STIMULATING PRESERVICE TEACHERS' BELIEFS ABOUT THE BENEFITS OF EVERYDAY TECHNOLOGY IN THEIR TEACHING

By

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CHAPTER 1: INTRODUCTION

Introduction

Education is at the core of American democracy, and though there is ongoing debate about specific learning goals and teaching methods, there is widespread agreement that a central purpose of education is to prepare students to be productive citizens with the capability of participating in society (Dewey, 1916). As the U.S. has moved from its roots in farming and trapping through the industrial age and now into an information age, the nature of what it *means* to prepare citizens has gone through major shifts. With the arrival of the 21st century, where much of life is entwined with the Internet and communication is constant and global, there are many voices calling for the development of new forms of literacy, arguing that students need to be better prepared as communicators and critical thinkers (Partnership for 21st Century Skills, 2008). Proponents of this view have criticized education for being stuck in an industrial model, and of not taking advantage of what new technologies have to offer both for learning and for life (Collins & Halverson, 2009). In this dissertation, I examine one perspective on technology for learning, which I call "everyday technology," and the role that it can play in helping students become better prepared for life in the 21st century. I argue that how teachers conceptualize technology is central to its use in education, and present data from a study of pre-service teachers learning about everyday technologies that uncovers both their thinking about technology for education in general and how a pre-service education course focused on models of using everyday technology led, in the majority of cases, to changes in their thinking about technology in learning. I also examine the implications this data has for thinking about the preparation of pre-service teachers to use technology.

There has been much debate about the proper use of technology in education in every era, including the current debate about the role of everyday technology. On the whole, the history of educational technology has not been glowing, and it is difficult to point to particular advances in the effectiveness of schools that are related to technology *(Cuban, Kilpatrick, & Peck*, 2001). Everyday technologies represent a significant break with prior thinking about technology in education for a range of reasons, which will be explored below. First, I present a brief overview of some of the major challenges that technology has both presented to education and faced in being used in schools, and for each briefly describe how everyday technology represents a potential solution or at least a departure from business as usual. These challenges include: determining the effectiveness of technology in education, preparing students for the workplace, digital disconnect with everyday technology tools and tools in school learning, and resistance to change among teachers and administrators.

Challenges in Education Technology

Challenge: Education Technology Effectiveness

While the ultimate goal for integrating new technologies into schooling should be to improve student learning, a continuing challenge for educators has been how to effectively use technology to meet this goal. Over the past decade funding allocated for education technology tools and resources has greatly increased. For example, Glen Kleiman (2000) reports that from 1990 until 2000 K-12 schools and state and federal governments spent around 6.9 billion dollars on computer hardware, Internet access, wiring, software, servers, and other digital equipment to make technology available to students and teachers. According to the U.S. Department of Education, as of 2003, 100%

of U.S. K-12 public schools had access to the Internet (National Center for Education Statistics, 2007). Large-scale spending continues to this day, where it is estimated that in the last decade the U. S government has spent 56 billion dollars on educational technology (Nagel, 2008). It appears that national, state, and local educational institutions have spent billions of dollars giving K-12 schools access to technology hardware and software. Yet, Larry Cuban (1986), who researched technology integration in U.S. schools, found that historically, having access to educational hardware and software in classrooms has not guaranteed that teachers will utilize the tools in an effective way or at all. Cuban found this was true not only of computers, but for earlier technologies like film, radio, and television. Despite the technological resources given to teachers and students since then, Larry Cuban, Heather Kilpatrick, and Craig Peck (2001) once again found that the money on spent tools and having access to educational software and hardware did not lead to widespread or effective uses of technology for classroom learning. If the U.S. is pouring money into education technologies in schools, then why aren't the tools and resources being utilized effectively?

Henry J. Becker (2000), in a national survey of teachers' uses of technology, found that the most creative and frequent uses of technology were not linked to core curricula, and the most successful technology use was not found in mainstream core courses. If technology is not used in support of core academic learning, it is not reasonable to expect that technology use will lead to positive learning outcomes in core academic subjects. As early as the 1970s, educational hardware and software has been developed with the objective of improving student learning. Even when education technology has been integrated into mainstream curriculum, studies have found mixed results when looking at

academic growth. For example, in the 1990s studies of computer-based tutoring systems to improve student achievement found varied results (Wilson, 1993), depending on the underlying model for the tutor. Some researchers, using "intelligent tutors" built on an empirically-derived student model, found that student achievement improved (Koedinger, Anderson, Hadley, & Mark, 1997). Others uses of tutors, which were more drill-and-practice based, were found to be detrimental to student achievement (Wenglinsky, 1998).

And there are many different models and ways in which technology might be used in classrooms. Jeremy Roschelle, Jim Kaput and Walter Stroup (2000) make a distinction between learning "from" technology, where the technology serves as a teacher, and learning "with" technology, where the technologies are one component of a larger educational ecosystem. But in the "with technology" situation, which many technology theorists argue is the most promising way to improve education, it can be even more difficult to find results that clearly argue for technology's unique role (Heinecke et al., 1999; Coley, 1997), and it is difficult to replicate or scale-up such complex uses of technology in reform-oriented classrooms (Fishman et al., 2004). This is part of the reason why there continues to be active debate about technology's effectiveness.

Workforce Preparation Challenge

Given that there are controversies surrounding whether technology actually improves learning, it begs the question, do students need to learn new technology skills as part of their school instruction? There is a growing concern in society that students are no longer adequately prepared for the workforce (Collins & Halverson, 2009). An early voice of this concern from an information age perspective was the 1991 SCANS Report

(Secretary's Commission on Achieving Necessary Skills, 1991). This national commission determined the skills necessary for high school graduates to become successful members of the workforce at that time. The report concluded that "...more than half our young people leave school without the knowledge or foundation required to find and hold a good job." This lack of necessary skills from graduates stemmed from the fact that the global workplace had drastically changed from the industrial workplace of the early 1900s, due to advances in technology and competition from countries abroad, while school learning had remained static. The SCANS Report argued that the way schools educate children must change. The report established a strong link between new workplace skills and information technologies, and argued that schools have a key role to play in preparing students for this work world.

The SCANS report was published in 1991, and the story has not changed over the last 18 years. In 2007, the Partnership for 21st Century Skills, an educational advocacy organization that researches what skills are needed for the 21st century workforce, found that 88% of the general public believes that students are ill-equipped to compete in the 21st century job market (Beyond the Three Rs, 2007). The findings indicated that students need more than the traditional skills of reading, writing, and arithmetic in order to be successful in their future. After reading this statistic one might ask, what exactly are the "skills" missing from 21st century students' schooling that causes this concern? One answer was provided by a nationwide survey conducted by Common Sense Media & The Joan Ganz Cooney Center (2008) which found that 83% of the parents surveyed believe that using and understanding digital media is key to their children's future success, and 75% of parents believe that digital media skills are just as important as traditional

learning skills. If schools are integrating technology developed for educational purposes in school learning, then what are these digital media skills are that missing from the school curriculum?

The answer may be found in the everyday interaction that students have with their own digital media. There is a disconnect between the technology students use in their daily lives and the technology tools they use in school for learning. The existing technological knowledge of 21st century students is fundamentally different than what was known by students of past decades. Students today are often called the M-generation because of their ability to multitask and interact with media (Rideout et al, 2005). The M-generation communicates through instant messaging, Internet chatting, cell phones, email, blackberries, web cams, video games, digital media players, and other network and digital devices. These devices are integral in students' everyday lives. Technology is the youth culture; it is part of everything that students do in their lives outside of school (Tell, 2000). To illustrate how digital devices permeate students' daily actions and interactions, I will present three examples.

The first example addresses the quantity of digital technologies that U.S. students own. Nearly 76% of secondary students have their own cell phones, and 80% of them have MP3 players (Project Tomorrow, 2008, Apr. 8). Additionally, 84% of children between the ages of 8 to 10 have a video game player in their household (Rideout et al, 2005). Children begin to use electronic gadgets around age 6, while 6 to 8 year olds are spending 75% more time using video games than they did just a few years ago (Amount of time, 2007).

The second example quantifies the amount of time each day that students are engaging with digital media. Students in grades 3 through 12 spend an average of 6.5 hours per day interacting with media yet are exposed to about 8.5 hours of media (Rideout et al, 2005). In other words, through multi-tasking, students are able to pack their 8.5 hours of media-related experience into 6.5 hours. Students are able to do this by talking on the phone, instant messaging, listening to music, watching TV, or surfing the Internet while doing homework. The bedrooms of 21st century students are becoming multi-media centers.

The third example puts into perspective how the ubiquitous nature of digital technologies in society has changed the way students view knowledge construction. Students do not want to associate learning with four walls of a classroom or a library with bookshelves: they want to be able to learn "anytime, anywhere, anyplace, at any pace" (Project Tomorrow, 2008). These claims from Project Tomorrow, a non-profit education group that promotes innovative ways to prepare students for 21st century citizenship, are based on research conducted by Neil Howe and William Strauss (2000). Howe and Strauss found that the 21st century student wants to be able to construct knowledge wherever they happen to be, not only in a classroom setting. In addition, students want learning to be connected with the real world (Howe & Strauss, 2000). Students see knowledge as collaborative and sharable, rather than information one memorizes on their own for an exam (Howe & Strauss, 2000). Students are learning how to be effective multi-taskers on their own, where they utilize many different types of media at once. The majority (if not all) of students' media interaction is done outside of school (Levin et al, 2002). While there are arguments that media multi-tasking could result in lower

academic performance, so far studies have not found any correlations between students' academic achievement and the amount of time spent with media (Rideout et al, 2005). Given that students are engaging with digital devices outside of school, many of them are begging to have their devices integrated into their schooling experiences. For example, the number one education technology request of K-12 students is to allow the use of cell phones in schools, and 50% of middle and high school students are asking for learning activities that involve their cell phones (Project Tomorrow, 2008). CEO of Project Tomorrow Julie Evans (Project Tomorrow, 2008) has written, "Kids tell us they power down to come to school." Andrea Lunsford (in Vigar, 2009), a professor of writing and rhetoric at Stanford, believes that students' digital activities should be embraced by educators:

> A whole generation is amassing a wealth of experience in writing that is being ignored and undervalued. A teacher's hope is that they will inspire their students to explore the world they live in. It is time that educators ventured into the world of their students and evolved to the next level. (Vigar, 2009)

If students are investing so much of their time outside of school into technology-mediated activities, might there not be a more prominent role for those same technologies inside of school that better leverages student skills and interests?

Challenge: Teacher Resistance to Technology Change

One of the greatest challenges to technology integration are teachers themselves. Historically many teachers and administrators have been opposed to technical change, despite society having made dramatic technical changes around them. One example is the slate. In 1909, long after paper was easy to obtain and used often in everyday society, most schools were still using slates. One reason was a belief that paper could be a health risk to students, Dr. Peter Fraser, late medical officer for Carnarvonshire, England, stated:

> The fact that the writing slate is non-absorbent and consequently can be easily cleansed and disinfected is a great advantage in numerous instances when it is necessary to disinfect schoolrooms and their contents after infectious material has obtained access to the school. On the other hand, paper which has been infected in any way, possibly while in process of manufacture or while being distributed or used, cannot be efficiently disinfected. Paper has to my knowledge been the means of conveying dangerous infection to others. (Slate, n.d.)

While society had converted to paper almost fifty years prior, schools still insisted on using slates. One reason for schools' resistance to technological change may be that using traditional tools is how the teachers themselves learned, and that was the only vision of learning they knew. Virginia Richardson (1996) found that models of technical tools used when teachers were students were often the technical tools that they used in their own classroom teaching, no matter how the state of the art may have changed. While the above example of the slates occurred at the turn of the 20th century, concern over integrating popular everyday technology tools into school learning is still an issue at the turn of the 21st century. For example, despite the fact that the Internet, email, and library databases have been publically available for more than a decade, in 1999 Michael Mowe (1999) wrote in The Montgomery County Heard:

> The Internet is not a great tool for teaching...People think that children can think of any topic and pull up a wealth of information on it, but that is not the case. The information in the library is what people seem to expect, but nobody has the time to transcribe entire libraries onto computers. There is nothing on the Internet that is incredibly beneficial to education.

