Integration of technology into the instructional practice of new teachers: case studies of beginning teachers' use of technology

Jon Michael Clausen

Iowa State University

Follow this and additional works at: https://lib.dr.iastate.edu/rtd

Part of the Communication Technology and New Media Commons, Curriculum and Instruction Commons, Instructional Media Design Commons, and the Teacher Education and Professional Development Commons

Recommended Citation

Clausen, Jon Michael, "Integration of technology into the instructional practice of new teachers: case studies of beginning teachers' use of technology" (2005). Retrospective Theses and Dissertations. 1724.

https://lib.dr.iastate.edu/rtd/1724

This Dissertation is brought to you for free and open access by the Iowa State University Capstones, Theses and Dissertations at Iowa State University Digital Repository. It has been accepted for inclusion in Retrospective Theses and Dissertations by an authorized administrator of Iowa State University Digital Repository. For more information, please contact digirep@iastate.edu.
Integration of technology into the instructional practice of new teachers: Case studies of beginning teachers' use of technology

by

Jon Michael Clausen

A dissertation submitted to the graduate faculty in partial fulfillment of the requirements for the degree of DOCTOR OF PHILOSOPHY

Major: Education (Curriculum and Instructional Technology)

Program of Study Committee:
Ann Thompson, Co-major Professor
Dale S. Niederhauser, Co-major Professor
Denise Schmidt
Patricia Leigh
William W. Miller

Iowa State University
Ames, Iowa
2005
INFORMATION TO USERS

The quality of this reproduction is dependent upon the quality of the copy submitted. Broken or indistinct print, colored or poor quality illustrations and photographs, print bleed-through, substandard margins, and improper alignment can adversely affect reproduction.

In the unlikely event that the author did not send a complete manuscript and there are missing pages, these will be noted. Also, if unauthorized copyright material had to be removed, a note will indicate the deletion.
This is to certify that the doctoral dissertation of

Jon Michael Clausen

has met the dissertation requirements of Iowa State University

Signature was redacted for privacy.

Co-major Professor

Signature was redacted for privacy.

Co-major Professor

Signature was redacted for privacy.

For the Major Program
DEDICATION

This work is dedicated to the memory of my brother, Joel Clausen, to my parents Marie and Kenneth Clausen, and to my family Stephanie, Garrett, and Ian who have always believed that if I put my mind to something I would eventually succeed. It has only been through your continued assistance and faith in me that I have been able to endure this process.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Chapter/Appendix</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHAPTER ONE. INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>CHAPTER TWO. LITERATURE REVIEW</td>
<td>7</td>
</tr>
<tr>
<td>CHAPTER THREE. RESEARCH DESIGN AND METHODS</td>
<td>29</td>
</tr>
<tr>
<td>CHAPTER FOUR. RESULTS</td>
<td>49</td>
</tr>
<tr>
<td>CHAPTER FIVE. CONCLUSION</td>
<td>109</td>
</tr>
<tr>
<td>APPENDIX A. COPY OF IRB FORM</td>
<td>115</td>
</tr>
<tr>
<td>APPENDIX B. FIRST YEAR TEACHER INFORMED</td>
<td>121</td>
</tr>
<tr>
<td>CONSENT FORM</td>
<td></td>
</tr>
<tr>
<td>APPENDIX C. FACULTY / ADMINISTRATION INFORMED</td>
<td>124</td>
</tr>
<tr>
<td>CONSENT FORM</td>
<td></td>
</tr>
<tr>
<td>APPENDIX D. INTERVIEW PARTICIPANTS AND DATES</td>
<td>127</td>
</tr>
<tr>
<td>APPENDIX E. OBSERVATION SCHEDULE FOR COURTNEY</td>
<td>129</td>
</tr>
<tr>
<td>APPENDIX F. OBSERVATION SCHEDULE FOR PATRICIA</td>
<td>130</td>
</tr>
<tr>
<td>APPENDIX G. FIRST YEAR TEACHER INTERVIEWS</td>
<td>132</td>
</tr>
<tr>
<td>APPENDIX H. OTHER PARTICIPANT’S INTERVIEW</td>
<td>138</td>
</tr>
<tr>
<td>APPENDIX I. SCHOOL ADMINISTRATOR INTERVIEWS</td>
<td>139</td>
</tr>
<tr>
<td>APPENDIX J. COLLEGE OF EDUCATION FACULTY</td>
<td>140</td>
</tr>
<tr>
<td>INTERVIEW</td>
<td></td>
</tr>
<tr>
<td>REFERENCES</td>
<td>142</td>
</tr>
</tbody>
</table>
CHAPTER ONE
INTRODUCTION

Research suggests that efforts to increase effective technology use in K-12 classroom teachers’ instructional practices have been largely unsuccessful (Larry Cuban, 2001; Office of Technology Assessment, 1995; Russell et al., 2003). Becker (2001) highlighted existing teachers’ lack of technology adoption with their students by claiming, “Frequent use of computers by middle and high school teachers and their students in math, science, social studies, and English is... still very much a rare phenomenon” (p. 26). In recent years policymakers, school administrators, and teacher educators have made numerous efforts to rectify this situation. For example, policymakers have issued national reports and have provided standards to encourage technology integration into teachers’ instructional practice. Federal, State, area, district, and school administrators have allocated substantial resources to provide hardware, software, networking, and training to create an environment that supports teachers’ instructional technology use. Further, teacher educators have developed programs and created opportunities to prepare preservice teachers as effective technology users when they enter the teaching profession. Results from these efforts are just beginning to emerge.

One place where results of these efforts to improve teachers’ instructional technology use may be evident is in the technology use of recent teacher education graduates as they begin their careers. Many beginning teachers have graduated from teacher education programs awarded Preparing Tomorrow’s Teachers to Use Technology (PT3) grants and have entered schools that have technology resources for teachers. An examination of these first year teachers offers an opportunity to investigate how teacher education and the institutional and classroom context affect new teachers’ instructional technology use during...
their first year in the classroom.

Background

First year teachers who graduated from PT3 grant projects were ostensibly prepared to integrate technology into their instruction. The PT3 grant programs’ goal was to “transform teacher education so that technology is integrated throughout teaching and learning” (www.pt3.org). Institutional grant recipients met this goal in various ways, which included faculty development efforts, curriculum restructuring, digital portfolio development, and video case studies (http://www.ed.gov/programs/teachtech/index.html). The goals of the PT3 program also included changing teachers’ instructional practice by providing preservice teachers with technical skills and pedagogical knowledge of progressive instructional reforms (Carroll, 2000). PT3 leaders envisioned that these new teachers would bring about instructional change by advocating effective technology use, while practicing constructivist instructional methods. Their skills and knowledge would allow them to act as change agents within schools once they entered their own classrooms (Carroll, 2000). These objectives meant that new teachers would not only know how to use technology, but also be able to use technology as a tool for effective student learning.

The PT3 grant awarded to the teacher education program at Iowa State University shared the PT3 vision of preparing preservice teachers to use technology effectively. Iowa State University’s PT3 project, Technology Collaboratives (TechCo) for Simultaneous Renewal in Teacher Education, was designed to address three areas to prepare new teachers to use technology. The project goals included expanding Iowa State’s existing faculty technology mentoring program, developing technology-rich curriculum within the teacher
education program, and working with cooperating schools to develop a supportive context for technology use during preservice teachers' field experiences (Thompson, Schmidt, Davis, 2003). Two cohorts of preservice teachers participated in the TechCo project. These preservice teachers enrolled in education courses as a cohort beginning their sophomore year, and had extensive field experiences with partner schools throughout the three-year project. Another component of the grant included cooperation with teachers and technical staff from partner schools in the project, who worked with university faculty and staff to create a technology-rich curriculum and to develop a supportive technology-using teaching context. The project ended in 2004 with the graduation of the second cohort.

Although funding for the project has ended, partner schools continue to host technology-rich field experiences for preservice teachers. These partner schools also serve as technology-rich contexts for new teachers. Graduates from Iowa State's PT3 project are now beginning their careers as first year teachers. These first year teachers may not begin their professional teaching careers in schools supported by PT3, but, in general, the schools they will enter have allocated substantial resources toward technology (Dickard, 2003).

School districts have allocated significant resources to acquire technology for instructional use with students. Federal and state funding agencies, and local school districts across the country have spent over $40 billion in the acquisition of hardware and software, and provided training and support in order to make computer technologies available to teachers and students (Dickard, 2003). School districts across the country continue to allocate resources for technology and are providing the infrastructure for teachers to use technology with their students (Quality Education Data, 2004). Such views from Quality Education Data suggest that Iowa State's PT3 graduates who entered these contexts have the
resources available to use technology with their students. At the same time, “Educational change depends on what teachers do and think—it’s as simple, and as complex as that” (Fullan, 2001, p. 115). New teachers who have been encouraged to use technology and incorporate constructivist instructional practices will have to make decisions about their own instructional practice as they begin their careers.

First-year teachers continue their professional development in the schools and classrooms (e.g. contexts) where they begin their careers (Feiman-Nemsar, 2001). Beginning teachers, who were prepared in the TechCo project, or begin their career in schools supported by Iowa State’s PT3 project, may find that their new school and classroom context may challenge, contradict, or support the reforms advocated by their teacher education program. These instructional contexts affect new teachers’ classroom practice (Grossman, Thompson, Valencia, 2002).

Teaching experiences during the first year are a complex interaction of personal and situational factors (Feiman-Nemsar & Buchman, 1987; Zeichner & Tabachnick, 1985). These personal and contextual factors are frequently characterized as difficult and a challenge for new teachers (Kagan, 1992; Veenman, 1984). Concerns about their new situation and daily teaching activities often overwhelm beginning teachers as they confront issues of classroom management, planning, and questions of self-worth (Bullough, 1989; Fuller & Bown, 1975). The first year of teaching however, is also a period of discovery and an opportunity for professional growth that can shape a new teachers instructional practice (Feiman-Nemsar, 2001; Gold, 1996; Huberman, 1989). How new teachers interpret these factors offers an opportunity to investigate issues related to beginning teachers development and their instructional decisions to use technology with their students.
Problem

The main goal of the Preparing Tomorrow's Teachers to Use Technology grant program was to reform teacher education so that new teachers would be prepared to use technology effectively in the technology-rich contexts they would enter. Researchers know very little about how new teachers who were prepared in PT3 teacher education programs, or who begin their careers in PT3 supported school contexts use technology with their students once the teacher leaves their teacher education program.

Purpose

The purpose of this study is to investigate how two first-year teachers use technology with their students. Each teacher was encouraged to use technology with students at different times in their development as teachers. One teacher participated in Iowa State University's PT3 grant project as a member of the TechCo cohort and began her career at a traditional elementary school. The second teacher was not a member of the PT3 cohort, but began her career at a school that had been a partner with Iowa State University's PT3 grant project. A case study analysis of these teachers investigated how each teacher used technology with their students and how their teacher education experience and the institutional and classroom context affected each teacher's instructional decisions and technology use with students during their initial year in the classroom.

Guiding Questions

The following questions guide this research.
1. How did two first-year teachers, one who was prepared in Iowa State’s PT3 TechCo cohort, and the other who was not in the cohort, but began her career in a school supported by Iowa State’s PT3 project, use technology with their students?

2. How did teacher education affect instructional practices and technology use of these first year teachers?

3. How did the existing institutional and classroom context affect instructional practices and technology use of these beginning teachers?
CHAPTER TWO
LITERATURE REVIEW

This literature review examines relevant literature related to efforts to improve beginning teachers’ preparation and support for technology use with their students during the initial year in the classroom. Major topics within the review include a discussion of the definition of effective technology use by teachers, and a review of studies that examine experienced and first-year teachers’ technology use with students. The next topic includes factors that affect beginning teachers’ technology use with students and includes literature related to the issues first-year teachers face as they transition from teacher education to their own classrooms. The chapter concludes with topics focused on recommendations on how to prepare and support new teachers’ effective technology use with their students. The literature reviewed within these topics provides an overview of how others have examined teachers’ technology use with students and suggests recommendations for how to improve that use. This review also provides the context for studying how beginning teachers who have been encouraged to integrate technology into their instructional practice actually do so with students, and whether or not approaches adopted by teacher education programs and schools affect new teachers technology use with their students.

Defining “Effective” Technology Use by Teachers

The term “effective” has been used frequently to describe various ways technology could be used by teachers and students to improve teaching and learning. Use of the term suggests specific skills, behaviors and practices that characterize effective use. This section investigates the literature surrounding effective technology use and the specific skills,
behaviors and practices that would identify whether a teacher is using technology effectively with his or her students.

Teachers' technology use has been defined in different ways in the literature over the last two decades (Office of Technology Assessment, 1995). Early on, researchers focused on how frequently teachers used technology. For example, a 1992 study by the International Association for the Evaluation of Educational Achievement used self-report data from teachers to define a "computer-using teacher as someone who "sometimes" used computers with students. Results from this survey classified 75% of U.S. teachers as "computer-using teachers" (Anderson, 1992). Another study conducted by Becker (1994) however, defined teacher computer use in a different way and reported that only approximately 25% of American teachers could be considered technology-using teachers. Becker (1994) constructed a more complicated system to classify technology use by teachers, focusing upon student use of computers. At least 90% of teachers' students needed to use a computer in the class in any way or for any amount of time in order to consider the teacher computer using. A third approach to defining teacher technology use focused upon the type of technology use. The International Association for the Evaluation of Educational Achievement defined teacher technology use in terms of type of instructional delivery (Anderson, 1992).

Russell, Bebell, O'Dwyer, and O'Connor (2003) revisited teachers' technology use in order to examine whether or not teachers' technology use had become more complex due to the increase in types of technology now available to teachers. Russell et al. (2003) defined six categories of how teachers' use technology in their examination of teachers' technology use. These categories included teacher technology use for preparation, teacher technology use for delivery, teacher directed student technology use, teacher technology use for special
education and accommodation, teacher use for email, and teacher technology use for recording grades. Differences in how researchers defined technology-using teachers led the Office of Technology Assessment (1995) to claim, “the percentage of teachers classified as computer-using teachers is quite variable and becomes smaller as definitions of use become more stringent” (p. 103). Variability in how technology-using teachers were defined and recognition that teachers play an important role in whether technology is used lead to an increased focus on teachers’ instructional practice as a means for defining effective technology use.

Researchers recognized that technology in and of itself had little impact on teacher use (Office of Technology Assessment, 1995) and began to recognize that technical skills and pedagogical knowledge were important factors in whether teachers used technology effectively. Anderson and Becker (2001), emphasize these factors in defining effective technology use by teachers:

...widespread consensus among those in government and research who have been studying computer use in education is that effective use of educational technology depends most strongly on the human element—on having teachers and support personnel who have not only technical skills in using computers but practical pedagogical knowledge about designing computer activities that create intellectually powerful learning environments for students. (p. 3)

This emphasis on teachers, their pedagogical practice and ability to use technology have become the central components in defining whether teachers use technology effectively with students.
Development of the National Educational Technology Standards for Teachers
(NETS-T) (International Society for Technology in Education, 2002) represents this focus on the role of teachers, their technical skills, and their ability to apply those skills to create learning opportunities for students. The NETS-T identifies six standards that all teachers should meet in order to be able to use technology effectively.

I. Technology operations and concepts - Teachers demonstrate a sound understanding of technology operations and concepts.

II. Planning and designing learning environments and experiences - Teachers plan and design effective learning environments and experiences supported by technology.

III. Teaching, learning and the curriculum - Teachers implement curriculum plans that include methods and strategies for applying technology to maximize student learning.

IV. Assessment and evaluation - Teachers apply technology to facilitate a variety of effective assessment and evaluation strategies.

V. Productivity and professional practice - Teachers use technology to enhance their productivity and professional practice.

VI. Social, ethical, legal, and human issues – Teachers understand the social, ethical, legal, and human issues surrounding the use of technology in PK-12 schools and apply those principles in practice. (International Society for Technology in Education, 2002)

These standards represent a wide range of technical skills and abilities expected of teachers as they use technology. Effective technology use includes specific technical knowledge and
knowledge of how teachers may use technology as part of their professional practice, but the
standards also emphasize teachers’ technology use with students and the development of
learning environments that promote student learning. NETS-T Standard II and Standard III
address these issues. Performance indicators articulate specific teacher characteristics as
meeting these standards and relate to teachers technology use with students. The performance
indicators for standard two (Planning and designing learning environments and experiences)
include:

A. Teachers design developmentally appropriate learning opportunities that apply
technology-enhanced instructional strategies to support the diverse needs of
learners.

B. Teachers apply current research on teaching and learning with technology when
planning learning environments and experiences.

C. Teachers identify and locate technology resources and evaluate and evaluate them
for accuracy and suitability.

D. Teachers plan for the management of technology resources within the context of
learning activities.

E. Teachers plan strategies to manage student learning in a technology-enhanced
environment. (International Society for Technology in Education, 2002)

Performance indicators for standard three (Teaching, learning and the curriculum include):

A. Teachers facilitate technology-enhanced experiences that address content
standards and student technology standards.

B. Teachers use technology to support learner-centered strategies that address the
diverse needs of students.
C. Teachers apply technology to develop students’ higher order thinking skills and creativity.

D. Teachers manage student learning activities in a technology enhanced environment. (International Society for Technology in Education, 2002)

These standards reflect specific skills, behaviors, and practices concerning learning environments created by the teacher where they can effectively use technology with their students. These standards also reflect calls for teachers to make changes in their general instructional practices.

Many national organizations have advocated instructional changes from traditional didactic instruction models to more cognitive constructivist models where students play a more significant role in their own learning (International Reading Association and the National Council of Teachers of English, 1996; National Council for Accreditation of Teacher Education, 2002; National Council of Teachers of Mathematics, 2000; National Research Council, 1996). In addition, many researchers have concluded technology is most powerful when used as an instructional tool within a constructivist or student-centered classroom (Ringstaff & Kelly, 2002; Sandholtz et al., 1997; Sheingold, 1991). For example, Means (1994) suggested that teachers’ instructional practice involves the development of student-centered learning environments and includes student technology use in authentic and meaningful learning activities (Means, 1994). Examples of teachers who have developed these types of learning environments is evident throughout research and policy reports related to effective technology use to improve student learning (Bagley & Hunter, 1992; Culp et al., 2003; Office of Technology Assessment, 1988, 1995; President's Committee of Advisors on...
Thus, a complete definition of effective technology use by teachers should include particular skills, behaviors, and practices that involve the teacher and students in technology use. Researchers must consider whether a teacher possesses technical skills, incorporates constructivist or student-centered pedagogical practices, and develops instructional opportunities for students where the students are involved in authentic and meaningful activities as they use technology in order to define whether a teacher is effectively using technology with their students.

Teachers’ Technology Use

Teachers have acknowledged the importance of technology in their professional lives and daily practice in the classroom; however, much of the technology use of typical teachers use does not involve developing student-centered learning environments or involving students in authentic instructional opportunities that incorporate technology as a tool for teaching and learning (Becker, 2000). In his first report from data collected for the Teaching, Learning and Computing: 1998 National Survey, Becker (1999) reported teachers found a teacher’s computer station with personal access to email and the world wide web access valuable as a teaching resource. Becker stated:

In each case, almost one-half of all teachers saw these resources as ‘essential’ for their teaching (49% and 47%, respectively) and nearly 90% reported they would consider these resources either valuable or essential. Even among teachers who did
not have access to the Internet either at home or in their own classroom, one-third regarded the Internet as an essential teaching resource (p. 9).

In another examination concerning teachers’ technology use Becker, Ravitz, and Wong (1999) concluded, “Most teachers find computers useful in preparing handouts for lessons, recording student grades, and doing other work of knowledge professionals” (p. 2). However, results from this study suggested that, most teachers do not use computers with their students. “To a large degree, teaching students to use computer resources such as the Internet remains a specialized province of the ‘computer teacher’ rather than having been integrated into the instructional repertoire of teachers across all subjects” (p. 13). For teachers in science, English, social studies, and math use of the Internet and other technologies has been limited to accessing information and improving writing skills. For most students, access to technology and the Internet has been in business, vocational, and specific computer-related courses. Teachers in the core academic areas have not incorporated technology into their instructional practices with students. Other researchers have reported similar results.

Russell et al. (2003) report that, “Teachers...use technology regularly for preparation and email but less frequently for instructional purposes in the classroom (either by the teacher or by the student)” (p. 301-302). They also found teachers’ beliefs about the importance of technology for teaching was the strongest predictor of type of technology use for delivery in the classroom and teacher directed student use. In general, they conclude that there is substantial technology use by teachers outside of the classroom, but efforts to get teachers to use technology within the classroom have shown little result (Russell et al., 2003).
Much of the literature on technology use by teachers with their students has focused on the implementation of specific technologies, but has not addressed issues surrounding the contexts where teachers work (Norris, C., Sullivan, T., Poirot, J., Solloway, E., 1999). In 1995 the U.S. Congress Office of Technology Assessment stated, “Despite the central role of the teacher in educational applications of technology, there has been relatively little research on how and why American teachers use technology” (p. 51). Seven years later, Zhao, Pugh, Sheldon, and Byers (2002) found little had changed:

...in spite of the rich tradition of research on classroom teaching and learning (Peterson & Walberg, 1979; Richardson, in press; Witrick, 1986), there is a conspicuous lack of attention to the complexities and intricacies of how classroom teachers actually incorporate technology in their teaching.” (p. 483)

There continues to be limited research related to teachers’ technology integration into their instructional practice. The noted exception however, has been the Apple Classroom of Tomorrow research conducted by Sandholtz, Ringstaff, and Dwyer.

Sandholtz, Ringstaff and Dwyer (1997) identified five stages of instructional evolution as teachers incorporated technology into their instructional practice during the Apple Classrooms of Tomorrow (ACOT) research. The five stages include entry, adoption, adaptation, appropriation, and invention. Teachers involved in the study had a wide range of technical skills and used technology in various ways. Results from the study found teachers’ technology use initially strengthened existing instructional practice. Teachers involved in the study eventually replaced their existing practice to more student-centered instructional practices as teachers became more knowledgeable about technology and how they could use it within their instruction.
Taken together, these studies demonstrate that some practicing teachers found technology valuable and have used it within their professional practice. Teachers in these studies had various levels of technical knowledge and used technology predominately in ways that reflected traditional instructional practice. Additional studies examining first-year teachers technology use include additional dimensions related to their novice position within the profession.

