tr>
<tr>
<td>11-20 years</td>
<td>16</td>
<td>18.6</td>
</tr>
<tr>
<td>21 years and over</td>
<td>17</td>
<td>19.7</td>
</tr>
<tr>
<td>Missing</td>
<td>7</td>
<td>8.1</td>
</tr>
<tr>
<td><strong>Computer skills</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very advanced</td>
<td>4</td>
<td>4.7</td>
</tr>
<tr>
<td>Advanced</td>
<td>28</td>
<td>32.6</td>
</tr>
<tr>
<td>Average/adequate</td>
<td>45</td>
<td>52.3</td>
</tr>
<tr>
<td>Limited</td>
<td>6</td>
<td>7.0</td>
</tr>
<tr>
<td>Very limited</td>
<td>1</td>
<td>1.2</td>
</tr>
<tr>
<td>Missing</td>
<td>2</td>
<td>2.3</td>
</tr>
<tr>
<td><strong>Familiarity with ISTE standards</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>13</td>
<td>15.1</td>
</tr>
<tr>
<td>Somewhat</td>
<td>21</td>
<td>24.4</td>
</tr>
<tr>
<td>No</td>
<td>42</td>
<td>48.4</td>
</tr>
<tr>
<td>Missing</td>
<td>10</td>
<td>11.6</td>
</tr>
</tbody>
</table>

*Note. N = 86*
Table 4

Spearman’s rho Correlations of Age, Confidence Level, and Skill Level

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>--</td>
<td>-.16</td>
<td>-.25*</td>
</tr>
<tr>
<td>Confidence level</td>
<td>--</td>
<td>.74**</td>
<td></td>
</tr>
<tr>
<td>Skill level</td>
<td>--</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. N = 86

* Correlation is significant at the .05 level (2-tailed).
** Correlation is significant at the .01 level (2-tailed).

College or University Characteristics

The participants in this study represented all geographic areas of the conterminous United States. Teacher educators from 33 different states responded to the survey. Participants were asked whether they taught at a private or public college or university, as well as the size of the student body. Information regarding college or university characteristics can be found in Table 5.

Type of college or university. As of the 1997-98 school year, there were 311 colleges or universities offering bachelor's degrees in "home economics." The majority (65.9%) of them were public institutions (U.S. Department of Education, 2000). Nearly three fourths (71%) of the respondents were teaching at private colleges or universities.

Size of college or university. One respondent reported an enrollment of eight for the department. This was obviously an outlier and was removed from the data before the mean population was calculated. The reported enrollment ranged from 1,000 to 55,000 with a mean of 14,285 students. The college or university population...
Table 5

Demographic Characteristics of Colleges and Universities

<table>
<thead>
<tr>
<th>College or university characteristics</th>
<th>n</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of college or university</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private</td>
<td>71</td>
<td>82.6</td>
</tr>
<tr>
<td>Public</td>
<td>15</td>
<td>17.4</td>
</tr>
<tr>
<td>Size of college or university</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4,999 and under</td>
<td>18</td>
<td>20.9</td>
</tr>
<tr>
<td>5,000 to 19,999</td>
<td>40</td>
<td>46.5</td>
</tr>
<tr>
<td>20,000 and over</td>
<td>25</td>
<td>29.1</td>
</tr>
<tr>
<td>Missing</td>
<td>3</td>
<td>3.5</td>
</tr>
</tbody>
</table>

Note. N = 86

was divided into the following groups for ease of analysis: group one, 4,999 and under; group two, 5,000 to 19,999; and group three, 20,000 and over. The highest percentage (46.5%) of respondents had student populations between 5,000 and 20,000.

Family and Consumer Sciences Program Characteristics

The participants were asked about their FACS programs. Information was requested on the number of student teachers during the 2001-2002 school year and whether or not student teachers were required to complete a technology course prior to graduation. They were additionally asked about advanced degrees offered through their departments. Information regarding the FACS programs in the survey during the 2001-2002 school year can be found in Table 6.

Number of student teachers. There was a wide range in the number of student teachers in the various schools for the 2001-2002 school year. On average, there were
Table 6

Demographic Characteristics of FACS Programs

<table>
<thead>
<tr>
<th>FACS program characteristics</th>
<th>n</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highest degree offered</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bachelors</td>
<td>29</td>
<td>33.7</td>
</tr>
<tr>
<td>Masters</td>
<td>37</td>
<td>43.0</td>
</tr>
<tr>
<td>Ph.D.</td>
<td>20</td>
<td>23.3</td>
</tr>
<tr>
<td>Student teachers in 2001-2002</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-5</td>
<td>47</td>
<td>54.7</td>
</tr>
<tr>
<td>6-10</td>
<td>22</td>
<td>25.6</td>
</tr>
<tr>
<td>11-19</td>
<td>11</td>
<td>12.8</td>
</tr>
<tr>
<td>20 or more</td>
<td>4</td>
<td>4.7</td>
</tr>
<tr>
<td>Missing</td>
<td>2</td>
<td>2.3</td>
</tr>
<tr>
<td>Technology course required</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>71</td>
<td>82.6</td>
</tr>
<tr>
<td>No</td>
<td>12</td>
<td>14.0</td>
</tr>
<tr>
<td>Missing</td>
<td>3</td>
<td>3.5</td>
</tr>
</tbody>
</table>

Note. N = 86

six student teachers per program. Three respondents reported that they would have no student teachers during the school year, while one respondent expected to have 25 placed during the same period. The majority (80%) expected 10 or fewer student teachers, while 4.7% expected to have 20 or more students.

Advanced degrees offered in FACS department. All of the programs offered bachelor’s degrees in Family and Consumer Sciences. A majority (66.3%) of the departments offered master’s degrees while 23.3% offered Ph.D. programs.

Required technology education. Only 12 of the respondents reported that student teachers were not required to take a technology course. Over three fourths (82.6%) of the responding colleges and universities require a technology course prior
to graduation and certification.

Research Questions

A total of 11 research questions were investigated in the study. Data relative to these questions are presented in this section. Questions solicited information regarding the importance respondents placed on computer technology use in the secondary classroom as well as in their own classrooms. The FACS teacher educators' rating of their own computer skills, their knowledge of the ISTE standards, and the perceptions they had of their students' ability to meet the ISTE standards at two different and distinct points in their education were investigated. Additional questions were designed to ascertain types of electronic technology and applications that were incorporated, modeled, and/or required in FACS methods courses. Another topic of research was the support FACS teacher educators receive from their college or university for integration of computer technology into classes. Differences in the respondents, their various responses, and the number of responses received by mail versus the Internet were also investigated.

Research Question 1

How much importance do FACS teacher educators place on the use of computer technology in the secondary classroom? Respondents were asked to rate how important they felt it was for FACS secondary teachers to use computer technology in their classes. They responded to a 4-point Likert scale ranging from "strongly agree" to "strongly disagree." The majority (65.1%) responded "strongly
agree," 33.7% responded "agree," and none responded "disagree" or "strongly disagree."

Research Question 2

How much importance do FACS teacher educators place on the use of computer technology in their own classrooms? Most respondents agreed that it was important for them to use computer technology in their own classrooms. The majority (70.9%) indicated they "strongly agree" with the importance of including technology in their courses. An additional 27.9% responded "agree" and none responded "disagree" or "strongly disagree."

Research Question 3

How do FACS teacher educators rate their own computer skills? A majority (52.3%) of the respondents rated their computer skills as average or adequate. An additional 37.3% rated their skills as advanced or very advanced and only 8.2% rated their skills as limited or very limited. A summary of the teacher educators' perceived computer skills can be found in Table 3. In addition to evaluating their computer skills, respondents reported on their comfort levels when teaching or demonstrating computer technology in the classroom. On a 4-point Likert scale, the mean response was 3.07 where 4 means "strongly agree" and 1 means "strongly disagree." The majority (81.7%) reported that they were confident in this area.

Research Question 4

Which types of electronic technology are incorporated/modelled/required in
FACS methods classes? The most frequently used electronic technology was the IBM/PC computer. Respondents reported incorporating it into their course (69.8%), modeling it by the teacher (41.9%), and requiring its use by students (44.2%). Video observations were likewise incorporated (46.5%), modeled (23.3%), and required (31.4%). The respondents may have interpreted the term "video observation" as videotaping the students and then viewing and/or critiquing those videos. While this is a form of technology, it is not computer technology. Digital video observation is currently being used to supplement preservice classroom observations. This technology may allow students to view classrooms in action from various viewpoints as well as interact with the teacher. Other forms of video observation present case studies for students to view and then analyze as if they were the teacher (U.S. Congress, 1995; Willis & Mehlinger, 1996). The researcher anticipated this interpretation of video observation, but did not clarify it on the survey instrument. Due to the ambiguity of meaning for "video observation," this category should not necessarily be considered a computer technology.

The responding teacher educators also incorporated (30.2%), modeled (24.4%), and required (12.8%) the use of telecommunications (distance education). Smaller percentages reported incorporating, modeling and/or requiring the use of digital videos, video conferencing, Apple/Macintosh computers, laserdiscs, and other technologies. The other technologies most frequently cited were digital cameras, digital videos, and scanners. Information regarding the varying technologies used in FACS methods courses can be found in Table 7.
Table 7

*Electronic Technologies Incorporated/Modeled/Required in FACS Methods Classes*

<table>
<thead>
<tr>
<th>Technologies used</th>
<th>Incorporated into the course</th>
<th>Modeled by the teacher</th>
<th>Required of the students</th>
<th>Not available</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple/Macintosh computers</td>
<td>6 n</td>
<td>4 n</td>
<td>4 n</td>
<td>35 n</td>
</tr>
<tr>
<td>IBM/PC computers</td>
<td>60 n</td>
<td>36 n</td>
<td>38 n</td>
<td>4 n</td>
</tr>
<tr>
<td>Digital videos</td>
<td>14 n</td>
<td>19 n</td>
<td>5 n</td>
<td>23 n</td>
</tr>
<tr>
<td>Laserdiscs</td>
<td>4 n</td>
<td>5 n</td>
<td>4 n</td>
<td>36 n</td>
</tr>
<tr>
<td>Video conferencing</td>
<td>9 n</td>
<td>10 n</td>
<td>3 n</td>
<td>30 n</td>
</tr>
<tr>
<td>Telecommunications (distance education)</td>
<td>26 n</td>
<td>21 n</td>
<td>11 n</td>
<td>21 n</td>
</tr>
<tr>
<td>Video observations</td>
<td>40 n</td>
<td>20 n</td>
<td>27 n</td>
<td>10 n</td>
</tr>
<tr>
<td>Other</td>
<td>7 n</td>
<td>3 n</td>
<td>3 n</td>
<td>3 n</td>
</tr>
<tr>
<td>Total</td>
<td>166 n</td>
<td>118 n</td>
<td>95 n</td>
<td>162 n</td>
</tr>
</tbody>
</table>

*Note. N = 86*
Research Question 5

Which types of electronic applications are incorporated/modeled/required in FACS methods classes? The most frequently used electronic application was word processing. Respondents reported incorporating word processing into their course (66.3%), modeling it by the teacher (37.2%) and requiring its use by students (58.1%). The next most frequently used applications were e-mail, presentation software, and multimedia integration. E-mail was incorporated (62.8%), modeled (34.9%), and required (47.7%) in classes. Presentation software was incorporated (58.1%), modeled (45.3%), and required (47.7%) in the methods courses. A large percentage of the respondents reported they incorporated (40.7%), modeled (24.4%), and required (23.3%) multimedia integration (Web, CD-ROM, etc.). Smaller percentages reported incorporating, modeling, and/or requiring the use of desktop publishing, multimedia software, networking, databases, spreadsheets, web design, hypermedia software, applications management, and other technologies. The most frequently cited other technologies used were Internet/Ethernet connections, WebCt, Blackboard, online chats, and electronic assignment submission. Information regarding the varying applications used in FACS methods courses can be found in Table 8.

Research Question 6

The majority of the respondents felt that they received financial support, training, time, and emotional support and encouragement in using computer technology in their teaching. A summary of the support respondents received is found
Table 8

Electronic Applications Incorporated/Modeled/Required in FACS Methods Classes

<table>
<thead>
<tr>
<th>Applications used</th>
<th>Incorporated into the course</th>
<th>Modeled by the teacher</th>
<th>Required of the students</th>
<th>Unfamiliar with</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>Percentage</td>
<td>n</td>
<td>Percentage</td>
</tr>
<tr>
<td>Word processing</td>
<td>57</td>
<td>66.3</td>
<td>32</td>
<td>37.2</td>
</tr>
<tr>
<td>Desktop publishing</td>
<td>32</td>
<td>37.2</td>
<td>23</td>
<td>26.7</td>
</tr>
<tr>
<td>Spreadsheet</td>
<td>21</td>
<td>24.4</td>
<td>22</td>
<td>25.6</td>
</tr>
<tr>
<td>Database</td>
<td>24</td>
<td>27.9</td>
<td>17</td>
<td>19.8</td>
</tr>
<tr>
<td>Presentation software</td>
<td>50</td>
<td>58.1</td>
<td>39</td>
<td>45.3</td>
</tr>
<tr>
<td>Multimedia software</td>
<td>28</td>
<td>32.6</td>
<td>20</td>
<td>23.3</td>
</tr>
<tr>
<td>Hypermedia software</td>
<td>9</td>
<td>10.5</td>
<td>8</td>
<td>9.3</td>
</tr>
<tr>
<td>Networking</td>
<td>25</td>
<td>29.1</td>
<td>16</td>
<td>18.6</td>
</tr>
<tr>
<td>Media communications (e-mail)</td>
<td>54</td>
<td>62.8</td>
<td>30</td>
<td>34.9</td>
</tr>
<tr>
<td>Multimedia integration (Web, CD-ROM, etc.)</td>
<td>35</td>
<td>40.7</td>
<td>21</td>
<td>24.4</td>
</tr>
<tr>
<td>Web design</td>
<td>21</td>
<td>24.4</td>
<td>19</td>
<td>22.1</td>
</tr>
<tr>
<td>Applications management (licensing, updating, etc.)</td>
<td>7</td>
<td>8.1</td>
<td>8</td>
<td>9.3</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
<td>1.2</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Total</td>
<td>357</td>
<td>1.2</td>
<td>226</td>
<td>1.2</td>
</tr>
</tbody>
</table>

*Note. N = 86*
in Table 9. The greatest support respondents felt was in the financial area with 87.1% agreeing they received sufficient financial support. On a 4-point Likert scale, the mean response was 3.19, where 4 means "strongly agree" and 1 means "strongly disagree." The majority (83.5%) reported that they were provided with sufficient training to comfortably use computers and technology for teaching. On the same Likert scale, the mean response to this question was also 3.19. Emotional support and encouragement from their respective colleges or universities in the use of computer technology was reported by 78.6% of the respondents. The mean response was 3.02 on the Likert scale. Fewer of the FACS teacher educators felt like they were provided with the time necessary to utilize computers in teaching. Only 61.9% said they had sufficient time, while 37.2% disagreed with that statement. The mean response on the issue of time support was 2.76 on the Likert scale.