The reluctance to adopt new technologies in school learning is a long-term feature of U.S. education (Cuban, 1986). Is it possible to change teacher beliefs so that they are willing to accept and adapt to the new technologies of 21st century society?

Addressing the Challenges

Given the challenges discussed above, why should schools continue to struggle to integrate technology? There has yet to be technology integration in education with clearly demonstrated long-term or substantial impact on student learning. Is it possible to integrate technology in education and avoid the pitfalls of overspending and under-utilization, limited impact on student learning, or teachers' reluctance to adapt their practice to utilize technology tools? This dissertation explores the possibility that it is possible to overcome these challenges, by utilizing the "everyday technologies" becoming prevalent in students' life outside of school.

Elliot Soloway, Mark Guzdial, and Kenneth Hay (1994) described how designs for educational technology require special consideration: They must grow along with students as they learn and mature, support diversity in students' backgrounds and cultural environments, and be able to connect to students' personal interests. Addressing learners' cultural and individual differences is particularly important, as much learning and knowledge building is now recognized as being situated in communities of practice (Bransford, Brown, & Cocking, 2000; Wenger, 1991). The work of Barbara Hutchins (1995) and Lev Vygotsky (1978) describe knowledge as not being owned by a single person but distributed amongst and across tools and people. This generation of students is the first generation to grow up with interactive media; they want to share knowledge with each other (Rainie, 2006). For example of 93% of teenagers who use the Internet, 64% of them have "participated in one or more among a wide range of content-creating activities on the Internet" (Lenhart et al, 2007). Considering that 55% of 12-17 year olds have a profile on Facebook or Myspace, teenagers are treating the Internet as a venue for

social interaction and networking (Lenhart et al, 2007). Carol Lee (2003) reminds us that an important aspect of designing a learning environment is analyzing the cultural practices and tools of the community in which the students live and participate. If students are developing their own community through their media devices, why not bring those devices into school learning? Students already understand these tools as useful for personal knowledge construction, which may provide an advantage for supporting formal learning in school. Vicky Rideout (2005), Vice President of the Kaiser Family Foundation, says about students' everyday technology use, "Anything that takes up that much space in their lives certainly deserves our full attention." We have not given their knowledge and skills with these technologies our full attention, at least not in a positive light.

While some researchers have used Soloway et al.'s (1994) theories on learner-centered design to develop technology-based environments to improve school learning, few have seriously considered using the technology hardware and software that students already own. Using students' personal technology in school learning may help alleviate many of the challenges of education technology in schools. For example, the vast amounts of spending on technologies might not be an issue when the students or their families already own the technology devices and resources. In addition, concerns over the disconnect between school technology tools and everyday technology tools could be reconciled by using the same tools inside and outside of school, thus students learning tools will be omnipresent in their daily lives. Given that the everyday technologies can always be available to students, the challenge of content-knowledge being constrained by its association only with specialized "school" technologies will be alleviated. Also, the

concern that students are not being technologically prepared to enter the future job could be addressed since the students will be using the same technologies as most of society in productive and thoughtful ways. The one challenge that is not easily addressed by the introduction of everyday technologies, however, is also the most difficult: educators' reluctance to meaningfully integrate new (or any) technology tools into school learning.

Teacher Beliefs Impede the Use of Everyday Technology Tools

In order for teachers to tap into the everyday technology, media knowledge, and tools of students, they must believe that everyday technologies can improve student learning. Most teachers do not currently hold this belief. For example, only 3% of the 264 teachers interviewed in the PBS survey thought cell phones could have educative benefit (Levine, et al 2008). Beliefs are a strong indicator of future behaviors (Pajares, 1992). Knowing that teacher beliefs are formed through life experiences such as cultural, work-related, and academic encounters (Rokeach, 1972; Nespor, 1987; Raths, 1997; Bruner, 1996), it should not be a surprise that teachers' prior experiences and beliefs concerning teaching and learning play a large role in how they use (or don't use) technology in the classroom. That most of today's teachers and preservice teachers did not grow up with models of everyday technologies in their own education could be one reason why we are not seeing everyday technologies integrated into K-12 learning.

Many educators might ask the question, if students are already engaged with digital media and collaborative knowledge construction outside of schools, why do we need to bring those tools into classroom learning? There is a false belief among educators, parents, and other adults that children know more about their digital toys than adults, so adults should just "back away" and leave children alone in their digital world

(The Joan Ganz Cooney Center at Sesame Workshop, 2008). This is a disadvantageous approach because students do not understand how to use these toys in an educative way; teachers are needed to provide scaffolding and support (The Joan Ganz Cooney Center at Sesame Workshop, 2008). Yet, as so many teachers are themselves unfamiliar with these tools, or uncomfortable with using them as learning tools, they require help with learning how to develop instruction that employs everyday technology tools. If teachers' beliefs determine the actions they will take in their classrooms, how do we change teacher beliefs?

Can Preservice Teacher Education Bridge the Disconnect?

Preservice education could be an important venue for changing teachers' beliefs about everyday technology tools. Preservice teachers enter their teacher education programs with images of themselves as teachers, and they are often remarkably confident that they will succeed as teachers (Kennedy, 1997). Preservice teachers may use these preconceived beliefs about teaching and learning as filters for subsequent learning during their teacher education (Richardson, 1996; Borko & Putnam, 1996; Kagan 1992; Goodman, 1988; Thomas & Pedersen, 2003). Despite the fact that beliefs are difficult to change, experiences and reflection on experiences can lead to changes in ways of thinking and valuing (Richardson, 1996).

As changing a teacher's beliefs often requires repeated presentation of new information over time (Jensen, 1998; Nuthall & Alton-Lee, 1993), such challenges should begin at the start of teacher education. Challenging preservice teachers' prior beliefs about teaching and learning with technology early on could begin with the introduction of new applications for pre-exisiting technology. Allowing pre-service teachers to explore

alternative approaches during their preservice education could facilitate pedagogical belief change (Resnick, 1987; Bullough, 1991; Albion & Ertmer, 2002). Their exposure to classroom experience, participation in alternative approaches to using technology, modeling alternative approaches, reflection on experiences, and repetition might lead to changes in beliefs.

It would be premature to assume that such exposure, though necessary, would be sufficient. Nor would this introductory experience be a final solution. Preservice teachers do not automatically envision everyday technology tools as necessary to their classroom instruction (Keren-Kolb & Fishman, 2006). Like veteran teachers, preservice teachers are also uncertain how to use students' everyday technology as learning tools (The Joan Ganz Cooney Center at Sesame Workshop, 2008). Preservice education allows for opportunities to experiment with new experiences with everyday student technologies, to have repeated experiences, and to create opportunities to reflect on those experiences over an extended period of time. Though only the first step of a long-term professional development process, preservice teacher education is well situated to foster shifts in preconceptions about teaching, because it is located directly between teachers' past experiences as students in classrooms and their future experiences as educators (Kennedy, 1997).

The Research Study

This study is based on two key assumptions, derived from the arguments presented above. First is the assumption that everyday technology tools have the power to improve learning and help students develop into productive and active citizens. Second, teachers need to understand that everyday technology tools are important to

improving 21st century student learning and that students also need help understanding how to use everyday technology tools effectively in classroom instruction. This study focuses on teaching strategies that may foster an acceptance of everyday technology instruction among preservice teachers who are participating in a preservice technology education course. In this study "everyday technology instruction" is defined as: preservice teachers' beliefs that they can implement successful instruction in core curricular areas with the assistance of students' everyday technology tools.

Orienting this study is my question: How can I, as a teacher educator, foster everyday technology instructional belief among preservice teachers? In order to research this question, I applied different instructional strategies in my preservice technology education course to uncover and utilize my preservice teachers' everyday technology knowledge. My aim was through these strategies to change preservice teacher beliefs concerning everyday student technologies and classroom learning.

This study is an exploratory qualitative study, which aims to meet three objectives. First, is the question of whether a connection or disconnection exists between the technology preservice teachers use outside of schools and the technology they plan on integrating into their future classroom practice. Second, I am interested in understanding whether my various teaching strategies in my technology education course promoted preservice teachers' adoption of everyday technology instruction as an option for their future classroom instruction. Finally, I am interested in whether changes occurred in preservice teachers'beliefs over the six months of their preservice program, as well as in describing those changes. I intend this research to be useful to teacher educators who are interested in fostering everyday technology instruction in preservice teachers.

Overview of the Dissertation

In this chapter I presented an argument about promise of and challenges to the past, present, and future use of technology in education, and introduced everyday technology as a possible solution to those challenges. Chapter 2 presents a review of literature on the technology knowledge of 21st century students, including new perspectives on youth culture and digital literacy, and explores how technology is currently being integrated K-16. Chapter 2 also investigates how preservice teachers are trained in technology education at the university level, and how they currently use technology in K-12 classrooms. Finally, the research on teacher and preservice teacher beliefs, experiences, and actions are explored. Chapter 3 describes the qualitative methods used in collecting and analyzing the data for this study. Chapter 4 discusses the findings, including evidence from the data collection. Finally, chapter 5 considers the overall significance of this study, by summarizing the findings and comparing them to the original research questions. Additionally, this final chapter highlights the limitations and implications for helping future preservice technology educators foster everyday technology instruction in their students.

CHAPTER 2: LITERATURE REVIEW

Overview

Chapter one introduced four challenges that have plagued technology integration in school learning over the last century. These challenges are: determining the effectiveness of technology integration for improving student learning, preparing students for the future workplace, the "digital disconnect" between students' everyday technology tools and tools used in school learning, and teacher resistance to using technology in support of learning. This chapter argues that through increased use of students' everyday technologies in school learning these challenges can be addressed.

This chapter begins by exploring how technology integration is being infused in teacher education programs. Current literature suggests that students are not being adequately prepared to use technology in teaching by their pre-service programs (Moursund & Bielefeldt, 1999). Teacher education programs face difficult challenges in preparing their students to integrate technology into their teaching for a range of reasons, such as the lack of consistency in the technology hardware and software used in K-12 schools. This makes it difficult for teacher education programs to plan and prepare their preservice teachers for the wide range of technology resources that they may encounter in their teaching placements. Shifting the focus away from content-specific tools to everyday technology tools may provide a solution to this problem, because these technologies will be common across both preservice teachers and their placement schools. While chapter one briefly discussed some reasons for the shift of focus, this chapter further fleshes out the reasons for integrating students' everyday technical tools in school learning. These reasons include: students' ubiquitous access to everyday

technology resources, the critical role that everyday digital media plays in the cultural capital of the 21st century, and the need for student understanding of digital safety and appropriate use. Next I move to two arguments discussing how using everyday technology tools can lead to improvements in student learning. These two arguments will concentrate on situated learning theory and literacy education practices. Situated learning theory provides a basis for understanding the positive implications of connecting school learning with authentic practices and resources (Brown, Collins, & Duguid, 1989). The field of literacy education has practical examples of successful studies that focus on students' everyday cultural practices in learning, and thus may be a model for everyday technology practices.

This chapter also considers teacher belief and the processes of belief change. If using students' everyday technology tools has potential to improve student learning, then how teachers view everyday student tools will play a role in whether or not the tools are integrated into classroom learning. If teachers do not believe this to be the case, belief change needs to happen as part of introducing everyday technology tools into the preservice curriculum. Finally, I present an overview of the study described in this dissertation, including the research questions.