Beginning teachers’ technology use

There is limited evidence of how beginning teachers use technology with their students. Existing literature has focused primarily on how beginning teachers interpret their preparation to use technology (Moursund & Bielefeldt, 1999; Strudler et al., 1999). Literature that has investigated beginning teachers’ technology use has reported new teachers perceive and use technology in similar ways to teachers with more experience (Novak & Knowles, 1991; Oliver, 1994; Russell et al., 2003).

An early study by Novak and Knowles (1991) explored beginning elementary teachers’ instructional technology use. Researchers used a case study methodology to examine how six beginning teachers in their second semester of full time teaching experience used computers within their instruction. Beginning teachers’ computer use included word processing, drill and practice software, and LOGO programming. Teachers used drill and practice software as a means to provide students with practice, reinforcement, and a fun alternative during open time of the day. Five of the six participants used word processing so students could produce final drafts of their written work. Novak and Knowles (1991) conclude that beginning teachers viewed computers as an important part of society and
believed that student's ability to use computers would make them successful in the future. The beginning teachers however, considered computer use in their classroom as something additional to the regular day and they did not view the computer as a tool to be integrated within their instructional practice that could improve their teaching or student learning (Novak & Knowles, 1991).

Oliver (1994) conducted research concerning first-year teachers' use of computers in Western Australia. The study examined questions related to the level of use and the level of IT training as influencing new teachers used computers. Survey results indicated that beginning teachers used computers for administrative tasks and personal productivity tools, but made little use of computers for instruction.

More recently, Russell et al. (2003) examined beginning teachers technology use and explored the assumption that new teachers who had grown up in technology-rich environments would have increased skills and comfort concerning technology that would help transform their instructional practices. Survey results reported that teachers with five or less years of experience did have a greater confidence in their technology use. However, beginning teachers also had significantly stronger negative beliefs about technology's impact on student learning. "... new teachers are more likely to believe that technology use harms specific aspects of student learning. These negative effects include making students more lazy, decreasing research skills, and decreasing the quality of student writing" (p. 305). In further analysis of the data on teachers' beliefs, Russell et al. (2003) examined teachers' pedagogical practices and found that beginning teachers had greater teacher-centered beliefs. In their summary Russell et al. conclude:
...teachers who have entered the profession during the past 5 years are significantly more confident with technology, use it more for professional purposes outside of the classroom, but require their students to use technology significantly less than do more experienced teachers (p. 306).

In general, these studies highlight ways beginning teachers have used technology and suggest that their technology practices are similar to those of more experienced teachers. The beginning teachers in these studies believed technology skills were important and used technology in their professional practice, but generally did not use technology in meaningful ways with students. Although the beginning teachers in the studies reviewed possessed more advanced technology skills than more experienced teachers, they did not use these skills as an integral part of their instructional practice with students.

Factors Affecting Technology Use

Issues of access, professional development, and support dominate the literature related to why teachers have not used technology effectively in their instructional practice (Office of Technology Assessment, 1988, 1995; Sandholtz et al., 1997; The CEO Forum on Education and Technology, 1997, 1999; Web-based Education Commission, 2000; Zhao et al., 2002). Cuban (2001) argued that educational reformers have oversold computer technologies as a transformative tool for instruction because teachers do not understand how to integrate the technology into their instructional practice. Cuban's claim concerning teachers' preparedness to integrate technology is supported by various sources (National Center for Education Statistics, 2000; Willis & Mehlinger, 1996). In one national study, only one-third of the teachers indicated that they felt well prepared or very well prepared to use
computers and the Internet for classroom instruction (National Center for Education Statistics, 2000). Cuban (2001) also argued that teachers do not readily adopt technology because the school systems do not support the types of instructional reforms that support effective technology use. Schools are similar to other bureaucratic structures that resist efforts to change and do not tend to accept wholesale reform. Instead, teachers who work within school adopt aspects of a reform that are most like existing practice (L. Cuban et al., 2001). Cuban concluded that attempts to reform instructional practices by incorporating technology into schools will have similar outcomes to previous attempts at reform where teachers co-opted the original intent of the reform in order to fit with their existing instructional practices.

Factors affecting beginning teachers’ technology use

Research on beginning teachers’ technology use suggests that access, preparation, and support for technology integration are also important factors in new teachers’ use of technology (Moursund & Bielefeldt, 1999; Office of Technology Assessment, 1988, 1995; Oliver, 1994; Strudler et al., 1999). Other issues related to being a first year teacher provide additional elements in whether beginning teachers use technology with their students. These issues concern teachers’ development as they transition from teacher education to their own classroom.

Leaving teacher education and beginning a career is a significant period in a teachers’ development. Gold (1996) stated that, “Few experiences in life have such a tremendous impact on the personal and professional life of a teacher as does the first year of teaching.”
Teacher induction is frequently framed as a transition from preparation to practice and from a student of teaching to a teacher of students (Feiman-Nemser, 2001).

The transition for beginning teachers from their teacher education program into their first year of teaching experience has frequently been characterized as a period of survival, discovery, adaptation, and learning (Nemsar, 1983). For some, the first year is simply a period of survival where the new teacher progresses through the year by making trial and error decisions about instruction, classroom management, curriculum development, and continues to rely on those decisions even though they do not represent best practices (Lortie, 1975; Veenman, 1984). Others describe beginning teachers’ as being concerned with personal conflicts related to acceptance, control, and adequacy (Bullough, 1989; Kagan, 1992). These concerns need to be resolved before the beginning teacher can focus on student learning. Other researchers have examined the social and contextual influences on new teachers (Bullough, 1989; Bullough & Baughman, 1997; Grossman, 1990; Zeickner et al., 1987). Support new teachers receive as they transition from teacher education affects their development during their first years in the classroom (Gold, 1996; Grossman, 1990). The characteristics and interpretations of a beginning teacher’s first year all depict a period where new teachers are placed in a position where they have to make numerous decisions about their instructional practice that frequently challenge their existing conceptions about teaching and learning. Research related to first-year teachers technology use recognizes that development and support affect how new teachers use technology.

Novak and Knowles (1991) identify two factors that influence how beginning teachers use computers. The first was that first-year teacher in their study felt constrained by time. “Overwhelmingly, the teachers felt constrained by time – time to plan for the computer;
time to identify, locate and preview software; and time to allow the students to use the computer during the schools day" (p. 48). Novak and Knowles (1991) concluded that the issue of time was something these teachers had to contend with generally as beginning teachers and that adding computer use to their already hectic day increased the amount of work they were required to do. The second factor was that teachers believed using the computer added to their existing classroom management problems. Beginning teachers had difficulty establishing organization, routines, and management aspects of their teaching. Adding computers to their already busy schedules created additional scheduling problems where the teachers tried to fit using the computer into an already crowded curriculum. Researchers concluded:

...computer use by beginning teachers in this study was influenced by a variety of factors. Most notably, it was impacted by their first year status. They felt they had other things to stress, such as ‘the academics,’ and had little time to use the computer because they were too busy dealing with their other responsibilities and getting comfortable in their new role. (p. 49)

Russell et al. (2003) suggested that beginning teachers’ lack of use and negative perspectives about technology use for student learning may occur due to the lack of positive models of how to integrate technology into instruction. Another possible explanation is these recent graduates came from teacher education programs that focused more on how to use the technology than how to teach with technology and integrate it into their teaching practices. A third explanation centered on new teachers difficulty during the first years of teaching. These beginning teachers did not have the time to find ways to integrate technology into their classrooms. In their conclusion, Russell et al. claimed that new teachers’ confidence in how
to use technology is not enough to reform education. Instead, “Teachers entering the profession need to develop positive beliefs about technology and skills to use technology in a wide variety of ways” (p. 309).

Oliver (1994) also questioned the focus of beginning teachers preparation programs in affecting why new teachers did not use technology. Preparation of the teachers surveyed emphasized developing technology skills and personal productivity. Teachers in this study self reported use that reflected their preparation and emphasized using their skills for personal productivity, rather than instructional, purposes.

In summary, the studies reviewed here suggest that factors affecting beginning teachers technology use emphasize that the first-year teachers' position as novice within a new school context placed additional challenges in how new teachers used technology. Typical concerns of beginning teachers such as time to organize the school day and concerns about management of student behaviors occupied new teachers attention on immediate classroom concerns instead of how to integrate technology into their instruction. Beginning teachers considered technology use with students as separate or additional to their instructional practice. How teacher education emphasized technology was also a factor in how beginning teachers used technology. How teacher education programs prepare beginning teachers to use technology and the support these new teachers receive as they begin their careers remain important questions in whether beginning teachers will use technology with their students.

Preparation and Support for New Teachers Technology Use
The need for adequate preparation and support for existing teachers is well documented (Becker, 1999; Office of Technology Assessment, 1995; President's Committee of Advisors on Science and Technology, 1997). Many however have concluded that these efforts have not been successful (Becker, 2000; Larry Cuban, 2001; L. Cuban et al., 2001; Oppenheimer, 2003). This has led to an increased focus on teacher education as the location that may provide the greatest opportunity to affect a change in how teacher use technology. While some have been critical of teacher education programs' ability to effectively prepare preservice teachers to use technology (Moursund & Bielefeldt, 1999), teacher education remains the primary location for efforts to effectively prepare new teachers to use technology with their students (Feistritzer, 1998).

Preparation

Researchers have identified beginning teachers' preparation as a factor in how new teachers use technology (Office of Technology Assessment, 1995; Oliver, 1994; Russell et al., 2003). Many preparation programs have emphasized development of technical skills over application of technology into beginning teachers' instructional practice. Researchers have suggested a reversal in this process in order to better prepare teachers (Oliver, 1994; Russell et al., 2003; Sandholtz & Reilly, 2004). Russell et al. (2003) suggested that teacher education programs move away from the focus on teaching technology skills and instead focus on teaching with technology. This shift in focus emphasizes technology use, "...as an integral tool with diverse uses and inherent potential to enhance teaching and learning beyond what traditional methods allow" (p. 309). One program in particular has focused on reforming teacher education so that beginning teachers can effectively use technology.
The United States Department of Education developed the Preparing Tomorrow’s Teachers to use Technology (PT3) grant program to “transform teacher education so that technology is integrated throughout teaching and learning” (http://pt3.org/). Since 1999, the PT3 program has invested $337.5 million in over 400 grant projects designed to help teacher education programs develop faculty training, restructure curriculum, change certification requirements, and to develop models that help facilitate technology use throughout teacher education (U.S. Department of Education, 2005). An implicit objective is that students in these teacher education programs will change, alter, or reinforce their beliefs about teaching and learning to beliefs that reflect their preparation. The vision for teacher educators and teacher education programs that have advocated student-centered instructional practices and technology use for teaching and learning is that graduates will implement the practices advocated during teacher education. Part of the PT3 vision includes the need for teacher education programs to work collaboratively with K-12 schools to ensure that students are prepared for the realities of technology use in K-12.

The International Society for Technology in Education (ISTE) has identified essential conditions that must be in place for both teacher education and the school context so that beginning teachers will use technology effectively once they enter their own classrooms. Elements of these conditions include; a shared vision, access, skilled educators, professional development, technical assistance, content standards and curriculum resources, student-centered teaching, assessment, community support, and support policies. Recommendations for teacher education emphasize that technology must be effectively modeled and used throughout teacher preparation in order to new teachers to use technology as part of their
own practice (International Society for Technology in Education, 2000). The standards indicate that:

Prospective teachers must experience and observe effective uses of technology in their general education and major coursework. School and college of education coursework must consistently model exemplary pedagogy that integrates the use of technology for learning content with methods for working with PK-12 students. (p.6-7)

These recommendations correspond with others that have called on teacher education to effectively model technology use within methods, content area coursework, and student teaching experiences (The CEO Forum on Education and Technology, 1997, 1999).

Support in the K-12 Context

As teacher education students move into K-12 environments, access to technology and support provided within schools can either enhance or negate efforts to prepare teachers to use technology effectively. Sandholtz (2001) warned that access and support within the school context where teachers work directly influence how teachers will use technology in their classroom:

Even when programs are highly rated by their participants and they leave with specific plans for using technology in their classrooms, outcomes vary depending on the particular school or district contexts to which the teacher returns. Without adequate access to equipment combined with appropriate technical, collegial, and administrative support, teachers may abandon even well developed plans for integrating technology into their classroom instruction. Yet when freed of these
constraints, teachers tend to follow through with their plans and concentrate on issues related to curriculum and instruction. (p. 372-373)

For new teachers who have been prepared to use technology as an integrated part of their instructional practice, the access and support within the new school contexts they enter can have an important effect in how they ultimately use technology with their students.

Novak and Knowles (1991) recommended school districts go beyond merely purchasing equipment and software, and instead, suggest districts should provide extensive support for using computers in classroom contexts. Included within the need for support is the need for the district to provide beginning teachers time. Time provided by the district can offer beginning teachers opportunities to become comfortable in their new context, plan activities, organize, and reflect on their professional development and how they may use the computer in instruction. Novak and Knowles (1991) predicted that beginning teachers would teach in ways different from their more experienced peers if given these opportunities. “The computer provides opportunities for beginning teachers to teach in new and innovative ways and to develop styles that are different from those used by their former teachers. (p. 50)"

Novak and Knowles (1991) conclude that without a supportive school context that provides time for beginning teachers to consider how they could use technology as part of their instructional practice, effective technology use by beginning teachers within the classroom will be limited. Essential conditions for first-year teachers recommended by ISTE (2000) also reflect the importance of support throughout the school in order for beginning teachers to use technology effectively.

Teachers in their first year must enter a school context supportive of technology use (International Society for Technology in Education, 2000). Conditions within schools that
support technology use include a shared vision for new teacher support by schools, districts, and universities. Schools should provide access to current technologies, software, and networks. Faculty and administrators should be skilled technology users that model student-centered approaches to learning that facilitate student technology use. Other conditions include continuous access to professional development that relate to local policies and content standards. New teachers should also be provided time to take advantage of the professional development opportunities. Technical assistance is another essential condition for beginning teachers to use technology. Technical assistance must be timely, onsite and include mentoring that enhances the new teachers technical skills and develops their understanding of how to assess student learning for technology-supported activities. School induction-year policies, budget allocations, and mentoring assignments should also support first-year teachers technology use (International Society for Technology in Education, 2000).

There have been significant efforts to improve the induction process of new teachers as they begin their careers (Gold, 1996), but the extent to which recommendations to support technology use for beginning teachers in schools remains unclear. Questions remain about how much and what kinds of support new teachers who have been prepared in technology-rich teacher education programs will have when they begin their careers.

Summary

Efforts to develop new teachers who use technology effectively have focused on teacher education and the contexts these teachers will enter as they begin their careers. Effective technology use by teachers includes student-centered pedagogical practices that facilitate student technology use within meaningful learning activities. In the past, beginning
teachers have used technology within their professional practice in many of the same ways as their more experienced colleagues. Similar to experienced teachers, beginning teachers have knowledge about how to use technology, but have not used technology within their instructional practice with students. Researchers have suggested teacher education incorporate and model effective technology use throughout preparation programs so that new teachers will be able to use technology more effectively, however developmental issues related to being a first-year teacher, such as time and concern about student behavior also affect new teachers technology use with students.

Support for beginning teachers within institutional and classroom contexts is also a vital component in whether new teachers will use technology with students, but it remains unclear just how supportive these new contexts are for effective technology use by beginning teachers. Renewed efforts to prepare teachers to use technology effectively are just beginning to emerge. Researchers have not investigated how these efforts to prepare new teachers to use technology effectively play out in the real-life contexts of beginning teacher’s classrooms. Researchers must investigate this intersection between preparation and context in order to better understand how new teachers use technology as they begin their careers.
CHAPTER THREE
RESEARCH DESIGN AND METHODOLOGY

The first year of teaching is a tremendous time for teacher growth and development (Gold, 1996). This period within a teachers’ development represents an initial opportunity for researchers to investigate how the Preparing Tomorrow’s Teachers to Use Technology (PT3) reforms are affecting beginning teachers technology use with students. Researchers know little about how PT3 reforms are affecting new teachers technology use with students. The PT3 grant project at Iowa State University worked in multiple areas to improve teachers’ technology use with students. These areas include curriculum development with university faculty and staff, technical skills and curriculum development with teachers at PT3 partner schools, and facilitation of a preservice teacher cohort who would have technology-rich experiences throughout their teacher education program (Thompson et al., 2003). This study examines two first-year teachers who were encouraged to integrate technology in their instructional practice at various points in their development.

Overview of Method

The researcher selected qualitative research methods and an interpretive case study design in order to examine how each beginning teacher used technology with their students. Merriam (2002) identifies four characteristics of interpretive qualitative research designs.

1. Researchers strive to understand the meanings people construct about their worlds and their experiences; that is, how people make sense of their experiences.

2. The researcher is the primary instrument for data collection and data analysis.
3. The research process is inductive; that is, the researcher gathers data to build concepts, hypotheses, or theories rather than deductively deriving postulates or hypotheses to be tested.

4. The product of qualitative research is richly descriptive. (p. 4-5)

This study will incorporate each of these four characteristics. The two first-year teachers made sense of their new experiences as beginning teachers, and constructed meaning about how and when to use technology with their students. The researcher observed and interviewed participants and analyzed the data collected throughout the study. The researcher developed hypotheses throughout the research process and made connections between how each first-year teacher used technology with their students, their prior experiences as a K-12 and teacher education student, and their current institutional and classroom context affect on their technology use with students. Study of these two beginning teachers is also appropriate for a case study research design.

Case studies include a unit of analysis where the case is a bounded integrated system (Merriam, 2002; Stake, 1995). Yin (2003) states that case studies are the preferred strategy, when the following three criteria exist.

1. When “how” or “why” questions are being asked.
2. When the investigator has little control over events.
3. When the focus is on a contemporary phenomenon within some real-life context.

(p. 1)

Case study is an appropriate research strategy to investigate these first-year teachers' technology use with students with each of the previous criteria present.
These criteria fit well with the study of these first-year teachers. The researcher asked "how" questions in an attempt to explain and understand each beginning teachers’ technology use with their students as the teachers began their careers. The researcher did not directly attempt to manipulate events or their students’ behavior in these two teachers' classrooms. The school and classroom existed before the start of this study. The researcher had no control over where these two teachers would accept their first teaching position or students assigned to the teachers’ classrooms. The researcher assisted each teacher at various occasions in the classroom, but had no role in developing curriculum. Two public school classrooms represent the real-life contexts of these two beginning teachers. There have been significant efforts to acquire technology in schools and to prepare teachers to use technology. These efforts to improve teachers’ technology use with students represent a contemporary phenomenon. A study of beginning teachers who have been encouraged to integrate technology into their instructional practice by either their teacher education program or their current institutional context addresses the phenomenon of how new teachers use technology with students within the real-life context of their school and classroom.

Merriam (1998) describes interpretive case studies as being unique because, although the researcher provides thick, rich descriptive data, these data “…are used to develop conceptual categories, or to illustrate, support, or challenge theoretical assumptions held prior to the data gathering” (p. 38). Through careful data analysis and a rich description of these teachers technology use with students, it is possible to develop a conceptually complete picture of what took place in these teachers’ classrooms. The researcher held the following assumptions before data collection began.
1. Preparation in a technology-rich teacher education program will affect graduates' technology use once they enter their own classrooms (Preparing Tomorrow's Teacher's to use Technology, 2002).

2. Participation in PT3 grant project will effectively change the teaching context a new teacher will enter.

3. Teacher education is a developmental process extending into the first years of teaching (Feiman-Nemsar, 2001).

4. The first year of teaching is a unique period in the development of a teacher's beliefs and pedagogical practices (Richardson, 1996).

Investigation of these first year teachers tests these assumptions. They also suggest new relationships that emerged through careful data analysis throughout the year. The decision to conduct two case studies on first-year teachers is an attempt to identify specific relationships unique to each case and to identify common themes found across the two cases.

Conducting qualitative research is an attempt to understand (Merriam, 2002). The researcher conducted a case study of each teacher in an attempt to understand each first-year teachers technology use with their students, and how the teachers' prior experiences and current institutional and classroom context affected their technology use with students. The decision to use case study represents an “all-encompassing method covering the logic of design, data collection techniques, and specific approaches to data analysis” (Yin, 2003).

Subject Selection and Gaining Access

Participant selection took place during the summer of 2004. Two criteria framed candidate selection. The first criteria was to identify two teachers who were recent teacher
education graduates and were beginning their first year of full time teaching in a traditional grade level classroom. The second criteria differentiated each participant’s preparation and placement. The researcher specifically looked for one teacher who participated in Iowa State University’s PT3 grant program and was a member of the program’s technology-rich cohort, but had taken a teaching position in a non-PT3 supported school. The researcher then looked for one teacher who was a traditional Iowa State University teacher education graduate, and not a member of the PT3 cohort. The placement criterion for this participant was that the teacher’s first year was in a school that had been a partner with Iowa State University’s PT3 grant project.

The researcher submitted and received approval from the Institutional Review Board before contacting potential participants for the study (Appendix A). The researcher began to search for potential candidates for the study after receiving approval. The researcher contacted an officer at Iowa State University’s College of Education Student Services office who monitored recent graduate placement to assist in participant location. The placement officer sorted through recent graduates after discussing the search criteria. The placement officer and researcher initially identified members of the PT3 cohort who had accepted a teaching position they then identified recent graduates who had accepted a teaching position in a PT3 partner school. The placement officer then sent an email to potential candidates that described the study and asked if they would like to participate.