Since the four questions relating to support were highly correlated, with an alpha of .79, they were combined into one variable, identified as support, for further analysis. While the majority of the respondents reported support from their college or university for including computer technology for teaching, mildly statistically significant correlations were found between support and the variable of age, and confidence level. The correlation between support and age was statistically significant with Spearman’s rho of .24. Respondents reporting less support also reported lower confidence in their ability to teach and demonstrate computer skills in the classroom (Spearman’s rho of .32). The correlation table is found in Table 10.
Table 9

Support FACS Teacher Educators Receive from Their College or University for the Use of Computer Technology for Teaching

<table>
<thead>
<tr>
<th>Support received</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
<th>Likert score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>Percentage</td>
<td>n</td>
<td>Percentage</td>
<td>n</td>
</tr>
<tr>
<td>Financial support</td>
<td>28</td>
<td>32.6</td>
<td>46</td>
<td>53.5</td>
<td>10</td>
</tr>
<tr>
<td>Training</td>
<td>31</td>
<td>36.0</td>
<td>40</td>
<td>46.5</td>
<td>13</td>
</tr>
<tr>
<td>Time</td>
<td>14</td>
<td>16.3</td>
<td>38</td>
<td>44.2</td>
<td>30</td>
</tr>
<tr>
<td>Emotional support and encouragement</td>
<td>20</td>
<td>23.3</td>
<td>46</td>
<td>53.5</td>
<td>18</td>
</tr>
</tbody>
</table>

Note. N = 86
Table 10

Spearman's rho Correlations of Support and Age, Confidence Level, Skill Level, ISTE, 1 and ISTE 2

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>--</td>
<td>-.16</td>
<td>-.25*</td>
<td>.24*</td>
<td>-.23*</td>
<td>-.19</td>
</tr>
<tr>
<td>Confidence level</td>
<td>--</td>
<td>.74**</td>
<td>.32**</td>
<td>.37**</td>
<td>.23*</td>
<td></td>
</tr>
<tr>
<td>Skill level</td>
<td>--</td>
<td>.20</td>
<td>.31**</td>
<td>.24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Support</td>
<td>--</td>
<td>.19</td>
<td>.16</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ISTE 1</td>
<td>--</td>
<td></td>
<td>.78**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ISTE 2</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. N = 86

* Correlation is significant at the .05 level (2-tailed).
** Correlation is significant at the .01 level (2-tailed).

Research Question 7

Are FACS teacher educators aware of the International Society for Technology in Education (ISTE) standards? Almost half (48.8%) of the respondents reported no familiarity with the ISTE standards. Nearly one quarter (24.4%) answered that they were “somewhat” familiar with the standards. Only 15.1% expressed a familiarity with the ISTE standards and performance indicators. A summary of the teacher educators’ awareness of the ISTE standards can be found in Table 3.

Research Question 8

How do FACS teacher educators perceive their students’ ability to meet the ISTE standards at two different and distinct points in their education? On a 4-point Likert scale, the majority of the respondents agreed that their preservice students were able to meet the ISTE standards. The average for the first profile, abilities of the students upon completion of the general preservice preparation component of their
program was 2.79, where 4 means "strongly agree" and 1 means "strongly disagree." Using the same scale, the mean for the second profile, abilities of the students prior to the culminating student teaching or internship experience, was 2.48. Respondents perceived their preservice students to be most prepared (mean of 3.50 on the Likert scale) in the ability to locate information from a variety of sources. The standard dealing with positive attitudes towards technology received the next highest rating from the teacher educators. There were some individual standards that respondents felt their students were less prepared in or they were unaware of the students' preparedness levels. These were standards in the following areas: ability to construct technology-enhanced models, ability to solve routine hardware and software problems, identify issues related to equitable access to technology, evaluation of technology-based student products, and using a variety of media/formats to publish. The lowest standard on the scale, with a mean of 2.35, was in using a variety of media/formats to publish with experts in the field.

In addition to examining the individual ISTE standards, it was determined that further analysis would be enhanced if the responses to the ISTE portion of the survey were combined into two new categories. Since the questions relating to the two ISTE standards were highly correlated, with an alpha of .92 for the first profile and .95 for the second profile, this was possible. Responses to individual standard questions were combined into two variables, identified as ISTE 1 and ISTE 2. This allowed for correlations with the support, age, and skill variables. The ISTE 1 and ISTE 2 scores were highly correlated with a Spearman's rho of .78 (see Table 11). Preservice
students perceived to be able to meet one set of performance standards were also perceived able to meet the other set.

**Research Question 9**

Is the profile of Internet respondents different than that of print respondents? Those returning the survey by mail were compared to those who completed the survey on-line. Modes were used to compare type of college or university, advanced degrees offered in their department, and technology course requirements. There were no differences between the mail and Internet respondents.

Medians were used to compare Internet and mail respondents on the highest degree received, respondent's age, knowledge of the ISTE standards, and student body size of the college or university. There were no differences between mail and Internet respondents except in the area of age. Internet respondents were younger (median of 3.00 rather than 4.00). Modes and medians are summarized in Table 12.
Table 12

Mode and Median Comparisons of Mail and Internet Respondents

<table>
<thead>
<tr>
<th>Variables</th>
<th>Internet respondents</th>
<th>Mail respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>Median</td>
</tr>
<tr>
<td>Type of university/college</td>
<td>86</td>
<td>2.00</td>
</tr>
<tr>
<td>Master's offered</td>
<td>86</td>
<td>1.00</td>
</tr>
<tr>
<td>Ph.D. offered</td>
<td>86</td>
<td>0.00</td>
</tr>
<tr>
<td>Technology course required</td>
<td>83</td>
<td>1.00</td>
</tr>
<tr>
<td>Highest degree of teacher</td>
<td>85</td>
<td>3.00</td>
</tr>
<tr>
<td>Age of teacher</td>
<td>84</td>
<td>3.00</td>
</tr>
<tr>
<td>ISTE knowledge</td>
<td>76</td>
<td>3.00</td>
</tr>
<tr>
<td>Enrollment (grouped)</td>
<td>83</td>
<td>2.00</td>
</tr>
</tbody>
</table>

Note. N = 86

A t test was used to compare continuous variables for mail and Internet respondents. There were no statistically significant differences between the two groups of respondents. The t test is summarized in Table 13.

Research Question 10

Do response rates differ between Internet and print respondents? After
Table 13

Results of t-Test Comparison of Mail and Internet Respondents

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mailed respondents</th>
<th>Internet respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$n$</td>
<td>Mean</td>
</tr>
<tr>
<td>Student teachers</td>
<td>52</td>
<td>6.06</td>
</tr>
<tr>
<td>Years teaching</td>
<td>48</td>
<td>11.24</td>
</tr>
<tr>
<td>Comfort level</td>
<td>52</td>
<td>3.04</td>
</tr>
<tr>
<td>Skill level</td>
<td>51</td>
<td>3.33</td>
</tr>
</tbody>
</table>

Note. $N = 86$

removing the members of the database no longer teaching FACS methods courses, each group consisted of 104 potential participants. Fifty-three surveys were returned by mail and 33 were returned via the Internet. Respondents receiving the mailed survey returned them at a rate of 51.0%. Only 31.7% of the Internet respondents returned the survey. A two-tailed $z$ test was used to determine significance with a resulting $z$ score of 2.84. With a $p$ value of .037, this was significant. This population is much more likely to complete and return a survey received in the mail than to complete one located on the Internet.

Research Question 11

Are the results obtained from Internet respondents different than the results
obtained from print respondents? A t test was used to compare responses of mail and Internet respondents on the ISTE standards and the variable of support. The t test is summarized in Table 14. There were no statistically significant differences in the responses between the participants who completed the survey by Internet and those who returned it by mail. However, when the means of the two groups on the ISTE standards are compared, the mean scores for those completing the survey on-line were consistently lower (the students were better prepared to meet the ISTE standards) than for those completing the mailed survey. In addition, Internet respondents reported less support than did mail respondents. While these differences were not statistically significant, it may suggest a trend and the need for further study with a larger population.

Table 14

Results of t Test Comparison of Mail and Internet Responses and ISTE1, ISTE 2, and Support

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mailed Respondents</th>
<th>Internet Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>Mean</td>
</tr>
<tr>
<td>Support</td>
<td>52</td>
<td>12.17</td>
</tr>
<tr>
<td>ISTE 1</td>
<td>51</td>
<td>104.69</td>
</tr>
<tr>
<td>ISTE 2</td>
<td>51</td>
<td>97.51</td>
</tr>
</tbody>
</table>

*Note. N = 86*
Testing of Research Hypotheses

Four research hypotheses were tested. Hypothesis 1 consisted of three parts while Hypothesis 2 had four parts. Hypothesis 1 was formulated to determine if there were significant relationships between the preparedness of FACS preservice students to meet the ISTE standards and college or university type (public or private), size of the college or university, and size of the FACS program as measured by the number of student teachers in the current (2001-2002) school year. Hypothesis 2 sought to determine if there were significant relationships between the preparedness of FACS preservice students to meet the ISTE standards and the teacher demographics of age, gender, highest degree earned, and years of teaching FACS methods courses.

Hypotheses 3 and 4 dealt with the differences between responses to on-line and print survey formats. Hypothesis 3 was formulated to determine if there were differences between the response rates of FACS teacher educators to an Internet survey versus a printed survey. Hypothesis 4 sought to determine if the responses of FACS teacher educators would be different if they completed the survey on-line versus in a printed and mailed format.

Hypothesis 1

There will be no significant difference between the type of college/university (public or private), size of the college/university, and size of the FACS program and the preparedness of their students to meet the ISTE standards. One-way ANOVAs were used to analyze the data pertaining to type (public or private) and size of the
college or university. There were no statistically significant differences between public and private colleges or universities or the student body size of the college or university and the preparedness of FACS preservice teachers to meet the two ISTE profiles. For ease of analysis, enrollment was divided into three groups, under 5,000, 5,000 to 19,999, and 20,000 and over. The ANOVA for enrollment groups and ISTE scores is found in Table 15. The ANOVA for public or private and ISTE scores is found in Table 16.

Since the number of student teachers was used to determine the size of the FACS program, correlations were run between these data and ISTE scores. There were

Table 15

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group</th>
<th>n</th>
<th>Mean</th>
<th>Standard deviation</th>
<th>Source of variance</th>
<th>df</th>
<th>Mean square</th>
<th>$F$</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISTE 1</td>
<td>Group 1</td>
<td>16</td>
<td>106.06</td>
<td>21.56</td>
<td>Between groups</td>
<td>2</td>
<td>160.27</td>
<td>.27</td>
</tr>
<tr>
<td></td>
<td>Group 2</td>
<td>37</td>
<td>103.95</td>
<td>23.41</td>
<td>Within groups</td>
<td>73</td>
<td>588.64</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Group 3</td>
<td>23</td>
<td>100.48</td>
<td>27.19</td>
<td>Total</td>
<td>75</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>76</td>
<td>103.34</td>
<td>24.03</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ISTE 2</td>
<td>Group 1</td>
<td>16</td>
<td>92.56</td>
<td>31.08</td>
<td>Between groups</td>
<td>2</td>
<td>69.97</td>
<td>.10</td>
</tr>
<tr>
<td></td>
<td>Group 2</td>
<td>37</td>
<td>95.76</td>
<td>25.43</td>
<td>Within groups</td>
<td>72</td>
<td>709.14</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Group 3</td>
<td>22</td>
<td>93.50</td>
<td>25.15</td>
<td>Total</td>
<td>74</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>75</td>
<td>94.41</td>
<td>26.30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note. N = 86*
no statistical differences between the size of the FACS program and the students’ preparedness to meet the ISTE standards. The correlations are found in Table 17. Hypothesis 1 was supported.

Table 16

*Relationship Between Private or Public College or University and ISTE Scores*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Public</th>
<th>14</th>
<th>104.00</th>
<th>22.31</th>
<th>Between groups</th>
<th>1</th>
<th>15.34</th>
<th>.03</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Private</td>
<td>65</td>
<td>102.85</td>
<td>24.47</td>
<td>Within groups</td>
<td>77</td>
<td>581.69</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>79</td>
<td>103.05</td>
<td>23.97</td>
<td>Total</td>
<td>78</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ISTE 2

<table>
<thead>
<tr>
<th>Variable</th>
<th>Public</th>
<th>14</th>
<th>87.93</th>
<th>32.20</th>
<th>Between groups</th>
<th>1</th>
<th>708.35</th>
<th>1.00</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Private</td>
<td>64</td>
<td>95.78</td>
<td>25.28</td>
<td>Within groups</td>
<td>76</td>
<td>706.92</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>78</td>
<td>94.37</td>
<td>26.59</td>
<td>Total</td>
<td>77</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note. N = 86*

Table 17

*Spearman’s rho Correlations of FACS Program Size and ISTE Scores*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Spearman’s rho</th>
<th>Student teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISTE 1</td>
<td>Coefficient</td>
<td>-0.01</td>
</tr>
<tr>
<td>n</td>
<td>79</td>
<td></td>
</tr>
<tr>
<td>ISTE 2</td>
<td>Coefficient</td>
<td>-0.02</td>
</tr>
<tr>
<td>n</td>
<td>78</td>
<td></td>
</tr>
</tbody>
</table>

*Note. N = 86*
Hypothesis 2

There will be no significant difference between the number of years of teaching FACS methods courses, the teachers' highest degree, gender, and age and the preparedness of their students to meet the ISTE standards. A Spearman's rho correlation was used to analyze the data pertaining to Hypothesis 2. There were no statistically significant differences between a FACS teacher educator's age, highest degree earned, and years of teaching FACS methods courses and the preparedness of FACS preservice teachers to meet the two ISTE profiles. Since there were no gender differences among the respondents, the gender variable was not included in the analysis. The correlations are found in Table 18. Hypothesis 2 was supported.