Teacher Preparation

Current Education Technology Preparation

Technology use and access in K-12 schools varies greatly from one school to another (Cuban, Kirkpatrick, & Peck, 2001). This inconsistency in technology integration at the K-12 level presents a challenge to education schools preparing teachers to teach with technology. How do schools of education prepare preservice teachers to teach,

given the vast range of technology resources found in K-12 schools? According to current studies, the spotlight for the last decade in preservice technology education has been on teaching preservice teachers how to use common software for classroom learning such as Inspiration, Kidpix, Graph Club, grading software, classroom management software, Smartboards, Classroom Performance Systems, and other content specific software (Jacobsen, Clifford, & Friesen, 2002; Sprague, 2004; Gimbert & Zembal-Saul, 2002). These tools have in common that they were created specifically for use in schools, and are rarely used by students outside of school. Most universities emphasize teaching preservice teachers many different types of educational software and hardware. Given that there is no standardized program for applications of technology in K-12 schools, teacher educators have little professional guidance for preparing future teachers in its uses. The outcome is a more-or-less experimental approach. This scattershot approach to instructional technology is often based on a belief that the more exposure preservice teachers have to a wide variety of educational technology resources, the greater the likelihood they will be familiar with some of the educational software and hardware selection to be found in their future K-12 school district (Hughes, 2004). Additionally, schools of education employ a wide variety of teaching strategies for technology preparation, which vary from a single course approach, to field-based, to workshops, to modeling, to integration among teacher education coursework, to collaborations amongst preservice and classroom teachers, to a combination of all these strategies. To date, research on the effectiveness of these strategies has not led to any clear outcomes, and there remains no accepted “best practice” for preparing teachers to use technology (Kay, 2006).

Perhaps because of the lack of continuity in preservice programs, there is concern that preservice teachers are not leaving their programs with a sufficient understanding of how to utilize technology in education. A study by the Milken Exchange on Education Technology and the International Society for Technology in Education found that, "in general, teacher-training programs do not provide future teachers with the kinds of experiences necessary to prepare them to use technology effectively in their classrooms" (Moursund & Bielefeldt, 1999). This study found three deficiencies that often occur in preservice teacher technology education. First, most teacher training program faculty do not model the use of technology in teaching, despite the fact that they feel that they have "adequate" technology facilities to utilize. Second, most teacher training programs do not have a written, funded, regularly updated technology plan. Finally, student teachers do not routinely use technology in their field experience and do not work with teachers who can advise them on its use, although information technology may be available in the K-12 classrooms where student teachers get their field experience.

One approach preservice teaching programs could take as they struggle with the wide variety of technology tools in K-12 schools or the lack of education technology plans, funding, and access to specific tools in field experiences, might be to shift their focus to a more universal approach. This approach could focus on using the everyday technologies of both current preservice teachers and their K-12 students. Under this approach, preservice teachers would no longer need to focus on content-specific tools that they might not find in their teaching placements. Instead, they could be learning how to use their own technology knowledge and tools as resources for learning. In addition,

preservice teachers could learn how to elicit their own students' everyday technological tools and knowledge in order to design learning activities.

Arguments for Using Students' Everyday Tools

Chapter one highlights some of the reasons why students' everyday tools should be integrated into learning environments. These arguments include: student access to everyday technology tools, frequency of student use with everyday tools, students' engagement with everyday tools, how students prefer to learn, and a global shift in tools necessary to be productive in society. In this section, I will focus on three arguments in particular. The first is the issue of access, which I expand from my presentation in chapter one to include the general population of everyday technology users. The next two arguments will expand the arguments introduced in chapter one about the importance of cultural capital and everyday digital safety.

Access

A growing number of people in society use cell phones, social networking sites, and video games. As of 2007, 82% of U.S. citizens had a cell phone (CTIA-The Wireless Association, 2007). At the secondary level, 76% of students age 12-17 had their own cell phone (Project Tomorrow, 2008). In one California school district, in 2005 one in five kindergarteners brought a cell phone to school (Education Digest, 2005). By the year 2010, it is predicted that 54% of 8 year olds will own their own cell phone (Amoroso, 2007). 35% of all American adults engage with social networking sites on a daily basis (Lenhart, 2009), while 75% of adults age 18-24 use such sites. Over half of all American adults play video games (Lenhart, Jones, & Rankin Macgill, 2008). These numbers are increasing with time asyounger generations age and continue to engage with their

everyday digital tools. Students' digital resources are ever-present in their lives. As a result, using their tools provides one solution to the challenge of students not having access outside of school to the educational technology resources applied during the school day.

Cultural Capital

Not only do students have access to new digital technologies, but the skills they are developing are fast becoming vital in 21st century society. Digital skills, such as using the Internet to collaborate, text messaging, chatting, gamming, and creating mobile web pages, are future skill requirements for the 21st century job force. For example, the Metiri Group recently reported that, "just twenty years ago, cell phones, laptops, pagers, and fax machines were in the realm of scientists and science fiction. Today, those technologies and the Internet have gained widespread public acceptance and use. It is clear that, in today's Digital Age, students must be technologically literate to live, learn, and work successfully" (Lemke et al., 2007). Not only are cell phones, video games, and social networking becoming ubiquitous in everyday life, they are fast becoming necessary tools for engagement in 21st century social and business worlds.

Moje and Sutherland (2003) argue that students need to learn the tools and practices that have cultural capital in their communities. According to recent studies, digital technology literacy skills and knowledge will be an important form of cultural capital for the students for both democratic citizenship in society and for jobs of the 21st century workforce (Lemke et al, 2007; Transition Brief, 2008). Below I describe how digital technology skills are playing and will play important roles in both democratic citizenship and in finding a place in the American workforce.

Fundamental Shift In Citizenship Practices

According to a recent study conducted by the PEW Internet and American Life Project, concerning the 2008 U.S. presidential election, 55% of adults in the U.S. went online to take part in the political process by gathering news, information, or participating in discussions (Smith, 2008). The number of adults participating in the political process online has almost doubled in the last five years since 2004 when only 29% of the adult population went online to participate politically (Smith, 2008). Over the last five years, the Internet surpassed magazines and radio as a principal source of political information and news for American citizens. In addition, a Pew study (Smith, 2008) found that the younger the population, the more likely they were to rely on the Internet as their primary source of news. During the 2008 campaign, 49% of younger voters (18-24) shared information via text message about the campaigns. 22% of all cell phone users who voted for Obama (young and old) shared and received campaign information via their cell phones. One in five Internet users posted political commentary online in one or more of the following places: a web blog, a social networking site, a discussion board, or a website. 74% of all 18-24 year olds were politically active on the Internet during the 2008 campaign (Smith, 2008). 26% of all online voters used the Internet to help them navigate the voting-day process, such as obtaining absentee ballots or learning about their polling places. While many voters tended to share their experiences from the polling places on election day, young voters (under the age of 30) were more likely to share experiences via their everyday digital devices such as text message, phone call, or a blog post. The shifts in society from print and analog media to digital media are now being seen in the participation of the democratic process in America.

Fundamental Shift In the 21st Century Workforce

According to the Partnership for 21st Century Skills (Transition Brief, 2008), there has been a fundamental shift over the past century in the American economy, workforce, and business that ultimately is reshaping the workplace. More than 80% of new jobs are found in the information service sector, compared to years ago when the majority of jobs were found in the manufacturing sector. Technology has played a large role in these changes. Technological changes are displacing low-skilled workers and making room for more high-skilled creative and innovative workers. While machines can now do the routine tasks of the low-skilled workers, there is a sizeable need for workers with skills such as invention, creativity, openness, communication, and global understanding. Many of these skills are frequently achieved with the aid of digital technologies. These changes are driving new demands for different types of skills in 21st century workers. Employers are calling for schools to integrate new skills into education (Are They Really Ready to Work, 2006). Reports of Current employers indicate a belief that American students are "woefully ill-prepared for the demands of today's (and tomorrow's) workforce" and they cite 21st century skills as "very important" to success in the workplace (Are They Really Ready to Work, 2006). While in the same study future employers all said that information technology skills were "very important" to future jobs, it is interesting that the least important skills for future jobs were found in the traditional core school subjects; mathematics, science, foreign languages, government/economics, humanities/art, and history/geography. While 81% of future employers ranked information technology skills as "very important" to students' future success, of all the core subject areas only English communication and language was ranked equally or more important. Employers appear

to prefer their workers have more applied skills, as well as solidknowledge in core subject areas. In the report, J. Willard Marriot Jr, Chairman and CEO of Marriot International Inc., states:

> To succeed in today's workplace, young people need more than basic reading and math skills. They need substantial content knowledge and information technology skills; advanced thinking skills, flexibility to adapt to change; and interpersonal skills to succeed in multi-cultural, cross-functional teams. (Are We Really Ready, 2006, p. 24)

In addition to future employers, the American voting public are also calling for these same changes in education. In a 2007 study conducted by the Partnership for 21st Century Skills (Beyond the Three Rs), 99% of American voters polled believed that teaching students a wide range of 21st century skills including computer technology, communication, and media literacy was vital to America's future economic success. In the same study 80% of voters claimed that the required technical skills students need to be successful in the professional world is vastly different than the required skills of twenty years ago. 42% of voters ranked new media literacies as one of the top skills students needed to be competitive in the 21st century workforce, and only 6% of the voters gave schools a high ranking on their ability to teach new media literacies effectively. 42% of voters think that other developed countries are doing a better job educating their students on 21st century skills. These studies point to growing concerns from the American public that students are in serious need of new literacy skills.

Digital Safety and Ethics

Another reason educators are well advised to include everyday technologies in their teaching practices is that most students are not aware of digital safety or ethics (Taylor, 2000). If students will be expected to integrate 21st century digital technologies

in their future jobs, they will also need to understand and be predisposed toward ethical and safe practices in using these resources. Recent studies show that students are often unaware of and indifferent to the consequences of their uses of technology (Rainie, 2006). Currently, students do not worry about their own privacy or about protecting the privacy of others when using digital media. For example, 55% of students have shown a disregard for whether the digital material they use is copyrighted or not (Rainie, 2006). A recent study conducted by Common Sense Media (High-Tech Cheating, 2009) found that over 35% of teenagers admit to using their cell phone to cheat on tests or exams in schools. In the same study, 52% of teenagers admitted to using some form of the Internet for cheating on tests or school papers, while 38% have copied directly from a webpage and passed it along as their own work. Students readily admit to these activities andmany do not consider these offenses serious forms of cheating or even cheating at all. Some students said they were not cheating, but "helping out a friend," when they sent text message answers to their friends or took cell phone photos of tests and sent those along as well (High-Tech Cheating, 2009). Even more troubling, most of these students are using their cell phones for these activities in schools where the devices are completely banned from campus.

Internet filters in schools have also created a barrier for students' understanding of digital safety. According to the Children's Internet Protection Act (2008), public K-12 schools must have filters on their Internet. This legislation resulted from the concern of many educational institutions about students accessing information that could be potentially harmful to minors. Yet at the same time, this solution created a problem: filters in some schools are blocking up to 70% of academic websites (Levin et al, 2002).

Some school filters are so strong that students cannot access sites containing advertising, which is the majority of online sites. Therefore, instead of teachers being able to use these filtered sites as teaching opportunities to explain the bias of advertisers and sponsors, schools are put in the position of having to ignore these sites. Such gross filters limit students to figuring out the authoritative nature of these sites on their own, outside of school.

This condition is equivalent to a ubiquitous, unmonitored online wild West. Eighty-seven percent of 12-17 year olds are online almost everyday (Fox, 2005). The majority of these students go online outside of school. A recent PEW research study (Lenhart et al, 2007) found that 47% of teens online have posted photos in public places and 89% of them report that "people comment on the images at least 'some of the time'." Schools are blocking sites that students use most in their everyday lives such as gaming sites, email, chatting, blogging, and music sites (Rainie, 2006). Although they have legitimate reasons for blocking or banning these sites, ignoring them does not stop students from exploring and using these sites outside of school in their everyday lives or for school projects. They use unfiltered Internet resources for their homework and class assignments (Levin et al, 2002), immersing themselves in these technologies without any guidance, support, or proper understanding of safety. The possibilities for engaging in unsafe practices and of being exploited are startling as on average 9 to 12 year olds regularly visit 70 different websites each month. Common Sense Media has found that almost half of the websites tagged as "educational" had some element of commercialism, such as advertisements or stores to purchase items (The Joan Ganz Cooney Center at Sesame Workshop, 2007).