The researcher had few responses that fit the search criteria following the initial attempt to contact participants via email. Many potential candidates who were members of the PT3 cohort were still looking for teaching positions, were located at distances that made frequent observations impossible (e.g. Illinois and Georgia), or they had accepted unique
teaching assignments that did not fit the search criteria (e.g. special education, Spanish, Montessori). The researcher had acquired contact information on a first-year teacher who had accepted a position at one of the PT3 partner schools and one cohort member who was teaching in a school not associated with a PT3 project. He then contacted these candidates directly via email, described the study in detail, and asked if they would participate in the study.

The two first-year teachers responded to the email request to participate in the study. The researcher then arranged a meeting with each teacher to discuss the study in more detail and to acquire informed consent (Appendix B). He also contacted each first-year teachers’ building principal via email to inform the school administration about the study and to acquire consent to conduct observations and interviews at each school.

Each building principal provided the researcher with access to the school, the first-year teachers’ classroom, and to other school personnel who could provide relevant data concerning each first-year teacher’s technology use with their students. The researcher contacted school personnel about participation in the study after he gained access to the school and classroom. Faculty from Iowa State University who were involved in the planning and implementation of the PT3 project also participated in the study. All other participants provided informed consent before data collection began (Appendix C).

Participants

Changes in the names of individuals and locations protect the identities of all participants in this study. For issues of clarity, the researcher selected participant names and locations to provide mnemonic reminders for readers. The teacher described in the first case
is Courtney. Courtney was a member of the Iowa State University PT3 technology cohort. Courtney worked at Trade Wind elementary a traditional elementary school not associated with Iowa State University’s PT3 grant project. The teacher described in the second case is Patty. Patty was not a member of Iowa State University’s PT3 grant project, but worked as Pine Tree elementary, a PT3 partner school with Iowa State University’s PT3 grant project. Other participants’ position within the school identifies who they are and their association to the first-year teacher.

The primary participants in this study are recent graduates from Iowa State University’s teacher education program who were in their first year of full time teaching. Both participants were female, Caucasian, and in their early twenties. Both first-year teachers taught in grade level classrooms and were the primary instructor in their classroom.

Courtney

Courtney grew up on her family’s dairy farm in a Midwestern state and attended a small public school from kindergarten through high school. She had positive images of her K-12 learning experience. Courtney remembered teachers who gave students problems to solve and related material to student lives (Courtney, interview 1, September 2004). She participated in student organizations related to education and included Family Career and Community Leaders of America and Future Teachers of America. She attended community college after high school and transferred to Iowa State University during her sophomore year.

Courtney participated in Iowa State University’s PT3 grant project as a member of the Technology Collaborative (TechCo) student cohort. She and other cohort members took all their methods courses together, had an opportunity to purchase a laptop computer at a
reduced price, participated in practicum and student teaching experiences in technology-rich contexts, and participated in a capstone course with other cohort members during her final semester in the teacher education program. Courtney also worked at the College of Education’s Center for Technology in Learning and Teaching (CTLT), for America Reads America Counts, and as a student assistant for faculty while she attended Iowa State University. She graduated from the Iowa State University teacher education in 2004.

Courtney began her teaching career at Trade Wind elementary school in the Running River school district. The Running River school district is a large rural district located in a mid-western state, and is comprised of seven elementary schools, one junior high school, one high school, and one alternative high school. Trade Wind elementary had one of the smallest student enrollments in the district with 180 students. Constructed in 2002, Trade Wind had one section of each grade level (K-6). Trade Wind elementary teaching staff was a mix of experienced and relatively new teachers. Courtney was the only first-year teacher in the building. The current building principal had been in at Trade Wind for seven years.

Courtney taught second grade and had 29 students (17 females, 12 males) in her classroom. The district provided a full time teacher’s aid to assist Courtney in daily activities in the classroom and to provide additional supervision because the student classroom population exceeded twenty-five students. Students in Courtney’s classroom came from diverse socio-economic backgrounds. All students were Caucasian with the exception of one Hispanic student. The Hispanic student received English as a Second Language support for English word recognition. Two students had special needs related to behavior disorders. Two other students received instructional support for reading. These students received additional support from special education teachers, special education teacher associates, other teaching
associates, and the full-time teacher’s aid that circulated in and out of Courtney’s classroom throughout the school day.

Patty

Patty grew up in a small community in a Midwestern state and attended public school from kindergarten through high school. She remembered her school experience positively and felt fortunate to have quality teachers (Patty, interview 1, September 2004). Patty’s mother was a high school Spanish teacher. Patty worked with children participated in teaching activities as she grew up. These activities included babysitting, teaching dance lessons, and helping other students in her classes when they had difficulty understanding a lesson. Patty graduated from high school and attended Iowa State University as a freshman.

Patty attended Iowa State University and intended to study journalism. She changed her major to elementary education after her sophomore year. Patty took the traditional elementary education core classes that included child development, a special education course, and a course in instructional technology. She took all methods courses, participated in practicum experiences, and completed two eight-week student teaching experiences to complete the typical elementary education major. She graduated in the fall of 2003. Patty substitute taught and continued to take courses related to a reading specialist certification during the spring and summer before accepting her first full-time teaching position.

Patty taught at Pine Tree elementary in the Three Tree’s school district. Three Tree’s school district was a rural district located in a Midwestern state. The district had two elementary schools and a combined junior and senior high school. Pine Tree elementary had approximately 275 students, pre-kindergarten through fifth grade. Pine Tree elementary had a mix of induction year and experienced teachers. Pine Tree elementary has a staff of twenty-
eight with two teachers per grade level. Patty was the only first-year teacher in Pine Tree elementary. The school had been a PT3 partner school with Iowa State University’s PT3 grant project. Pine Tree had received support from university faculty and staff to develop a technology-rich context for technology integration that supported teaching and learning. This development included professional development, restructuring, and improved technology access and capabilities within the school. The school also had a full time technology coordinator, who splits her time between the two elementary schools in the district. The current principal had been in the district for two years and took over as principal of Pine Tree elementary in April 2004.

Patty taught third grade and had 21 students (8 females, 13 males) in her classroom. Students in Patty’s classroom came from diverse socio-economic backgrounds. All students were Caucasian. There was a variety of academic abilities within the room. The class included two male students identified with Attention Deficit Hyperactivity Disorder (ADHD).

Other participants

Other participants in this study included individuals who had knowledge of each first-year teacher’s preparation to use technology and each teachers actual technology use with students. These participants included two principle investigators from the Iowa State University PT3 grant project, the principal from each building, mentors of the first-year teachers, a building technology coordinator, teacher associates, special education teachers, and a full-time teacher aid. These participants provided data regarding the Iowa State University PT3 grant project, preservice teacher preparation to use technology, the
institutional context of each school to support teachers’ technology use with students, the
classroom context, and each beginning teachers’ technology use with students throughout the
year.

Role of the Researcher

LeCompte, Preissle, and Tesch (1993) observe that qualitative research “is
distinguished partly by its admission of the subjective perception and biases of both
participants and researcher into the research frame” (p. 92). Merriam (1998) adds to this
perspective by claiming; “Because the primary instrument in qualitative research is human,
all observations and analyses are filtered through that human being’s worldview, values, and
perspective” (p. 22). The researcher’s background and experiences filter the design, data
collection, and data analysis of this study.

The researcher was a former teacher whose experiences have shaped his perspectives
about technology use with students. The researcher’s perspectives about technology use with
students, teacher education, teacher development, and the institutional and classroom context
were shaped by his own experiences as a K-12 student, his own teacher education
experience, as a public school secondary social studies teacher for seven years, and as a
graduate student whose graduate program focused on preservice teachers development to use
technology. His technology use as a K-12 student and throughout his teachers education
program was limited to word processing and a technology in education course. His
experience with technology changed as he began teaching.

Technology use with students became an important part of the researchers’ classroom
practice as he began his career. The researcher began his career on a Native American
reservation and used technology with students to expand the curriculum and to improve student participation in classroom activities. He continued to use technology with students as he moved to a larger school district. The researcher concluded that his technology use with students and pedagogical practice reflected his beliefs about how people learn after he reflected on his classroom practice and technology use with students. His instructional practice emphasized constructivist learning in which students built on their existing knowledge. Students in his classes completed many project-based or problem-based learning activities in which they used technology to expand what they already knew and as a means to represent their knowledge. The researchers’ experience with technology use in student learning influenced his decision to pursue graduate degrees that focused on technology use to reform teachers’ instructional practice.

Wolcott (1987) warns against former educators who conduct educational research because their experiences are likely to affect their analysis. The researcher recognizes potential bias in that his experiences have influenced his perspectives toward education, constructivist pedagogical practices, and technology use with students. The researchers’ experiences also offer unique insights into the instructional decision-making process, issues related to beginning teachers, and technology use in teachers’ instructional practice. The researcher has attempted to improve the reliability and validity of the study by how he collected, analyzed, and interpreted the data from participants in the study.
Data Collection Methods

Data sources included semi-structured interviews, direct observations, field notes, classroom and teacher documents, and technology artifacts. These multiple data sources allowed for data triangulation (Lincoln & Guba, 1985; Yin, 2003).

Semi-structured interviews

Semi-structured interviews conducted throughout the school year provided detailed information from participants about the background and development of the two beginning teachers’ first year in the classroom and their technology use with students (Appendix D). Interviews with each first-year teacher and their building principal took place at the beginning, middle, and end of the school year. Interviews with other participants who had knowledge of the beginning teachers preparation to use technology and their technology use with students took place in April after the first-year teacher had taught most of the year.

Interviews with each first-year teacher, building principals, and other school personnel focused on each beginning teachers development throughout the year, how the beginning teacher used technology with her students, and how the institutional and classroom context affected the first-year teachers technology use with students (Appendix G, H, and I). Interviews with Iowa State University faculty provided background regarding Iowa State University’s teacher education program, the faculty’s perspective toward technology use in teacher preparation at Iowa State University, and the PT3 project (Appendix J).

Direct observation

The researcher conducted observations throughout the school year (Appendix E and Appendix F). Times and locations of the observations were scheduled with the teachers
before the researcher came to the school. Observations took place in the teacher’s classrooms, computer labs, or other locations in the school building during the regularly scheduled school day. Initial observations began in the fall and increased throughout the school year. The majority of the observations took place during the spring semester.

Observations took place for a minimum of one hour, but most lasted throughout the morning or afternoon’s instructional sessions. The researcher conducted ten-minute observation cycles in which he recorded events taking place in the classroom, teacher behaviors, and student behaviors. He sat in the back of the room during most of the observations, but periodically moved around to interact with students or to provide students with access to where he sat. The researcher wrote field notes that described the observation and his reflections about the experience following each interview.

Field notes

Field notes captured the researcher’s thoughts and perspectives in regards to interviews and observations conducted throughout the year. The researcher wrote field notes during classroom observations to note behaviors that occurred frequently from observation to observation. He also wrote field notes during or shortly after each interview and to track information gathered from participants following member checks. Field notes provided the researcher with an opportunity to reflect on each experience and begin theme development as frequently observed behaviors or characteristics occurred throughout the year.
Classroom and teacher documents

Documents collected during the year include written and email communication, lesson plans, classroom rules and procedures, district information, first-year teacher journals and portfolios, and other documents related to the teacher's technology use with students and development during her first year in the classroom. These documents provided data from early in the year when classroom observations were not as frequent. These document also provided data developed by each teacher and represented how they thought about the profession and how they used technology with their students. First-year teaching journals provided data on how each teacher was interpreting their first-year teaching experience and how their institutional and classroom context affected their development. Lesson plans provided a record of each teachers planning process as well as planned activities throughout the year in which the teachers' used technology with their students.

Technology artifacts

Technology artifacts included technology products created by the teacher or students during the teachers' instructional practice with students. These artifacts included web authored activities, software, databases, spreadsheets, or other artifacts created by the teacher or students. Technology artifacts provided data related to the teachers' pedagogical perspective the extent that each teacher's technology use with students related to National Educational Technology Standards.
Data Management

Data management is the process by which the researcher manages data collected throughout the course of the study. This process consists of the preparation, collection, organization, and manipulation of data. Merriam (1998) suggests that this process is continuous and takes place simultaneously throughout the process and not just at the completion of data collection.

The researcher recorded all interviews using an audiocassette and had a digital recording device as a backup. A professional transcribed all audiotapes from interviews. The researcher reviewed transcribed documents for accuracy and checked for errors or omissions within the text files. During the initial review of transcribed documents the researcher developed preliminary codes that related to each teacher’s preparation to use technology, their development as beginning teachers, the institutional and classroom context, and the beginning teachers’ technology use with students. Code examples included; "tech use-TE" for when the beginning teacher made a comment about technology use during their teacher education program and “teaching realities” for when the first-year teacher spoke about the differences between teacher education and their current experience. Other codes included “development-classroom management” for when a participant made a comment about classroom management and “tech use-classroom” for when one of the first-year teachers talked about technology use in their classroom. A notebook contained observation notes, field notes, and the researchers’ reflections about the research process. The researcher also used the notebook to develop preliminary codes as they began to emerge from the data sources. Codes were refined throughout the data collection process. The researcher categorized codes into three major headings that included “development”, “support”, and
“tech use”. Blue and green colors differentiated observation participants in the notebook. Qualitative software managed all interview data.

Qualrus qualitative analysis software managed interview data and simplified the coding process. Software use streamlined the coding process and made it easy to manipulate data and to identify themes. The researcher created projects for each case study and then imported each transcript text file into the software that related to that particular case. For example, the case one project contained all interview transcript text files from Patty, her mentor, the building principal, and the technology coordinator. He then created a code list within the software that he used to code the transcripts as he re-read them on the computer. Qualitative analysis software use also made it easy to tabulate the frequency of statements or phrases and extract them into separate documents. For example, the researchers’ use of the software allowed him to search all the coded text for the code “tech use-TE”. The software identified and tabulated each instance the code was present within a project. It then displayed the extracted text segments within a new window on the computer screen. The researcher then saved the extracted segments as a separate hypertext mark up language (HTML) document.

The researcher identified the initial themes and then pulled all of the related quotes and did a more thorough analysis of the extracted data using the software in this way. This process allowed him to manipulate the data in ways that would have otherwise been difficult and time consuming. It also provided the opportunity for him to rethink the data in ways that allowed for significant relationships within the data to emerge.
Data Analysis

Data analysis in qualitative research is a recursive process in which data collection and analysis happen simultaneously (Merriam, 1998). Throughout data collection for this study, analysis of data took place prior, during, and after observations, interviews, and review of documents. The use of constant comparative techniques guided the analysis. According to Goetz and LeCompte (1981) this method "combines inductive category coding with a simultaneous comparison of all social incidents observed" (p. 58). The researcher reviewed transcripts, field notes, and other documents following the initial round of interviews and observations and before the next round. This process continued throughout the data collection. Going through this process allowed the researcher to develop “converging lines of inquiry” that helped identify major themes throughout the data analysis process (Yin, 2003).

Merriam (1998) stated that, “a unit of data is any meaningful (or potentially meaningful) segment of data...” and “…can be as small as a word a participant uses to describe a feeling or phenomenon, or as large as several pages of field notes describing a particular incident” (p. 179). Units of data within these cases were any comment, artifact, or observation related to the way the teachers used technology with their students. Examples include classroom technology use, but also included discussions about how the school culture or technical support available within the school affected the teachers’ technology use with their students. The researcher organized the units of data into categories and continually refined categories as he collected more data.

As indicated earlier, the researcher used Qualrus qualitative analysis software to manipulate the data in ways that allowed him to refine categories and themes throughout data analysis. He also developed a graphic organizer and concept map to visually represent how
units of data developed into categories. These categories represented how each teacher used technology throughout the school year with their students. This also allowed for a cross-analysis of the coded categories.

The researcher conducted a cross-case synthesis of the two cases following analysis of each case independently (Yin, 2003). Analysis included separate word tables created for aspects of each case. Each word table held data related to a particular research question from each independent case. For example, the researcher created a word table concerning each teachers’ technology access within her classroom (Table 3.1) in order to help assess the institutional and classroom context and how the context may affect the beginning teachers’ technology use with students.

Table 3.1: Word table example: Classroom technology access

<table>
<thead>
<tr>
<th>Courtney’s classroom technology access</th>
<th>Patty’s classroom technology access</th>
</tr>
</thead>
<tbody>
<tr>
<td>One desktop computer (located away from teachers desk).</td>
<td>Four desktop computers</td>
</tr>
<tr>
<td>Internet access to desktop computer through Ethernet cable the school network.</td>
<td>- One at the teachers desk.</td>
</tr>
<tr>
<td>Personal laptop computer (located at table in back of the room).</td>
<td>- Two in the front of the room</td>
</tr>
<tr>
<td>Overhead projector</td>
<td>- One near the back of the room close to the reading area</td>
</tr>
<tr>
<td>Television</td>
<td>All computers connected through Ethernet and to the school network.</td>
</tr>
<tr>
<td>VCR</td>
<td>Wireless network available.</td>
</tr>
<tr>
<td></td>
<td>Laptop cart with six laptops available to</td>
</tr>
</tbody>
</table>
Analysis of the tables identified whether each case shared similarities or represented differences that would need further investigation. For example, the researcher used the word table for classroom technology access to demonstrate that each school had provided technology resources and access to teachers, and that these resources were available for these first-year teachers to use with their students. Therefore, with similar access available to these beginning teachers, the researcher analyzed other aspects of the institutional or classroom context that may have affected the beginning teachers' technology use with their students such as support from other teachers or discipline challenges with students. These commonalities or differences represented mutual or distinct characteristics that lead the researcher to a more thoroughly understand how teacher education and the institutional and classroom context affected each of the beginning teachers technology use with their students. The following chapter reports results of this analysis.
CHAPTER FOUR
RESULTS

Learning to teach is a cumulative process that involves personal experience as a K-12 student, a student in teacher education, and the continued experience as a beginning teacher (Feiman-Nemsar, 2001). Each case in this study describes an individual who, at one point in the teacher development process, was encouraged to integrate technology into her instructional practice. The first case describes Courtney, who was a cohort member from the Iowa State University Preparing Tomorrow’s Teachers to use Technology (PT3) Technology Collaborative (TechCo) grant project. The second case describes Patricia, who began her career at a partner school with the Iowa State University TechCo project.

Case descriptions of each first-year teacher trace their memories and experiences concerning instructional practices and instructional technology use from their K-12 experience through the end of their initial year in the classroom. A qualitative approach is used to pay attention to the “…complexities and intricacies of how classroom teachers actually incorporate technology into their teaching” (Zhao, Pugh, Sheldon, Byers, 2001, p. 483). Examination of these two teachers’ initial year of classroom experience is an attempt to understand how efforts to improve teachers’ technology use with students affected these teachers. The following three questions provided direction for this study:

1. How did two first-year teachers, one who was prepared in Iowa State University’s PT3 TechCo cohort, and the other who was not in the cohort, but began her career in a school supported by Iowa State University’s TechCo project, use technology with their students?
2. How did teacher education affect instructional practices and technology use of these first year teachers?

3. How did the existing institutional and classroom contexts affect instructional practices and technology use of these beginning teachers?

The chapter begins with a descriptive case study of each first-year teacher—and analysis that addresses the guiding questions follows.

Patricia

Patricia was a graduate of Iowa State University’s general teacher education program. She grew up in a rural community and was the daughter of a teacher. After graduating from high school, Patricia began attending classes at Iowa State University. She had limited experience with instructional technology during high school but some of her university coursework emphasized technology integration. Patricia began her teaching career at a school that had been a partner school with the TechCo grant project. This school had worked with university faculty and staff to develop a technology-rich teaching context for preservice teachers involved in the Iowa State University teacher education program. What follows is a chronological description of Patricia’s professional development experiences in becoming a teacher.

Patricia’s K-12 experience

Patricia described teachers from her K-12 experiences that engaged students’ interests by providing a variety of classroom activities. Her memories of teachers’ instructional practices focused on teachers who facilitated student learning by developing hands-on projects for students. She remembered teachers who scaffolded instruction and let students
work together in groups to develop their own understandings, "...they were good at 
explaining and good at scaffolding things to get us where we needed to be, and then they let 
us go" (Patricia, September 2004). Patricia resonated with teachers who provided initial 
direction, then allowed students to develop their own understandings.

Patricia’s experience with technology primarily involved keyboarding. Only in her 
computer applications course did she have an opportunity to use other technologies. Students 
involved in the applications courses developed computer skills and learned various computer 
software including multimedia and video software applications. These courses took place in a 
new computer lab, but as Patricia remembered, the primary use of the lab was for students to 
wordprocess papers for other classes.

Technology use by Patricia and her teachers was limited. During her school 
experiences, technology use for Patricia consisted primarily of word processing, technology 
skill development, and entertainment as a reward for good behavior. “I remember 
keyboarding, I remember going into the lab to type papers, and if you behaved really well, 
you got to stay in at recess and play computer games, like the Oregon Trail on the real floppy 
desk” (Patricia, September 2004). Technology use remained focused on keyboarding and 
skill development as Patricia went through high school.

Patricia’s teacher education program

Patricia participated in the general teacher education program at Iowa State 
University. The program included requirements for admission, general education courses, 
and methods courses to prepare new teachers. Students were required to have a minimum 2.5 
grade point average, minimum test scores (ACT of 19 or 910 on the SAT), and rank above
the 49th percentile in their high school graduating class. Students were also required to have a composite Praxis 1 score of 522, with a minimum of 170 on each test, documented completion of 10 hours of pre-student teaching field experience, and a criminal background check. Preadmission coursework included successful completion of 33.5 credit hours from four general education groups that included natural sciences, social studies, humanities, and communications.

In addition to content area courses, teacher education students were required to successfully complete professional teacher education coursework and 50 hours of pre-student teaching laboratory experience. Coursework included social foundations of American education, educational psychology, multicultural gender fair education, and introduction to instructional technology. Students began content area methods courses during their junior year. Methods courses included instructional blocks in English and Language Arts, Mathematics, Science, and Social Studies. These courses took place in conjunction with classroom observations. Practicum experiences took place at various locations selected by the student. Following completion of the methods blocks, students completed student teaching. Student teaching included two eight-week placements during the students’ final semester in the program.