Hypothesis 3

There will be no significant difference between the response rate of teachers to an on-line survey versus a print format. A two-tailed \( z \) test was used to analyze the data pertaining to Hypothesis 3. The resulting \( z \) score was 2.84, with a \( p \) value of .04. These respondents are more likely to complete surveys they receive in a printed and

<table>
<thead>
<tr>
<th>Variable</th>
<th>Spearman's rho</th>
<th>Years teaching</th>
<th>Highest degree</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISTE 1</td>
<td>Coefficient</td>
<td>-.11</td>
<td>-.04</td>
<td>-.23</td>
</tr>
<tr>
<td></td>
<td>( n )</td>
<td>74</td>
<td>79</td>
<td>78</td>
</tr>
<tr>
<td>ISTE 2</td>
<td>Coefficient</td>
<td>-.18</td>
<td>-.08</td>
<td>-.19</td>
</tr>
<tr>
<td></td>
<td>( n )</td>
<td>73</td>
<td>78</td>
<td>77</td>
</tr>
</tbody>
</table>

Note. \( N = 86 \)
mailed format than surveys they are asked to complete on the Internet. There was a statistically significant difference between the response rates. Hypothesis 3 was not supported.

Hypothesis 4

There will be no significant difference between the responses of those replying on-line versus those replying by mail. A $t$ test was used to analyze the data pertaining to Hypothesis 4. No statistically significant differences were found between the responses of those replying to the Internet survey and those returning the printed and mailed survey. The results of the $t$ test are found in Table 19. Hypothesis 4 was supported.

Table 19

*Independent Samples Test of Internet and Mailed Responses and ISTE 1 and 2*

<table>
<thead>
<tr>
<th>Variable</th>
<th>$n$</th>
<th>Mean</th>
<th>Standard deviation</th>
<th>$df$</th>
<th>$t$</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISTE 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mailed</td>
<td>51</td>
<td>104.69</td>
<td>22.77</td>
<td>77</td>
<td>.82</td>
</tr>
<tr>
<td>Internet</td>
<td>28</td>
<td>100.07</td>
<td>26.17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ISTE 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mailed</td>
<td>51</td>
<td>97.51</td>
<td>27.20</td>
<td>76</td>
<td>1.44</td>
</tr>
<tr>
<td>Internet</td>
<td>27</td>
<td>88.44</td>
<td>24.81</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note. $N = 86$*
Summary

This study examined computer usage in FACS methods classes and the perceived abilities of preservice FACS students to meet the ISTE standards, as reported by teacher educators. A survey instrument titled "Technology Survey for Family and Consumer Sciences Teacher Educators" (see Appendix C) was developed and sent to all identified FACS teacher educators in the United States. A total of 86 teacher educators responded to the survey. A majority (98.8%) of the respondents felt it was important that computer technology be included in the secondary classroom. An even larger percentage (98.8%) agreed that computer technology should be a part of their own classroom experience.

In general, FACS teacher educators rate their computer skills as average or above (89.6%) with only a small percentage (8.2%) reporting limited abilities. The majority (81.4%) of the respondents reported confidence in their ability to use computer technology in the classroom. The most frequently used technology, either by the teacher educators or the preservice students, was the PC computer. Word processing, followed closely by e-mail, presentation software, and multimedia integration, was the most frequently used computer application by both teacher educators and their preservice students. Most respondents felt they received support of various kinds from their college or university for including technology into their courses. The greatest assistance was felt in the area of financial support while the lowest rate was in time support. Younger respondents reported less support than did older respondents. Teacher educators that reported receiving less support from their
college or university rated both their skill levels and their students' ability to meet the ISTE standards lower.

Almost half (48.8%) of the responding teacher educators had no familiarity with the ISTE standards. However, the perceived ability of their preservice students to meet the ISTE standards was fairly high. Preservice students were rated highest in the ability to locate information from a variety of sources and lowest in the ability to publish with experts in the field, using a variety of media and formats.

There was no difference found in the demographics or the responses of the teacher educators that returned the survey by mail and those that completed it over the Internet. There was, however, a significant difference in the response rate. Teacher educators were much more likely to return mailed surveys than complete them via the Internet.

The study had four hypotheses. In testing them, it was found that there were no relationships between the perceived ability of preservice students to meet the ISTE standards and the type of college or university, the size of the college or university, or the size of the FACS program. Likewise, there were no relationships between the perceived ability of preservice students to meet the ISTE standards and the teacher educators' length of time teaching FACS methods courses, highest earned degree, gender, or age. There was a difference in the response rate of teacher educators to on-line versus printed and mailed surveys. The respondents were much more likely to return mailed surveys than they were to complete the same survey on-line. The fourth hypothesis examined the responses of those completing the survey by mail and on-
line. There was no difference in the responses of the two groups.
CHAPTER 5
SUMMARY AND CONCLUSIONS

The purposes of this chapter are to summarize the study, identify major findings, and state conclusions which can be drawn from the analyses and interpretation of the data. Recommendations for further research are also presented.

Overview of the Problem

Computers are standard features in American schools. Teachers are not only encouraged to use computers to improve their own productivity, but also for the teaching of content. In order for new teachers to be prepared in both of these areas, it is critical they receive training in the use of computer technology during their preservice education (U.S. Congress, 1995). Constructivist theory suggests that preservice teachers will learn to teach content with computer technology by observing others teaching with technology and actually creating lesson plans and using computers themselves (Vannatta & Beyerbach, 2000).

The National Council for Accreditation of Teacher Education (NCATE), the governing accreditation body for many schools and colleges of education, established new accreditation standards in 2001. These require the infusion of technology throughout the preservice education of future teachers (NCATE, 2001a). The International Society for Technology in Education (ISTE) received a grant to develop standards and performance profiles that would enumerate what preservice and beginning teachers should be able to do with technology (ISTE, 2000). While many
education programs require students to complete a technology course, methods courses are a much better fit for teaching the use of computers in content areas (U.S. Congress, 1995; Willis & Mehlinger, 1996). Previous studies have shown that Family and Consumer Sciences (FACS) teachers are motivated to incorporate computer technology into their courses (Croxall, 1998; Simerly et al., 2000; Way & Montgomery, 1995).

While previous studies have been done to assess the use of computer technology in preservice education programs, many of them collected data from administrators or technology facilitators rather than actual methods teachers. In addition, recent studies have been narrow in scope, usually assessing technology usage in a limited location. No studies have been found that report computer technology usage in FACS methods classrooms by teacher educators themselves.

This study addressed current issues regarding the use of computer technology in FACS methods courses. A nationwide census of FACS teacher educators was undertaken to gain a broad perspective and establish a baseline for future research. The major purposes were to determine the importance FACS teacher educators place on the use of computer technology in both the secondary classroom and their own classrooms, how FACS teacher educators rate their own computer skills, and what types of computer technology and applications they utilize in their classes, model for their students, and require preservice students to use. The study also explored the support teacher educators feel they receive from their colleges and universities for using computer technology in teaching. Teacher educators were asked about their
personal familiarity with the ISTE standards and their perceptions of preservice students' ability to meet the first two profiles of the ISTE standards.

The Internet is being explored by some as a means of conducting research. Time and money savings are cited as advantages for conducting surveys via the Internet (Schmidt, 1997; Thach, 1995; Watt, 1997). Little research has been done comparing survey research done via the Internet versus that done by means of a printed and mailed format. This study addressed the feasibility of conducting research using targeted e-mails and an Internet survey for FACS teacher educators. The survey instrument was developed in two formats, on-line and printed. Half the population received the printed survey while the other half received an e-mail message asking them to complete the survey on-line. The purpose of this portion of the study was to determine if the profile of Internet respondents was different than print respondents, how the response rates differ between the two groups of respondents, and what differences, if any, there were between the responses given by teacher educators to a printed and mailed format of the survey versus an on-line format.

The relationships between teacher educators' perceptions of preservice students' abilities to meet the ISTE standards and the type of college or university (public or private), the student body size of the institution, and the size of the FACS department were examined. The study also explored the relationships between the FACS teacher educators years of teaching FACS methods courses, highest degree earned, gender, and age and their perceptions of preservice students abilities to meet the ISTE standards. Differences in the response rate and responses of those returning
the survey through the mail and those completing it on-line were examined.

Procedures of the Study

The researcher developed a survey instrument titled "Technology Survey for Family and Consumer Sciences Teacher Educators" (see Appendix C) based on the first two profiles of the ISTE standards (see Appendix A). The population was randomly divided into two groups. One group received the survey in a printed format through the U.S. Postal system. The other group received an e-mail message containing a link to the survey on-line and asking them to complete the survey. Data from 86 FACS teacher educators in all regions of the U.S. were analyzed for this study. Information gathered from this survey was used to answer 11 research questions and test four hypotheses.

Conclusions and Implications

This study addressed four general limitations cited from previous research. A nationwide census was done, rather than a study limited in geographic scope and therefore application. Responses were received from 33 different states and 78 colleges and universities. Despite a limited response rate of 41% for this study, previous nationwide surveys reported response rates of 34% (Moursund & Bielefeldt, 1999), 20% (Willis, et al., 1995) and 8% (Poftak, 1999). Such a comparison suggests that 41% is a respectable return rate for a national census of this nature.

With the exception of Vannatta and Beyerbach (2000), previous studies dealt
with limited computer technology and applications. Some looked at Internet use (Di et al., 2000; Johnson-Gentile, et al., 2000; Owens, 1999; Ropp, 1999), multimedia applications (Green & Cohen, 1998; Johnson-Gentile et al., 2000; Omorogie & Coleman, 1997), productivity applications (Halpin, 1999), and student attitudes (Yildirim, 2000). Other research highlighted a lack of study dealing with emerging technology (Infusing technology, 2001; Kemp et al., 2000). This study was designed to include up-to-date technology, including distance education, video observation (Willis & Mehlinger, 1996; U.S. Congress, 1995), web design, and application management. Productivity applications, the Internet, PC computers, and e-mail were the most frequently used technology by both teacher educators and preservice students. It is important that teacher educators begin to use and require practice with more of the emerging technology now available.

The third identified limitation of previous research was a lack of response from actual methods teachers (Moursund & Brelifeldt, 1999; Poftak, 1999; Queitzsch, 1997; Willis & Mehlinger, 1996). Some studies exhibited a lack of consistency in respondents (Moursund & Brelifeldt) while others failed to report respondent job descriptions (Poftak, Queitzsch). A major factor of the current study was the selection of FACS teacher educators as the target population. The survey instrument was sent directly to FACS teacher educators at their school address, either mail or e-mail. In addition, survey recipients who were not FACS teacher educators were asked to either return the survey or forward it to the current teacher educator within the department. While this limited the possible respondent population and response rate, it assured that
actual teacher educators were reporting what was happening in their own classes.

A fourth limitation of previous research was a lack of data relating to FACS teacher education. Given the need to incorporate technology into FACS classes (Fedje, 1998; Simerly et al., 2000), it is vital to understand the current level of computer technology use in preparing preservice FACS students to teach with technology. This study provides baseline information on computer technology use in FACS methods courses. Information is provided on current technology being used as well as attitudes, skills, and comfort levels of FACS teacher educators when dealing with computer technology.

Based on the findings and interpretation of data, the following conclusions were drawn from this study of FACS teacher educators' use of computer technology in methods courses. Conclusions were also drawn from this study about the ability of FACS preservice students to meet current ISTE standards in the first two profiles of teacher preparation. Implications of these findings for teacher educators, administrators, and professional associations are identified.

All of the respondents felt it was important that FACS secondary teachers use computer technology in their classes. In order for future teachers to be prepared to do so, they must receive training in teaching content with technology (NCATE, 1997; NCATE, 2001a; Willis & Mehlinger, 1996; U.S. Congress, 1995). Future teachers need to be prepared in the applications and technology that will enable them to successfully teach the various FACS content areas in the most effective manner, including the use of computers. Currently most preservice students are required to pass
a technology course, but often the focus in these courses is on productivity software or dealing with hardware (Rosenthal, 1999; U.S. Congress, 1995; Yildirim, 2000). Since stand-alone technology courses do not produce an ability to teach with technology (Kemp et al., 2000; Moursund & Bielefeldt, 1999), it is vital to include additional preparation for preservice students. Technology uses vary, depending on the subject being taught (Willis & Mehlinger, 1996), so the best person to facilitate this learning for FACS preservice students is the FACS teacher educator. The best place to teach the implementation of technology into teaching is the FACS methods course (Vannatta & Beyerbach, 2000; Way & Montgomery, 1995; Willis & Mehlinger). This is not being done with any consistency in the methods courses of respondents to this survey. Less than half (44%) of the respondents require the use of any electronic technology by their methods students. Just over half of the respondents (58%) require students to use word processing with all other applications required less frequently (48% require e-mail and presentation software, 23% multimedia integration). More than one teacher educator reported, "This is not all appropriate to our methods courses but would be included in the tech course in the Ed. Dept." or "Covered in other courses not methods." This is consistent with what the Office of Technology Assessment found when they reported that technology is viewed as a "separate type of content, rather than as something that should or could be integrated into a content area" (U.S. Congress, 1995, pp. 189-190). With the emphasis on integration of technology across the curriculum (ISTE, 2000; NCATE, 2001a), it is imperative that FACS teacher educators also teach about and require their students to become
proficient in using and teaching with technology.