One could infer from these statistics that there is a need to teach students about digital appropriateness and safety in school learning. Yet less than 5% of educators in one survey said that digital safety is included in the state curriculum that they use and less than 3% of those educators said that their state curriculum included information on how to teach students social networking and Internet chat room safety (Hancock, Randall, & Simpson, 2009). In this same study, 60% of teachers admitted that they do not know how or if their schools teach students about cyber bullying, identity theft, or other online safety issues and 79% said they did not feel prepared to teach students about online digital safety (Hancock et al., 2009). These concerns and the statistics that warrant them not only demonstrate a need for schools to begin educating students about digital and mobile appropriate use and safety, but more importantly a need for teacher educators to better prepare teachers to educate their students on issues of digital media safety. If an important role of the educator is to prepare students for participation in American democracy and the workforce, then educating students about the benefits, responsibilities and dangers of everyday technology through their uses in school could be one way to meet those challenges.

How Using Everyday Technology Will Improve Student Learning

Situating Learning In Students' Culture

As utilizing everyday technologies in the classroom will require altering current bans, a strong argument that the benefits out-weighing the dangers is necessary. One thread of that argument promotes the contribution everyday technology will make to students' learning of their subject matters. As raised in chapter one's discussion of research involving situated cognition, students learn better when their learning activities

are situated in authentic real-world environments with familiar, authentic tools (Brown, Collins, & Duguid, 1989). In addition to authentic learning environments and tools, cognitive growth is also fostered by building upon existing knowledge (Lee, 2003; Bransford, Brown, & Cocking, 1999). For example, Seymour Papert, a cognitive theorist who developed the LOGO programming language, points out that when students enter new learning situations they may already have the skills for learning something new, but they may not have the knowledge of how to use their prior skills in order to learn in new ways. They need help understanding how their prior knowledge can be reconceptualized. Papert states, "Some of the most crucial steps in mental growth are based not simply on acquiring new skills, but on acquiring new administrative ways to use what one already knows" (Minksy, 1988 p. 102). Practically speaking, by allowing children to create their own learning environments using their prior knowledge, students retain and acquire more knowledge than they would in non-authentic learning environments (Papert, 1980). Classroom activities are more engaging and enriching when students are supported in making connections between a new task and their prior knowledge. It follows from this understanding that schools could leverage students' own technological knowledge if the tools used in school are the same as those tools and practices that students are already comfortable with from their everyday lives.

The Literacy Connection

In support of this position, researchers who have studied the disconnect between the students' home culture and students' experiences in school argue that if students' culture is integrated into their classroom learning, they are more likely to be academically successful (Mohatt & Erikson, 1981; Cazden & Leggett, 1981; Jordan, 1985). Today,

technology is often a large part of the cultural activities of youth outside of school and is considered one of the multiple literacies in today's society. The concept of multiliteracies was introduced in 1996 (New London Group, 1996) to describe significant shifts in how society views literacy. The New London Group (1996) acknowledges that in a rapidly changing, culturally and linguistically diverse society, literacy goes beyond print language and incorporates multiple modes of meaning found in new information and communication technologies (including digital technologies). Allowing educators to use multiple literacies, these literacy scholars argue, provides a bridge for students between the real-life texts of the community and school learning.

Education technology researchers have yet to examine multiliteracies concerning everyday technology use by students and its implications for student learning. However, many researchers in the field of literacy, such as Moje and Alvermann have focused their studies over the last decade on broadening the definition of literacy by researching the multiple literacies of students inside and outside of schooling. These literacy experts have studied student culture outside of school as a resource for adolescent literacy learning within schools (Alvermann & Xu, 2003; Moje, 2002; Finders, 1996; Chandler-Olcott & Mahar, 2003; Bean et al, 1999). While none of the literacy researchers have focused specifically on students' everyday technology use, their research on everyday student culture provides a relevant perspective for bridging to everyday student technologies in the education technology field. Many student literacy practices outside of school (such as gang-related literacy) are often seen as deviant and not considered literacy (Moje, 2000). Yet, Moje (2000) found that the gang practices of students were actually ways the adolescents identified with others and found space to belong. In other

words, through gang relationships youths communicated, collaborated, and shared knowledge. This is analogous to the way many everyday student technologies, like cell phones and mp3 players, are utilized and viewed by students. In the paragraph below, Elizabeth Moje describes the significance of redefining literacy practices to include students' cultural literacy activities:

> We can become more aware of what adolescents can do and of the power and sophistication of those practices that are so often dismissed as vandalism or laziness. If we reconceptualize our literacy theory, research, and pedagogy to acknowledge the tools at use for making meaning in unsanctioned practices, to work with the strengths that our students already possess, and to teach students how to navigate the many discursive spaces called for in new and complex times and then we may be able to teach students tools that provide them with opportunities to be part of and to construct multiple stories in many different social worlds (Moje, 2000, p.685).

Moje argues that by educators acknowledging the unsanctioned literacy tools students use outside of school learning, educators may be able to use these tools to help students not only grow academically, but also to navigate their future worlds. Moje's argument about cultural literacy is useful for thinking about everyday technology and school learning. If educators considered the benefits of using students' everyday technology tools in learning, they might better provide students with opportunities to connect learning inside and outside of school, creating more authentic learning environments.

Literacy research calls for research on the nature of literacy practices both in and out of school in order to understand more fully the U.S. literacy crisis and develop possible solutions (Resnick, 2000). Yet, because of the lack of research on how to integrate out-of-school literacy practices into classroom activities, educators cannot successfully confront the problem. The field of literacy has acknowledged the need for classroom teachers to redefine and broaden what constitutes literacy and a need to

critically look at how new literacies can bridge the gap between youth culture and in-school learning (Bruce, 1997; Moje, 2000; Bean et al, 1999; Chandler-Olcott and Mahar, 2003; Alvermann & Xu, 2003; Finders, 1996). Literacy scholars Bean et al. (1999) state that, "Until we bridge this gap by tapping the multiple literacies in adolescents' lives, we will continue to see adolescents develop a disinterested cognitive view of in-school literacy functions and a more enthusiastic sociocultural view of out-of-school discourse functions" (p. 447). Highlighting the gap that exists between students' everyday culture and their school learning, Bean et al. (1999) are asking educators to begin integrating multiple literacies in order to help bridge this gap and help students see the benefits of school learning in their everyday lives. Recently literacy leaders have created a new framework for teachers of English, where they call for more emphasis on teaching students 21st century skills as part of their K-12 educational experiences (The Partnership for 21st Century Skills, 2008). English is the first content field to reorganize its goals to include the skills that students will need as they enter the 21st century workforce. Part of creating a 21st century teaching framework is recognizing the skills that students already posses in concert with those skills what will be significant for the next generation of the global workforce.

For over a decade scholars in the field of literacy have called for integration of adolescent everyday literacies into the classroom. Yet we are just now seeing literacy studies that focus on using everyday student technology tools and resources in learning. This new emphasis is evident in the workshops and presentations at the 2008 Annual Convention for the National Council of Teachers of English (2008), where of the 710 total sessions, a total of 19 concerned using one or more of the following everyday

student technologies: iPods, cell phones, web blogs, wikis, social networking sites, and video games in teaching K-12. While 19 out of 710 sessions does not sound like much, it is a start, but a great deal of work remains. Only one of these NCTE conference sessions focused on preservice teachers becoming culturally responsive with everyday technologies through their preservice education. This particular session addressed how preservice teachers needed to understand the balance between using electronic and spoken conversations with their future students. Not a single session highlighted how technology teacher educators could help preservice or inservice teachers become culturally responsive to using students' everyday technology tools in their current or future teaching. While literacy educators are leading the way for including 21st century student technology tools in K-12 classroom teaching, there is still a long way to go.

According to the study The Power of Pow! Wham!: Children, Digital Media & Our Nation's Future, conducted by The Joan Ganz Cooney Center at Sesame Workshop (2008), over the next few years mobile technologies will allow students to move away from their traditional classroom literacy learning and move towards more out-of-school experiences. This development could exacerbate the existing gap, unless movement occurs soon toward bringing digital media into education. But teachers must select their tools wisely and structure activities with the tools to work with appropriate content at students' skill levels (The Joan Ganz Cooney Center at Sesame Workshop, 2008). In order for new technology tools to successfully enhance literacy in schools, researchers agree that educators need professional development and curricula in order to understand how to teach with these new digital resources (The Joan Ganz Cooney Center at Sesame Workshop, 2008). According to Mitchel Resnick of the Media Laboratory at MIT:

> Kids can do amazing things with technology. They can explore and experiment in more sophisticated ways than adults would expect. But it is also true that kids left on their own will run into barriers. Many adults think they need to just get out of the way. They are wrong. Kids can browse and click and find comic book sites, but they can't make interactive animated books on their own. So there is a big role for scaffolding if kids are to make full use of technology and really learn how to express themselves. (In The Joan Ganz Cooney Center at Sesame Workshop, 2008, pp. 46-47)

Further research will need to be conducted on how to guide teacher preparation programs in helping teachers prepare children for the 21st century digital world (The Joan Ganz Cooney Center at Sesame Workshop, 2008).

While literacy research supports the move to everyday student cultural tools in learning, and current research on the significance of everyday mobile and digital devices in the future points to the need for structures and learning around these tools, there is still one question that has not been answered: How can teacher educators prepare teachers and preservice teachers to embrace students' everyday technology use in classroom learning?

The Preservice Teacher Education Challenge

The first part of this chapter explored how schools of education currently integrate technologies into their teaching and why they should consider using everyday student technologies in place of their current practice. Given that preservice teachers often see their future teaching modeled after how they were taught (Richardson, 1996), there may also be a need to consider university courses that preservice teachers take outside of schools of education. Accordingly, it is important to examine the attitudes that non-teacher education instructors hold towards everyday student technologies. For example, universities such as Harvard, MIT, Georgia Tech, and Carnegie Mellon are beginning to

research the use of video games in classroom instruction (McLester, 2005) and exploring the use of iPods at the higher education level (Read, 2005; Glater, 2008). But for the most part, universities are not including students' everyday technology resources as part of their instruction. This may be because of instructors' general attitudes towards students' everyday technologies. According to Scott Campbell (2006) most university instructors think of students' everyday technologies as distracting or even harmful to education. For example, in one study done by Marilyn Gilroy (2004) at Berrien College, 85% of university faculty surveyed stated that they wanted to ban cell phones from classrooms. In the same study, Gilroy (2004) found that almost one third of university students play video games or text message on their cell phones during class. It is interesting to note that the data in Gilroy's study display a technology divide between the students and the course instructor. The instructors are telling the students to turn off cell phones because they assume they are useful only as a social tool. Studies like these suggest preservice teachers' beliefs are not only being shaped by the technologies modeled in their teacher education program, they are also being shaped by other university educators, reiterating the barrier between technology used in students' everyday communication and technology used for learning in schools. This condition may solidify beliefs held by many teacher candidates that everyday technology tools are not an option for school learning, raising the question: Can these beliefs be changed?

Fostering Teacher Belief Change

Virgina Richardson (1996) found that while beliefs are difficult to change, experiences and reflection on experiences can lead to changes in beliefs. A change in a teacher's beliefs often requires new information presented repeatedly over time (Jensen,

1998; Nuthall & Alton-Lee, 1993). Challenging preservice teachers' prior beliefs about teaching and learning by allowing them to explore alternative approaches during their preservice education may facilitate pedagogical belief change (Resnick, 1987; Bullough, 1991; Albion & Ertmer, 2002). Perhaps classroom experience, participation in alternative approaches to using technology, modeling alternative approaches, reflection on experiences, and repetition may lead to changes in beliefs.