Technology integration into teacher instructional practice was an important piece of the teacher education program at Iowa State University. In addition to the required course on instructional technology, many other courses encouraged technology integration. The college of education faculty mentoring program has worked with faculty for over ten years to help them integrate technology into their preservice teacher education courses. Iowa State University’s teacher education program also offered a minor in instructional technology. The
program provided a series of courses focused on how to integrate technology into specific content areas.

As a student in the general teacher education program, Patricia fulfilled the requirements for admission to the program, completed the required education core and methods courses, and participated in practicum and student teaching experiences to complete her program. Patricia's experiences with technology during her teacher education program included the required instructional technology course, her methods courses, and an additional course on technology integration in the Language Arts that she took to complete a reading endorsement.

*Patricia's teacher education coursework*

Patricia recognized that there was a technology emphasis within her teacher education program. However, course differences and the various ways instructors used technology within their courses created an image of technology use that was dependant on whether the instructor believed technology was appropriate for students or the lesson. Patricia described instructors who used technology to present information to students, but had a difficulty identifying instructors who encouraged their students to use technology. “Outside of the classes for education that were about technology, not very much was used, as I remember, unless the professor was using it” (Patricia, September 2004). Some instructors openly questioned technology use and claimed there was an over-emphasis on technology in education—these instructors did not use technology with their students at all.

Instructors within her technology specific courses, however, enthusiastically emphasized technology as a tool that could assist the teacher in making learning more
meaningful for students. Patricia acquired technology skills and used technology within these courses to create lessons that incorporated technology. Speaking about her course on integration of technology into Language Arts Patricia stated, “We were in the [computer] lab every day, making up our own or working on previously prepared projects” (Patricia, September 2004). Patricia described digital post card and digital movie projects where she developed a lesson and then used the technology to create an example of a student project. She also spoke of software applications such as Kid Pix and iMovie that she used in her technology classes that accompanied instructional lessons.

Patricia interpreted these differences between courses and how instructors conceived technology use to mean that it was important to use technology and that teachers could add technology to their instructional practice if they found it appropriate for students or if they felt that it fit well within the curriculum.

I think the perspectives that most of them [instructors] tried to convey was to use technology when it fits what you are doing…use it, but use it when it really makes sense with the activity that you're doing and when it can be the most powerful. (Patricia, September 2004).

Patricia’s practica experiences

Practica experiences for students completing the general teacher education program at Iowa State University took place simultaneously with content area instructional methods courses. Students worked with the office of field placement to coordinate placement locations for observations and practice teaching experiences. The objective was to provide
teacher education students with opportunities to observe experienced teachers and to practice teaching before they began their full-time student teaching activities.

Technology use was not a required component of practicum experiences. Although students were allowed to request a placement with a teacher who used technology, placements were dependent on the availability of teachers who were willing to host a teacher education student. Patricia remembered these experiences as opportunities to learn from the teachers she observed and to work with students. During her observations, she did not recall cooperating teachers who used technology with their students. When Patricia had opportunities to teach during her practica, she used technology to plan and to write her lessons, but did not incorporate technology use with students.

*Patricia’s student teaching experiences*

Patricia completed two eight-week student teaching placements during her final semester. Both of her student teaching placements were within driving distance from the university. Each of Patricia’s student teaching experiences gave her opportunities to make instructional decisions with students and to use technology in the classroom. Patricia claimed the she “sometimes” used technology during her student teaching experiences (Patricia, January 2005).

She began her first student teaching placement in a sixth-grade classroom in a TechCo partner school that was a technology-rich placement opportunity for preservice teachers. Cooperating teachers modeled how to integrate technology into their instructional practice for preservice teachers (Faculty 2 interview, April 2005). The school also had a technology teacher who worked with teachers to use technology and develop a technology-
rich curriculum. Patricia referred to her technology use during her first student teaching placement as “pretty basic” (Patricia, January 2005). She explained that she used technology a couple times with students during her first placement and that it’s use was associated with a literacy circle activity that was part of the school’s established curriculum. Patricia took students to the school’s computer lab and worked with the school’s technology teacher to use technology with students during the literacy circle activity. Students used the computer lab to locate information on the Internet, wordprocess the stories they had written, and insert clip art images into the wordprocessed documents (Patricia, January 2005). The school’s existing curriculum and the institution’s technology teacher prompted Patricia to use technology with students during her first student teaching placement. She did not have this kind of support in her second placement.

Patricia’s second placement was in a first-grade classroom. This school had a computer lab and other technology resources available to teachers, but was not associated with the TechCo project. Patricia’s cooperating teacher provided her with the curriculum and other materials during the eight weeks she was in the classroom. The cooperating teacher did not expect Patricia to use technology with the second-grade students. Patricia used technology to write up her lesson plans, but she did not use technology with the students. She remembered sixth-grade teachers in the building who took their students to the computer lab, but commented that the school did not have a school-wide focus on technology use (Patricia, January 2005). If teachers wanted to use technology with their students they had to do everything by themselves.

That school didn't have a technology teacher so if you wanted to do anything with the kids, you did it all on your own, you put it together on your own, you took them into
the lab on your own, so that just wasn't something that I saw very much. (Patricia, January 2005)

Patricia recognized that if she wanted to use technology with students she had to plan, organize, and implement it all herself. Since her cooperating teacher did not expect her to use technology Patricia chose not to use technology with her students in her second placement. "[Using technology] wasn't something I saw that fit in with what they asked me to do, and I wasn't comfortable taking 25 first-graders into the lab by myself" (Patricia, January 2005). Thus, in this environment, the conditions related to technology support and the school's expectations lead Patricia to decide that she should not use technology with her first-grade students.

Patricia's student teaching experiences provided her with two different opportunities to consider how she might use technology with students. Each school had different perspectives concerning teachers' technology use with students, and Patricia's decisions about whether to use technology during her student teaching experiences corresponded with what she thought were the expected requirements at each placement. There was strong support for technology use in her first placement and an expectation that Patricia would use technology since it was part of the established curriculum—but that expectation did not exist at her second placement. These experiences prompted Patricia to develop a particular perspective about appropriate technology use with students as she began her career.

Patricia's first year of teaching

Patricia began her professional career teaching third-grade at Pine Tree elementary school. Pine Tree elementary had been a partner school with the TechCo grant project and
had worked with Iowa State University to establish a school culture and curriculum that integrated technology. Cooperating teacher or contextual expectations shaped Patricia’s prior instructional decisions concerning technology use with students. These expectations, along with her teacher education coursework, helped Patricia construct her perspective about when it was appropriate to use technology with students. Patricia made instructional decisions about technology use as a beginning teacher based on those perspectives and in a context that supported technology integration.

*Patricia’s technology access*

Patricia had technology available to her and her students to use in her classroom and in other parts of the building. Four desktop computers were located in Patricia’s classroom. One of these four was located at Patricia’s desk. The others were located around the room. One was at a back table and the other two were on a cart near the front of the room. Each of these machines had Ethernet connections that networked the computers to the school’s local area network and made it possible for them to connect to the Internet (Technology coordinator interview, April 2005). There was also an overhead projector located next to her desk. Patricia had access to computer software through the school and the Area Education Agency. Titles included Jumpstart, Spell It Deluxe, Appleworks, and Microsoft Office, as well as the school’s grade book program (Technology coordinator interview, April 2005). Pine Tree elementary also piloted a web-based software from Princeton Review called homeroom.com that could be used by teachers to link curriculum with district standards and to assess student learning as they progressed through the year (Patricia, field notes, January
The school's computer lab also provided technology access to teachers and students.

The computer lab contained 25 desktop computers that were networked and able to connect to the Internet. Students could save their work to a file located on the school's server in the lab. The lab also contained a digital video projector to display from the lab's teacher station. The lab included software titles available in the classroom but also included software available only in the lab. Software titles in the lab included KidPix, iMovie, and Apple Remote Desktop. The Apple Remote Desktop software allowed the teacher or technology coordinator to control all the other computers in the lab. Teachers could lock the students' screens to get their attention or a teacher could share a computer screen with the rest of the computers in the lab to demonstrate how to perform a skill using this software. The teachers signed a sheet posted on the lab door to reserve the computer lab. Pine Tree elementary had additional resources including a digital camera for each grade level, a laptop cart with six Apple iBook laptop computers available for teachers to check out, and a wireless network available so laptops could connect to the Internet (Patricia, field notes, October 7, 2004; January 19, 2005; Technology coordinator interview, April, 2005).

Pine Tree elementary school provided considerable access to technology for Patricia as she began her teaching career. Access to hardware and software was available in her classroom and the school’s computer lab. Pine Tree also provided instructional support for technology use.
There was strong support for technology use at Pine Tree elementary school. Both the technology coordinator and teachers within the building supported technology use. The school had worked closely with Iowa State University to provide a technology-rich context for student teachers from the teacher education program. Grant funding provided resources to upgrade the school’s hardware and software. Funding also provided opportunities for existing teachers to have release time from their classes to work individually with university faculty and staff to learn about different technologies and to develop curriculum that integrated technology. Another aspect of the relationship between the school and university was the development of the technology coordinator position to support teachers’ technology use.

The technology coordinator worked with teachers as a consultant. She collaborated with teachers about how technology use could enhance student learning. She also assisted the teachers and developed learning opportunities for students that utilized technology. The technology coordinators’ current role as a technology facilitator had not always been the case. Technology was a pull-out program in the school before the grant. Teachers sent their students to the technology teacher who had activities for them. This pedagogical approach changed under the grant. Technology no longer was an additional class where teachers could drop-off their students and return to their classrooms. Teachers now had to relate technology use to curricular goals. They accompanied their classes to the computer lab and remained there while their students were in the lab (Technology Coordinator interview, April 2005, Faculty 2 interview, April 2005). The technology coordinator also managed technology throughout the building.
Pine Tree’s hardware management and maintenance support was the responsibility of the technology coordinator. Teachers who had problems with technology went to the technology coordinator for assistance. The coordinator installed software and performed routine maintenance on all of the computers in the building. She also managed the school’s wireless network and network servers that hosted teacher and student accounts, email accounts, and the school’s grade book program (Technology Coordinator interview, April 2005). Teachers in the building also provided support for technology use.

Pine Tree provided mentors for all beginning teachers in the building. Many of the teachers who became mentors also participated in the TechCo grant project and were involved in developing curriculum that integrated technology. Patricia’s mentor was one of these teachers. Patricia’s mentor was the other third-grade teacher, and was a veteran teacher with thirty years of experience, who had taught a variety of grade levels within the district. She had an excellent knowledge of district policies, the school organization, the community, and the students (Principal, January 2005). Patricia’s mentor participated in the TechCo program to develop her own technical skills and to develop curriculum that integrated technology (Mentor interview, April 2005). Patricia felt fortunate to have a mentor with so much experience. Patricia noted:

I really went in with the attitude that I could have so much to learn from her, because she was a veteran teacher. She's been teaching for over 20 years and been at Pine Tree, teaching mostly third-grade, for something like 17 years. She had so much knowledge to share. (Patricia, May 2005)

Patricia’s room was located directly across the hall from her mentor. This close proximity made it easy for Patricia and her mentor to talk between classes, during recess, and before or
after school. School administration also supported technology use through mentoring relationships.

The school administration also provided Patricia and her mentor shared planning time in which they could collaborate and develop lessons or unit ideas. The school also built into the calendar planning days in which Patricia and her mentor could work with other third-grade teachers in the district on areas that were of interest to all. They used these days to observe other teachers, to attend workshops, to develop units and lessons, and to try out new software or other technology the district had purchased.

Patricia began her career in a school that provided considerable support for new teachers and their technology use with students. The school’s technology coordinator and Patricia’s mentor had worked with university faculty and staff to develop curriculum and structures within the school that supported technology use. Collaborative relationships between the school technology coordinator and Patricia’s mentor, as well as an established curriculum that integrated technology, provided Patricia with opportunities to use technology with her students. It was now up to her to make instructional decisions about whether she should take advantage of these opportunities to use technology as she began her career.

*Patricia’s first year – teaching*

Patricia began the year excited about the opportunity to have her own classroom and to work with students (Patricia, September 2004). She soon realized that even though she had expected her first year to be challenging, she was unprepared for just how challenging it actually was.
I grew up seeing both the good sides of teaching, and what that potential down falls and frustrations could be. So I think when I decided to become a teacher, and went into teaching, I was pretty aware of how tired I was going to be, and you know, how much kids can frustrate you sometimes. I was pretty well aware of that and prepared for that, but as much as I thought I knew how challenging it would be, it's been even more challenging. (Patricia, September 2004).

Patricia began the year prepared to work hard and knew the first year required that she learn about curriculum, scheduling, and her students. The amount of time that she devoted to thinking about her class and whether or not she met her students’ needs surprised her.

There are so many questions I ask myself throughout the day. I didn't realize that it never stops, you never get a break, even when you are eating lunch, even when you don't have recess duty, it's not, like free time, there is always something to think about or something that you can do, and basically, I mean, your role as a teacher only stops when you want it to. (Patricia, September 2004)

Patricia tried to strike a balance between work and family. Patricia’s work with her mentor helped her balance the competing demands on her time.

Patricia worked closely with her mentor as the school year began to develop schedules and to learn school policies. Her meetings with her mentor before the school year began helped Patricia learn the existing curriculum, how to schedule specials such as art and music, and how to schedule the computer lab. Pine Tree’s Administration had also scheduled a shared planning time so that Patricia and her mentor would have time to collaborate and address challenges that arose during the year. Discussing the ways she assisted Patricia during the year, her mentor stated, “...she definitely wanted to know how I did things, and I
think that's really a great thing, because we should be communicating and collaborating. We should be similar as much as we can, but unique to each of our groups” (Mentor, April 2005).

Shared planning and collaboration between Patricia and her mentor continued throughout the school year. They worked together to prepare and administer standardized tests, to plan major projects, work with the fourth-grade teachers who would get their students the next year, and collaborated about what activities they would like to try the next school year. Patricia and her mentor’s openness toward their relationship made it possible for Patricia to bring in her own ideas, but also allowed Patricia to utilize her mentor’s experience and materials. Patricia focused on establishing routines and procedures for her students within her own classroom.

Patricia’s experience in her classroom during the first few months focused on trying to set up routines. Patricia spent the first four days of the school year working with students on establishing routines (Patricia, first year teaching portfolio). Patricia believed modeling behavior and practicing routines were the best ways to manage the classroom. “...as far as classroom management and keeping their routine, I think that's best done by establishing those routines and practicing them” (Patricia, January 2005). Routines included having students line up for recess or to go to their special courses, such as art or physical education. Routines also included classroom behaviors such as staying seated during work time, being quiet while Patricia or another student was talking or demonstrating a procedure for an activity, and being able to hand in work with their names in the appropriate place. Patricia worked with students on these routines throughout the year.

Student behavior challenged Patricia. Students who did not follow classroom procedures or routines created disruptions for Patricia throughout the year (Field notes,
October 7, 2004; October 28, 2004; January 22, 2005; January 31, 2005; February 16, 2005; February 28, 2005; March 14, 2005; April 20, 2005; May 9, 2005). These challenges affected her decisions about her instructional practice and the strategies she tried with her students. Patricia made decisions about her students’ ability to work together or to do group projects.

The reality is ... there are about 5 that can handle that kind of instruction every day and be fine. The other 16, are somewhere in between needing so much structure, needing me to constantly be kind of pretty much on top of them, telling them what to do, and when to do it. If I turn away for a second, they are just off task, looking around the room. So there are some that can handle that, but a lot more that are in the middle or just not able to do that yet. A few kids I found they do good work academically, but working in pairs, working in small groups, is a big challenge for them. (Patricia, September 2004)

Student behavior caused Patricia to question her students’ ability to handle activities that required collaborative or small group work. In response, Patricia attempted to modify student behaviors by stressing routines and emphasizing that students should be quiet and listen to instructions throughout the year. The class lost recess time or special privileges (such as opportunities to win candy) if they did not follow procedures. Patricia also enlisted others to help her with discipline. She contacted the school’s building assistance team to help her determine if a couple of the most disruptive students needed special services (Patricia, field notes, February 16, 2005). The building assistance team required that Patricia gather data on the students’ behaviors and track those behaviors before any intervention could take place. Patricia eventually requested help from the AEA to help her with classroom management.
Patricia continually reminded the class about these strategies following the AEA visit and frequently referred to the large “S” written on the board with the words “seated, silent, sitting” written next to it (Patricia, field notes, April 20, 2005; May 18, 2005). She also played secret tic-tac-toe with students who created the most disruptive climate in the classroom. Students took a turn if they followed classroom rules and remained on task. Patricia took a turn if the students were not on task or disrupted the class. Disruptions went down considerably after Patricia began playing the game (Patricia, field notes, April 20, 2005). Patricia hoped students would recognize that if they changed their behavior they would have better experiences during the school day. “...if they could just change these couple little behaviors, they would not have to be in for recess time every day, or fill out the action plan I had them fill out to think about their behavior” (Patricia, May 2005). Her students’ ability to follow routines and demonstrate appropriate behaviors affected Patricia’s instructional practice. Student behaviors in the classroom also affected Patricia’s instructional decisions about technology use with her students.

**Patricia’s first year – technology use with students**

Collaboration with others and a willingness to use existing curriculum facilitated Patricia’s technology use with students during her first year teaching. Patricia collaborated with her mentor to expand existing technology projects within the curriculum, and she coordinated with the school’s technology coordinator to use the school’s computer lab as the primary location for technology use with students. Students’ technology use took place at
various times throughout the year and related to the school's curriculum. The challenges related to classroom management affected Patricia's instructional decisions about the ways she used technology with her students.

Issues related to planning and classroom management concerned Patricia about whether her students would be able to use technology early in the year.

...it's been a real challenge for me to plan very far in advance... I haven't done anything [with technology] yet. Honestly, technology this year, I'm going to try it, but I have a feeling it might be limited just because I'm not really able, right now, to plan too much, a month in advance. (Patricia, September 2004)

She was also concerned about her students' ability to use technology.

...They are not very self-directed learners. It [using technology] would really depend on what I thought they could handle with technology ... I guess that's kind of a concern right now... I'd like to [use technology], but finding the time to do it, and knowing that they could work in small groups to do an iMovie or something is a little scary right now. (Patricia, September 2004)

Patricia worked with her mentor and the building technology coordinator to link technology use with the school's curriculum even though she was apprehensive about using technology with her students.

The collaboration between Patricia and her mentor helped Patricia understand how activities and student projects fit into larger curriculum goals. Patricia's mentor provided her examples of student work that utilized technology so that Patricia could make connections between the written curriculum and what students could produce.
We really worked together a lot on curriculum...which was wonderful. Sometimes...we'd sit down and talk about it and I pretty much, understood the idea and we'd maybe make modifications to it, but then I would ask her if could I see an example so I can see what we're really talking about. I mean, it was so beneficial that she had those years and had examples of work to show me. (Patricia, May 2005)

Similarly, Patricia’s mentor recognized Patricia had knowledge of how to work with technology and valued the knowledge Patricia brought with her to the classroom; “I see new ideas from her.... She's had new and different things that I've tried. So it's been a real rewarding experience for me” (mentor interview, April 2005). In reflecting about their relationship throughout the year, Patricia’s mentor commented, “I think it's been nice for her, too, because she always knows that she can come over here and talk to me, and I can help her with something” (mentor interview, April 2005). Patricia brought in additional resources that added new information to many of the technology projects. At the end of the year Patricia commented, “I would say overall, my biggest supporter was my mentor” (Patricia, May 2005). Patricia’s work with her mentor to plan and develop curriculum helped her to use technology with her students.

An example of how Patricia used technology in relation to the larger curriculum is the rainforest unit students completed during the spring semester. The book, *The Great Kapok Tree*, served as a foundation for a larger unit on the rainforest that contained various components where students used technology. The unit required that students read the book as part of the English language arts curriculum. Students then used technology to expand their understanding of the rainforest. Students completed a rainforest web quest after reading the book. They then used the Internet or other traditional resources to research information on an
animal from a particular part of the rainforest. Students added the information they found to a rainforest animal database that the technology coordinator had created. The final part of the unit asked students to construct a rainforest out of construction paper and to place their animals in the proper location within the rainforest (Patricia, May 2005; Mentor interview, April 2005; field notes, December 15, 2004; February 16, 2005). The rainforest unit is one example of how Patricia used technology with her students. Access to the computer lab and the support from the technology coordinator also helped Patricia connect technology to the curriculum and overcome her concerns about technology use with her students.

Patricia’s access to the computer lab allowed her students to all use the computers at the same time. The use of the computer lab gave them access to their individual folders that saved their work to the network server. Patricia could schedule the lab any time during the week, however, she, as well as most of the other teachers in the building, tended to go to the lab only when the technology coordinator was in the building:

I am hesitant anymore to go into the lab if the technology coordinator is not here. Just because my group of kids is such that it's very helpful to have two people in there. They just get really excited and sometimes just, ah, don't behave appropriately in the lab. So, if we're doing something more interactive, I really try to go when the lab coordinator will also be there, just to have another adult, another pair of hands.

(Patricia, January 2005)

The technology coordinator played an important role in helping Patricia use technology with her students.

The technology coordinator’s presence in the computer lab provided additional supervision, which was an important factor for Patricia’s technology use with students
throughout the year. The technology coordinator worked with teachers to plan technology activities and would then lead the class in demonstrations of technical skills needed to complete an activity. An example of the technology coordinators' assistance and collaboration with Patricia occurred during the inventor trading card project.

The inventor trading card activity was part of a science unit. Patricia directed students to select an inventor to research at the beginning of the project. Students used print and Internet resources to locate information about the inventor. Students then wrote a paragraph about the inventor in the classroom before going to the computer lab to create their trading card. In the computer lab the technology coordinator demonstrated how to locate images of their inventors using the Goggle Internet search engine. The technology coordinator then showed students how to insert their pictures into an Appleworks template the technology coordinator had made that was the size of a trading card. Students inserted the picture they found of their inventor and typed in the paragraph they had written into the appropriate spaces within the trading card. Patricia and the technology coordinator monitored students and addressed their questions during the presentation and during work time (Patricia, field notes, January 22, 2005).