With all of the respondents also reporting that it was important to use technology in FACS methods courses, it was hoped and expected that they were doing so. This positive attitude toward incorporating technology confirmed the findings of Kemp et al. (2000), U.S. Congress (1995), and Willis et al. (1995) who found that teacher educators in general regard technology as an important element in teacher education. This study found that, to a limited extent, teacher educators are incorporating technology into methods courses. However, preservice students are most likely to see the use of IBM/PC computers (42%) or distance education (24%) technologies and presentation software (45%), word processing (37%), e-mail (35%), or multimedia ((24%) modeled in FACS methods courses. These are very limited uses of computer technology, particularly if the goal is to empower preservice students to teach FACS content using computer technology. Teacher educators need to understand the importance of modeling technology instruction (Vannatta & Beyerbach, 2000) and requiring preservice students to become proficient in using and teaching with technology. One respondent commented, "I know what [all] these [computer applications] are but do not use all of them." Her students were only required to use word processing and desktop publishing in class.

The findings regarding responding FACS teacher educators' perceptions of the support they receive from their college or university in regards to computer technology are important. It should be remembered that the perceptions of responding teacher educators and their administrators might not be the same. Responding teacher
educators reported receiving various types of support for integration of technology into teaching. The majority (87%) felt they had sufficient financial support with smaller percentages reporting sufficient training, emotional support and encouragement, and time to incorporate technology into teaching. Several studies have emphasized the need for increased professional development for faculty (CEO Forum on Education and Technology, 2000; Moursund & Bielefeldt, 1999; U.S. Congress, 1995; Willis & Mehlinger, 1996). Just as preservice students learn through a constructivist approach, so do teacher educators. The U.S. Congress mentioned the specific need to provide training in teaching with technology since most education faculty were already proficient with a computer for productivity uses. Teacher educators need to continue seeking out the computer training they lack. At the same time, it is important that administrators be sensitive to their continuing needs in the various areas of support.

The greatest need for continuing support was in the area of time to find ways to share emerging technologies with their students with 37% expressing a need in this area. Previous studies (U.S. Congress, 1995; Vannatta & Beyerbach, 2000) have highlighted the time commitment required to integrate technology into teaching. Jerry Willis and other's study (as cited in U.S. Congress, 1995) quoted one respondent regarding this situation.

At a major university, rewards come only to those who do research and writing. No time is available to retool (learn the necessary skills) and restructure classes accordingly. It's an exciting time in the development of
more advanced instructional technology. Released time for hands-on
information immersion would be exciting. (p. 191)

It is important that teacher educators find time to improve their teaching
techniques to include technology. In addition, administrators should recognize the
time constraints in restructuring classes to include computer technology, rewarding
teacher educators who develop these skills.

There was a mild correlation (-.26) between age and perceived support.
Younger respondents reported less support than did older respondents. The reasons for
this are unknown. It was not surprising to find that those reporting lower support also
reported lower skill and comfort levels when using computer technologies.

With the majority (52%) of the respondents reporting average computer skills,
there is some indication that continued training in computer technology would be
welcome. It is encouraging to find only 8% reporting limited computer skills. There
are still teacher educators who feel intimidated by technology. One of the non-
respondents commented: "If it was on-line I would have printed it out to complete. I'm
not in a computer mode." While she rated her skills as limited, she is certainly not an
isolated case. A weak correlation (.25) was found between the age of the respondent
and her reported computer skill level. Older respondents rated their computer skills
lower than did younger respondents. Since less than half of the respondents were
incorporating technology beyond word processing, e-mail, and presentations into their
class work, there is an indication that even those reporting average computer skills
would benefit from training in incorporating technology into teaching. As the U.S.
Congress (1995) concluded:

Since the majority of teacher education faculty completed graduate programs and taught in schools where technology was not a major part of the educational environment, it is not surprising that they tend to have limited experience with technologies for instruction. (p. 190)

It is expected that FACS teacher educators are similar to other teacher educators in this area. They would likely benefit from continued training, support, and encouragement in areas involving computer technology, especially in developing and improving the skills necessary for teaching or demonstrating technology to preservice students.

Respondents reporting lower amounts of support for technology in the classroom rated preservice students lower on the ISTE standards. Since many of the technology classes preservice students complete are outside FACS departments, this may reflect a lack of support for technology in education as a whole. McCoy (1999), CEO Forum (2000), Moursund and Bielefeldt (1999) and U.S. Congress (1995) all commented on the lack of funding for technology in colleges and departments of education. Paul Resta’s study (as cited in U.S. Congress) found that "colleges of education are often at the very bottom of their universities' priority lists for equipment funding" (p. 187).

Most SCDEs [schools, colleges, and departments of education] receive over half (54% on average) of their funding from the institution as a whole. Thus, support translates into the dollars needed for building the human and
technological infrastructure of the teacher education program. It also means
giving the SCDE the green light to seek financial support from those donors
(foundations and businesses) whose support has typically been targeted for
business, engineering, computer sciences, and other high visibility programs
and departments on campus. (CEO Forum, 2000, University Chancellors
section, ¶2)

Beck and Wynn (2001) reported that "federal and state monies that have been
made available for educational technology advancements and professional
development have not been accessible to higher education" (Support for Change
section, ¶1). The CEO Forum reported that "in most SCDEs, the ratio of students to
computers is approximately 10 to 1, higher than the 7 to 1 ratio in higher education
overall" (SCDE Infrastructure section, ¶1). Willis and Mehlinger (1996) reported that
"data suggested that teacher education programs at public colleges and universities
received less than their proportional share of the computer funds" (p. 982). Funding
for higher education varies widely among the states. It would be impossible to break
down funding, even technology funding, to see exactly where it is used and in what
capacity. As a result, no correlation can be drawn between reported perceptions of
support and actual support received. This situation should be remedied through
increased funding for technology and training for all teacher educators.

Given the strong correlation (.74) between skill level and confidence level to
teach or demonstrate computer technology in the classroom, it is important that those
teacher educators desiring to improve their skills be given the opportunity to do so.
This opportunity should be provided through training offered by their college or university, as recommended by the CEO Forum on Education and Technology (2000), Moursund and Bielefeldt (1999), U.S. Congress (1995), Willis and Mehlinger (1996). Teacher educators need to make the effort to seek out available training and help, but administrators need to ensure it is available for all college or university faculty.

Preparing teacher educators to teach with technology should also become an integral part of professional organizations. "Organizations such as NCATE and ISTE, through their roles in establishing and disseminating standards for educational technology, have an important part to play in encouraging and facilitating change" (Moursund & Bielefeldt, 1999, p. 24). Organizations (NCATE and ISTE) that expect teacher educators to prepare technology-proficient teachers should ensure that all teacher educators are familiar with not only the standards themselves but also the importance of integration of technology across the teacher education curriculum. It is equally vital that leaders in the FACS profession take an active role in promoting the use of computer technology to teach FACS content. Moursund and Bielefeldt recommended that "in order to provide models for change, researchers, professional societies, and education agencies should, on an ongoing basis, identify, study, and disseminate examples of effective technology integration that reflect the current needs in both teacher education and K-12 schools" (p. 24). Exemplary teachers should be identified and invited to share their curriculum and student activities with other teacher educators in state and national meetings. Teaching techniques and ideas highlighting current technologies that help prepare preservice students should also be
shared through professional publications. While some exemplary programs have been identified (Beck & Wynn, 2001; U.S. Congress, 1995; Vannatta & Beyerbach, 2000; Willis & Mehlinger, 1996), none include FACS programs. Teacher educators need to see how computer technology and applications fit into the FACS classroom.

The creation of websites that not only organize Internet information into usable formats but also contain lesson plan ideas and teaching techniques specific to FACS content are beneficial (personal communication with Denise Musick, December 11, 2001; Sanders et al., 1999). While websites have been created by individuals, it would be helpful to compile a list of these sites and make it readily available to a wider audience, perhaps through the websites of professional organizations.

A majority (70%) of teacher educators reported using IBM/PC computers for their methods courses. There was a small group (7%) that used and reportedly required their students to use Apple/Macintosh computers. From the results of this study, it is impossible to determine if students were actually required to use specific types of computers or were just required to complete work on the computer, with responses reflecting the predominant type of computer available on campus for student use. However, it is clear that future programming developed for use in FACS secondary or college classrooms should be available in a PC format and possibly available for Macintosh computers as well.

Video observations were widely used by responding teacher educators (47%). Due to the ambiguity in interpretation of "video observation," no conclusions can be drawn as to the types and uses of video in FACS methods classrooms. It seems likely
that respondents were reporting the use of video to record student activities for later evaluation and observation. While this is not computer technology, it is a valid and credible constructivist teaching technique. More research is needed in this area before further conclusions can be drawn.

With the exception of telecommunication and distance education, FACS teacher educators do not appear to be using emerging computer technology in their methods classrooms. Some few respondents were using scanners (1), digital cameras (2), laserdiscs (4), and video conferencing (9), but most were not. Some reported that specific technologies such as laserdiscs (42%), Apple/Macintosh computers (41%), video conferencing (35%), digital videos (27%), and telecommunications (24%) were not available for their use. This may be due to a scarcity of funding with which to purchase and update equipment or a lack of interest in these technologies. This was a problem Vannatta and Beyerbach (2000) encountered during the first year of their study. As one respondent commented, "Our dept. (FCS) has limited technology available for student exposure—most done in computer labs on campus or in education dept." A lack of knowledge and training regarding newer technologies on the part of the teacher educators could also be a factor in their restricted use. Vannatta and Beyerbach found that use of emerging technologies by teacher educators increased substantially with training in not only the use of technology but practice and support in developing lesson plans and teaching strategies to use technology in methods classes. Teacher educators need to be proactive in seeking access to emerging technologies for their classrooms as well as the necessary training to successfully teach with them.
Administrators need to ensure technology and training are available.

Responding FACS teacher educators use a wide variety of electronic applications in their methods courses. Not surprisingly, productivity programs such as word processing (66%) are the most frequently used. This type of program is also the most often required of preservice students by their methods instructors (58%). Both teacher educators and preservice students made frequent use of e-mail for communication (63% and 48%, respectively). Presentation software was the application most often modeled (45%) in FACS methods courses.

Often, in a desire to upgrade available technology, software applications are overlooked in favor of hardware (personal communication with Dorothy Reese, FACS teacher, 1996). Croxall (1998) found that many FACS secondary teachers were unfamiliar with software that could be used for teaching FACS content. While FACS teacher educators appear familiar with general computer applications, many programs designed to facilitate the teaching of content by secondary teachers were underused in methods classes. These include hypermedia software (11%), spreadsheets (24%), databases (28%), and web design (24%). It is important that FACS teacher educators become familiar with these and other emerging applications. This will enable them to share the potential of an increasing variety of technologies with preservice students.

Simerly et al. (2000) identified the "use of, and accessibility to current and emerging technologies" as a major concern for FACS professionals (p. 80). It is vital not only to provide teacher educators access to current software, but to update it regularly.

Hardware is useless without accompanying software.
Only 15% of responding teacher educators were familiar with the ISTE standards. Who is at fault when established national standards are unknown to some of the people responsible for training to meet those standards? Since several states have adopted the ISTE student standards and therefore expect teachers to be able not only to teach those skills but also to model them (personal communication with Lajeane Thomas, project director, December 6, 2001), it is important that teacher educators become aware of these expectations. If teacher educators are not aware standards exist, they are unlikely to seek out and implement them in classes. NCATE and ISTE have the responsibility to disseminate the standards they have established (Moursund & Bielefeldt, 1999). Colleges and departments of education familiar with the standards should communicate their existence and importance to FACS and other methods teachers outside the education department. At a minimum, FACS teacher educators should be aware of the more general NCATE standards (see Appendix B) requiring infusion of technology through the curriculum for preservice teachers. That would be a beginning in providing FACS teacher educators with an understanding of what the goals are as they strive to prepare teachers capable of meeting both the NCATE and ISTE standards. Professional organizations have a responsibility to familiarize their members with applicable standards pertaining to their area of responsibility (Moursund & Bielefeldt). Communication appears to have been lacking in this area between all parties involved: teacher educators, education departments, professional organizations, and ISTE.

There was a wide range of ability levels for preservice students reported on the
ISTE standards. Many teachers were unsure of preservice students' skills in these areas, either leaving complete sections blank or selecting "don't know." It is important to remember when discussing the standards that ISTE 1 and ISTE 2 are not the same nor are they progressive levels of the same competencies (see Appendix A). For example, in ISTE 1, one of the standards states, "Discuss diversity issues related to electronic media." In ISTE 2, there are two standards that might be construed as follow-ups to that concept. They are "Identify specific technology applications and resources that maximize student learning, address learner needs, and affirm diversity" and "Identify issues related to equitable access to technology in school, community, and home environments." While the skills mentioned in ISTE 2 are definitely higher level, they are in many ways different skills altogether.

The standard receiving the highest number of "strongly agree" responses dealt with the use of technology to locate, evaluate, and collect information from a variety of sources. (Because the standards were broken down to facilitate understanding on the survey, exact numbers for each standard are not available after they are recombined into the original format.) The next highest ranking went to the standard dealing with positive attitudes towards technology uses that support lifelong learning, collaboration, personal pursuits, and productivity. Both of these standards were in the ISTE 1 profile. The highest ranked standard in the ISTE 2 profile concerned identifying technology resources available in schools and analyzing how accessibility to technology resources affects planning for instruction. That was followed by the standard that states that preservice students can plan and teach student-centered
learning activities and lessons in which students apply technology tools and resources. However, as one teacher educator commented, "My students can do all of these things. Whether or not they do them is a different story."

The lowest ranking on the standards was also in ISTE 1. It concerned the ability of preservice students to solve routine hardware and software problems and make informed choices about technology systems, resources, and services. The first part of this standard addresses the ability to use common input and output devices, which was not perceived as a problem for most of the preservice students. In the second profile, ISTE 2, teacher educators ranked preservice students lowest in the ability to identify issues related to equitable access to technology in school, community, and home environments. This was closely followed by the ability to design and teach technology-enriched learning activities that connect FACS content standards with student technology standards and meet the diverse needs of students. The ability to design and peer teach a lesson that meets content area standards and reflects the current best practices in teaching and learning with technology also received a low rating.