Preservice education allows for opportunities to experiment with new experiences with everyday student technologies, to have repeated experiences, and to create opportunities to reflect on those experiences over an extended period of time. Preservice teacher education is well situated to foster shifts in preconceptions about teaching, because it is located directly between teachers' past experiences as students in classrooms and their future experiences as educators (Kennedy, 1997). In this study, I focus on the everyday technology beliefs of entering preservice teachers in a teacher education program, and strategies implemented through a technology in education course intended to change their current beliefs.

This Study Overview

There is evidence to suggest that the disconnect between how students communicate outside of schools, and how they learn and communicate inside classrooms, is growing (Tell, 2000; Levin et al, 2002; Project Tomorrow, 2008). Teachers have very little appreciation for new technologies and the communication and knowledge-building skills students have developed as a result of using them (Levin et al., 2002). While teachers assume that the traditional learning methods that worked for them when they were students will work for students today (Prensky, 2001), students are aware and

sensitive to their teachers' hostility toward and disdain for their social "toys." Instead of trying to force students into traditional forms of learning, Julie Evans (Project Tomorrow, 2008) argues that teachers should embrace the technology knowledge and skills that students bring with them into the classroom. She also argues that educators should embrace how students like to learn with these tools (Project Tomorrow, 2008). The study in this dissertation is predicated on the assumption that it is the job of K-12 educators to demonstrate how students' technology devices can become tools for learning and acquiring knowledge. The study addresses the need for schools of education to prepare teachers to become more culturally responsive to how students learn by using their students' everyday technologies in classroom instruction.

Exploring a Bottom-up Approach

One reason for technology integration's historic failure in schools is that technology has been initiated from the top-down, where administrators force certain technologies onto their teachers (or teachers force certain technologies onto students) (Cuban, Kirkpatrick, & Peck, 2001). In this study, I am using a bottom-up approach, where the students (not the teachers) are the source of the technologies utilized in the classroom. Instead of researching what students are doing with technology outside of school and attempting to make connections inside schools, research on technology in education has focused most of its attention on developing hardware and software specifically for classroom instruction. Instead of designing new educational software, the bottom-up approach could take advantage of the everyday software and hardware students already own (or are free to own or use) and are already motivated to interact with. By taking this approach, I believe that schools could create more authentic learning

opportunities for students that can easily extend beyond the classroom walls. Research by Gavriel Salomon, David N. Perkins, and Tamar Globerson (1991) supports this position. They claim that unless educational technology tools are ubiquitous in students' everyday culture, educators must be careful about "attaching" cognition to a technology tool in the classroom that is otherwise inaccessible outside of the classroom. Otherwise, software and hardware that was developed specifically for classroom instruction (the top-down approach) can create a barrier between students' ability to perform outside of school the way they do inside of school using the specialized tools. In my review of the literature, I could not locate any academic studies in which software or hardware designed explicitly for an educational purpose led to widespread use outside the classroom. Although the findings from this type of research have shown some immediate positive academic growth for students, there is little long-term evidence that students are able to sustain this growth without the assistance of the educational tool. It may be difficult for students to sustain cognitive growth when their cognition relies upon a specific classroom technology tool (which the students may not have access to outside of the classroom).

Fostering Preservice Teacher Acknowledgement of Everyday Technology Tools

If it is important to bring everyday technology knowledge into the classroom, then how do technology teacher educators convince teachers, who spent 16+ years of their own schooling using and observing traditional forms of technology in the classroom, that everyday technologies can benefit classroom instruction?

To address this key question, I decided to begin with preservice teachers. As the literature suggests, there is a need for more preservice teacher education concerning

methods of technology integration in the mainstream secondary classroom (Doering, Hughes, & Huffman, 2003; Albion, 2001). There is concern among researchers that preservice education is not preparing educators to integrate technology into their classrooms (National Center for Education Statistics, 2000; Doering, Hughes, & Huffman, 2003). For example, in 2003 only 11.3% of America's teachers felt they had developed advanced skills in integrating technology into their daily instruction, and they blamed teacher education programs as part of the problem (Doering et al, 2003). Aaron Doering, Joan Hughes, and D. Huffman (2003) explain, "although preservice instruction in the use of technology is required by 22 states ... the courses used to satisfy such requirements typically provide no actual experience in using computers to teach, and impart little knowledge of available software" (p. 343). As of 2001 fewer than 25% of new teachers considered themselves adequately prepared for using computers in instruction (Albion, 2001).

A large gap currently exists between current digital technology and teachers' ability to integrate this technology into their everyday classrooms. In 2008, the issue may not be whether teachers have access to technology, but whether they know how to appropriately use the technology in classroom learning. Some may believe that preservice teachers should be the most comfortable with integrating technology tools into the classroom, because most preservice teachers are either part of or not far removed from contemporary youth media practices in their "everyday" lives. However, Peter Albion (2001) strongly contends that newly trained teachers who use computers in their daily lives have difficulty adapting the computers to their classroom practices. Recently, I conducted a study of 45 preservice teachers entering their teacher-training program and

found that of preservice teachers age 22-25, 21% of them were actively using instant messaging, mp3 players, and video games in their daily life (Keren-Kolb & Fishman, 2006). The youngest members of the teaching profession have grown up with digital technologies. They have developed a strong communication system outside of the academic community with everyday digital devices. While that study was conducted with a small number of preservice teachers, those findings are consistent with a larger study concerning media use by youth conducted by the Kaiser Family Foundation Study (Rideout, 2005). In that study, *not one* of those preservice teachers considered integrating any of their everyday technologies into their future classroom teaching. These studies affirmed my belief that there is a need for preservice education about everyday technology instruction. In hypothesized that if I could target preservice teachers who were already utilizing technology in their everyday life, they would more easily transition those tools into their classroom teaching. Furthermore, I assumed that during their student teaching, preservice teachers would model everyday technology integration in order to teach their cooperating teachers. According to Jon Margerum-Leys (2000), both student teachers and their mentors have much to offer each other. Student teachers can introduce technology knowledge and tools that they have acquired through their university preparation, creating a bottom-up effect of the student teacher teaching the mentor teacher.

Research questions

While more studies are needed on the exact benefits of combining everyday youth culture and classroom learning, it is arguably important to connect students' everyday culture with classroom learning (Mohatt & Erikson, 1981; Cazden & Leggett, 1981;

Jordan, 1985). Literacy scholars have expanded the definition of what constitutes literacy to include digital literacies (New London Group, 1996). Literacy scholars have also called for more research on methods to bring student literacies into classroom learning (Bean et al, 1999). My study focuses on belief change strategies that bridge the disconnect between everyday student technology tools and classroom learning technology tools by focusing on training the next generation of teachers to understand the concept of everyday technology instruction. These strategies are based on Richardson's (1996) suggestions and include using everyday technology tools for reflective journaling, modeling the use of everyday technology tools in classroom instruction, interacting with everyday tools repeatedly over six months. All of these strategies took place in my six-month preservice education technology course at a research university.

In this study, I explore unanswered questions about the integration of everyday technology into preservice training. There is a need for teacher training programs to help teacher candidates understand how to appropriately integrate technology into their future classrooms. There is also a need to teach teachers how to adapt to their students' evolving everyday technology in the future. In the first two chapters of this dissertation, I highlighted four arguments that underlie the purpose and focus of this study. Below I introduce the three questions that I address in this study to report the results of my research into my application of various strategies to convince preservice teachers of the importance of everyday technology instruction. Data collection and analysis for this study were guided by the following questions:

1. *What everyday technology knowledge do preservice teachers bring with them into their teacher education program?*

2. *How can I, as a teacher educator, use my preservice education courses to foster change in preservice teacher beliefs regarding everyday technology instruction?*
3. *If technology belief change occurs in my preservice teachers, can I pinpoint when, how and why it occurred?*

Summary and Overview of Remaining Chapters

Chapter one illustrated the disconnect in education between everyday technology tools that students are engaging with outside of classroom learning and the technology tools that they are using in classroom learning. This chapter described the need to reconceptualize students' everyday digital literacy to be included in educators' spectrum of technologies to support learning. In addition it described the need for preservice teacher educators to help future teachers adopt everyday technology instruction as part of their preservice education. Chapter three describes the methodological approach employed in this research, including the data collection and analysis process. Chapter four presents findings. Finally, chapter five examines the results in relation to the research questions, describes the limitations of the study, and considers implications for future research.

CHAPTER 3: METHODS

Overview

This is an exploratory study, which aims to highlight entering preservice teachers' beliefs concerning everyday technology tools and their future classroom teaching. In addition to highlighting current beliefs, this study is an attempt to document and discuss strategies for developing preservice teachers' beliefs in the efficacy of everyday technology for instructional purposes through teacher education coursework. In the first section of this chapter, I discuss the reasons for using a qualitative approach in the data collection and analysis. In the second part of this chapter, with a focus on my original research questions, I detail the data collected and the analysis of this data.

Overview of study

The first research question I address in this study is What type of everyday technology knowledge do preservice teachers bring with them into their teacher education program? To address this research question, I designed a qualitative instrument, which allowed 45 entering preservice teachers' prior beliefs concerning technology tools and everyday technology tools to emerge. This data allowed me to compare and contrast the technology tools that future teachers see themselves using in their teaching and the technology tools they use in their everyday lives.

The second research question I address in this study is How can I, as a teacher educator, use my preservice education courses to foster change in preservice teacher beliefs regarding everyday technology instruction? The final research question I address in this study is If technology belief change occurs in my preservice teachers, can I

pinpoint when, how and why it occurred? To address these research questions, I studied an education technology course I co-taught for 45 entering preservice teachers over a six-month period.. In the course, I integrated strategies using everyday technology tools in order to develop everyday technology instructional use among the preservice teachers. Throughout the course, I used web blog journals to track the preservice teachers' beliefs and to document if, when and how belief change occurred.

Qualitative Study

The intended audience for this research study is teacher education instructors in technology education. The purpose of this study is to help teacher educators understand the need for, and to begin developing strategies for, instilling everyday technology instructional belief in preservice students. Additionally, I have a personal interest in this work because I would like to improve my own instruction of preservice teachers concerning their technology education. According to Patton (2002), qualitative research can integrate the interest of multiple audiences in its methods, "it is also important to acknowledge that you may be the primary intended audience for your work. You may study something because you want to understand it" (p.11). This method of including myself as one of the possible audiences is called personal inquiry (Patton, 2002).

Beyond my need for a focus on personal inquiry in the research, I found I needed to take a qualitative approach to this study for three other reasons. First, Marshall & Rossman (1999) claim one value a qualitative approach brings to a study is that it can explore where and why knowledge and practice are at odds. By using a qualitative approach, I am able to understand not only preservice teachers' prior beliefs concerning everyday student technologies, but also where the beliefs are coming from and how

ingrained they are in preservice teachers orientations. By pinpointing these prior beliefs, I am able to compare preservice teachers' beliefs to the current negativity toward using everyday student technology tools on the part of educators in teaching and learning.

Second, I wanted to understand each entering preservice teacher's beliefs about classroom technology and everyday technology tools without being influenced by preconceived categories on the data collection instrument(s). It was important for the preservice teacher's beliefs concerning everyday technologies to emerge from their own way of explaining their values, dispositions and practices, rather than from data created by giving teachers predetermined categories for thinking about technology tools in their future classroom. For example, if entering preservice teachers were given a survey that listed possible technologies for their future classroom, the list might limit and skew what they would have considered when entering the course as well as what they would have taken into account as the course progressed. By using an open-ended instrument, preservice teachers chose their own language to describe their technology worlds, making the data sources for analysis participant-based rather than research-based.

The third reason for taking a qualitative approach is to make possible a more nuanced representation of belief change by pinpointing where and when beliefs concerning everyday teaching technologies and teacher change, and how that change occurs. A pre- and post-test design is not sufficient to capture the attitudinal feelings that signal values and beliefs, signaled by participants' expressions of feelings or emotions. According to Strauss and Corbin (1998), "qualitative methods can be used to obtain the intricate details about phenomena such as feelings, thought processes, and emotions that are difficult to extract or learn about through more conventional research methods"

(p.11). This study aims for such density of representation so as to be applicable for technology educators, and thus requires this degree of nuance in understanding changes in belief. Understanding the moments of change and reasons for those changes is important to this particular goal of my study.