The technology coordinator also monitored student behavior using Apple Remote Desktop software. If the class became too loud or if a number of them had the same question, she could lock their screens and prevent them from working (Technology coordinator interview, April 2005; field notes, October 7, 2004; January 22, 2005; January 31, 2005). This way, she was able to maintain control and address student questions. Patricia's concern about student behavior was evident in her thoughts about whether or not her students could use technology. The existing curriculum and an extra adult to supervise student behavior
helped Patricia to feel comfortable enough to use technology with her students in the school’s computer lab.

Patricia used the lab to work on a variety of projects throughout the year. Students’ technology use during these activities connected to other parts of the curriculum. Such projects included a six-week keyboarding unit (Patricia, field notes, October 7, 2004), the development of skills to locate information on Internet about Native American tribes (Patricia, field notes, December 15, 2004), and the creation of slide shows on Dr. Martin Luther King Jr. and the water cycle (Patricia, field notes, February 28, 2005; April 20, 2005). The class also went to the lab to research information, word process, and draw pictures that related to classroom activities or stories they had read.

Patricia’s technology use was limited outside of the computer lab. She had technology available for her students to use in her classroom, and she used the overhead projector in her room daily to present information or for students to demonstrate their work. She used these approaches during math activities and periodically had students write on the overhead to demonstrate how they solved problems (Patricia, field notes, October 7, 2004; December, 12, 2004). Three of the four classroom computers were available for students to use, but in the classroom visitations for this research, she never used these computers. Patricia mentioned a desire to use them throughout the year, but by the end of the year she admitted that students had not used them (Patricia, September 2004; January 2005; May 2005). “To be very honest, the three student ones [computers] did not get turned on. I don’t think once the whole year” (Patricia, May 2005). Patricia considered the fourth computer in the room to be the teacher’s computer and used it as a resource for herself to do email, her grade book, to look up resources on the Internet, and to develop handouts for students.
Patricia considered the classroom computers to be old and slow. She commented that, unlike the computer lab machines, the classroom computers could not connect to the students' files and that it was difficult to have the whole class work on a project at the same time in the classroom. These limitations lead Patricia to reconsider the usefulness of the classroom computers.

I think next year, to free up some more table space, I'm going to request just my computer and one student computer, just in case they have work that they need to stay in and work on during recess or, if they have some extra time. (Patricia, May 2005)

Computer technology did not serve an important instructional purpose in Patricia's classroom during the year. Patricia became comfortable enough with her students by mid-year that she brought the building's laptop cart into the classroom a couple of times during the second part of the year (Patricia, May 2005, field notes, January 22, 2005). Her students used the laptop cart to look up information on the Internet and to complete word processing activities that did not get finished while the class was in the computer lab. Patricia's instructional decisions to use technology with students related to her thinking about when it was most appropriate to use technology with students.

I think technology should be used whenever it will aid the curriculum. Whenever it will enrich it, whenever it will make it, you know, come to life and be more clear for the students. That's when I think it should be used. So I think there are some projects that can be done very well and be very motivational and great for the students without technology. I also think there are many projects where technology is very necessary and could not be completed as well without it. (Patricia, May 2005)
Patricia viewed technology use as an important part of schooling, although she felt that technology use was an instructional choice for when a teacher thought it might aid, or enrich the curriculum. She held a positive view that technology could help motivate students and help them to understand complex concepts, but the decision to use technology was dependent on whether or not the teacher saw it as a benefit or if student behavior warranted its use.

In sum, Patricia began her first year teaching surprised by just how demanding the job actually was. Her concerns about student needs and issues related to classroom management dominated much of the year. Her collaboration with her mentor helped Patricia become familiar with the school curriculum and supported her technology use with students. The assistance provided by the technology coordinator helped Patricia maintain control of her class when they used technology. The support from her mentor and the building technology coordinator helped Patricia understand that technology use with students was an expected part of the school curriculum and that support would be available for her to monitor student behavior when she took the class to the computer lab. Patricia found that she could use technology with students by the end of the year and that technology could be an important tool to help students learn, under certain conditions.

Courtney

Courtney graduated from a small rural high school and attended a community college to attain course prerequisites for entrance into the Iowa State University teacher education program. She had very limited experience with instructional technology before her participation in the TechCo cohort. What follows is a chronological description of Courtney’s experiences in becoming a teacher.
Courtney’s K-12 experience

Courtney related memories of teachers who cared about their students, who developed learning activities around the students’ interests and encouraged students to make connections between the curriculum and their personal experiences. A geometry teacher demonstrated these characteristics: “She would give us a problem and before we'd even learn how to solve it, ... she'd say, ‘okay, bring in an example tomorrow of something that you see in the real world that does this’” (Courtney, September, 2004). Courtney resonated with teachers who had students do projects and allowed students a degree of control in their own learning.

The only extended technology use in Courtney’s K-12 experience occurred in a high school multimedia class. In this stand-alone class, she learned to use different hardware and software, and developed projects using those technologies. She used digital cameras, digital video cameras, and computer software to produce various projects including the senior class video. When asked about whether other courses used any of those technologies, or if teachers linked technology use to content area curriculum, Courtney replied, “No, we just had to have our papers typed up” (Courtney, April 2005).

Technology use by Courtney and her teachers was limited during her K-12 experiences. During her elementary, middle school, and high school years, she took keyboarding classes and indicated that teachers’ only expectations for student technology use seemed to be to turn in word-processed reports. With the exception of a multimedia class, Courtney’s K-12 technology use focused primarily on improving her typing skills.
Courtney's teacher education program

After completing admission prerequisites, Courtney was admitted to an experimental project funded by the Preparing Tomorrow's Teachers to use Technology grant program. The TechCo project was designed to help university faculty and partner schools design and implement a program that provided technology experiences to enhance all education courses and field experiences typically taken by teacher education students (Thompson et al., 2003). Aspects of the TechCo project included work with university faculty and methods instructors to develop and model technology use within their courses. They also worked in partner schools to establish technology-rich placements where teacher education students could observe practicing teachers model effective technology use in their own classrooms. The TechCo project also provided resources for two cohorts of student teachers. Cohort participants had the same program requirements as general teacher education students; however, they also had additional opportunities that went beyond what others' experienced in the general teacher education program.

Cohort members took all of their teacher education courses together, beginning with their sophomore year. These courses included the required educational core, methods blocks in English and Language Arts, Mathematics, Science, and Social Studies. They took additional courses including an action research course, a robotics/programming technology course that incorporated Lego/Logo, and a capstone course that occurred directly after the student teaching experience. Cohort members also had all of their initial field experiences in TechCo partner schools—although not all student teaching experiences were in TechCo schools.
These opportunities allowed cohort members to observe teacher education faculty and classroom teachers model technology use while giving cohort members a chance to practice their own technology use. The TechCo project also provided structures that allowed cohort members to have increased access to technology, additional support for using technology with students, and opportunities to reflect on educational technology use with faculty, mentors and peers.

Involvement with the TechCo project allowed Courtney and other cohort members to purchase a laptop computer at a significantly reduced price—this offer was not available to other teacher education students. The size and flexibility of a laptop allowed Courtney to carry her laptop computer with her wherever she might need it, giving Courtney continuous access to technology. Wireless network capabilities built into the computer allowed Courtney to use her laptop on campus, in her apartment, and at other locations in the community. Access to networks and the Internet enabled her to communicate with others and locate information from remote resources using the wireless capabilities on her laptop. She also used software included on the computer to complete class assignments or group projects.

Additional support for cohort members also accompanied their additional technology access. Faculty and staff from the college of education provided additional support to TechCo members and assisted them in their technology use. Support took many forms as cohort members progressed through their teacher education program. A TechCo office was established to provide program and technical support for cohort members. Staff provided additional laptops to cohort members if their computer malfunctioned and needed repair. Technical support for cohort members who wanted to learn more about specific software applications and assisted cohort members develop digital portfolios was also available. The
Iowa State University Center for Technology in Learning and Teaching (CTLT) also provided support for cohort members by providing software updates and other information regarding network and system recalls. The TechCo project offered cohort members opportunities to reflect about technology use in teaching and learning.

Courtney and her fellow cohort members were encouraged to reflect on how to integrate technology into their instructional practice. Opportunities to reflect about technology integration occurred as they paired practicum experiences with instructional methods courses that advocated technology integration. The capstone course specifically provided an opportunity for cohort members to reflect on their teacher education experience as they student taught and prepared for the transition to their own classroom.

Beyond these opportunities for cohort members, Courtney took additional coursework to complete an instructional technology minor. These courses specifically emphasized integration of technology. Courtney also worked as a student assistant in the CTLT. Working at the CTLT provided Courtney with access to technology and opportunities to expand her technical skills.

Courtney's teacher education coursework

Much of the coursework, for Courtney and the other TechCo cohort members, emphasized technology use to support instruction. Instructors developed curriculum that pressed students to make connections between the instructional objectives of the lesson and how technology could be used to support those objectives. With the increased access to technology available to cohort members, they were able to complete course assignments and develop group projects using their own laptop computers.
Courses in Courtney’s teacher education program gave her opportunities to learn technical skills. Instructors also modeled how to use technology as an instructional tool. Courtney described instructors who used PowerPoint to deliver information, but also remembered how instructors used technology projects to help preservice teachers understand how technology could help students learn. “We developed iMovie’s, and hyperstudio projects, and multimedia projects, lots of different ways to help me understand how I could use it with my kids” (Courtney, April 2005). Instructors modeled technology integration, then expected students to use technology as they developed practice lessons and instructional units. “...teachers would model it [technology use] for us or give us an idea of what they expected of us and then we would do it ourselves” (Courtney, April 2005).

Coursework in Courtney’s teacher education program helped her make connections between technology use and the development of instructional opportunities for students. Instructors expected that cohort members had technical skills, but also that they could apply those skills to develop meaningful instructional units. Instructors’ ability to effectively model how to integrate technology themselves also helped Courtney understand how she might use technology with her own students.

Courtney’s practica experiences

TechCo Cohort members completed their practica in TechCo partner schools and took place in conjunction with their instructional methods courses. The objective of having cohort members complete their practica experiences at TechCo partner schools was to provide cohort members with opportunities to observe teachers who used technology within
their instructional practice, and allow them to use technology with their students in a technology-rich instructional context.

Courtney made connections between the messages about technology use she heard in her coursework and her experiences in schools. “I learned a lot from just going into the school and being in the practicum… at the same time, I was getting [encouraged], ‘let's try something new,’ you know, instead of being traditional, traditional, traditional” (Courtney, September, 2004). Courtney noticed differences between what she observed and the type of instruction advocated by her teacher education program:

I went into the schools and I could see, this is traditional. This is what, you know, kids are doing, is traditional, and so then I could see the difference. How that wasn't working, … yes, they [students] were doing things, but they weren't really interested in it. (Courtney, September 2004)

Courtney emphasized these differences when she described an observation in which a teacher made students copy notes, word for word, from an overhead projector. “I was bored out of my mind. I couldn't imagine being a fourth-grader and having patience enough to do that, because I was losing my patience a little bit” (Courtney, September, 2004).

Courtney described another practicum experience in which she observed two different math teachers:

I was doing my practicum and there was one teacher, who was everything that you could possibly want in a math teacher… And then I would walk from her room to this other room, and observe a teacher who had probably been using the same stuff …for how many years she had taught, maybe 40. (Courtney, September 2004)
These observations provided Courtney with a context in which she could weigh her existing knowledge about teaching against the experiences she had as a member of the TechCo cohort. They also offered Courtney an opportunity to reflect on her experiences with other cohort members.

During one practica experience, Courtney and other cohort members traveled approximately forty miles from the university to participate in a practica experience at an elementary school in a local urban area. On the return trip, Courtney and other cohort members discussed the teaching they observed, and how what they saw related to the instructional reforms advocated by instructors in their teacher education program. "I think that [the drive] helped me realize how important reflection is and how important it is to bounce ideas off of other people" (Courtney, April 2005). These, and other discussions with her TechCo peers, helped Courtney make connections between her teacher education coursework and how she might implement the ideas and concepts from teacher education into her own practice.

Courtney's student teaching experiences

Courtney had two eight-week student teaching experiences during her final semester of study. She taught in a traditional second-grade classroom for her first placement. Her second student-teaching placement was with a technology coordinator in a school located in New Zealand. These experiences provided Courtney with many opportunities to develop her understanding about teaching, learning, and using technology in the classroom.

Courtney described two entirely different experiences with respect to the ways her cooperating teachers implemented technology use with students. Courtney's first placement
challenged many of the perspectives advocated by her teacher education program. "I taught full time for seven and a half weeks out of my eight weeks... She [the cooperating teacher] wasn't even in the room" (Courtney, January 2005). Lack of support created tension between Courtney and her cooperating teacher. Courtney wanted to use technology with her students but her cooperating teacher rejected the idea and expected Courtney to follow the existing curriculum, "...she didn't want a lesson with technology at all. For her, technology and education were two different things" (Courtney, September, 2004). Student technology use was limited to one-half hour session once a week in the computer lab, with additional opportunities to use the technology if they stayed inside for recess. Student technology use consisted of playing games and drawing pictures. Lack of support from her cooperating teacher resulted in an inability to design activities to integrate technology into her curriculum. This frustrated Courtney so much that by the end of her first placement she became discouraged about her decision to enter the teaching profession (Research Journal, October 6, 2004).

Courtney had a different experience in her second student-teaching placement. She participated in the international student teaching program at Iowa State University and traveled to New Zealand where she taught in a classroom of thirty-three seventh and eighth-graders. Her cooperating teacher was the school's technology teacher and vice principal. His vice principal responsibilities frequently took him out of the classroom, leaving Courtney as the primary teacher during much of the eight-week experience. This differed from her first experience, however, because the vice principal supported Courtney by providing suggestions and advice about her teaching and her use of technology in the classroom. When he realized that Courtney had technical expertise he encouraged her to integrate technology
into her curriculum as frequently as possible. Courtney responded by teaching her students to use PowerPoint and iMovie, and integrated technology into other parts of the existing curriculum. The cooperating teacher eventually encouraged Courtney to share her technical knowledge with other staff by conducting in-service training sessions for other teachers on the use the applications she had taught students, and how to run the school’s new digital projector (Courtney, September 2004).

Courtney was the primary teacher in the classroom during each of her student teaching experiences. The differences between her cooperating teachers beliefs about technology use offered Courtney contrasting images of the teaching profession and how she would use technology with her future students. She built on these experiences as she began her first year of teaching.

Courtney’s first year of teaching

Courtney began her teaching career at Trade Wind elementary school, a school not associated with the TechCo grant project. Courtney’s prior experiences with teaching and instructional technology use were primarily as a student. Teachers, university instructors, and cooperating teachers directed many of her decisions on teaching and technology use through her K-12 and teacher education experiences. Courtney was now the one who made instructional decisions within her classroom as a first-year teacher. These decisions included how students might use technology, and may be dependent on the school’s access and support for technology use. The following sections describe these factors and how Courtney used technology during her first year in the classroom.
Courtney’s technology access

Courtney and her students had a variety of technology resources available to her within the school and classroom. A mounted television and VCR were in the front corner of the room. An overhead projector on a cart was at the front of the room, which made it easy for Courtney to use. A classroom desktop computer was located away from Courtney’s desk and near the reading center. Courtney also used a digital camera she received as a graduation present and the laptop computer she had purchased while part of the TechCo project. A Local Area Network (LAN) connection provided Internet access to the room and allowed Courtney and her students access to a variety of software on the desktop computer. Networked software titles included Academy of Reading, Accelerated Reader and Exemplars (a math tutorial software application). Other software available in the classroom differed by content and included software titles such as Jumpstart, Spell It Deluxe, Destination Rainforest and Math Blasters. Production software, such as Microsoft Office, was available on both the desktop and laptop computers. Trade Wind elementary also had a computer lab located next to the media center (Courtney, field notes, October 6, 2004; January 12, 2005; March 30, 2005).

The computer lab contained 30 desktop computers that were networked and able to connect to the Internet. The lab also had a mounted video projector to display information from the teacher station. Computers in the lab were loaded with software similar to the desktop machine in Courtney’s classroom (Courtney, field notes, February 16, 2005; Principal interview 1, October 2004). If teachers wanted to use the lab, they could sign up in a notebook located in the media center.
Trade Wind elementary provided a variety of technologies for Courtney to use throughout the school year. Equipment included hardware and software located in the school media center and in her own classroom. Courtney was also willing to bring her own equipment to provide more technology access in her classroom. Equipment maintenance and support for instructional technology use however was largely up to each teacher.

Courtney’s technology support

Support for technology within Trade Wind elementary school was primarily up to the teachers in the building. The school building did not have a technology coordinator to handle maintenance and other technical problems. The school instead relied on teaching staff to troubleshoot routine technical problems that arose with computers or other technology within the building. The district, however, paid one teacher in each building to help with technology troubleshooting. The teacher who took the technology support position performed these duties on top of his/her existing teaching load. In Courtney’s case, the first-grade teacher in her school held this position. School administration officials expected that Courtney would also be a person teachers would go to if they needed technology help (Principal interview 2, February 2005). To resolve technology problems, teachers were supposed to contact district technical support and wait until the problem was resolved if they could not solve the technical problem themselves. An example of this technical troubleshooting process occurred when nearly all computers in the media center and school lab failed shortly after the school year began.

Courtney and other teachers noticed that computers in the lab began to turn off and on without anyone physically resetting the machines. Many of the computers eventually stopped
turning on. Teachers spent weeks trying to figure out what had happened. Teachers ran anti-virus software and checked power connections in an attempt to solve the problem. District technical support eventually discovered the computers internal power supplies had failed. The unpredictability of the lab limited its use throughout the first semester (Courtney, field notes, December 15, 2004). Technical support for technology was limited and was primarily the teachers’ responsibility. Instructional support for technology use was also limited.

Trade Wind elementary provided teachers with a variety of technology, but each teacher determined whether they used the technology (Principal, September 2004). Instructional support for teachers’ technology use was limited. The district technology coordinator and school media specialist did not facilitate instructional technology use by teachers. The school did work with their local Area Education Association (AEA) to provide some training with software, but teachers determined whether to use the software with students (Principal, September 2004). Teachers’ technology use with students was dependent on whether the teacher chose to use the technology available to them in the building. Trade Wind elementary did support teachers instructional practices although technical support and support for technology use in instruction was limited.

Trade Wind elementary supported teacher instructional practices that improved student learning. Veteran teachers were willing to try new instructional methods and were excited to learn from beginning teachers (Principal, September 2004). Courtney described the teaching culture of the building as out of the ordinary from other schools, “...this is an atypical building because everyone is so into the modern [methods] and what is the best way for the kids to learn” (Courtney, January 2005). Courtney went on to describe how teachers in the building worked with students to do group learning activities, multi-grade level
projects, and service learning activities. Courtney described a veteran third-grade teacher and her push to improve the school’s math scores as an example of the teaching culture in the building.

She's in her sixties. She has grandkids, and I'm just like, are you kidding? She is a wonderful example that everyone is just trying to get better, regardless of their age...I never ever in a billion years would have guessed there would be this many teachers doing the best that they can do to become better teachers. (Courtney, January 2005).

Courtney was encouraged to be part of a staff that focused on student learning. When asked how she fit in with the school culture Courtney responded, “As long as it's for the good of the kids...and everything I want to do is, they are behind me” (Courtney, January 2005).

Courtney began her career in a school that provided her with resources and gave her freedom to determine how she would use technology. Technical and instructional support for technology use was dependant on teachers at Trade Wind elementary. Teachers solved technical problems and determined how they would use technology for instruction. Instructional decisions concerning technology were also dependent on whether the teacher found technology to be a valuable tool to achieve their instructional goals. Courtney had technology resources available to her, but her instructional decisions about how she would use technology were left to her.

Courtney’s first year - teaching

Courtney was excited and anxious with her career choice as she began her first year, however she quickly became inundated by classroom realities. A large class size, warnings
about student behavior, and additional adults present in her classroom heightened her anxiety.

I have 29 kids and the teacher who had them last year (a veteran teacher) tells me she had a breakdown and was sick for 45 days to get away from them. How do I get started? I’m supposed to organize my days and weeks and I don’t know how to begin! (Courtney, first year teaching journal, entry 1, August 16, 2004)

Courtney felt unprepared for how much planning she needed to do. Courtney had previously relied on existing plans from cooperating teachers or plans she had spent time developing in teacher education as guides for what she needed to teach. She now had little additional time to plan and was the person responsible for scheduling each day and planning lessons.

I had no idea, what order of the day I wanted. I wanted someone to organize my days for me, to already have a plan, and all I would have to do was go to work. Instead, it’s me organizing it, and me figuring out which ways work best. (Courtney, January 2005)

Courtney had to make decisions about daily schedules and plan lessons for the entire day, week, and month. It was now up to her to make decisions on what and how to teach. She also had to learn how to manage adults in her classroom.

Other adults in the classroom added to Courtney’s concerns. The school provided Courtney with one full-time teacher’s aid and other teaching associates to assist her with instruction. Professionals from the AEA and social workers from the State Child Welfare department were present to evaluate special needs students, the English as a Second Language (ESL) student, and children under protective services. Parents also volunteered to offer Courtney assistance as the year began (Courtney, September 2004). Courtney spent
most of her time early in the year trying to organize a schedule and plan lessons for students because of her concerns about student behavior and how parents and others might judge her teaching.

Courtney began the year focused on the textbook and the lesson or activity for each day instead of looking at the concepts or themes (Courtney, January 2005). She attempted to plan for every possible thing that could happen, and in her own admission ended up getting lost in the details. Courtney became quite frustrated with how much time it took her to plan and to try to meet student needs early in year. “Teaching sucks! It is totally day by day. I’m always trying to reach the high and low and plan” (Courtney, first year teaching journal, entry 1, August 16, 2004)! She spent late nights at the school planning lessons and activities for each day without much thought about how the lessons fit into larger district goals, and was not confident about how she was doing.