Responding teacher educators were given the option of "don't know" when evaluating preservice students ISTE abilities. Some dealt with a lack of knowledge by stating "other education courses do this" or "these may be done within Education Dept." One teacher educator dealt with her lack of knowledge as to what students could/could not do by asking some students to work together to complete that portion of the survey. The standards teacher educators were most unfamiliar with (or did not
understand) concerned: (a) the ability to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works using productivity tools; and (b) the ability to use a variety of media and formats, including telecommunications, to collaborate, publish, and interact with peers, experts, and other audiences. Both of these standards are in the ISTE 1 profile. In the ISTE 2 profile, the standard dealing with the ability to examine multiple strategies for evaluating technology-based student products and the processes used to create those products was the least well known or understood by the respondents.

Teacher educators' responses on the ISTE standards indicate that while the attitudes of preservice students regarding the use of technology are perceived as high, they are not always perceived as being able to translate that into teaching practice. Teacher educators perceive preservice students as being able to use technology but not deal with problems that may arise during its use. It also appears that preservice students are well prepared to use technology as a learning tool for themselves and to identify technology resources available and accessible in schools. Preservice students are perceived as able to plan and teach student-centered lessons that include technology tools and resources. However, since responding teacher educators did not indicate requiring the use of high levels of technology in methods courses, how do they know preservice students can create and present technology-rich lesson plans?

There is work to be done in several areas to enable preservice students to meet the ISTE standards. In addition to preparing to solve hardware and software problems, preservice students need information and practice in dealing with some of the social
issues related to technology: equitable access and meeting diverse needs of students. A lack of knowledge of student technology standards may be the reason it was felt that preservice students would not be able to connect FACS content standards with technology standards. Students need continued practice in designing lessons that meet FACS content area standards and reflect the current best practices in teaching and learning with technology. Constructivist theory holds that as teachers model the use of technology in their classes, students are given the opportunity and requirement to practice using technology during class, and then as preservice students create lesson plans rich in technology, this tool will become part of their teaching repertoire. FACS teacher educators should consider addressing all of these computer technology aspects in methods courses. Special attention should be directed towards connecting FACS content standards to technology standards and best practices in teaching and learning with technology.

The fact that FACS teacher educators were unfamiliar with or did not understand several of the standards has implications for both the teachers and those establishing the standards. It may indicate that these student abilities are not required or exhibited in FACS methods courses. A lack of knowledge concerning the requirements in technology and other education courses could be a reason for teacher educators' unfamiliarity with many of the standards. One responding teacher educator commented, "Our students must take a technology course, but depending on instructor, outcomes differ".

If the language of the standards is too "technical," teachers reporting lower
computer skill levels may not understand it. The term "technology-enhanced models" could easily fall into this category. Since it is expected that non-computer personnel are going to be preparing preservice students to meet the ISTE standards (ISTE, 2000; NCATE, 2002; Willis & Mehlinger, 1996), they should all be easily understood. The fact that teacher educators are unaware of preservice students' abilities to "prepare publications, produce creative works," (ISTE 1, standard 6), and "use a variety of media and formats to collaborate, publish, and interact with others" (ISTE 1, standard 13) may be a reflection of a lack of this type of assignment in methods courses. Preservice students have opportunities to "examine multiple strategies for evaluating student products and the processes used to create them" (ISTE 2, standard 12), but technology-based products are not often included in the mix it appears. If it is expected that FACS preservice students will be able to meet all of the ISTE standards, there is a great deal of education to do, much of it with the teacher educators. Where can current FACS teacher educators find information on the various standards they are expected to meet? Administrators and professional organizations need to facilitate both awareness and training.

There are several important implications to be considered before moving from a printed and mailed survey format to an on-line survey format solicited by e-mail with this population. When considering time and money costs, it is important to include in the equation the expertise level of the researcher as well as facilities available for conducting on-line research. Both of these will figure heavily into the equation. For this study, financial costs were very close for the two survey forms. No
dollar costs were added for time investment with either format. Expenditures for the printed and mailed survey included costs for copying, envelopes (return and original), and postage. They came to $326.46. The cost to hire a technician to prepare the survey in an on-line format, which allowed responses to download into a database, was $455.00. Researcher time was approximately 50% higher for the printed and mailed survey format than for the on-line format. This included time spent copying, collating, and stapling the surveys, labeling the envelopes, stuffing the envelopes and applying postage, as well as coding the data after the mailed surveys were returned. The major time expenditure with the on-line format was the entering of coding numbers in each e-mail, which allowed for follow-up with nonrespondents. Some time was spent dealing with incorrect addresses for each format. This time expenditure was somewhat greater with the on-line surveys, but still less total time was required for the on-line format.

The decision to use printed and mailed surveys versus on-line surveys should rest at least partially upon the expertise of the researcher and the decision of whether to spend time or money in preparing the survey. Even with the technical expertise to create an on-line survey, it can be a time-consuming process (13 hours were used by the technician to prepare this survey). It is also important to consider a secure location in which to house the survey while it is available. It was discovered that not all computer servers fit the needs required of those seeking to conduct research on-line.

Another issue that is of concern with either form of survey is identification of correct addresses. The initial database for this study included many individuals who
were no longer teaching at the listed institution or in the listed position of teacher educator. In addition, several of the addresses were wrong or incomplete. This was true for both postal addresses and e-mail address. However, there were more incorrect e-mail addresses. Handwerk et al. (2000) experienced this same difficulty with their population. This could be due to the relative newness of e-mail in many locations and at many colleges and universities. It was noted that many of the initial e-mail addresses did not reflect a connection to an educational institution (.edu). Several of these were addresses that had been changed. There was also a problem in that some of the e-mail addresses were found to be incorrect but the initial invitation to participate was not returned to the researcher. This precluded the researcher from identifying a correct e-mail address. It is suspected that some of the messages are still "floating in cyberspace" at this time.

While there was no statistically significant difference in the respondents' characteristics or their responses when printed and mailed surveys were compared to on-line surveys, some trends were noted. Respondents completing the survey on-line reported higher mean scores for support and on both the ISTE 1 and ISTE 2 profiles. The difference was greater for the second profile. One possible explanation for differences in the ISTE 2 profile is the number of on-line respondents that did not finish the survey. While there were some who did not complete the mailed survey, those respondents were more likely to stop before answering any of the questions dealing with the ISTE standards than in the middle of that section. This may have been because they could see the entire survey at once. As the survey continued for on-line
respondents, they may have gradually quit answering the questions.

Another possible explanation for differences in perceived support and ISTE mean scores for mailed versus on-line respondents lies in the possible difference in those likely to be comfortable working in an on-line format. This group of teacher educators may either identify computer technology skills more readily in preservice students or project their own skills and abilities onto preservice students. In addition, it is possible they are more inclined to seek out technology support and utilize facilities and training available through the college or university.

When response rate was examined, there was a statistically significant difference in return rates for the two survey formats. FACS teacher educators were much more likely to complete a mailed survey than one available over the Internet. This was very similar to the findings of Handwerk et al. (2000). Like the findings of Handwerk et al., Internet respondents in this survey were likely to be younger. More written comments were included with the mailed surveys than the Internet surveys. While neither format provided a location to include comments, teacher educators completing the printed survey often wrote notes in the margins. A limited number of Internet respondents e-mailed comments to the researcher. If a high response rate is desired or necessary, at this time it is advised that surveys be conducted using the printed and mailed format.

Limitations of the Study

This study was limited to FACS teacher educators and the results are
applicable only to this population. Not every FACS teacher educator teaches the same curriculum and requirements for teacher credentials vary widely among the states in the U.S. As a result, not all preservice students will receive the same preparation before beginning their student teaching or internship phase of their program. Consequently, not all will have the same training in the utilization of computer technology for teaching or in the required abilities to meet the ISTE standards.

Since this study used surveys with a self-reporting technique, the data collected were subject to the limitations associated with such methods. Results were also dependent upon FACS teacher educators' cooperation in completing the questionnaires. While every effort was made to keep the survey short, the final length of seven pages may have been a confounding factor in the low response rate as well as the varying number of responses to some of the questions. While 86 completed part A of the survey, only 55 completed the last page. Each respondent may have interpreted the questions on the survey in a different manner. Teacher educators may have responded to the survey in ways that would make their teaching appear better than it is. In addition, teacher educators may have been unaware of the technology preparation preservice students in their department receive in other courses.

The technical language used in the survey may have presented a problem for teacher educators as they attempted to complete it. Some of the terms used had multiple meanings, especially for teacher educators. One example is the problem mentioned previously with the term "video observations." This could have been
interpreted to mean digital and/or real-time classroom observations, as explained by Willis and Mehlinger (1996) or videotaping of students during class. Some of the terms used in the ISTE standards caused confusion as well. One respondent who said she was familiar with the ISTE standards and rated her skill level as very advanced still wrote "What is this…. Don’t know what this jargon above means" about more than one of the ISTE standards.

Due to the lack of a more recent directory of FACS teacher educators, some potential respondents may not have been contacted. New programs may have started while others were discontinued. Many surveys were likely sent to programs that had been discontinued and therefore were not returned. The changeable nature of both mail and e-mail addresses may also have contributed to some respondents not receiving the invitation to participate in the survey.

The results of this survey are applicable only to FACS teacher educators and may not be generalized to a larger population. While conclusions may be drawn about the usage of computer technology in FACS methods courses and the preparedness of FACS preservice students to meet ISTE standards, no causal effects may be determined.

Recommendations for Further Research

As a result of this study, the following recommendations are presented for consideration as topics for further research. This research involved only FACS teacher educators. This or a similar study could be conducted using methods teachers in other
disciplines. Of more particular use would be comparisons with other vocational educators (agriculture, business, etc.) and computer usage in preparing preservice students in their particular fields.

Only teacher educators were involved in this study. A parallel study involving preservice students would contribute valuable insight into the accuracy of teachers’ perceptions and knowledge of student technical ability. In addition, students could be surveyed at all four levels in the ISTE standards, allowing for comparisons throughout their preservice education. This might provide insight into which courses most influence computer technology development in preservice students.

This study determined which technologies and applications were incorporated into, modeled, and required of students in FACS methods courses. A follow-up study could determine the effectiveness of some of those technologies and applications. In addition, an investigation of the level of integration of computer technology into other FACS courses could help with an understanding of how technology is and is not modeled for students.

FACS programs with high ISTE scores could be identified. An examination of their methods courses might lead to the development of curriculum promoting better use of computer technology. "Best practice" examples might also be identified and then shared with others through professional publications and meetings.

Since this study did not ask about survey format preferences, focus groups might be formed to examine reasons FACS teacher educators seem to prefer printed and mailed surveys over on-line surveys. With the increasing use of both e-mail and
the Internet, it is suggested that the use of an on-line format be reevaluated within
the next 5 years.
REFERENCES


Using technology in the classroom (pp. 69-75). New York: Haworth Press.


Sciences 91(3), p. 75-76.


Oklahoma City, OK. (ERIC Document Reproduction Service No. ED 415 213)


Rosenthal, I. G. (1999). New teachers and technology: As government investments in school technology increase, schools of education are pushed to arm new teachers with the knowledge and skills to use it. *Technology & Learning* 19(8), 22-27.


Willis, J., Willis, D. A., Austin, L., & Colón, B. (1995). Faculty perspectives on

APPENDICES
Appendix A. International Society for Technology in Education Standards
International Society for Technology in Education Standards

General Preparation Performance Profile

Students may be in their major or minor course of study. They may be at the lower division level or may have received skill development through on-the-job training, obtaining a degree or experience in a nontraditional program. Typically, the university arts and sciences areas provide the experiences defined in this Profile. Programs may have multiple ways for candidates to demonstrate that they are able to perform the tasks that go beyond the classroom setting. Upon completion of the general preparation component of their program, prospective teachers should be able to meet the competencies described in this Profile.

1. Demonstrate a sound understanding of the nature and operation of technology systems.

2. Demonstrate proficiency in the use of common input and output devices; solve routine hardware and software problems; and make informed choices about technology systems, resources, and services.

3. Use technology tools and information resources to increase productivity, promote creativity, and facilitate academic learning.

4. Use content-specific tools (e.g., software, simulation, environmental probes, graphing calculators, exploratory environments, Web tools) to support learning and research.

5. Use technology resources to facilitate higher order and complex thinking skills, including problem solving, critical thinking, informed decision making, knowledge
construction, and creativity.

6. Collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works using productivity tools.

7. Use technology to locate, evaluate, and collect information from a variety of sources.

8. Use technology tools to process data and report results.

9. Use technology in the development of strategies for solving problems in the real world.

10. Observe and experience the use of technology in their major field of study.

11. Use technology tools and resources for managing and communicating information (e.g., finances, schedules, addresses, purchases, correspondence).

12. Evaluate and select new information resources and technological innovations based on their appropriateness to specific tasks.

13. Use a variety of media and formats, including telecommunications, to collaborate, publish, and interact with peers, experts, and other audiences.

14. Demonstrate an understanding of the legal, ethical, cultural, and societal issues related to technology.

15. Exhibit positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

16. Discuss diversity issues related to electronic media.

17. Discuss the health and safety issues related to technology use.
Professional Preparation Performance Profile

Students have been admitted to a professional core of courses or experiences taught by the school or college of education or professional education faculty. Experiences in the Profile are part of professional education coursework that may also include integrated fieldwork. The school or college of education or professional development school is typically responsible for preservice teachers having the experiences described in this Profile. Prior to the culminating student teaching or internship experience, prospective teachers should be able to meet the competencies described in this Profile.

1. Identify the benefits of technology to maximize student learning and facilitate higher order thinking skills.

2. Differentiate between appropriate and inappropriate uses of technology for teaching and learning while using electronic resources to design and implement learning activities.

3. Identify technology resources available in schools and analyze how accessibility to those resources affects planning for instruction.

4. Identify, select, and use hardware and software technology resources specially designed for use by PK-12 students to meet specific teaching and learning objectives.

5. Plan for the management of electronic instructional resources within a lesson design by identifying potential problems and planning for solutions.

6. Identify specific technology applications and resources that maximize student learning, address learner needs, and affirm diversity.
7. Design and teach technology-enriched learning activities that connect content standards with student technology standards and meet the diverse needs of students.

8. Design and peer teach a lesson that meets content area standards and reflects the current best practices in teaching and learning with technology.

9. Plan and teach student-centered learning activities and lesson sin which students apply technology tools and resources.

10. Research and evaluate the accuracy, relevance, appropriateness, comprehensiveness, and bias of electronic information resources to be used by students.