Grounded Theory Approach

This study aims to inform teacher educators in education technology about potential strategies for developing everyday technology instructional belief in preservice teachers. At the same time, this study did not begin with an assertion of a particular outcome. Rather I wanted to see what occurred as I studied preservice teachers' beliefs concerning everyday technologies, and possible belief change when taking a course focused on integrating everyday technology instructional. I selected a qualitative approach that would allow ideas and assertions to emerge from the data rather than starting with a theory in mind. Therefore, I used a grounded theory approach to data collection and analysis.

Grounded theories derive from the collected data rather than from projecting a theory onto the data to frame analysis (Strauss & Corbin, 1998). While I started this research with an area of study in mind that was informed by unconscious theories regarding what counted as data about preservice teachers and everyday technology, I did not have specific, preconceived outcomes in mind. According to Strauss and Corbin (1998), by using a grounded theory approach to data collection and analysis, the results can offer insight and provide guidance for action. Therefore, asthe goal of my study is to offer insight and understanding for teacher educators in the field of education technology

concerning everyday technology tools, a grounded theory approach proved to be an appropriate method.

Setting and Participants

It was important to select a practical setting where preservice teachers were both entering a teaching program and starting an education technology course. This is because I did not want the preservice teachers' prior knowledge about teaching and technology to be influenced by previous teacher education coursework. As one of my research goals was to inform myself about how to develop everyday technology instructional belief in future teachers, I wanted to be involved in the course instruction. I also wanted a range of preservice teachers with various backgrounds, ages, and content specializations. The reason for this approach is to understand if age or content specialty had any influence on preservice beliefs or belief change that might occur in the study. As a result, the data for this study was collected from 45 beginning preservice secondary teachers enrolled in a graduate level technology education course that I co-taught at a midwestern research university. These preservice teachers were part of a 2006-2007 secondary post-baccalaureate certification program. The preservice teachers' specializations included social studies, mathematics, science, English, physical education, and foreign languages. This was the first and only technology course that the preservice students would take in their program. The technology education course was a university requirement for students' teaching certification program, and was conducted over the summer and fall 2006 semester.

The technology education course was divided into two different phases; Summer and Fall. Students were required to attend all five Summer sessions and three Fall

sessions. They were then given the choice to attend four of six Fall sessions which focused on student presentations of the Point/CounterPoint projects. These projects were student-led debates about using everyday technology tools in learning. In addition, students were given a choice to participate in two of four workshops or participate in an internship experience (which lasted the entire Fall term). The workshops were a series of sessions focusing on a technology tool and finding ways to integrate that device into classroom projects. The students in the workshops learned: how to use the tool, how to manage the tool in their placements, and they developed lesson plans for how they would use the tool in their teaching. The workshop options were: Interactive PowerPoint, iMovie and video editing, Animation, and Creating Webpages. If students did not choose to participate in the workshops, they were required to participate in an internship, where they were placed in a K-12 school and took part in a semester long technology integration project. Figure 3.1 shows the time frame for the structure of the technology education course.

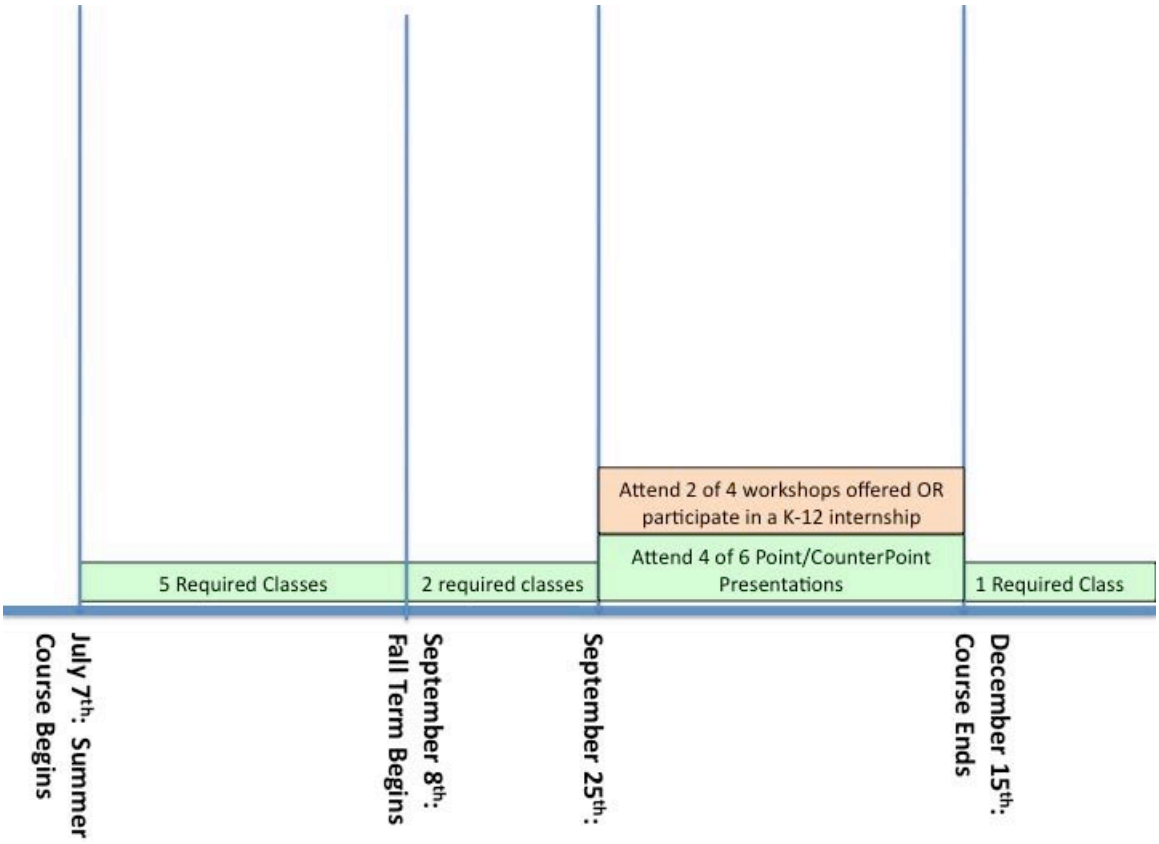


Figure 3.1. The technology education course structure and time frame for activities

Data Sources

The objective of the data collection was to allow preservice teachers to reflect upon their experiences with technology inside and outside of their technology education course experience. Additionally, I was interested in understanding how those experiences impacted the preservice teachers' own philosophy about using everyday technology tools in their future teaching. Table 3.1 shows the pieces of data used to answer my research questions (see Appendix A for a more detailed rendering of all data collected in this study). Figure 3.2 marks the time periods for collection of selected data during the course.

Table 3.1
The relationship between the data collection sources and the research questions

Research Question	Data Sources
What everyday technology knowledge do preservice teachers bring with them into their teacher education program?	• 45 first day questionnaires including a list of technology tools that each preservice teacher would like to include in their future classroom.
How can I, as a teacher educator, use my preservice education courses to foster change in preservice teacher beliefs regarding everyday technology instruction?	• Course Syllabus • Video Recordings of Course Sessions • 45 student web blogs with a minimum of 12 posts between July 2006 and December 2006. • 45 final reflection pieces concerning technology in each student teacher's future classroom.
If technology belief change occurs in my preservice teachers, can I pinpoint when, how and why it occurred?	• 45 student web blogs with a minimum of 12 posts between July 2006 and December 2006. • 45 final reflection pieces concerning technology in each student teacher's future classroom.

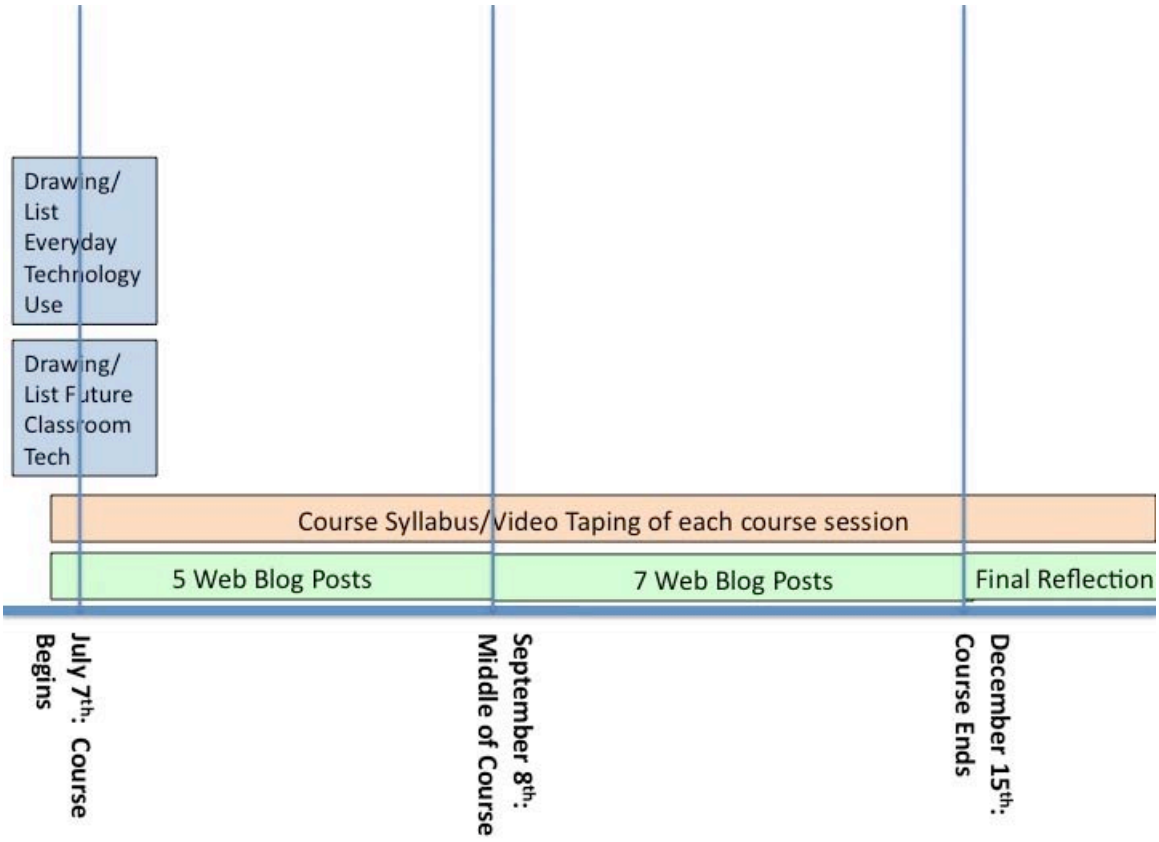


Figure 3.2. Timeline of data collected and analyzed in this study.

Procedures

List and Drawings

Knowing that higher education classes might be more likely to reinforce preservice teachers' prior beliefs and experiences than to adjust them (Goodman, 1988), it was important to unleash prior beliefs and experiences that entering preservice teachers hold with technology, so that I, as their technology teacher educator, could understand what beliefs I may or may not be refining in the preservice teachers. The study began on the preservice teachers' first day of their preservice education. Before viewing a syllabus for the education technology course, the preservice teachers were asked to complete a qualitative instrument with four subjective questions (see Appendix B for example of instrument). Before they answered the subjective questions, they were asked to write

their age, and their secondary content specialization, and to identify their comfort with using technology tools. For the first question, the preservice teachers created a list of all the technology they would like to have in their future classroom. I told the students that they could define the term "technology" for themselves, thus keeping it a naturalistic process. Next, from the list they were asked to create a drawing that depicted how they envisioned their future classroom, including all the technology from the list. I used drawings because they can reveal what a questionnaire cannot, the precise way teachers envision teaching and learning happening in their future classroom.