I just did the day to day and turn the page stuff, because there were so many people in the room. I didn't want to, I knew what I was doing, but you are unsure if you know what you are doing or not, when you have these professional educators who are now AEA staff in there all the time, evaluating your kids, you think, is my lesson going well? (Courtney, May 2005)

Planning, scheduling, and other adults in her classroom flustered Courtney as she started the year. She was concerned about meeting immediate needs and unsure if she was having an affect on student learning. Her instructional practice focused on day-to-day activities instead of broad instructional goals. These behaviors negatively affected Courtney’s perceptions about her job. Courtney began to think differently about the situation toward the end of November.
I just thought to myself one day, why am I doing this... I knew from the beginning what I should be doing was to think about the big picture. I mean I knew that I should be doing that, but I just didn't. (Courtney, January 2005)

Courtney reviewed standards and benchmarks for the district and for her-grade level during the Thanksgiving break (Courtney, January 2005). She then developed learning activities that focused on larger learning objectives and goals for her grade level. She challenged herself to create activities that interested her students. These changes helped Courtney become more flexible in her planning and helped her to use other adults in the room more effectively. An example of this change was how she used “centers.”

Center time took place each morning session and involved students who worked independently in small groups while Courtney lead guided reading sessions with various students. Students worked independently in four small groups spread out around the room. Students had two different activities at each center and every center focused on a different aspect of the district’s language arts curriculum. Activities changed throughout the year with students in the groups as they worked on spelling words, independent reading, or writing. Some activities included spelling boxes, as students practiced their spelling words by writing them in sand or shaving cream. Students also did “Ad Lib’s,” in which students created funny short stories using letter blends they had learned, and wrote sentences on the board using spelling challenge words. They also wrote and acted out plays, and used computer software on the room’s desktop computer. Courtney used teaching associates and parent volunteers during center time to help guide students and to monitor activities. Courtney had up to four other adults in the room at certain times of the morning (Courtney, field notes,
Courtney’s transformation a few months into the first semester helped her to move beyond thinking about the day-to-day chaos of planning and the management of kids and adults. She changed her instructional practices by concentrating on the larger learning goals within the district curriculum and developed activities built around student interests. Technology use with her students was a tool for her to reach those goals.

Courtney’s first year – technology use with students
Technology use with students was diverse and an integral part of each student’s day. Courtney did not view technology use with students as something she had to make special accommodations for. She used the technology available in her classroom and in the school’s media center as integral parts of her daily instructional practice. Her development of “centers” and other activities throughout the day focused on standards, learning objectives, and student interests, which allowed Courtney to use technology as a means for reaching those objectives and exploring those interests. “...I use it as a tool to get kids excited. To try and help them learn about things that they are interested in... just like I would use a book, or, just anything” (Courtney, May 2005). Courtney’s perspectives about technology use were evident in the ways she used technology with her students.

Courtney integrated technology into her instructional practice. A typical day included the student use of various technologies along with other materials to reach learning goals or to explore student interests. Courtney used the room’s overhead projector every morning to display the Daily Oral Language (DOL) activity, so that students could work as they came
into the room. Students also used technology during center time. Students used reading or math software, searched the Internet, and created plays they later performed in front of the class while other students read independently, played language arts games, practiced spelling words, or wrote on the board at the front of the room during center time (Courtney, field notes, January 12, 2005; January 26, 2005; March 2, 2005; March 17, 2005; May 5, 2005; May 13, 2005). The use of Courtney’s personal laptop to write plays is one specific example of how students used technology during center time.

Three or four students gathered around the laptop and discussed the different roles each would play and the story’s theme. As they talked, one of the students opened the laptop, turned it on, and opened the Microsoft Word application. Students then began to compose the play. Students took turns typing as other members of the group discussed who would say what and what actions they would perform as they acted out the play. Students then asked Courtney or one of the other adults in the room to proofread what they had written. Courtney printed copies of the play and scheduled a time for the students to perform it in front of the rest of the class (Courtney, field notes, January 26, 2005; January 31, 2005; March 2, 2005; March 17, 2005; May 5, 2005). Technology use in the classroom continued after center time was over.

Courtney used technology with her students during other parts of the instructional day. Courtney and her students moved on to reading and math activities following center time. During the reading lessons students frequently used the classroom computer to look up information when they had questions or wanted to find out more information about something in their stories. An example of technology use during this part of the day occurred when a student was writing a story about horses but had trouble drawing a picture to go along
with the story. When the student asked Courtney about pictures she could use as a guide, Courtney said, “Let’s go look one up on the Internet quick” (Courtney, field notes, January 12, 2005). Courtney and the student went to the classroom desktop computer where the student searched for pictures of horses that related to the story she had written. Courtney had moved on to help other students in the room. Once the student at the computer found a picture she wanted, she raised her hand to get Courtney’s attention, and Courtney then helped her to print out the picture (Courtney, field notes, January 12, 2005). When asking Courtney later about students’ technology use in her classroom she stated, “I think that when a child asks something I’ll say, ‘Hey, go look it up on the computer, or Hey, go check on the Internet’, and see what they can find” (Courtney, January 12, 2005). Courtney frequently used the school’s math software with her students. The drill and practice software reinforced students’ existing math knowledge. Going to the lab excited students and was “something different and not flashcards” (Courtney, field notes, March 30, 2005). Courtney also developed activities where students went to various web sites related to counting money and where students used digital cameras to take pictures of geometric shapes they found around the school building at different times during the year (Courtney, field notes, January 26, 2005; March 2, 2005; March 17, 2005). Courtney and her students eventually turned the pictures from the digital camera activity into a book they shared with parents during parent teacher conferences (Courtney, field notes, April 20, 2005). Student technology use continued in the afternoon session after students returned from lunch.

The afternoon schedule typically had students going to other classes such as music, physical education, and art. The school also used the afternoon sessions for school-wide activities such as convocations or Multiple Age Group (MAG) activities. Courtney worked
on science and social studies in the afternoon when students were in her classroom, but also had flexibility in the schedule that allowed her to pursue student interests. Student questions about current events, questions about something they read, or experiences outside of school were frequently catalysts for technology use with students.

Courtney took her students to the lab to do web quests or to do other large group computer activities throughout the year. Whether the activities were about habitats, sharks, bats, dinosaurs, money, or volcanoes Courtney used student questions to develop the activities.

A lot what they choose to do with technology and stuff is just things that they say they are interested in, and I think about it and it gives me a day to soak it in. Like the shark thing, we had sharks in the basil reader, then they are asking me all these questions about sharks and I don't really know that much about sharks. It's like, I'll just put this web quest together and we'll see if the lab is reserved and we'll go tomorrow, and do it. So, it's a last minute kind of thing. (Courtney, May 2005)

Students wrote down questions they had about a particular subject and Courtney took those questions, located web sites where the students could find answers to their questions, and developed a web page with hyperlinks. This made it easy for students to locate information about the subject. Courtney also helped students use technology to express and share their knowledge with other students in the class. Two examples included the development of a PowerPoint slide show about one student's family trip to the San Diego zoo, and when Courtney allowed a special needs student present information he found on the Internet about how to care for another classmate's salamander (Courtney, field notes, April 2005). Students used technology to help them learn in ways that went beyond the standard curriculum.
Teachers, teacher associates, and the teacher’s aid who worked with Courtney and her students all recognized she used technology in different ways than other teachers in the building. They noticed that she was very comfortable using technology and that she could integrate technology into her instructional practice as a tool to help students learn (Special Education teacher 1, Special Education teacher 2, Teaching associate 2, Teacher’s aide, Mentor, April 2005).

...some of the teachers don't necessarily use any technology... [in Courtney’s classroom] the technology is more incorporated into what she's trying to do. More daily opportunities to be on the computer and having experience with it, which I think is great for the kids. (Special education teacher 2, April 2005)

Teachers and aids provided examples of Courtney’s approach, like when she brought up web sites related to the Mount St. Helens eruption and the tsunami that devastated India and parts of Asia as current events to show the class. They also discussed when Courtney developed web quests for the students to explore questions they had about dinosaurs and sharks (Special education teacher 2, Teacher’s aid, April 2005). They noted how her instructional decisions focused on hands-on activities, student interests, and that she differentiated her instruction to try and meet students needs in her classroom (Special Education teacher 1, Special Education teacher 2, Teaching associate 1, Teaching associate 3, Teacher’s aid, April 2005). Special education teachers identified Courtney’s instructional practice as student centered and constructivist.

I always hate to give it as a label, constructivist, but she's more in that vein of let's give the kids some information and some tools to play with and see what they come up with. Like when she had them build the cities... they built their little roads and
towns, and it was here are all these materials, just go for it, so very hands on and very focused on letting the children build their knowledge. She kind of guides them in that.

(Special education teacher 1, April 2005)

Courtney used technology with her students throughout the year. Other adults who worked with Courtney recognized that her technology use with students was different from other teachers and that she focused on student interests as a catalyst for many classroom activities that incorporated technology. Courtney believed technology use with her students helped them learn.

Instructional decisions to use technology in her classroom supported Courtney’s beliefs that technology helped students learn.

I really do believe that technology does help get the children excited and motivated…but can also be a great problem solving tool, that promotes higher-level thinking. There are a lot of things that you can do with it to promote higher-level thinking and, isn’t that what all teachers want? To be able to teach kids how to learn so that they can continue to learn. (Courtney, May 2005)

Courtney did not recognize the ways she used technology with students as unique or distinctive (Courtney, May 2005). Courtney’s technology use with students represented what she believed to be good teaching and did not consider technology to be something separate or to be added to a teacher’s instructional practice; instead it was an integral part of it. “I just learned how to teach, and I really don’t separate technology from my teaching” (Courtney, April 2005).
Courtney began her teaching career overwhelmed by everything that was new. Classroom realities including scheduling, long term planning, and students' needs as well as questions about her adequacy as a teacher preoccupied Courtney's experience at the beginning of the year. She focused more on larger instructional goals as the year progressed and began to make instructional decisions based on instructional concepts and student interests instead of day-to-day survival. Courtney viewed technology as an integrated part of her instructional practice. Students used technology daily in Courtney's classroom where technology use served as a tool to develop skills, explore curriculum, and to construct knowledge.

Analysis

*Question One: How did two first-year teachers, one who was prepared in Iowa State University's PT3 TechCo cohort, and the other who was not in the cohort but began her career in a school supported by Iowa State University's PT3 project, use technology with their students?*

Results from each case suggest that these first-year teachers used technology in meaningful ways with their students and that they met many of the performance indicators identified in National Educational Technology Standards for Teachers (NETS-T). The International Society for Technology in Education (ISTE) developed the NETS-T standards to serve as a general guide for preservice teacher education programs so those programs could provide opportunities for teacher education students to meet the standards by the time they begin their careers (International Society for Technology in Education, 2002). These standards represent general guidelines for teachers technology use. When comparing
Courtney and Patricia’s technology use to the NETS-T standards, as discussed in chapter two, each first-year teacher met the indicators that focused on instructional technology use with students.

Courtney and Patricia both planned and designed learning environments and experiences supported by technology (NETS-T Standard II). Courtney independently planned her curriculum and designed learning environments so her students could use technology. Whether this was in the development of webquest activities or the use of instructional software, Courtney organized a variety of technology that supported student learning. She identified appropriate web sites for her students to use in the webquest’s she designed and other technology that she used in her classroom. Patricia also planned curriculum and developed activities that gave students opportunities to use technology. Working closely with her mentor and building technology coordinator, she reviewed Internet resources and assisted in the revision of various technology activities throughout the year.

They also implemented these plans so that students would have technology-rich learning opportunities (NETS-T Standard III). Courtney implemented her curriculum plans to maximize learner-centered student technology experiences. She used student interests to expand on the existing curriculum or to allow students to explore their own interests. Courtney managed student learning while the class was in the lab and in the classroom, she actively monitored student behavior and was constantly involved addressing student questions. Patricia worked with her mentor and building technology coordinator to implement aspects of the existing curriculum that integrated technology while meeting content standards. While in the computer lab, Patricia monitored and assisted students while they worked or when the technology coordinator provided instruction.
Both of these first-year teachers used technology in meaningful ways with their students that would normally indicate a comparable level of technology use with their students. If these teachers would be surveyed about their technology use with students, they may very well look similar to one another. Use of qualitative methods however, makes it possible to do a deeper level of analysis one might not otherwise be able to do. Upon further analysis of how Patricia and Courtney used technology with their students, it becomes evident that each teacher held a different personal conception of technology use with students and that conception related to how each teacher incorporated technology into their instruction practice.

Courtney’s personal conception about technology use was that technology was an instructional tool that was inseparable from of her teaching practice. Because of this perspective, technology was a ubiquitous aspect of student learning throughout Courtney’s first year in the classroom. She created a learning environment within her classroom where students had continuous access to technology and where technology was a daily part of student instruction.

Student technology use happened daily, was consistent throughout the year, and took place in both her classroom and in other locations in the school. Student technology use included a wide range of software and hardware. Courtney’s technology use with her students’ also involved a variety of activities. These activities included her use of drill and practice software for skill reinforcement, the development and creation of technology activities that expanded the curriculum and related to students’ desire to learn more about a particular subject (for example, animal habitat, shark, and bat web quests, counting money activity, digital picture math activity). She also used technology to bring in events from
outside the school (e.g. Mt. St. Helen's eruption, tsunami), to help students share their own interests and knowledge (family trip to San Diego Zoo, special education student sharing information he found about how to care for a classmates pet). Technology was also a classroom learning resource for students, teacher aids, and Courtney herself to use informally to find information.

Patricia’s conception about technology use with students related to whether the teacher believed technology was appropriate for the instructional objective and whether students’ behavior warranted the teacher allowing students to use technology. This perspective represents a view that technology is something additional to a teachers’ instructional practice and that various external factors may affect whether a teacher decides to use technology with students. As she year began, Patricia questioned whether she should use technology at all with her students. These concerns about technology use were centered on her ability to plan activities, schedule access to the computer lab, and concern about student behavior. By the end of the year, she had used technology with her students, but questions remain about whether her personal conception about technology use had changed.

Technology use for students in Patricia’s class took place in direct relation with existing curriculum and predominately in the schools’ computer lab. Within the lab, students used a variety of software applications to learn technology skills and to develop projects that represented their knowledge about a topic or concept within the curriculum. Patricia did not use technology with her students beyond curriculum expectations. As a first-year teacher, she relied on the existing resources. Because technology was an established part of the existing curriculum, Patricia was able to integrate technology. Patricia conception about technology use with students being dependent on whether the teacher perceived it was appropriate was
still evident in her decision to remove all but one of the three student computers in her classroom at the end of the year. More telling of her perspective toward technology use with students was that students were to use the computers during recess or during free time. In sum, Patricia used technology with her students as an integrated part of the school's existing curriculum, but results suggest that she did not consider technology use with students to be an integral part of her daily instructional practices with students.

Question Two: How did teacher education affect instructional practices and technology use of these first year teachers?

Results from each case suggest that teacher education had an affect on the development of each teachers' personal conceptions about instructional technology use. Patricia and Courtney shared some aspects of their teacher education program, but Courtney's involvement in the TechCo project cohort provided her with other opportunities to develop her conceptual understanding of instructional integration of technology. Both first-year teachers completed their teacher education programs with technology skills and knowledge about how to integrate technology into instructional practice. They differed however, in how they interpreted their teacher education programs' focus on technology integration into a teacher instructional practice. For Courtney, technology was an integral tool that was inseparable from good instructional practice. For Patricia, technology and instructional practice were separate. Technology may assist a teacher in reaching her instructional objectives, but it remains a separate aspect of that practice.

Iowa State University’s TechCo project attempted to put in place many of the recommendations to prepare preservice teachers to effectively use technology. These
recommendations include providing access to technology, modeling effective technology use throughout the preservice teachers' teacher education experience, and providing support for technology use (International Society for Technology in Education, 2000; Moursund & Bielefeldt, 1999; Office of Technology Assessment, 1988, 1995). Results suggest that the TechCo project had a positive affect in Courtney's technology use with students during her first year teaching.

Courtney had vivid images of instructors who modeled technology use and expected teacher education students to develop and deliver lessons that integrated technology. Courtney and her other cohort members had greater access to technology, support for technology use throughout their teacher education experience, opportunities to observe faculty and classroom teachers model technology use within their own instructional practice, and time to reflect on their experiences. Through these experiences, Courtney drew distinctions between traditional instructional practice and how technology use could support dynamic learning opportunities for students. She also made connections between her educational coursework and her experiences in schools by reflecting with others about their experiences in schools and how they might use technology.

Courtney recognized that she had been influenced by her teacher education program and commented frequently about how she used the resources and methods modeled by her teacher education program instructors. Her teacher education program incorporated technology use along with constructivist and student-centered instructional practices. These models combined with additional opportunities to observe classroom teachers and to reflect on their practice, allowed Courtney to develop her perspective of what a good teacher was and to develop an alternative instructional perspective that viewed technology use as an
integral part of good teaching. These images of teaching and how to use technology transferred into her first year of teaching.

General teacher education students in Iowa State University’s teacher education program had a different teacher education experience than members of the TechCo cohort. Although many of the instructors in the teacher education program at Iowa State University participated in the technology-mentoring program, and taught both the TechCo cohort students and general students in the program, technology integration for students within the general teacher education program, was occasional, isolated, and compartmentalized. Results suggest that teacher education programs that do not provide students with a consistent and clear message about technology integration, and how it can support teachers’ instructional practice, may develop teachers who find technology important, but consider it something additional to their existing practice.

Patricia’s memories of technology use in teacher education were similar to her K-12 experiences. She primarily word processed assignments and located resources while instructors used technology to present information. The two courses related to technology integration into teachers’ instructional practice provided her with alternative models of how to integrate technology into the curriculum, but for Patricia they did not provide her with connections to other courses or practica experiences that may have shaped her conceptions about technology use with students. This was evident during her student teaching placements. Technology use with students took place only when it focused on existing curriculum and when she thought it was something expected of her. Patricia separated technology use from other aspects of teaching and saw its use with students as something that would require
additional planning and work in order to accomplish. This perspective carried over into her first year of teaching.

In sum, these two cases both suggest that teacher education had an important influence on how these first-year teachers integrated technology into their instructional practice. Courtney’s TechCo experience provided her greater opportunities to use, model, and reflect about technology use with students and to create a vision of technology use that facilitated constructivist and student-centered learning. This resulted in an instructor who thought about technology use as an integral part of her instructional practice. Patricia’s more general teacher education program resulted in an instructor who viewed technology as important, but made decisions about its use dependent on whether it was well suited for a particular instructional objective. These differences were evident in how each teacher used technology with their students during their first year in the classroom. Both cases suggest that teacher education has a real impact. At the same time, it is important to understand that these findings are limited due to the small sample size, but the differences in how each teacher thought about and used technology in their first year teaching of experience lend support to those scholars who maintain that teacher education matters.

Question Three: How did the existing institutional and classroom context affect instructional practices and technology use of these beginning teachers?

Results from these case studies suggest that the institutional and classroom context affected how Courtney and Patricia used technology with their students. The institutional and classroom context of each school supported both Patricia and Courtney’s technology use with students during their first year of teaching. Technology access and support for
instructional technology use have been cited as important factors for teachers’ technology use with students (Office of Technology Assessment, 1988, 1995; Web-based Education Commission, 2000). Results from these case studies suggest that technology access did not play an important role in either Patricia or Courtney’s technology use with students. Patricia and Courtney had comparable technology access in their school and classroom, yet how they utilized the resources available to them was considerably different.

Patricia had greater access to computer technologies in her classroom; with four classroom computers and a wireless laptop cart available, but she predominately used the computer lab to use with students. Courtney in contrast, used school technology resources but also went beyond what the school provided in order to make more technology available to her students. She brought in her personal laptop and digital camera, and sought out resources from the university to increase the amount of technology in her classroom. Courtney frequently used these resources in her room or scheduled time to use the school’s computer lab if she wanted to do something with the entire class. Technology integration was a seamless part of classroom activities. In sum, technology access within the institutional or classroom context did not affect the beginning teachers technology use with students. Instead, support from school personnel and challenges related to first year teachers appeared to affect each teacher’s technology use with their students.

The results indicate that support provided to the new teachers had an affect on how they used technology with their students. As has been suggested, schools and the support they provide to new teachers are important factors in changing or developing new teachers instructional practices (Fullan, 2001; McLaughlin & Talbert, 2001). Technology support is also an important factor in helping teachers use technology (Ringstaff & Kelly, 2002;
Sandholtz et al., 1997; Strudler et al., 2001). The issue of support affected each case in different ways. Each school provided their first year teacher with a supportive context as they began their careers.

Patricia began her career at a school that had worked hard to develop teachers’ technology skills and to integrate technology in meaningful ways into the school curriculum. Patricia’s mentor had worked with Iowa State University faculty and staff as a cooperating teacher during the TechCo project and had developed instructional units that integrated technology. The school’s technology coordinator had also played an important role during the TechCo project and collaborated with many of the teachers to link technology skills to content area curriculum. This existing curriculum and support structure within the school helped her to use technology with her students.

Patricia’s relationships with her mentor and technology coordinator helped her to use technology with her students. Shared planning time and other opportunities to work with other teachers in the district helped Patricia build relationships and understand that technology integration was an expected part of the curriculum. Collaboration with her mentor helped her to modify existing technology projects and determine if new applications were appropriate for their students. In addition, support from the building technology coordinator facilitated technology projects and provided additional supervision of students so that Patricia felt comfortable allowing her students to use technology.

Courtney however, did not have the same kinds of supportive structures in place as she began the year. The school had no organized or comprehensive effort to integrate technology into the instructional practices of teachers, and therefore left it up to individual teachers to determine how they would use technology. Courtney made instructional decisions
about what would be appropriate in regards to her students technology use without any established support from the school. In Courtney’s case, the schools lack of structured support gave her a level of autonomy to structure the curriculum and allowed her to take the initiative to use technology with her students.