11. Discuss technology-based assessment and evaluation strategies.

12. Examine multiple strategies for evaluating technology-based student products and the processes used to create those products.

13. Examine technology tools used to collect, analyze, interpret, represent, and communicate student performance data.

14. Integrate technology-based assessment strategies and tools into plans for evaluating specific learning activities.

15. Develop a portfolio of technology-based products from coursework, including the related assessment tools.

16. Identify and engage in technology-based opportunities for professional education and lifelong learning, including the use of distance education.

17. Apply online and other technology resources to support problem solving and
related decision making for maximizing student learning.

18. Participate in online professional collaborations with peers and experts.

19. Use technology productivity tools to complete required professional tasks.

20. Identify technology-related legal and ethical issues, including copyright, privacy, and security of technology systems, data, and information.

21. Examine acceptable use policies for the use of technology in schools, including strategies for addressing threats to security of technology systems, data, and information.

22. Identify issues related to equitable access to technology in school, community, and home environments.

23. Identify safety and health issues related to technology use in schools.

24. Identify and use assistive technologies to meet the special physical needs of students.
Appendix B. National Council for Accreditation of Teacher Education Professional Standards for the Accreditation of Schools, Colleges, and Departments of Education
Conceptual Framework
The conceptual framework(s) establishes the shared vision for a unit’s efforts in preparing educators to work effectively in P-12 schools. It provides direction for programs, courses, teaching, candidate performance, scholarship, service, and unit accountability. The conceptual framework(s) is knowledge-based, articulated, shared, coherent, consistent with the unit and/or institutional mission, and continuously evaluated.

I. Candidate Performance

Standard 1: Candidate Knowledge, Skills, and Dispositions
Candidates preparing to work in schools as teachers or other professional school personnel know and demonstrate the content, pedagogical, and professional knowledge, skills, and dispositions necessary to help all students learn. Assessments indicate that candidates meet professional, state, and institutional standards.

Standard 2: Assessment System and Unit Evaluation
The unit has an assessment system that collects and analyzes data on the applicant qualifications, candidate and graduate performance, and unit operations to evaluate and improve the unit and its programs.

II. Unit Capacity

Standard 3: Field Experiences and Clinical Practice
The unit and its school partners design, implement, and evaluate field experiences and clinical practice so that teacher candidates and other school personnel develop and demonstrate the knowledge, skills, and dispositions necessary to help all students learn.

Standard 4: Diversity
The unit designs, implements, and evaluates curriculum and experiences for candidates to acquire and apply the knowledge, skills, and dispositions necessary to help all students learn. These experiences include working with diverse higher education and school faculty, diverse candidates, and diverse students in P-12 schools.

Standard 5: Faculty Qualifications, Performance, and Development
Faculty are qualified and model best professional practices in scholarship, service, and teaching, including the assessment of their own effectiveness as related to candidate performance. They also collaborate with colleagues in the disciplines and schools. The unit systematically evaluates faculty performance and facilitates professional development.

Standard 6: Unit Governance and Resources

The unit has the leadership, authority, budget, personnel, facilities, and resources, including information technology resources, for the preparation of candidates to meet professional, state, and institutional standards.
Appendix C. Technology Survey for Family and Consumer Sciences Teacher Educators
Technology Survey for Family and Consumer Sciences Teacher Educators Part A

Tell us about yourself and your program.

Please circle the appropriate response or fill in the blank:

1. At which type of college/university do you teach?
   - Private
   - Public

2. How many students are enrolled at your college/university?
   - Yes
   - No

3. Does your department offer a master's program?
   - Yes
   - No

4. Does your department offer a Ph.D. program?
   - Yes
   - No

5. How many students in your FACS program will student teach in the 2001-2002 school year?
   - Yes
   - No

6. Are preservice teachers required to take a technology course prior to graduation?
   - Yes
   - No

7. What is the highest degree you have received?
   - Bachelor's
   - Masters
   - Ph.D.
   - Ed.D.

8. What is your gender?
   - Male
   - Female

9. How many years have you taught FACS methods classes?
   - 20-29
   - 30-39
   - 40-49
   - 50-59
   - 60-69

How do you see computer technology fitting into your program?

SA - strongly agree
A - agree
D - disagree
SD - strongly disagree

1. My college/university provides sufficient financial support for computer technology.
2. My college/university provides me the training I need so I can comfortably use computers and technology for teaching.
3. My college/university provides me enough time to use computers and technology for teaching.
4. My college/university provides me emotional support and encouragement in using computer technology.
5. It is important for teacher educators to use computer technology in their methods classes.
6. It is important for FACS secondary teachers to use computer technology in their classes.
7. I am confident in my ability to teach/demonstrate computer skills in the classroom.

How would you rate your computer skills?

very advanced
advanced
average/adequate
limited
very limited

In which subject areas is computer technology incorporated/modelled/required?

I - incorporated into the course
M - modelled by the teacher
R - required of the students
N - not used
DK - don't know

1. Apparel and textiles
2. Child development
3. Consumerism and Finance
4. Family Living
5. Foods and Nutrition
6. Interior Design
7. Other, please specify
What types of electronic technology are incorporated/modeled/required in your methods classes?

Please circle all that apply. I - incorporated into the course M - modeled by the teacher R - required of the students NA - not available

1. Apple/Macintosh computers I M R NA
2. IBM/PC computers I M R NA
3. Digital videos I M R NA
4. Laserdiscs I M R NA
5. Video conferencing I M R NA
6. Telecommunications (Distance Education) I M R NA
7. Video observations I M R NA
8. Other, please specify I M R NA

What types of electronic applications are incorporated/modeled/required in your methods classes?

Please circle all that apply. I - incorporated into the course M - modeled by the teacher R - required of the students U - unfamiliar with

1. Word-processing I M R U
2. Desktop publishing I M R U
3. Spreadsheet I M R U
4. Databases I M R U
5. Presentation software I M R U
6. Multimedia software I M R U
7. Hypermedia software I M R U
8. Networking I M R U
9. Media communications (e-mail) I M R U
10. Multimedia integration (Web, CD-ROM, etc.) I M R U
11. Web design I M R U
12. Applications management (licensing, updating, etc.) I M R U
13. Other, please specify I M R U

The International Society for Technology in Education (ISTE) has developed standards and performance indicators for teachers. All classroom teachers are being encouraged to meet them.

Are you familiar with the ISTE standards and performance indicators?

Please circle the best response. Yes Somewhat No

The following questions deal directly with the ISTE National Educational Technology Standards and Performance Indicators for Teachers. I would like your input as to how prepared your Family and Consumer Sciences preservice teachers are, at different points in their education, in meeting the standards and performance indicators.
Technology Survey for Family and Consumer Sciences Teacher Educators Part B

Upon completion of the general pre-service preparation component of their program, prospective Family and Consumer Sciences teachers can:

1. Demonstrate a sound understanding of the nature and operation of technology systems.   
2. Demonstrate proficiency in the use of common input and output devices.  
3. Solve routine hardware and software problems.  
4. Make informed choices about technology systems, resources, and services.  
5. Use technology tools/information resources to increase productivity.  
6. Use technology tools/information resources to promote creativity.  
7. Use technology tools/information resources to facilitate academic learning.  
8. Use content-specific tools (e.g., software, simulation, environmental probes, graphing calculators, exploratory environments, Web tools) to support learning/research.  
9. Use technology resources to facilitate higher order/complex thinking skills, including problem solving, critical thinking, informed decision-making, knowledge construction, and creativity.  
10. Collaborate in constructing technology-enhanced models.  

Upon completion of the general pre-service preparation component of their program, prospective Family and Consumer Sciences teachers can:

1. Collaborate in preparing publications.  
2. Collaborate in producing other creative works using productivity tools.  
3. Use technology to locate information from a variety of sources.  
4. Use technology to evaluate information from a variety of sources.  
5. Use technology to collect information from a variety of sources.  
6. Use technology tools to process data/report results.  
7. Use technology in the development of strategies for solving problems in the real world.  
8. Observe the use of technology in Family and Consumer Sciences.  
9. Experience the use of technology in Family and Consumer Sciences.  
10. Use technology tools/resources for managing information (e.g., finances, schedules, addresses, purchases, correspondence).  
11. Use technology tools/resources for communicating information (e.g., finances, schedules, addresses, purchases, correspondence).
Upon completion of the general pre-service preparation component of their program, prospective Family and Consumer Sciences teachers can:

1. Evaluate new information resources/technological innovations based on their appropriateness to specific tasks. SA - strongly agree A - agree D - disagree SD - strongly disagree DK - don’t know

2. Select new information resources/technological innovations based on their appropriateness to specific tasks.

3. Use a variety of media/formats, including telecommunications, to collaborate with peers.

4. Use a variety of media/formats, including telecommunications, to collaborate with experts.

5. Use a variety of media/formats, including telecommunications, to publish with peers.

6. Use a variety of media/formats, including telecommunications, to publish with experts.

7. Use a variety of media/formats, including telecommunications, to interact with peers.

8. Use a variety of media/formats, including telecommunications, to interact with experts.

Upon completion of the general pre-service preparation component of their program, prospective Family and Consumer Sciences teachers can:

1. Demonstrate an understanding of the legal issues related to technology.

2. Demonstrate an understanding of the ethical issues related to technology.

3. Demonstrate an understanding of the cultural/societal issues related to technology.

4. Exhibit positive attitudes toward technology uses that support lifelong learning.

5. Exhibit positive attitudes toward technology uses that support collaboration.

6. Exhibit positive attitudes toward technology uses that support personal pursuits.

7. Exhibit positive attitudes toward technology uses that support productivity.

8. Discuss diversity issues related to electronic media.

9. Discuss the health/safety issues related to technology use.
Prior to the culminating student teaching or internship experience, prospective Family and Consumer Sciences teachers can:

1. Identify the benefits of technology to maximize student learning.  
   SA - strongly agree  A - agree  D - disagree  SD - strongly disagree  DK - don't know

2. Identify the benefits of technology to facilitate higher order thinking skills.  
   SA - strongly agree  A - agree  D - disagree  SD - strongly disagree  DK - don't know

3. Differentiate between appropriate and inappropriate uses of technology for teaching and learning while using electronic resources to design and implement learning activities.  
   SA - strongly agree  A - agree  D - disagree  SD - strongly disagree  DK - don't know

4. Identify technology resources available in schools.  
   SA - strongly agree  A - agree  D - disagree  SD - strongly disagree  DK - don't know

5. Analyze how accessibility to technology resources affects planning for instruction.  
   SA - strongly agree  A - agree  D - disagree  SD - strongly disagree  DK - don't know

6. Identify hardware/software technology resources specially designed for use by secondary students to meet specific teaching and learning objectives.  
   SA - strongly agree  A - agree  D - disagree  SD - strongly disagree  DK - don't know

7. Select hardware/software technology resources specially designed for use by secondary students to meet specific teaching and learning objectives.  
   SA - strongly agree  A - agree  D - disagree  SD - strongly disagree  DK - don't know

8. Use hardware/software technology resources specially designed for use by secondary students to meet specific teaching and learning objectives.  
   SA - strongly agree  A - agree  D - disagree  SD - strongly disagree  DK - don't know

9. Plan for the management of electronic instructional resources within a lesson design by identifying potential problems and planning for solutions.  
   SA - strongly agree  A - agree  D - disagree  SD - strongly disagree  DK - don't know

Prior to the culminating student teaching or internship experience, prospective Family and Consumer Sciences teachers can:

1. Identify specific technology applications/resources that maximize student learning.  
   SA - strongly agree  A - agree  D - disagree  SD - strongly disagree  DK - don't know

2. Identify specific technology applications/resources that address learner needs.  
   SA - strongly agree  A - agree  D - disagree  SD - strongly disagree  DK - don't know

3. Identify specific technology applications/resources that affirm diversity.  
   SA - strongly agree  A - agree  D - disagree  SD - strongly disagree  DK - don't know

4. Design/teach technology-enriched learning activities that connect FACS content standards with student technology standards.  
   SA - strongly agree  A - agree  D - disagree  SD - strongly disagree  DK - don't know

5. Design/teach technology-enriched learning activities that meet the diverse needs of students.  
   SA - strongly agree  A - agree  D - disagree  SD - strongly disagree  DK - don't know

6. Design/peer teach a lesson that meets FACS content area standards and reflects the current best practices in teaching and learning with technology.  
   SA - strongly agree  A - agree  D - disagree  SD - strongly disagree  DK - don't know
Prior to the culminating student teaching or internship experience, prospective Family and Consumer Sciences teachers can:

1. Plan/teach student-centered learning activities and lessons in which students apply technology tools and resources. 
   - Strongly agree (SA)
   - Agree (A)
   - Disagree (D)
   - Strongly disagree (SD)
   - Don't know (DK)

2. Research/evaluate the accuracy, relevance, appropriateness, comprehensiveness, and bias of electronic information resources to be used by students. 
   - Strongly agree (SA)
   - Agree (A)
   - Disagree (D)
   - Strongly disagree (SD)
   - Don't know (DK)

3. Discuss technology-based assessment and evaluation strategies. 
   - Strongly agree (SA)
   - Agree (A)
   - Disagree (D)
   - Strongly disagree (SD)
   - Don't know (DK)

   - Strongly agree (SA)
   - Agree (A)
   - Disagree (D)
   - Strongly disagree (SD)
   - Don't know (DK)

5. Examine multiple strategies for evaluating the processes used to create technology-based student products. 
   - Strongly agree (SA)
   - Agree (A)
   - Disagree (D)
   - Strongly disagree (SD)
   - Don't know (DK)

6. Examine technology tools used to collect, analyze, interpret, represent, and communicate student performance data. 
   - Strongly agree (SA)
   - Agree (A)
   - Disagree (D)
   - Strongly disagree (SD)
   - Don't know (DK)

7. Integrate technology-based assessment strategies and tools into plans for evaluating specific learning activities. 
   - Strongly agree (SA)
   - Agree (A)
   - Disagree (D)
   - Strongly disagree (SD)
   - Don't know (DK)

8. Develop a portfolio of technology-based products from coursework, including the related assessment tools. 
   - Strongly agree (SA)
   - Agree (A)
   - Disagree (D)
   - Strongly disagree (SD)
   - Don't know (DK)