Vygotsky (1978) pointed out that drawings can be a vital way for children to create stories and demonstrate a particular way of knowing. Drawings are more than simply pictures on a page; they can denote the beliefs and experiences of a person's culture and possibly their future actions while providing rich qualitative data when collected and analyzed (Kendrick & McKay, 2002; Haney et al., 2004). Drawings by adults of everyday situations involving schools and learning have remarkable power to document and possibly even change the educational environment of classrooms and schools (Haney, et al, 2004). Besides being a significant way to record a person's thoughts and beliefs about the teaching and learning environment, drawings also provide an opportunity for reflective thinking and self-awareness (Haney, et al. 2004). For example if a preservice student drew a picture of a teacher at a desk in the front of the classroom, I assumed that the preservice teacher believed she would be conducting her class from the front of the classroom. In a previous study, I was able to corroborate my assumptions by doing follow-up interviews with the preservice students who drew the pictures and learned that my assumptions were generally in agreement with the preservice

students' vision of their future classroom (Keren-Kolb & Fishman, 2005).

After listing all the technology they used in their everyday lives including how often they used the technology, I asked the preservice teachers to depict all the technology from these lists in a drawing portraying their everyday lives. The images in these drawings, similar to those of their future classrooms,reflected entering teachers' prior beliefs and experiences regarding how they used technology in their everyday lives.

Web Blog and Final Reflections

Experiences and reflection on those experiences may lead to changes in beliefs (Richardson, 1996). To capture those changes from the first day of the course, preservice teachers were asked to keep web blog journals containing their reflections on their education technology experiences. They posted a web blog reflection 13 times during the six-month course. The web blog posts did not have to be related to the course topics of teaching and technology; rather the blogs were meant to be a space for preservice teachers' informal reflections on topics of their choosing. Other than the number of times they had to post, there were no guidelines given for the content or timing of the blog posts, so that students could post anything at anytime they desired. Setting up the blogs in this way was meant to, as naturalistically as possible, document beliefs and belief changes, by assuming that preservice teachers only wrote about everyday technology tools when they felt moved to do so by course related content or outside experiences. The last blog post (#13) for each preservice teacher was a final reflection piece written after they finished the course, prompted by the question: "Please reflect on your experiences and views on teaching with technology."

Beyond documenting possible belief change, allowing preservice teachers to journal in a web blog for reflection was meant to serve another purpose. Such self examination has been thought to help facilitate belief change (Resnick, 1987; Bullough, 1991; Albion & Ertmer, 2002). Therefore, the web blog reflections modeled one method where the preservice teachers could use web blog collaborative tools in their own teaching with their future students. For example the student teachers could set up web blogs for their own secondary students and ask them to write informal reflections on class activities.

The Course Activities

While it was important to document belief and belief change, it was just as important to document the education technology course strategies that focused on everyday technology instruction. The course syllabus documents a variety of activities that the preservice teachers participated in concerning everyday technology instruction (see Appendix T for the entire course syllabus). These activities included four different ways to explore everyday technology instruction.

First, there were course discussions and readings to develop a philosophical understanding concerning the significance of 21st Century students' everyday technology tools and their impact on society. Second, preservice students participated in course activities where everyday tools were modeled in lesson plans that they could use in their own teaching. Third, students were given opportunities to explore different perspectives on using those everyday tools in school learning. Fourth, there were opportunities for the preservice students to observe and participate in everyday tool use in authentic school settings. Table 3.2 lists the course activities that were related to everyday student

technology instruction as well as the purpose of the activities. Figure 3.3 is a timeline of the course activities.

Table 3.2
Course activities related to infusion of everyday technology instruction and the purpose of the activity.

Course Activity	Purpose for Preservice Teachers
Instant Message Chat Room	To participate in a modeling activity (where the student teachers use the tool in the same fashion that their own secondary students could use the tool) of using instant messaging in learning
Discussion and Article Readings: 21st Century Students and their Tools	To instill a philosophical belief in the preservice teachers to recognizing everyday students and the significance of their technology tools.
Web Blog Reflection	To participate in a modeling activity of using web blogs in learning
Cell Phone Podcasts	To participate in a modeling activity of using cell phones in learning
Point/CounterPoint Project	To explore the controversial topics of social networking, cell phones, web blogs, video games, MP3 players, and wikis in education
Internship	To explore how everyday student technology was being used in schools other than their own student teaching placement.
Workshop	To create and teach a lesson plan utilizing everyday technology tools.
Class Wiki	To participate in a modeling activity using wikis in learning
Technology in My Placement Survey	To investigate how the cooperating teachers and the preservice teachers' placements are using or not using everyday technology tools.

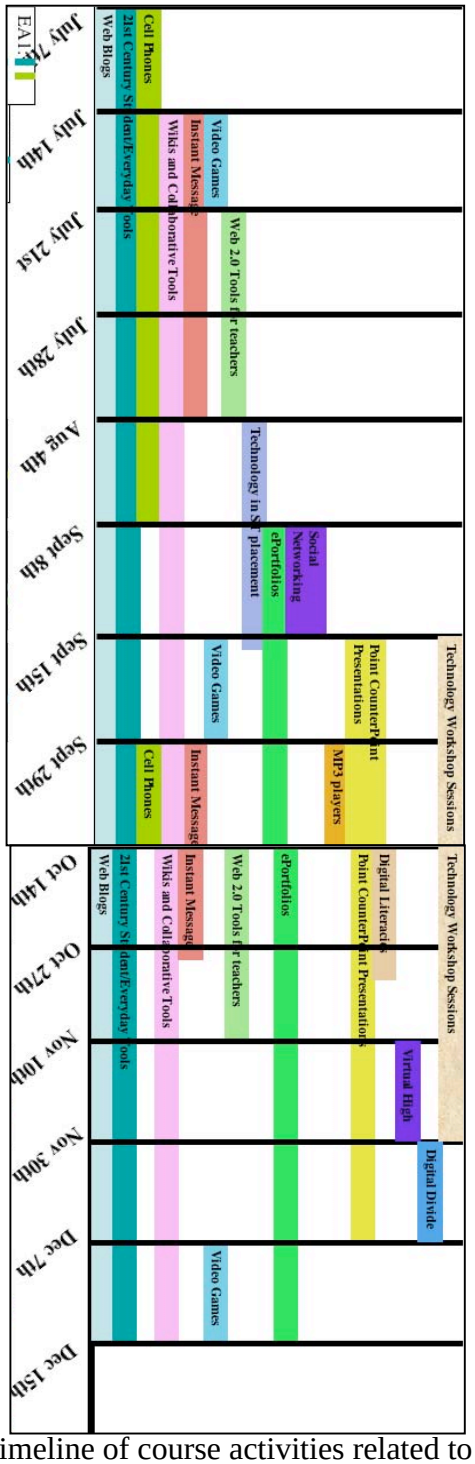


Figure 3.3. Timeline of course activities related to everyday technology instruction. Students were required to attend all sessions between July 7th and September 15th (7 class sessions). They then were able to choose 4 of the 6 sessions between September 29th and December 7th. They were also required to attend 2 of 4 workshop strands (totaling 2 class sessions). They were again required to attend the last session on December 15th.

Data Analysis

The data collection for this study began in June 2006 and was completed in December 2006. To analyze the data, I used inductive content analysis. As opposed to deductive analysis, where I would be looking for predetermined specific patterns in the data, I allowed patterns or categories to emerge in the data (Patton, 2002). As a result of using a grounded theory approach in gathering the data, the analysis also needed to be naturalistic and allow patterns to emerge. Lincoln and Guba (Cited in Krefting, 1991), describe how emergent design and the naturalistic inquiry work hand-in-hand: "what these considerations add up to is that the design of a naturalistic inquiry (whether research, evaluation, or policy analysis) cannot be given in advance; it must emerge, develop, unfold" (p.225). In grounded theory, the data analysis is the interplay between researcher and the data (Strauss & Corbin, 1998). Therefore, I used inductive content analysis to identify key concepts relating to everyday technology tools and teaching. In this section, I detail the coding procedures I used in order to allow categories to emerge from the data.

Data From the Drawings and Lists

In order to capture entering preservice teacher's prior teaching and technology tool preferences, I collected 45 preservice teachers' ideal classroom drawings and lists of technology that they would like to have in their future classrooms. In order to capture entering preservice teachers' prior everyday technology tool preferences, I collected 45 preservice teachers' drawings and lists concerning their everyday use of technology tools in their daily lives. By collecting these 4 artifacts, I was able to compare and contrast the

preservice teachers' views on their future classroom teaching technology and their own technology use outside of the classroom.

Content Coding for categories of the individual lists and drawings

To begin the content analysis, I labeled each of the items that appeared on each of the 45 drawings and lists (all 4 artifacts) related to technology tools and teaching as well as technology tools and everyday use outside of school. See Figure 3.4 for an example of the coding for a preservice teacher's drawing of their ideal future classroom and their list of technology for their ideal future classroom. See Figure 3.5 for an example of the coding for a preservice teacher's drawing and list of their everyday interaction with technology.

Coded categories include: one computer in the classroom, teacher laptop or desktop, LCD projector, Internet access, projector screen, traditional student rows, teacher in front of classroom, technology with students, DVD player, TV, and graphing calculators.

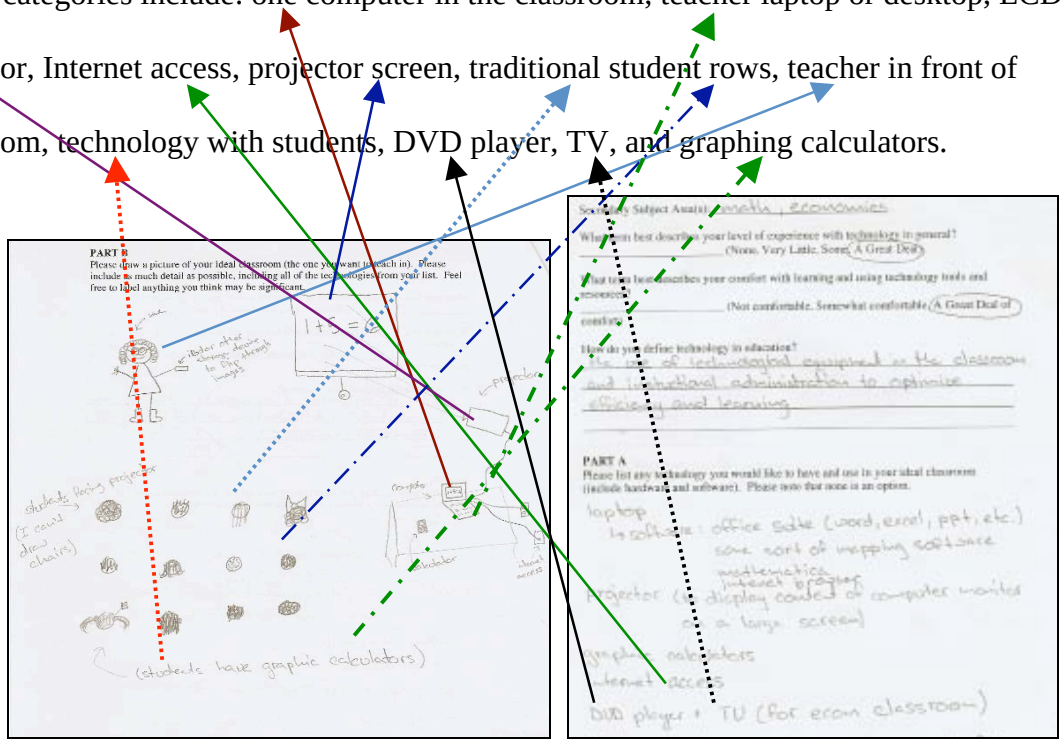
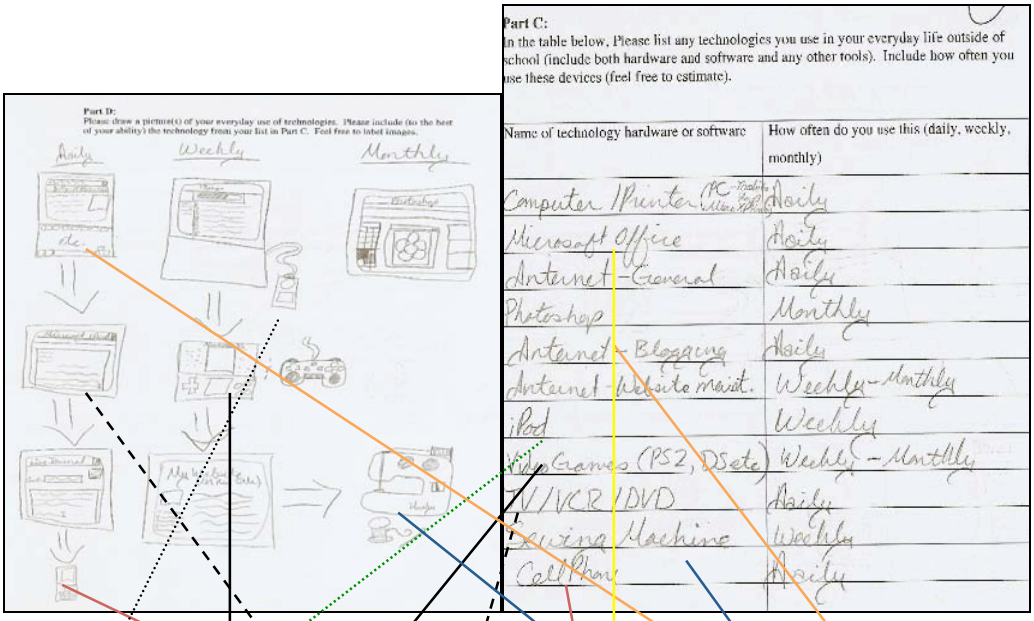