Support for beginning teachers’ development continues to be an important factor as teacher education student’s transition from student to teaching professional. The impact of the teaching context on the development of these first year teachers and their technology use was important. Each offered the beginning teachers support in using technology with their students even though each context was unique. These results continue to emphasize the important role support plays in both the development of beginning teachers and beginning teachers’ technology use with students.

The results from these case studies suggest that Patricia and Courtney had many of the same challenges beginning teachers frequently experience and that these experiences had an affect on how they used technology with students. The realities of the classroom surprised both teachers as the year began. This period of survival exhausted and frustrated both first-year teachers as they worked to manage time, set up routines within their classrooms, plan, and learn about their school and students (Fuller, 1969; Nemsar, 1983; Veenman, 1984).

Similar to the teachers studied by Novak and Knowles (1991), time and her status as a first year teacher affected Patricia’s technology use with students. Issues of control dominated many of Patricia’s interactions with students. Classroom management and challenges with student behavior remained issues for her throughout the year. Patricia initially made instructional decisions concerning student technology use based on whether or not she thought it would fit in her schedule and whether her students could handle
independent or group work early in the year. The supportive context and the relationships she formed with her mentor and the technology coordinator helped her to overcome her issues with planning and student behavior.

The large number of students and adults in Courtney's classroom flustered her as she began the year. Similar to the teacher studied by Bullough (1989), Courtney felt inadequate as AEA staff, parents, and administrators frequently visited her classroom. By November, Courtney recognized that she had "froze up" at the beginning of the year, but that she knew all along what she should have been doing. Technology use with her students played an important role in helping her overcome much of the pressure she felt at the beginning of the year. Courtney viewed technology use with students as inseparable from any other instructional method she would use with her students. Her use of technology as a means to focus student's attention and to engage them in their own learning served as a tool for her as she settled into her new career.

The institutional and classroom context affected the instructional practice and technology use of these two beginning teachers. This context played a vital role in assisting Patricia to use technology with her students. Support from her mentor and the building technology coordinator helped her to understand technologies role within the existing curriculum and overcome classroom management issues. Courtney on the other hand, took advantage of the lack of focus within her institutional context concerning technology use with students to develop her instructional practice that integrated technology while fostering student interests.
Chapter Summary

This chapter presented the results of two case studies of beginning teachers who at one point in their development as teaching professionals were encouraged to integrate technology into her instructional practice with students. The first case described Patricia, who began her career at a school that had been a partner during Iowa State University's PT3 TechCo grant project. The second case described Courtney, who participated as a cohort member in the TechCo project. Case descriptions provided data concerning Courtney and Patricia’s memories of their own technology use as students throughout their K-12 and teacher education experiences and then how each first-year teacher used technology during their initial year in the classroom. Data from each case provided information concerning each of the three research questions posed at the onset of this study. Analysis of the data suggests that personal conceptions about technology integration into the teachers’ instructional practice were developed during their teacher education program and that these conceptions affected how they used technology with their students during their initial year in the classroom. While each teacher used technology in meaningful ways with their students, the teachers’ personal conceptions about technology use with students affected how the teachers responded to many of the challenges experienced by first-year teachers and how they adjusted to their new institutional and classroom contexts.
CHAPTER FIVE
CONCLUSION

Efforts to improve technology use have taken place in schools and in teacher education programs across the country. New teachers are beginning their careers with greater access and skills than many of their colleagues, yet questions remain about how new teachers who have been encouraged to integrate technology into their instructional practice actually use technology with their students once they begin their careers. This study investigated how two beginning teachers used technology with their students during their first year of teaching. Qualitative methods for data collection and analysis provided rich descriptive data concerning how each of these teachers used technology with their students and the factors that influenced that use. This case study describes the experiences of two first year teachers in detail and results from this investigation cannot generalize to a larger population. However, this study contributes to our understanding of the developmental nature of beginning teaching and that teacher education can play a role in the development of new teachers’ personal conceptions and actions concerning technology use with their students.

Contrary to claims about teacher educations’ ineffectiveness in shaping preservice teachers practice (The Abell Foundation, 2001), evidence from both cases illustrate that each first-year teachers’ technology use with their students reflected perspectives that were developed during their teacher education programs. Patricia’s experience in teacher education developed her conception that technology use should be dependent on whether the teacher determined its appropriateness for the students or lesson. For Patricia, technology use reinforced other instructional practices, but remained something additional, separate, or distinct from typical instructional practice. Courtney’s teacher education experience, on the
other hand, developed her conception that technology use with students was just a part of good instruction and she conceived technology use as integral to teachers’ instructional practice. For Courtney, technology was another tool used naturally by students and teachers to explore interests and improve learning. These conceptions of effective technology use affected how Courtney and Patricia used technology with their students, how they used technology in relation to challenges of being a first-year teacher, and how they responded to the various levels of support they were offered as they began their careers.

Patricia’s and Courtney’s personal conceptions of what constituted effective technology use affected how each thought about and used technology with their students during their first year in the classroom. Each teacher used technology in ways that were consistent with how she interpreted effective technology use from her experiences in her teacher education program. While both first-year teachers used technology in meaningful ways with their students, how they integrated technology into their instructional practice looked quite different. Patricia’s technology use with students remained an additional part of her instructional practice. Technology use linked directly to existing curriculum and was dependent on Patricia making instructional decisions about whether technology was appropriate for the lesson or whether student behavior warranted its use. Courtney’s technology use with students was ubiquitous within her instructional practice and technology was an integrated tool within the classroom that students used daily to explore their interests.

Both Courtney and Patricia experienced many of the typical problems first-year teachers face as they begin their careers. Personal conceptions of effective technology use affected how each first-year teacher dealt with these challenges. Patricia’s conception, that technology use with students should be dependent upon teachers’ instructional decisions
about its appropriateness for the lesson and whether student behavior warranted its use, became an additional barrier for her as a first-year teacher. Patricia identified many of the same challenges related to her technology use with students as those identified by others (Novak & Knowles, 1991; Russell et al., 2003). Challenges such as time to develop activities, scheduling the computer lab or other equipment, and concerns about student behavior became additional challenges for Patricia to overcome as a first-year teacher. Technology use with her students became one more thing she had to do and was in addition to everything else she was trying to learn. Courtney’s conception, that technology use with students should be an integral part of good instructional practice, assisted her in overcoming the first-year challenges she faced. Although she was overwhelmed and unsure of herself as she began the school year, Courtney did not distinguish between technology use and teaching. For her, they were the same. Since Courtney did not differentiate between teaching and technology use with her students, she did not consider planning technology use or scheduling lab time as something additional to her existing practice. She integrated technology into the daily classroom routine and used technology as a catalyst to explore student interests and expand the curriculum.

Courtney and Patricia had different types of support available to them as they began their first year in the classroom. The support they received encouraged technology use in both cases, but whether the support developed or reinforced each teacher’s personal conceptions about technology use with their students remains unclear. Patricia’s collaboration with her mentor and the building technology coordinator established that technology use with students was part of the existing curriculum and set an expectation that Patricia should use technology with her students. The additional support she received helped
her to overcome her concerns about student’s inability to handle technology work and her concern about student behavior in the computer lab. Although collaboration with her mentor and the technology coordinator helped Patricia use technology with her students during her first year in the classroom, Patricia’s comments at the end of the year concerning her intent for technology use with students during her second year, raises doubts about whether the support she received altered her conception about technology use with students. For Courtney, the institutional context did not provide expectations or structured support for teachers’ technology use, however, it provided her with the freedom to do whatever she thought was appropriate to help her students learn. This autonomy supported her technology use with students because she did not draw a distinction between her instructional practice and technology use. She was free to develop a learning environment within the classroom that emphasized standards important to the district, and in doing so, used technology as a tool throughout the development of her curriculum.

These two first-year teachers’ personal conceptions of how to effectively use technology played an important role in how they used technology with their students. Support for each teacher’s conception was evident in how she interpreted her teacher education program and its emphasis on how and when to use technology. These interpretations continued to affect these teachers through their initial year in the classroom. Differences between the two teachers’ preparation programs indicate possible opportunities for teacher educators to tailor programs in ways that promote technology use as an integral part of a teachers’ instructional practice.

The ISTE NETS essential conditions for teacher preparation emphasize the importance of modeling appropriate technology use within student-centered learning
environments, providing appropriate access to technologies, and supporting technology use throughout teacher education and within school contexts new teachers enter (International Society for Technology in Education, 2000). While these conditions are vital in helping new teachers use technology, there should also be occasions within teacher education that provide teachers opportunities to make connections between these conditions and the development of their own instructional practice. Opportunities for preservice teacher to reflect on what they see and do creates the possibility for them to develop a conceptual framework that supports technology use with students as an integral part of their own instructional practice. Teachers who begin their careers with a conceptual framework about how technology can support their instructional practice may be more likely to use technology with their students.

Future research

Future research concerning beginning teachers' technology use should include longitudinal studies that attempt to identify changes in teacher conceptions about technology use in teaching and learning. Data should be collected early in a teacher’s pre-service program and data collection should continue through their induction years of teaching. There should also be further research conducted concerning graduates of PT3 programs. As researchers, we still know very little about how graduates from PT3 programs use technology with their students once they enter their own classrooms. Further research into how these beginning teachers use technology can help us assess reforms promoted by PT3, and help identify persistent challenges to effective technology use by teachers.
Conclusions

Results from this study demonstrate that these two teachers' personal conceptions about technology use with their students had an affect on how each first-year teacher used technology with her students. Both teachers were encouraged to use technology at various points within their development as teachers. Each teacher used technology in meaningful ways with their students, but upon closer examination of this use, it became clear that the personal conceptions about technology use developed during teacher education was an important indicator of how they used technology with students in their own classroom. How each teacher responded to challenges of being a first-year teacher and the support they received within the institutional context could also be analyzed through their personal conceptions about how technology should be used. The study of these two first-year teachers suggests that modeling effective technology use, providing access to technology, and support for technology continue to be important factors in helping new teachers use technology. Results from this study also suggested that the beliefs formed during teacher preparation on the use of technology played a powerful role in how these first year teachers used technology with their students. These results suggest the importance of providing opportunities for preservice teachers to reflect and make conceptual connections between their preparation and practice as they develop and understand their visions of technology use in K-12 classrooms.
DATE: August 17, 2004
TO: Jon Clausen
FROM: Ginny Austin, IRB Administrator
RE: IRB ID # 04-367
STUDY REVIEW DATE: August 17, 2004

The Institutional Review Board has reviewed the project, "Preparation and Context, Their Roles in the Development of Beginning Teachers" requirements of the human subject protections regulations as described in 45 CFR 46.101(b) 2. The applicable exemption category is provided below for your information. Please note that you must submit all research involving human participants for review by the IRB. Only the IRB may make the determination of exemption, even if you conduct a study in the future that is exactly like this study.

The IRB determination of exemption means that this project does not need to meet the requirements from the Department of Health and Human Service (DHHS) regulations for the protection of human subjects, unless required by the IRB. We do, however, urge you to protect the rights of your participants in the same ways that you would if your project was required to follow the regulations. This includes providing relevant information about the research to the participants.

Because your project is exempt, you do not need to submit an application for continuing review. However, you must carry out the research as proposed in the IRB application, including obtaining and documenting (signed) informed consent if you have stated in your application that you will do so or required by the IRB.

Any modification of this research must be submitted to the IRB on a Continuation and/or Modification form, prior to making any changes, to determine if the project still meets the Federal criteria for exemption. If it is determined that exemption is no longer warranted, then an IRB proposal will need to be submitted and approved before proceeding with data collection.

cc: C&I
    Dale Niederhauser

ORC 04-21-04
ISU NEW HUMAN SUBJECTS RESEARCH FORM

SECTION I: GENERAL INFORMATION

Principal Investigator (PI): Jon M. Clausen
515-231-5245  Fax: 515-231-5245

Degrees: MS

Correspondence Address: 503 Lagomarcino

Department: Curriculum and Instruction
Email Address: jmclaus@iastate.edu

Center/Institute: CTLT
College: Education

PI Level:  • Faculty  □ Staff  □ Postdoctoral  □ Graduate Student  □ Undergraduate Student

Title of Project: Preparation and context, their roles in the development of beginning teachers

Project Period (Include Start and End Date): [8/20/04] to [12/30/05]

FOR STUDENT PROJECTS

Name of Major Professor/Supervising Faculty: Dr. Dale Niederhauser

Signature of Major Professor/Supervising Faculty: __________

Phone: 294-6841  Campus Address: 4031 Lagomarcino

Department: Curriculum and Instruction  Email Address: dsnt@iastate.edu

Type of Project: (check all that apply)
  • Research  □ Thesis  □ Dissertation  □ Class project
  □ Independent Study (490, 590, Honors project)  □ Other. Please specify:

KEY PERSONNEL

List all members of the research team including the principal investigator, his/her degrees, their position at ISU (or other organization) and role on the project, their training and most recent date of their training if known. Please use additional space as necessary. For projects involving animals, please include the veterinary, animal caretakers and technical staff. For projects involving human subjects, please include anyone who will have contact with the subjects.

<table>
<thead>
<tr>
<th>NAME &amp; DEGREE(S)</th>
<th>POSITION AT ISU &amp; ROLE/SPECIFIC DUTIES ON PROJECT</th>
<th>TRAINING &amp; DATE OF TRAINING</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Jon M. Clausen, MS</td>
<td>Graduate student in the department of curriculum. Will be involved with conceptualization, data analysis, and reporting. Will be recording class sessions, observing and interviewing participants, collecting and analyzing data. Locating related research as themes emerge from the data.</td>
<td>Human Subject Training. 8-19-02</td>
</tr>
<tr>
<td>2. Dale Niederhauser, Ph.D</td>
<td>Conceptualization, data analysis, reporting</td>
<td>ISU Human Subjects Training, 11-12-01</td>
</tr>
</tbody>
</table>

Research Compliance 04/10/03
FUNDING INFORMATION

| If internally funded, please provide account number: N/A |
| If externally funded, please provide funding source and account number: N/A |
| If funding is pending please provide OSPA Record ID on GoldSheet: N/A |
| Title on GoldSheet if Different Than Above: N/A |
| Other: e.g., funding will be applied for later. N/A |

SCIENTIFIC REVIEW

Although the compliance committees are not intended to conduct peer review of research proposals, the federal regulations include language such as “consistent with sound research design,” “rationale for involving animals or humans” and “scientifically valuable research,” which requires that the committees consider in their review the general scientific relevance of a research study. Proposals that do not meet these basic tests are not justifiable and cannot be approved. If a compliance review committee(s) has concerns about the scientific merit of a project and the project was not competitively funded by peer review or was funded by corporate sponsors, the project may be referred to a scientific review committee. The scientific review committee will be ad hoc and will consist of your ISU peers and outside experts as needed. If this situation arises, the PI will be contacted and given the option of agreeing that a consultant may be contacted or withdrawing the proposal from consideration.

☐ Yes ☒ No Has or will this project receive peer review?

If the answer is "yes," please indicate who did or will conduct the review:

If a review was conducted, please indicate the outcome of the review:

NOTE: RESPONSE CELLS WILL EXPAND AS YOU TYPE AND PROVIDE SUFFICIENT SPACE FOR YOUR RESPONSE.

COLLECTION OR RECEIPT OF SAMPLES

Will you be: (Please check all the apply.)

☐ Yes ☒ No Receiving samples from outside of ISU? See examples below.
☐ Yes ☒ No Sending samples outside of ISU? See examples below.

Examples include: genetically modified organisms, body fluids, tissue samples, blood samples, pathogens.

If you will be receiving samples from or sending samples outside of ISU, please identify the name of the outside organization(s) and the identity of the samples you will be sending or receiving outside of ISU:

N/A

Please note that some samples may require a USDA Animal Plant Health Inspection Service (APHIS) permit, a USPHS Centers for Disease Control and Prevention (CDC) Import Permit for Etiologic Agents, a Registration for Select Agents, High Consequence Livestock Pathogens and Toxins or Listed Plant Pathogens, or a Material Transfer Agreement (MTA) (http://www.aps.isu.edu/site/hs/mating.htm).

STUDY OBJECTIVES

Briefly explain in language understandable to a layperson the specific aim(s) of the study.

Research Compliance 04/10/03
FUNDING INFORMATION

| If internally funded, please provide account number: N/A |
| If externally funded, please provide funding source and account number: N/A |
| If funding is pending please provide OSPA Record ID on GoldSheet: N/A |
| Title on GoldSheet if Different Than Above: N/A |
| Other: e.g., funding will be applied for later. N/A |

SCIENTIFIC REVIEW

Although the compliance committees are not intended to conduct peer review of research proposals, the federal regulations include language such as “consistent with sound research design,” “rationale for involving animals or humans” and “scientifically valuable research,” which requires that the committees consider in their review the general scientific relevance of a research study. Proposals that do not meet these basic tests are not justifiable and cannot be approved. If a compliance review committee(s) has concerns about the scientific merit of a project and the project was not competitively funded by peer review or was funded by corporate sponsors, the project may be referred to a scientific review committee. The scientific review committee will be ad hoc and will consist of your ISU peers and outside experts as needed. If this situation arises, the PI will be contacted and given the option of agreeing that a consultant may be contacted or withdrawing the proposal from consideration.

☐ Yes ☐ No Has or will this project receive peer review?
If the answer is "yes," please indicate who did or will conduct the review:
If a review was conducted, please indicate the outcome of the review:

NOTE: RESPONSE CELLS WILL EXPAND AS YOU TYPE AND PROVIDE SUFFICIENT SPACE FOR YOUR RESPONSE.

COLLECTION OR RECEIPT OF SAMPLES

Will you be: (Please check all that apply.)

☐ Yes ☐ No Receiving samples from outside of ISU? See examples below.
☐ Yes ☐ No Sending samples outside of ISU? See examples below.

Examples include: genetically modified organisms, body fluids, tissue samples, blood samples, pathogens.
If you will be receiving samples from or sending samples outside of ISU, please identify the name of the outside organization(s) and the identity of the samples you will be sending or receiving outside of ISU:

N/A

Please note that some samples may require a USDA Animal Plant Health Inspection Service (APHIS) permit, a USPHS Centers for Disease Control and Prevention (CDC) Import Permit for Etiologic Agents, a Registration for Select Agents, High Consequence Livestock Pathogens and Toxins or Listed Plant Pathogens, or a Material Transfer Agreement (MTA) (http://www.aph.isiastate.edu/bio/shipping.htm).

STUDY OBJECTIVES

Briefly explain in language understandable to a layperson the specific aim(s) of the study.

Research Compliance 04/10/03
The purpose of this paper is to examine the professional development of a group of recent graduates from ISU's teacher education program. Two of the participants were members of a technology rich cohort (TechCo) while the other two participants were in the regular certification program. The TechCo participants were provided with training on integrating technology into their teaching practice and are now entering their own classrooms. The purpose of this research is to monitor these four teachers' development into the classroom and identify how their preparation has transferred into their teaching practice.

BENEFIT

Explain in language understandable to a layperson how the information gained in this study will benefit participants or the advancement of knowledge, and/or serve the good of society.

The benefit of this study is to help us better understand beginning teacher's transition and development from pre-service teaching experiences to their own classroom. For this study we are especially interested in how the knowledge gained about the use of technology in the classroom is transferred into these participants classroom practice and how the teaching context advances or hinders pedagogical reform. Benefits to participants will be an opportunity for reflection about their teaching practice and the role of their pre-service preparation in their development as teachers. It is hoped that the information gained in this study will benefit society by providing valuable information about teacher education, teacher development, and technology integration while helping schools of teacher education, teacher educators, district and school administrators, teachers and students better understand the transition into the teaching profession.

ASSURANCE

- I certify that the information provided in this application is complete and accurate and consistent with any proposal(s) submitted to external funding agencies.
- I agree to provide proper surveillance of this project to ensure that the rights and welfare of the human subject or welfare of animal subjects are protected. I will report any problems to the appropriate compliance review committee(s).
- I agree that I will not begin this project until receipt of official approval from all appropriate committee(s).
- I agree that modifications to the originally approved project will not take place without prior review and approval by the appropriate committee(s), and that all activities will be performed in accordance with all applicable federal, state, local and Iowa State University policies.

CONFLICT OF INTEREST

A conflict of interest can be defined as a set of conditions in which an investigator's or key personnel's judgment regarding a project (including human or animal subject welfare, integrity of the research) may be influenced by a secondary interest (e.g., the proposed project and/or a relationship with the sponsor). ISU's Conflict of Interest Policy requires that investigators and key personnel disclose any significant financial interests or relationships that may present an actual or potential conflict of interest. By signing this form below, you are certifying that all members of the research team, including yourself, have read and understand ISU's Conflict of Interest policy as addressed by the ISU Faculty Handbook (http://www.provost.iastate.edu/faculty/) and have made all required disclosures.

☐ Yes ☐ No Do you or any member of your research team have an actual or potential conflict of interest?
☐ Yes ☐ No If yes, have the appropriate disclosure form(s) been completed?

SIGNATURES

Signature of Principal Investigator Date

Research Compliance 04/10/03
Signature of Department Chair  Date

PLEASE NOTE: Any changes to an approved protocol must be submitted to the appropriate committee(s) before the changes may be implemented.

Please proceed to SECTION II.
INFORMED CONSENT DOCUMENT

Title of Study: Transition to teaching: Preparation and context, their roles in the development of beginning teachers

Investigator: Jon M. Clausen, M.S.

INTRODUCTION

The purpose of this study is to examine the professional development of first year teachers. Specifically, this study seeks to examine the influence of a teacher education program once the teacher enters his or her own classroom. My mission is to better understand issues associated with teacher development from pre-service teacher preparation through induction years of teaching. I am asking you to participate in this study because you are a recent graduate from ISU’s teacher education program.