Prior to the culminating student teaching or internship experience, prospective Family and Consumer Sciences teachers can:

1. Identify technology-based opportunities for professional education and lifelong learning, including the use of distance education. 
   - Strongly agree (SA)
   - Agree (A)
   - Disagree (D)
   - Strongly disagree (SD)
   - Don't know (DK)

2. Engage in technology-based opportunities for professional education and lifelong learning, including the use of distance education. 
   - Strongly agree (SA)
   - Agree (A)
   - Disagree (D)
   - Strongly disagree (SD)
   - Don't know (DK)

3. Apply online and other technology resources to support problem solving and related decision-making for maximizing student learning. 
   - Strongly agree (SA)
   - Agree (A)
   - Disagree (D)
   - Strongly disagree (SD)
   - Don't know (DK)

4. Participate in online professional collaborations with peers. 
   - Strongly agree (SA)
   - Agree (A)
   - Disagree (D)
   - Strongly disagree (SD)
   - Don't know (DK)

5. Participate in online professional collaborations with experts. 
   - Strongly agree (SA)
   - Agree (A)
   - Disagree (D)
   - Strongly disagree (SD)
   - Don't know (DK)

6. Use technology productivity tools to complete required professional tasks. 
   - Strongly agree (SA)
   - Agree (A)
   - Disagree (D)
   - Strongly disagree (SD)
   - Don't know (DK)

7. Identify technology-related legal/ethical issues, including copyright, privacy, and security of technology systems, data, and information. 
   - Strongly agree (SA)
   - Agree (A)
   - Disagree (D)
   - Strongly disagree (SD)
   - Don't know (DK)

8. Examine acceptable use policies for the use of technology in schools, including strategies for addressing threats to security of technology systems, data, and information. 
   - Strongly agree (SA)
   - Agree (A)
   - Disagree (D)
   - Strongly disagree (SD)
   - Don't know (DK)
Prior to the culminating student teaching or internship experience, prospective Family and Consumer Sciences teachers can:

1. Identify issues related to equitable access to technology in school environments.
2. Identify issues related to equitable access to technology in community environments.
3. Identify issues related to equitable access to technology in home environments.
4. Identify safety/health issues related to technology use in schools.
5. Identify/use assistive technologies to meet the special physical needs of students.
6. Identify specific technology applications/resources that affirm diversity.

SA – strongly agree  A – agree  D – disagree  SD – strongly disagree  DK – don’t know

<table>
<thead>
<tr>
<th></th>
<th>SA</th>
<th>A</th>
<th>D</th>
<th>SD</th>
<th>DK</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix D. Letter to Pretest Agriculture Teacher Educators
Dear Agriculture Teacher Educators;

With the push to incorporate computer technology into classrooms, many teacher educators are being asked to prepare preservice teachers in this area. The International Society for Technology in Education (ISTE) has developed the National Educational Technology Standards and Performance Indicators for Teachers. All classroom teachers should be prepared to meet them. Consequently, preservice teachers must receive preparation in teaching with computers in order to meet the standards. The purpose of this study is to assess the degree to which Family and Consumer Sciences methods teachers are incorporating computer technology into their teaching as a means of preparing their preservice teachers to meet the ISTE standards.

In order to be sure that this survey instrument is understandable and clear, we need your help to pretest the survey. While this survey will be used with Family and Consumer Sciences teacher educators, we are asking your help to review it so that we do not remove any from that pool. Please fill out the survey and make any comments you feel are needed to improve the clarity and ease of completing the survey. Write these comments directly on the survey next to the appropriate questions. Please also indicate on the last page how long it took to complete the survey.

Please complete the survey and return it in the enclosed self-addressed, stamped envelope by October 12, 2001. Participation is voluntary and you may withdraw at any time without consequence. All responses will be treated confidentially. If you have any questions call me at (435) 797-3408. Thank you very much for your cooperation. After you complete and return the survey, we will send you a small "thank-you" gift as a token of our appreciation.

Sincerely,

Kathy C. Croxall, ABD
Graduate Instructor
Department of Human Environments
2910 Old Main Hill
Utah State University
Logan, Utah 84322-2910
(435) 797-3408
Enclosures (2)
Appendix E. Technology Survey for Family and Consumer Sciences Teacher

Educators, On-line Version
Welcome! The questions in this survey focus on the preparation of preservice teachers to use computer technology to teach Family and Consumer Sciences content. The International Society for Technology in Education (ISTE) has developed the National Educational Technology Standards and Performance Indicators for Teachers. The purpose of this study is to assess the degree to which Family and Consumer Sciences methods teachers are incorporating computer technology into their teaching as a means of preparing their preservice teachers to meet the ISTE standards.

We would appreciate your response to this survey to ensure representation of all Family and Consumer Sciences teacher educators in this national assessment. Your completion of this survey implies your consent for the utilization of this information. Participation is voluntary and you may withdraw at any time without consequence. All responses will be treated confidentially. No individual participant or school will be identified. Code numbers will be used for follow-up purposes only.

The survey is in two parts. Part A should take 5 to 10 minutes to complete. Part B should take 15 to 20 minutes to complete.

You were given an ID code in your e-mail. If you do not have this code, please e-mail or call Kathy Croxall:
(435) 797-3408
kcroxall@cc.usu.edu

Please enter your ID code:

Start Questionnaire
Tell us about yourself and your program.

Please check the appropriate response or fill in the blank.

<table>
<thead>
<tr>
<th>Question</th>
<th>Response Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. At which type of college/university do you teach?</td>
<td>Private</td>
</tr>
<tr>
<td>2. How many students are enrolled at your college/university?</td>
<td>Yes</td>
</tr>
<tr>
<td>3. Does your department offer a Master's program?</td>
<td>Yes</td>
</tr>
<tr>
<td>4. Does your department offer a Ph.D. program?</td>
<td>Yes</td>
</tr>
<tr>
<td>5. How many students in your FACS program will student teach in the 2001-2002 school year?</td>
<td>Yes</td>
</tr>
<tr>
<td>6. Are preservice teachers required to take a technology course prior to graduation?</td>
<td>Yes</td>
</tr>
<tr>
<td>7. How many years have you taught FACS methods classes?</td>
<td>Bachelors</td>
</tr>
<tr>
<td>8. What is the highest degree you have received?</td>
<td>Male</td>
</tr>
<tr>
<td>10. What is your age?</td>
<td></td>
</tr>
</tbody>
</table>

How do you see computer technology fitting into your program?

SA - strongly agree  A - agree  D - disagree  SD - strongly disagree

<table>
<thead>
<tr>
<th>Question</th>
<th>SA</th>
<th>A</th>
<th>D</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. My college/university provides sufficient financial support for computer technology.</td>
<td>c</td>
<td></td>
<td></td>
<td>c</td>
</tr>
<tr>
<td>2. My college/university provides me the training I need so I can comfortably use computers and technology for teaching.</td>
<td>c</td>
<td></td>
<td></td>
<td>c</td>
</tr>
<tr>
<td>3. My college/university provides me enough time to use computers and technology for teaching.</td>
<td>c</td>
<td></td>
<td></td>
<td>c</td>
</tr>
<tr>
<td>4. My college/university provides me emotional support and encouragement in using computer technology.</td>
<td>c</td>
<td></td>
<td></td>
<td>c</td>
</tr>
<tr>
<td>5. It is important for teacher educators to use computer technology in their methods classes.</td>
<td>c</td>
<td></td>
<td></td>
<td>c</td>
</tr>
<tr>
<td>6. It is important for FACS secondary teachers to use computer technology in their classes.</td>
<td>c</td>
<td></td>
<td></td>
<td>c</td>
</tr>
<tr>
<td>7. I am confident in my ability to teach/demonstrate computer skills in the classroom.</td>
<td>c</td>
<td></td>
<td></td>
<td>c</td>
</tr>
</tbody>
</table>

How would you rate your computer skills? very advanced, advanced, average/adequate, limited, very limited

Continue on next page | Reset all fields
In which subject areas are computer technology incorporated modeled/required? Check all that apply.

I- incorporated into the course  M- modeled by the teacher  R- required of the students  N- not used  DK- don't know

<table>
<thead>
<tr>
<th>Subject Area</th>
<th>I</th>
<th>M</th>
<th>R</th>
<th>N</th>
<th>DK</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Apparel and textiles</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Child development</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Consumerism and Finance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Family Living</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Foods and Nutrition</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Interior Design</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Other (specify)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Continue on next page  Reset all fields
What types of electronic technology are incorporated modeled required in your methods classes? Check all that apply.

I-incorporated into the course M-modeled by the teacher R-required of the students DK-don't know

<table>
<thead>
<tr>
<th></th>
<th>I</th>
<th>M</th>
<th>R</th>
<th>DK</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Apple/Macintosh computers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. IBM/PC computers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Digital videos</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Laserdiscs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Video conferencing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Telecommunications (Distance Education)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Video observations</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Other (specify)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Continue on next page | Reset all fields
What types of electronic applications are incorporated/modeled/required in your methods class? Check all that apply.

I - incorporated into the course  M - modeled by the teacher  R - required of the students  DK - don't know

<table>
<thead>
<tr>
<th></th>
<th>I</th>
<th>M</th>
<th>R</th>
<th>DK</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Word Processing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Desktop Publishing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Spreadsheet</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Databases</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Presentation Software</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Multimedia Software</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Hypermedia Software</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Networking</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Media Communications (e-mail)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Multimedia Integration (Web, CD-ROM, etc.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Web design</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Applications Management (licensing, updating, etc.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Other (specify)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Are you familiar with ISTE standards and performance indicators?  

- Yes
- Somewhat
- No

Click here to finish  |  Reset all fields
Technology Survey for Family and Consumer Sciences Teacher Educators

Thank you for your time in completing part A of this survey. Part B deals with the first two profiles from the in International Society for Technology in Education (ISTE) National Educational Technology Standards and Performance Indicators for Teachers. I would like your input as to how prepared your Family and Consumer Sciences preservice teachers are, at different points in their education, in meeting the standards and performance indicators.

Part B should take 15 to 20 minutes to complete. Upon completion of Part B, an incentive will be mailed to your school address as a thank you for your help in this research.

Click here to complete optional questions
## Technology Survey for Family and Consumer Sciences Teacher Educators Part B

Upon completion of the general pre-service preparation component of their program, prospective Family and Consumer Sciences teachers can:

<table>
<thead>
<tr>
<th></th>
<th>SA - strongly agree, A - agree, D - disagree, SD - strongly disagree, DK - don't know</th>
<th>SA</th>
<th>A</th>
<th>D</th>
<th>SD</th>
<th>DK</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Demonstrate a sound understanding of the nature and operation of technology systems.</td>
<td></td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
</tr>
<tr>
<td>2. Demonstrate proficiency in the use of common input and output devices.</td>
<td></td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
</tr>
<tr>
<td>3. Solve routine hardware and software problems.</td>
<td></td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
</tr>
<tr>
<td>4. Make informed choices about technology systems, resources, and services.</td>
<td></td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
</tr>
<tr>
<td>5. Use technology tools/information resources to increase productivity.</td>
<td></td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
</tr>
<tr>
<td>6. Use technology tools/information resources to promote creativity.</td>
<td></td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
</tr>
<tr>
<td>7. Use technology tools/information resources to facilitate academic learning.</td>
<td></td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
</tr>
<tr>
<td>8. Use content-specific tools (e.g., software, simulation, environmental probes, graphing calculators, exploratory environments, Web tools) to support learning/research.</td>
<td></td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
</tr>
<tr>
<td>9. Use technology resources to facilitate higher order/complex thinking skills, including problem solving, critical thinking, informed decision making, knowledge construction, and creativity.</td>
<td></td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
</tr>
<tr>
<td>10. Collaborate in constructing technology-enhanced models.</td>
<td></td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
</tr>
</tbody>
</table>

Upon completion of the general pre-service preparation component of their program, prospective Family and Consumer Sciences teachers can:

<table>
<thead>
<tr>
<th></th>
<th>SA - strongly agree, A - agree, D - disagree, SD - strongly disagree, DK - don't know</th>
<th>SA</th>
<th>A</th>
<th>D</th>
<th>SD</th>
<th>DK</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Collaborate in preparing publications.</td>
<td></td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
</tr>
<tr>
<td>2. Collaborate in producing other creative works using productivity tools.</td>
<td></td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
</tr>
<tr>
<td>3. Use technology to locate information from a variety of sources.</td>
<td></td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
</tr>
<tr>
<td>4. Use technology to evaluate information from a variety of sources.</td>
<td></td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
</tr>
<tr>
<td>5. Use technology to collect information from a variety of sources.</td>
<td></td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
</tr>
<tr>
<td>6. Use technology tools to process data/report results.</td>
<td></td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
</tr>
<tr>
<td>7. Use technology in the development of strategies for solving problems in the real world.</td>
<td></td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
</tr>
<tr>
<td>8. Observe the use of technology in Family and Consumer Sciences.</td>
<td></td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
</tr>
<tr>
<td>9. Experience the use of technology in Family and Consumer Sciences.</td>
<td></td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
</tr>
<tr>
<td>10. Use technology tools/resources for managing information (e.g., finances, schedules, addresses, purchases, correspondence).</td>
<td></td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
</tr>
<tr>
<td>11. Use technology tools/resources for communicating information (e.g., finances, schedules, addresses, purchases, correspondence).</td>
<td></td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
</tr>
<tr>
<td>Upon completion of the general pre-service preparation component of their program, prospective Family and Consumer Sciences teachers can:</td>
<td>SA</td>
<td>A</td>
<td>D</td>
<td>SD</td>
<td>DK</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>1. Evaluate new information resources/technological innovations based on their appropriateness to specific tasks.</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td></td>
</tr>
<tr>
<td>2. Select new information resources/technological innovations based on their appropriateness to specific tasks.</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td></td>
</tr>
<tr>
<td>3. Use a variety of media/formats, including telecommunications, to collaborate with peers.</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td></td>
</tr>
<tr>
<td>4. Use a variety of media/formats, including telecommunications, to collaborate with experts.</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td></td>
</tr>
<tr>
<td>5. Use a variety of media/formats, including telecommunications, to publish with experts.</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td></td>
</tr>
<tr>
<td>6. Use a variety of media/formats, including telecommunications, to interact with peers.</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td></td>
</tr>
<tr>
<td>7. Use a variety of media/formats, including telecommunications, to interact with experts.</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
<td></td>
</tr>
<tr>
<td>8. Continue on next page</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Technology Survey for Family and Consumer Sciences Teacher Educators Part B

Prior to the culminating student teaching or internship experience, prospective Family and Consumer Sciences teachers can:

|   | SA - strongly agree, A - agree, D - disagree, SD - strongly disagree, DK - don't know |   |
|---|---|---|---|---|---|
| 1. | Identify the benefits of technology to maximize student learning. |   |
| 2. | Identify the benefits of technology to facilitate higher order thinking skills. |   |
| 3. | Differentiate between appropriate and inappropriate uses of technology for teaching and learning while using electronic resources to design and implement learning activities. |   |
| 4. | Identify technology resources available in schools. |   |
| 5. | Analyze how accessibility to technology resources affects planning for instruction. |   |
| 6. | Identify hardware/software technology resources specially designed for use by secondary students to meet specific teaching and learning objectives. |   |
| 7. | Select hardware/software technology resources specially designed for use by secondary students to meet specific teaching and learning objectives. |   |
| 8. | Use hardware/software technology resources specially designed for use by secondary students to meet specific teaching and learning objectives. |   |
| 9. | Plan for the management of electronic instructional resources within a lesson design by identifying potential problems and planning for solutions. |   |

Prior to the culminating student teaching or internship experience, prospective Family and Consumer Sciences teachers can:

|   | SA - strongly agree, A - agree, D - disagree, SD - strongly disagree, DK - don't know |   |
|---|---|---|---|---|---|
| 1. | Identify specific technology applications/resources that maximize student learning. |   |
| 2. | Identify specific technology applications/resources that address learner needs. |   |
| 3. | Identify specific technology applications/resources that affirm diversity. |   |
| 4. | Design/teach technology-enriched learning activities that connect FACS content standards with student technology standards. |   |
| 5. | Design/teach technology-enriched learning activities that meet the diverse needs of students. |   |
| 6. | Design/peer teach a lesson that meets FACS content area standards and reflects the current best practices in teaching and learning with technology. |   |

Continue on next page  |  Reset all fields
### Technology Survey for Family and Consumer Sciences Teacher Educators Part B

Prior to the culminating student teaching or internship experience, prospective Family and Consumer Sciences teachers can:

<table>
<thead>
<tr>
<th></th>
<th>SA - strongly agree, A - agree, D - disagree, SD - strongly disagree, DK - don't know</th>
<th>SA</th>
<th>A</th>
<th>D</th>
<th>SD</th>
<th>DK</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Plan/teach student-centered learning activities and lessons in which students apply technology tools and resources.</td>
<td></td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
</tr>
<tr>
<td>2.</td>
<td>Research/evaluate the accuracy, relevance, appropriateness, comprehensiveness, and bias of electronic information resources to be used by students.</td>
<td></td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
</tr>
<tr>
<td>3.</td>
<td>Discuss technology-based assessment and evaluation strategies.</td>
<td></td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
</tr>
<tr>
<td>4.</td>
<td>Examine multiple strategies for evaluating technology-based student products.</td>
<td></td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
</tr>
<tr>
<td>5.</td>
<td>Examine multiple strategies for evaluating the processes used to create technology-based student products.</td>
<td></td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
</tr>
<tr>
<td>6.</td>
<td>Examine technology tools used to collect, analyze, interpret, represent, and communicate student performance data.</td>
<td></td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
</tr>
<tr>
<td>7.</td>
<td>Integrate technology-based assessment strategies and tools into plans for evaluating specific learning activities.</td>
<td></td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
</tr>
<tr>
<td>8.</td>
<td>Develop a portfolio of technology-based products from coursework, including the related assessment tools.</td>
<td></td>
<td>c</td>
<td>c</td>
<td>c</td>
<td>c</td>
</tr>
</tbody>
</table>

Continue on next page | Reset all fields
Technology Survey for Family and Consumer Sciences Teacher Educators Part B

Prior to the culminating student teaching or internship experience, prospective Family and Consumer Sciences teachers can:

<table>
<thead>
<tr>
<th></th>
<th>SA - strongly agree, A - agree, D - disagree, SD - strongly disagree, DK - don't know</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Identify issues related to equitable access to technology in school environments.</td>
</tr>
<tr>
<td>2.</td>
<td>Identify issues related to equitable access to technology in community environments.</td>
</tr>
<tr>
<td>3.</td>
<td>Identify issues related to equitable access to technology in home environments.</td>
</tr>
<tr>
<td>4.</td>
<td>Identify safety/health issues related to technology use in schools.</td>
</tr>
<tr>
<td>5.</td>
<td>Identify/use assistive technologies to meet the special physical needs of students.</td>
</tr>
<tr>
<td>6.</td>
<td>Identify specific technology applications/resources that affirm diversity.</td>
</tr>
</tbody>
</table>

Click here to finish! Reset all fields
Technology Survey for Family and Consumer Sciences Teacher Educators

Thank you for your time and effort in completing this survey.

These data will be used in a Doctoral dissertation at Utah State University. The data and resulting findings will be disseminated throughout Family and Consumer Sciences professional organizations and networks.

All responses will be treated confidentially. No individual participant or school will be identified. Code numbers will be used for follow-up purposes only.

An incentive will be mailed to your school address as a thank you for your help in this research.

Kathy Croxall
Appendix F. Institutional Review Board Approval
MEMORANDUM

TO: Nancy Thompson
    Kathy Croxall

FROM: True Rubal, IRB Administrator

SUBJECT: Computer Technology Usage in Family and Consumer Sciences Methods
         Courses to Prepare Preservice Teachers

Your proposal has been reviewed by the Institutional Review Board and is approved under expedite procedure #7.

X There is no more than minimal risk to the subjects.
There is greater than minimal risk to the subjects.

This approval applies only to the proposal currently on file for the period of one year. If your study extends beyond this approval period, you must contact this office to request an annual review of this research. Any change affecting human subjects must be approved by the Board prior to implementation. Injuries or any unanticipated problems involving risk to subjects or to others must be reported immediately to the Chair of the Institutional Review Board.

Prior to involving human subjects, properly executed informed consent must be obtained from each subject or from an authorized representative, and documentation of informed consent must be kept on file for at least three years after the project ends. Each subject must be furnished with a copy of the informed consent document for their personal records.

The research activities listed below are exempt from IRB review based on the Department of Health and Human Services (DHHS) regulations for the protection of human research subjects, 45 CFR Part 46, as amended to include provisions of the Federal Policy for the Protection of Human Subjects, June 18, 1991.

7. Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.
Appendix G. Cover Letter for Printed/Mailed Survey Participants
Dear Family and Consumer Sciences Teacher Educators;

With the push to incorporate computer technology into classrooms, many teacher educators are being asked to prepare preservice teachers in this area. The International Society for Technology in Education (ISTE) has developed the National Educational Technology Standards and Performance Indicators for Teachers. All classroom teachers should be prepared to meet them. Consequently, preservice teachers must receive preparation in teaching with computers in order to meet the standards. The purpose of this study is to assess the degree to which Family and Consumer Sciences methods teachers are incorporating computer technology into their teaching as a means of preparing their preservice teachers to meet the ISTE standards.

As a Family and Consumer Sciences teacher educator, your opinions on this topic are essential. These data will be used in a Doctoral dissertation at Utah State University. The data and resulting findings will be disseminated throughout professional organizations and networks. We would appreciate your response to this survey to ensure representation of all Family and Consumer Sciences teacher educators in this national assessment. If you are not the current FACS teacher educator at your institution, please pass this to that individual. If you no longer have a FACS teacher education program at your institution, please return the survey with an indication of such. (Utah State University, 2910 Old Main Hill, Logan, UT 84322-2910.)

It should take you 20 to 30 minutes to complete both parts of the survey. Please complete the survey and return it in the enclosed self-addressed, stamped envelope by December 15, 2001. If you have any questions call me at (435) 797-3408 or e-mail me at kccroxall@cc.usu.edu

Your completion of this survey implies your consent for the utilization of this information. Participation is voluntary and you may withdraw at any time without consequence. All responses will be treated confidentially. No individual participant or school will be identified. Code numbers will be used for follow-up purposes only. After you complete and return both parts of the survey, we will send you a small "thank-you" gift as a token of our appreciation.

Sincerely,

Kathy C. Croxall, ABD
Graduate Instructor

Enclosures (2)
Appendix H. Cover Letter for On-line Survey Participants
Dear Family and Consumer Sciences Teacher Educators;

With the push to incorporate computer technology into classrooms, many teacher educators are being asked to prepare preservice teachers in this area. The International Society for Technology in Education (ISTE) has developed the National Educational Technology Standards and Performance Indicators for Teachers. All classroom teachers should be prepared to meet them. Consequently, preservice teachers must receive preparation in teaching with computers in order to meet the standards. The purpose of this study is to assess the degree to which Family and Consumer Sciences methods teachers are incorporating computer technology into their teaching as a means of preparing their preservice teachers to meet the ISTE standards.

As a Family and Consumer Sciences teacher educator, your opinions on this topic are essential. These data will be used in a Doctoral dissertation at Utah State University. The data and resulting findings will be disseminated throughout professional organizations and networks. We would appreciate your response to this survey to ensure representation of all Family and Consumer Sciences teacher educators in this national assessment. If you are not the current FACS teacher educator at your institution, please pass this to that individual. If you no longer have a FACS teacher education program at your institution, please return the survey with an indication of such. (Utah State University, 2910 Old Main Hill, Logan, UT 84322-2910.)

It should take you 20 to 30 minutes to complete both parts of the survey. Please go to http://facs.usu.edu to take the survey. I would appreciate it if you could complete it by December 15, 2001. If you have any questions call me at (435) 797-3408 or e-mail me at kccroxall@cc.usu.edu

Your completion of this survey implies your consent for the utilization of this information. Participation is voluntary and you may withdraw at any time without consequence. All responses will be treated confidentially. No individual participant or school will be identified. Code numbers will be used for follow-up purposes only. After you complete and return both parts of the survey, we will send you a small "thank-you" gift as a token of our appreciation.

Please copy and use the following ID code to access the survey: **ID Code XXX**

Sincerely,

Kathy C. Croxall, ABD
Graduate Instructor

Nancy E. Thompson, Ph.D.
Family and Consumer Sciences Teacher Educator
Appendix I. Follow-Up Postcard
Dear Family and Consumer Sciences Teacher Educators:

We need your input to complete the Technology Survey for Family and Consumer Sciences Teacher Educators that you recently received in the mail. Thank you for your participation. We look forward to receiving your response form.

If you have already returned the survey, please disregard this notice. If not, please mail it at your earliest convenience. If you have any questions or comments, please don't hesitate to contact us at (435) 797-3408 or kccroxall@cc.usu.edu

Thank you.

Kathy C. Croxall, Graduate Student
Nancy Thompson, Ph.D., Advisor
VITA

Kathy C. Croxall
(May 2002)

EDUCATION

Ph.D. 2002 (expected) Utah State University, Family Life; Emphasis: Family and Consumer Sciences Education

M.S. 1998 New Mexico State University, Major: Family and Consumer Sciences, Emphasis: Education; Minor: Agriculture and Extension Education

B.S. 1975 Brigham Young University, Major: Home Economics Education; Minor: Foods Science and Nutrition

PROFESSIONAL EXPERIENCE

1999-Present Graduate Instructor
Utah State University, Logan, Utah
Consumer and the Market
Social Systems and Issues (Internet based)
Family Resource Management (graduate, distance education)
Student Teacher Supervision

1998-1999 Family and Consumer Economics Teacher
Gadsden Independent School District, Anthony, New Mexico
Clothing and Textiles
Child Development

1997-1998 Graduate Teaching Assistant
New Mexico State University, Las Cruces, New Mexico
Textiles
Fashion Illustration

1992-1997 Family and Consumer Economics Teacher
Fontana Unified School District, Fontana, California
Clothing and Fashion Design
Interior Design
Health
Decorative Arts
Life Skills
1974-1975  Graduate Teaching Assistant  
Brigham Young University, Provo, Utah  
Household Equipment Laboratory  
Home Management House

PUBLICATIONS


PRESENTATIONS


RELATED PROFESSIONAL PRESENTATIONS & ACTIVITIES

Utah Family and Consumer Sciences Educators Summer Conference, August 2000  
"Sewing Websites and Software"

Utah Family and Consumer Sciences Educators Summer Conference, August 1999  
"Sewing Websites and Software"  
"21st Century Consumer Skills: What Students Really Need to Know"

Clothing and Textiles Update Workshop, July 1999  
"Sewing Websites and Software"

New Mexico State 4-H Competition, July 1998  
Fashion Revue Judge

State Leadership and Management Conference, Home Economics Teachers of California, August 1996  
Curriculum Roundtable Presentation
RESEARCH PROJECTS

"Family and Consumer Sciences Preservice Teachers' Computer Technology Preparation" (Dissertation, Utah State University)

"Computer Usage in Secondary New Mexico Family and Consumer Sciences Classrooms" (Masters Thesis, New Mexico State University)

AWARDS AND RECOGNITION

Jewell L. Taylor Fellowship, American Association of Family and Consumer Sciences, June 2001

Family and Consumer Sciences Division Fellowship, Association for Career and Technical Education, Dec. 2000

Flemmie D. Kittrell Fellowship, American Association of Family and Consumer Sciences, June 2000

Graduate Honor Roll, Utah State University, June 2000

Leah D. Widtsow Graduate Scholarship, College of Family Life, Utah State University, March 2000

University Graduate Fellowship, Utah State University, July 1999
Gamma Sigma Delta nomination, 1998

District Human Rights Award, Fontana Unified School District, June 1997

Kappa Omicron Nu nomination, 1974

PROFESSIONAL ASSOCIATIONS MEMBERSHIP

Association for Career and Technical Education

American Association of Family and Consumer Sciences

Family & Consumer Sciences Education Association

National Association of Teachers of Family and Consumer Sciences

National Association of Teacher Educators for Family and Consumer Sciences

Kappa Omicron Nu