Your participation will consist of one to three 10 to 30 minute open-ended interview(s) that will focus on your experiences as a first year teacher, and your pedagogical beliefs. Interviews will take place between August of 2004 and June of 2005. During interviews I will ask a series of questions and tape record your responses. You may skip any question that you do not wish to answer or that make you feel uncomfortable. You may end your participation in the study at any time. Simply tell me that you wish to stop and all of your data will be removed from the data set. All tape recordings will be erased in December of 2005. Participation will also consist of providing copies of lesson plans and other documents related to your work with students.

RISKS

There are no foreseeable risks from participating in this study.

BENEFITS

If you decide to participate in this study there may be no direct benefit to you. It is hoped that the information gained in this study will benefit society by providing valuable information about the teacher induction process and help teacher educators, district and school administrators, and teachers better understand how beginning teachers make meaning of the complex transition from their teacher education program to their own classrooms.

COSTS AND COMPENSATION

You will not have any costs nor receive any compensation from participating in this study.

PARTICIPANT RIGHTS

Your participation in this study is completely voluntary and you may refuse to participate or leave the study at any time.

CONFIDENTIALITY

Records identifying participants will be kept confidential to the extent permitted by applicable laws and regulations and will not be made publicly available. However, federal government
regulatory agencies and the Institutional Review Board (a committee that reviews and approves human subject research studies) may inspect and/or copy your records for quality assurance and data analysis. These records may contain private information.

To ensure confidentiality to the extent permitted by law, the following measures will be taken: Your responses made during the interview will be available only to the project team. You will be assigned a code number that will be associated with your data. Data will be stored in a locked office and computer files of transcripts will be password protected. Data will be destroyed in December of 2005. The information you contribute will be strictly confidential. Neither your name nor the name of your school will be associated with any write up of the interviews. If the results are published, your identity will remain confidential.

QUESTIONS OR PROBLEMS
You are encouraged to ask questions at any time during this study. For further information about the study contact Jon Clausen, N062 Lagomarcino Hall, (515) 231-5245; jmclaus@iastate.edu. If you have any questions about the rights of research subjects or research-related injury, please contact the Human Subjects Research Office, 2810 Beardshear Hall, (515) 294-4566; austingr@iastate.edu or the Research Compliance Officer, Office of Research Compliance, 2810 Beardshear Hall, (515) 294-3113; dament@iastate.edu

SUBJECT SIGNATURE
Your signature indicates that you voluntarily agree to participate in this study, that the study has been explained to you, that you have been given the time to read the document and that your questions have been satisfactorily answered. You will receive a copy of the signed and dated written informed consent prior to your participation in the study.

Subject's Name (printed) ____________________________________________

(Subject's Signature) ____________________________________________ (Date)
INVESTIGATOR STATEMENT

I certify that the participant has been given adequate time to read and learn about the study and all of their questions have been answered. It is my opinion that the participant understands the purpose, risks, benefits and the procedures that will be followed in this study and has voluntarily agreed to participate.

(Signature of Person Obtaining Informed Consent)  (Date)
APPENDIX C: FACULTY / ADMINISTRATION INFORMED CONSENT FORM

INFORMED CONSENT DOCUMENT
Faculty/ Administration

Title of Study: Transition to teaching: Preparation and context, their roles in the development of beginning teachers
Investigator: Jon M. Clausen, M.S.

INTRODUCTION
The purpose of this study is to examine the professional development of first year teachers. Specifically, this study seeks to examine the influence of a teacher education program once the teacher enters his or her own classroom. My mission is to better understand issues associated with teacher development from pre-service teacher preparation through induction years of teaching. I am asking you to participate in this study because you have had or will have opportunities to interact with the first year teacher as a student, as a colleague, or as an administrator.

Your participation will consist of one to three 10 to 30 minute open-ended interview(s) that will focus on pedagogical beliefs and interaction with the student/first year teacher. Interviews will take place between August of 2004 and June of 2005. During interviews, I will ask a series of questions and tape record your responses. You may skip any question that you do not wish to answer or that make you feel uncomfortable. You may end your participation in the study at any time. Simply tell me that you wish to stop and all of your data will be removed from the data set.

RISKS
There are no foreseeable risks from participating in this study.

BENEFITS
If you decide to participate in this study there may be no direct benefit to you. It is hoped that the information gained in this study will benefit society by providing valuable information about the teacher induction process and help teacher educators, district and school administrators, and teachers better understand how beginning teachers make meaning of the complex transition from their teacher education program to their own classrooms.

COSTS AND COMPENSATION
You will not have any costs nor receive any compensation from participating in this study.

PARTICIPANT RIGHTS
Your participation in this study is completely voluntary and you may refuse to participate or leave the study at any time.

CONFIDENTIALITY
Records identifying participants will be kept confidential to the extent permitted by applicable laws and regulations and will not be made publicly available. However, federal government regulatory agencies and the Institutional Review Board (a committee that reviews and approves
human subject research studies) may inspect and/or copy your records for quality assurance and data analysis. These records may contain private information.

To ensure confidentiality to the extent permitted by law, the following measures will be taken: Your responses made during the interview will be available only to the project team. You will be assigned a code number that will be associated with your data. Data will be stored in a locked office and computer files of transcripts will be password protected. Data will be destroyed in December of 2005. The information you contribute will be strictly confidential. Neither your name nor the name of your school will be associated with any write up of the interviews. If the results are published, your identity will remain confidential.

QUESTIONS OR PROBLEMS
You are encouraged to ask questions at any time during this study. For further information about the study contact Jon Clausen, N062 Lagomarcino Hall, (515) 231-5245; jmclaus@iastate.edu. If you have any questions about the rights of research subjects or research-related injury, please contact the Human Subjects Research Office, 2810 Beardshear Hall, (515) 294-4566; mustingr@iastate.edu or the Research Compliance Officer, Office of Research Compliance, 2810 Beardshear Hall, (515) 294-3115; dament@iastate.edu.

*****************************

SUBJECT SIGNATURE
Your signature indicates that you voluntarily agree to participate in this study, that the study has been explained to you, that you have been given the time to read the document and that your questions have been satisfactorily answered. You will receive a copy of the signed and dated written informed consent prior to your participation in the study.

Subject’s Name (printed) ____________________________________________

(Subject’s Signature) ____________________________________________ (Date)
INVESTIGATOR STATEMENT

I certify that the participant has been given adequate time to read and learn about the study and all of their questions have been answered. It is my opinion that the participant understands the purpose, risks, benefits and the procedures that will be followed in this study and has voluntarily agreed to participate.

(Signature of Person Obtaining Informed Consent) (Date)
### APPENDIX D: INTERVIEW PARTICIPANTS AND DATES

#### Case One

<table>
<thead>
<tr>
<th>Participant</th>
<th>Interview</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Courtney</td>
<td>Interview 1</td>
<td>September 24, 2005</td>
</tr>
<tr>
<td></td>
<td>Interview 2</td>
<td>January 13, 2005</td>
</tr>
<tr>
<td></td>
<td>End of the year interview</td>
<td>May 25, 2005</td>
</tr>
<tr>
<td></td>
<td>Member check</td>
<td>June 20, 2005</td>
</tr>
<tr>
<td>Principal 2</td>
<td>Interview 1</td>
<td>October 6, 2004</td>
</tr>
<tr>
<td></td>
<td>Interview 2</td>
<td>February 11, 2005</td>
</tr>
<tr>
<td></td>
<td>Interview 3</td>
<td>June 6, 2005</td>
</tr>
<tr>
<td>Special Education Teacher 1</td>
<td>Interview 1</td>
<td>April 4, 2005</td>
</tr>
<tr>
<td>Special Education Teacher 2</td>
<td>Interview 1</td>
<td>April 6, 2005</td>
</tr>
<tr>
<td>Teacher aid</td>
<td>Interview 1</td>
<td>April 4, 2005</td>
</tr>
<tr>
<td>Mentor 2</td>
<td>Interview 1</td>
<td>April 6, 2005</td>
</tr>
<tr>
<td>Teacher Associate 1</td>
<td>Interview 1</td>
<td>April 4, 2005</td>
</tr>
<tr>
<td>Teacher Associate 2</td>
<td>Interview 1</td>
<td>April 6, 2005</td>
</tr>
</tbody>
</table>

#### Case Two

<table>
<thead>
<tr>
<th>Participant</th>
<th>Interview</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patty</td>
<td>Interview 1</td>
<td>September 9, 2004</td>
</tr>
<tr>
<td></td>
<td>Interview 2</td>
<td>January 13, 2005</td>
</tr>
<tr>
<td></td>
<td>End of the year interview</td>
<td>June 3, 2005</td>
</tr>
<tr>
<td>Principal 1</td>
<td>Interview 1</td>
<td>September 28, 2004</td>
</tr>
<tr>
<td>Interview 2</td>
<td>February 28, 2005</td>
<td></td>
</tr>
<tr>
<td>---------------------</td>
<td>-------------------</td>
<td></td>
</tr>
<tr>
<td>Interview 3</td>
<td>June 6, 2005</td>
<td></td>
</tr>
<tr>
<td>Mentor 1</td>
<td>Interview 1</td>
<td>April 6, 2005</td>
</tr>
<tr>
<td>Technology coordinator</td>
<td>Interview 1</td>
<td>April 6, 2005</td>
</tr>
</tbody>
</table>

**University Faculty**

| COE Faculty 1       | Interview 1       | April 7, 2005    |
|---------------------|-------------------|
| COE Faculty 2       | Interview 1       | April 8, 2004    |
### APPENDIX E: OBSERVATION SCHEDULE FOR COURTNEY

<table>
<thead>
<tr>
<th>Observation Date</th>
<th>Morning or Afternoon Observation</th>
</tr>
</thead>
<tbody>
<tr>
<td>September 14, 2004</td>
<td>Afternoon</td>
</tr>
<tr>
<td>December 15, 2004</td>
<td>Afternoon</td>
</tr>
<tr>
<td>January 6, 2005</td>
<td>Snow Day (Observation Cancelled)</td>
</tr>
<tr>
<td>January 12, 2005</td>
<td>Morning</td>
</tr>
<tr>
<td>January 19, 2005</td>
<td>Afternoon</td>
</tr>
<tr>
<td>January 26, 2005</td>
<td>Morning</td>
</tr>
<tr>
<td>January 31, 2005</td>
<td>Morning</td>
</tr>
<tr>
<td>February 10, 2005</td>
<td>Afternoon</td>
</tr>
<tr>
<td>February 16, 2005</td>
<td>Afternoon</td>
</tr>
<tr>
<td>February 23, 2005</td>
<td>Courtney is sick (Observation cancelled)</td>
</tr>
<tr>
<td>March 2, 2005</td>
<td>Morning</td>
</tr>
<tr>
<td>March 7, 2005</td>
<td>Morning</td>
</tr>
<tr>
<td>March 17, 2005</td>
<td>Morning</td>
</tr>
<tr>
<td>March 31, 2005</td>
<td>Afternoon</td>
</tr>
<tr>
<td>April 6, 2005</td>
<td>Afternoon</td>
</tr>
<tr>
<td>April 20, 2005</td>
<td>Morning</td>
</tr>
<tr>
<td>May 5, 2005</td>
<td>Morning</td>
</tr>
<tr>
<td>May 13, 2005</td>
<td>Morning</td>
</tr>
</tbody>
</table>
APPENDIX F: OBSERVATION SCHEDULE FOR PATRICIA

<table>
<thead>
<tr>
<th>Observation Date</th>
<th>Morning or Afternoon Observation</th>
</tr>
</thead>
<tbody>
<tr>
<td>September 4, 2004</td>
<td>Morning</td>
</tr>
<tr>
<td>October 7, 2004</td>
<td>Afternoon</td>
</tr>
<tr>
<td>October 28, 2004</td>
<td>Morning</td>
</tr>
<tr>
<td>December 15, 2004</td>
<td>Morning</td>
</tr>
<tr>
<td>January 6, 2005</td>
<td>Snow Day (Observation cancelled)</td>
</tr>
<tr>
<td>January 13, 2005</td>
<td>Afternoon</td>
</tr>
<tr>
<td>January 22, 2005</td>
<td>Afternoon</td>
</tr>
<tr>
<td>January 27, 2005</td>
<td>Afternoon</td>
</tr>
<tr>
<td>January 31, 2005</td>
<td>Afternoon</td>
</tr>
<tr>
<td>February 7, 2005</td>
<td>Afternoon</td>
</tr>
<tr>
<td>February 16, 2005</td>
<td>Morning</td>
</tr>
<tr>
<td>February 21, 2005</td>
<td>Morning</td>
</tr>
<tr>
<td>February 28, 2005</td>
<td>Afternoon</td>
</tr>
<tr>
<td>March 9, 2005</td>
<td>Afternoon</td>
</tr>
<tr>
<td>March 14, 2005</td>
<td>Morning</td>
</tr>
<tr>
<td>March 21, 2005</td>
<td>Morning</td>
</tr>
<tr>
<td>March 30, 2005</td>
<td>Morning</td>
</tr>
<tr>
<td>April 20, 2005</td>
<td>Afternoon</td>
</tr>
<tr>
<td>April 27, 2005</td>
<td>Morning</td>
</tr>
<tr>
<td>May 5, 2005</td>
<td>Afternoon</td>
</tr>
</tbody>
</table>
APPENDIX G. FIRST YEAR TEACHER INTERVIEWS

Initial first-year teacher interview questions

Interview #1
30-45 minutes

1. What were the experiences you remember most from your k-12 school experience?
   - What instructional practices of your teachers do you remember?
     - What was it about those experiences that caused you to remember them so vividly?
     - How would you describe the type of instruction you received? (traditional, teacher centered, constructivist, student centered)
     - What was the role of technology in your k-12 experiences?

2. Why did you decide to become a teacher?

3. What were the influences that led you to become a teacher?

4. Can you tell me a little about your perspectives on teaching and learning?
   - How do you see your role in the classroom?
   - What is the role of students?
   - How do you think students learn?
     - Individual work, centers, group projects, student centered activities
   - How does technology fit into what you do in the classroom?

5. What were the courses from your teacher education program that influenced these beliefs?
   - What was it about those courses that caused you to remember them so vividly?
     - Were there courses that challenged your thinking
       - about how to teach
       - what to teach
       - how you previously thought about teaching
     - What was it about those courses that challenged your thinking?
- What instructional practices of your instructors do you remember?
  - How would you describe the type of instruction you received? (traditional, teacher centered, constructivist, student centered)

- What do you remember about the role of technology in your preparation program?
  - How would you describe your preparation programs perspective on the use of technology for teaching and learning?

6. What experiences from your teacher education program were most memorable?

- What was it about those experiences that caused you to remember them so vividly?

- Were these associated with a specific course?
  - Were there experiences that challenged your thinking
    - about how to teach
    - what to teach
    - how you previously thought about teaching and student learning
  - What was it about those experiences that challenged your thinking?

- What instructional practices of your cooperating teachers do you remember?
  - How would you describe the types of instruction of your cooperating teachers? (traditional, teacher centered, constructivist, student centered)

- What do you remember about the role of technology in your practicum and student teaching experiences?
  - How would you describe your cooperating teachers perspective on the use of technology for teaching and learning?

7. How have these experiences affected or influenced:

- Your decision about going into teaching?
- Your thinking about your role as a teacher?
- Your thinking about how students learn?
- Your current practice?
- Your technology use with students?

8. Can you describe what it is like to be a first year teacher?
- Have there been any challenges in your experience so far?
- What have been some highlights of your experience so far?
Second first year teacher interview questions

Interview #2
30-45 minutes

Personal Learning
9. Do you learn best in classes that focus on factual information or classes that focus on ideas and concepts/
   a. Why do you learn best in the type of class you chose above?

10. In learning about something you really want to know, what is the role of an expert?

11. Sometimes people talk about: searching for the truth.” I’m not sure what they’re talking about.
   a. What are your views?

12. Can you tell me your views on who is responsible for learning?

Teaching
13. Can you describe what good teaching is?

14. Can you tell me about how you perceive the relationship between teaching and learning?
   a. How do you see your role in the classroom?
   b. What is the role of students?
   c. How do students learn?
      i. Individual work, centers, group projects, student centered activities
   d. What is the role of technology in this relationship?

15. Describe an instructional situation in which you had to make a difficult decision.
   a. What was the decision?
   b. What did you decide to do?
   c. Looking back on it now, did you make the best choice?
   d. What did you learn from it?

16. Can you describe a teaching experience that you have had that was particularly good for you?
   a. What was the experience?
   b. What did you learn from it?

Experience to this point
17. Now that you are through the first half of the year, what stands out for you?

18. Has being here (in this school) changed the way you think about yourself or the world?
   a. …The profession of teaching?
   b. …Your role as a teacher?
   c. …How students learn?
   d. …How you use technology?
      i. In teaching
      ii. For learning

19. How is this similar or different from what was advocated during teacher education program?

20. How have you used technology so far this year with your students?

21. What do you think will stay with you about your experiences here (in this school)?
First-year teacher End of the year interview questions

End of the year interview

Technology access and use

1. Can you tell me about how you have used technology with your students this year?
   a. Specific examples
   b. Use in the lab or classroom?

2. Can you tell me about any factors that have influenced your technology use with students throughout the year?
   a. Access to technology?
      i. ?

3. Has your technology use with students changed throughout the year?
   a. What do you account for this change or lack of change?

Support for technology use

1. Can you tell me about the types of support you received this year?
   a. Mentoring
   b. Administrative
   c. Other teachers

2. Can you tell me about the support you received for technology use with your students?
   b. Mentor?
   c. Tech coordinator?
   d. Administration?

4. Has this support affected your thinking about...
   a. How to work with student, parents, teachers, etc...
   b. The teaching profession
   c. How technology could be used
      i. To help students learn?
      ii. To be more productive?
      iii. To communicate with others?

Development: Context and culture

1. Can you tell me about how your first year of teaching has shaped your thinking about teaching and learning?
   a. Have your beliefs about teaching and learning changed?
i. What is the role of the teacher in the classroom?
b. What are some lessons you have learned about yourself in your first year teaching?
c. What have you learned about the teaching profession?

2. What aspects of teaching have been the most difficult?
   a. Examples?

3. What aspects of teaching have been the most rewarding?
   a. Examples

4. Looking to next year;
   a. What things would you do differently?
      i. Why?
   b. What things would you do the same?
      i. Why?
   c. What things would you do differently with technology?
      i. Why?
   d. What things would you do the same with technology?
      i. Why?
APPENDIX H. OTHER PARTICIPANT'S INTERVIEW

1. Could you tell me about your role in the school and how you have worked with the first year teacher during her first year?
   a. About how frequently do you work with the first year teacher?

2. Can you tell me about how the first year teacher has used technology throughout the year with her students?
   a. In the classroom
   b. In the computer lab

3. What kinds of activities have the first year teachers done with students that have also used technology?
   a. Can you think of some specific examples?
   b. Where have these activities taken place?
      i. Classroom
      ii. Computer lab
      iii. Some where else?

4. How does the first year teachers' technology use with students compare to other teachers in the building?

5. How does the first year teachers' technology use with students corresponds with building and district goals for technology use?

6. ow would you consider her development as a first year teacher?
   a. From when she started the year to now
   b. What kind of growth have you seen?
      i. Specific examples of things that she’s changed or adapted?
APPENDIX I: SCHOOL ADMINISTRATOR INTERVIEWS

Administrator’s interview #1

Questions for Administration

I. Principal Background
   a. Can you tell me a little about your educational background?

II. School Background
   a. Can you tell me about your school?
      b. Demographics of teachers
         i. New teachers
         ii. Experienced teachers
      c. Age of the building
      d. Technology within the building

III. Technology Role
   a. What is the educational role of technology in your building?
      i. How has the school utilized technology in the past?
      ii. How do teachers’ use technology with their students?
      iii. What are the schools goals for the utilization of technology?
      iv. How is technology supported in your building?

IV. Teacher Effectiveness/New Teacher Support
   a. What makes a teacher effective?
      i. How do these characteristics play themselves out in the classroom?
      ii. Examples of an effective classroom?
      iii. Pedagogical practices do you believe are the most appropriate for student learning?
      iv. Does Technology have a role in teaching and learning?
   b. What opportunities does the district have to support new teachers?
      i. Mentors?
      ii. Is there anything in place to support new teachers with the state requirements?
      iii. Technology’s role in supporting new teachers
   c. What are your expectations for beginning teachers in your building?
      i. New teachers technology use with students?
   d. Describe your interactions with __________.

V. Do you have any questions about anything I’ve asked or is there anything you would like to add.
APPENDIX J: COLLEGE OF EDUCATION FACULTY INTERVIEW

COE Faculty Interview

College of Education
Can you tell me about how the College of Education has approached the topic of technology and teacher education?
   How long has this been the approach?

Are there College goals for all students in regards to technology use?
   - How are those goals enacted?
     o Courses?
     o Tech minor?

Can you tell me about how the college hopes graduates will use technology once they enter their own classrooms?

PT3
Can you tell me about the PT3 grant project?

How was the grant project implemented?
   - Theory behind it?
   - Project goals?
   - Cohorts
   - Partner schools

Partner schools
Can you tell me some more about the partner schools and how the PT3 project supported technology use in the partner schools?
   - Paid subs
   - Provided workshops
   - Continuous support

What were the goals for partner schools?

What were the hopes for partner schools once the grant funding ended?

Preservice teacher cohorts
Can you tell me more about the cohort structure of the PT3 grant project?

How was cohort participants’ teacher education preparation different from traditional TE students?
How was cohort participants’ preparation in technology use different from traditional TE students?

How did the PT3 project support the cohort member’s technology use?

What were your hopes for how these students would use technology once they entered their own classrooms?

Closing
As you continue to work with teachers and students concerning the integration of technology, how has your definition of effective technology integration developed or changed?

- How do you define effective integration of technology?
- Has this definition changed or developed over time?
  - What has affected or influenced your definition?

End Interview
REFERENCES


Carroll, T. G. (2000). If we didn't have the schools we have today, would we create the schools we have today? *Contemporary Issues in Technology and Teacher Education* (Vol. 1).