Figure 3.4. A preservice teacher's drawing of their ideal future classroom and their list of technology for their ideal future classroom. The figure includes the coding categories from each list or drawing item.

Content Coding for comparison of 45 drawings and lists

In order to physically represent the data to see comparisons that I might not otherwise be able to see, I developed a matrix of the categories of content uncovered in all 45 of the drawings and lists (Strauss & Corbin 1998). To develop this matrix, I went through the 45 classroom drawings and lists marking on a spreadsheet each item related to technology and teaching that each preservice teacher included or did not include in their drawing. Figure 3.5 represents an example of one preservice teacher's everyday technology list and drawing and how the coding of the categories was put into the spreadsheet. In Figure 3.5, a number 1 was inserted in the row order to represent the

appearance or mention of an object in the drawing or list, while a number 0 represented the lack of appearance.



MP3 Player	Video Games	VCR/DVD	Cell Phone	Photo Editing Software	Blogging
1	1	1	1	1	1
Social Networking Sites	Building Websites	PowerPoint	Word	Excel	Sewing Machine
0	1	1	1	1	1

Figure 3.5. A sample of coding from the preservice teacher's drawings and lists which were put into technology and teaching categories in a spreadsheet so they could be used for comparison of all 45 preservice teachers' drawings and lists.

Once I finished individually coding the categories into the matrix, I needed to know how many preservice teachers represented or did not represent the different teaching and technology tools in their lists and drawings. Therefore I totaled the number of mentions on all 45 preservice teacher spreadsheets to create a comprehensive matrix of all the technology tools represented or not represented in the lists and drawings. Table 3.3

represents summative data of some of the everyday technology tool categories and classroom technology tool categories that emerged from the July 2006 ideal classroom drawings and ideal list of technology for all 45 preservice teachers' future classrooms and the everyday technology drawings and lists.

Table 3.3
Summative data gathered from the July 2006 ideal classroom drawings and ideal list of technology for all 45 preservice teachers' future classrooms and the everyday technology drawings and lists.

Everyday Tools	Web Blogging	Cell Phones	Wikis	Social Networking tools	MP3/iPod	Multitasking	Video Games
Day One Classroom List	0% n=0	0% n=0	0% n=0	2% n=1	4% n=2	0% n=0	2% n=1
Day One Everyday List	4% n=2	84% n=38	4% n=2	4% n=2	58% n=26	31% n=14	16% n=7

Typical Classroom Tools	Content Specific Software	PowerPoint	Calculator
Day One Classroom List	31% n=14	67% n=30	22% n=10
Day One Everyday List	9% n=4	49% 22	4% n=2

Once I could physically represent entering preservice teachers' technology tool preferences and their future classroom teaching with the comprehensive matrix, I wanted to compare the preservice teachers further by dividing them into three different groupings. I divided the preservice teachers into groupings by secondary subject area; social studies, English, mathematics, foreign language, and science (see Appendix E). I also grouped the preservice teachers according to their self-identified comfort with technology (see Appendix E). Finally I grouped the preservice teachers according to age

(see Appendix E). I wanted to see if the age of the preservice teacher had any affect on their technology tool preferences.

Data From the Web Blogs and Final Reflections

How Categories Emerged

Once I understood entering preservice teachers' technology tool preferences, I needed a way to document possible individual preservice teacher belief change. In order to recognize if and when preservice teachers' beliefs concerning everyday technology tools were changing, I had each preservice teacher keep a web blog[1] for the entire technology education course. Between July 2006 and December 2006 each preservice teacher created a web blog and posted once a week their thoughts on technology in teaching, totaling a minimum of 12 blog posts. There were no prompts for the weekly blog entries; therefore students could write about class experiences, technology in general, teaching experiences, or even topics unrelated to teaching in their journal. At the end of the course, the preservice students were asked to write a final blog reflection of the course activities and their feelings about technology in their future classroom; this would become the 13th blog post.

In order to make sure categories and themes arose from the data (and were not predetermined), I used inductive content analysis for the initial data analysis of the web bogs. I began the analysis by reading all 45 web blogs and final reflections marking categories of everyday technology tools that emerged (Strauss & Corbin, 1998). I coded by reading through each blog post and marking every comment related to everyday technology tools and/or the 21st Century student. Each mark became a category (if I did not already have a category for that

[1] Web blogging had a dual purpose as it was also meant to raise the students' consciousness about how blogging could be utilized as an educational learning tool for their own K-12 teaching.

mark). I created categories meant to directly reflect the comment in the blog post. In addition, I coded for posts that were unrelated to teaching and technology. Blog Post 3.1 represents an example of a preservice teacher's blog post and categories that I developed from that particular post.

Blog Post 3.1

A preservice teacher's blog post on September 18th, 2006. The categories that emerged from this post are illustrated in the table below the blog post.

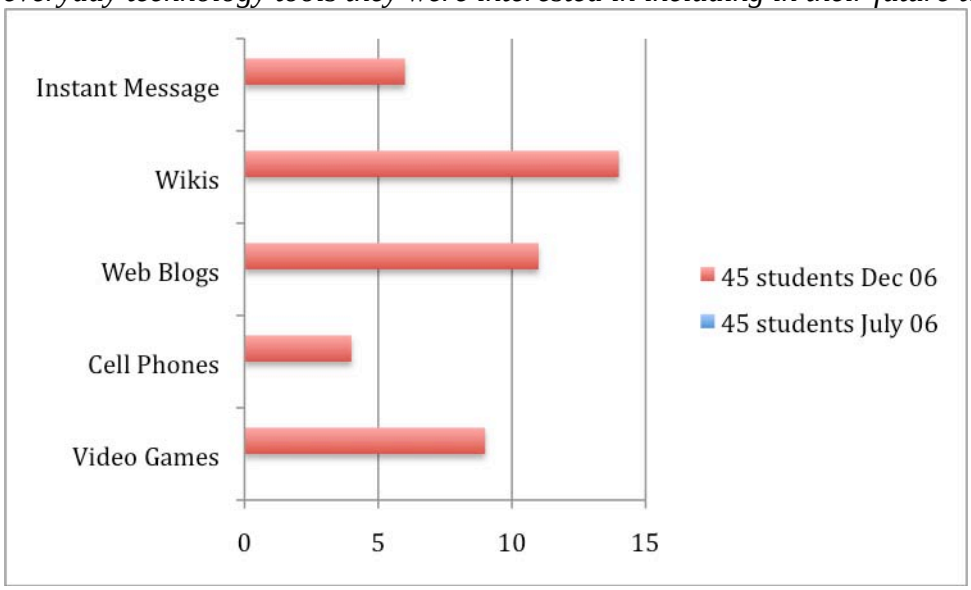
Text	Category Coded	Justification for Code
"I must admit, I was surprised at what I found at ----- High.	Light bulb moment	Expressing a new revelation about technology and teaching.
Strikingly, as far as actual equipment, the school library was equipped with almost, if not all, of the items on the list! Mr. ---- is not trained to use a few of the items, including the LCD projector, which I didn't know of a special training for! He seemed to be quite skilled in the technological area, but he readily admitted that there were some things he'd like to know more of. I went to him to ask about the restrictions on the internet service, and many of the items he'd not heard of before.	Course connection	Citing a course-related activity, which was the "technology in my placement" survey.
"I took the opportunity to show him our class wiki, and explain to him how it worked. I hoped that he would see something that could be added to the schools internet activities."	Teachable Moment	Preservice student teaching their mentor teacher about the wiki which is considered an everyday technology tools.
"I took the opportunity to show him our class wiki, and explain to him how it worked. I hoped that he would see something that could be added to the schools internet activities."	Yes to Wikis	Expressing positive interest ("I hoped") in using everyday tool (Wikis) in teaching.

Comparing Coded Categories with Drawings and Lists

Once I finished coding the 45 web blogs and final reflection posts, I compared these final course reflections to the entering data from the drawings and lists to understand if any change in beliefs concerning everyday technology tools took place. To do so I created a summative matrix of all 45 teacher initial findings on everyday technology tools (from their drawings and lists) with all 45 final course reflections. While I did collect final lists and drawings from the students at the end of the course, I found that the blog posts provided richer reflections on the students' beliefs concerning if they were interested in using certain tools, how, and why. Since the students did not begin the course with a blog, I was unable to use blogs as the initial data. Table 3.4 compares the data from the initial classroom lists and drawings (July 2006) on everyday technology tools with the final web blog reflections (December 2006) on which everyday technology tools they were interested in including in their future teaching. (You will note that no blue lines representing July 2006 mentions are included on the table. That is because none of the teachers who entered the program in July 2006 identified instant messaging, web blogs, wikis, cell phones, or video games as tools they would use in their future teaching.)Because the final blog posts were open-ended (the preservice teachers were told that they should give their honest feedback on teaching with technology), I count them as a fair representation of the preservice teachers' beliefs at that point concerning these everyday tools in their future teaching.

Table 3.4

Table 3.4 compares the data from the initial classroom lists and drawings (July 2006) on everyday technology tools with the final web blog reflections (December 2006) on which everyday technology tools they were interested in including in their future teaching.



Defining and Categorizing Adoption

Throughout the content analysis coding of the web blogs and the final reflection pieces, I looked to see if any of the preservice teachers "adopted" everyday technology instruction for their future teaching during the technology course, and if so when. I defined "adoption" as preservice teachers who recognized everyday student technology tools (e.g. social networking, cell phones, instant messaging, mp3 players, web2.0 tools such as blogs, video games) as potential tools in their future classroom teaching.

While categorizing for adoption, I interpreted that the preservice teachers fell into one of five adoption groups. I labeled these five groups: early adopters, middle adopters, late adopters, interested adopters, and non-adopters (see section 4.2.1 for examples of blog posts from early, middle, late, interested, and non adopters). The adoption groups were developed purposefully based on the class syllabus. The syllabus divided the course into three different time frames.

Between July 2006 and August 2006 (early adopters) preservice students participated in face-to-face course instruction where they were given a philosophical reasoning for using everyday tools in learning. The philosophical reasoning included research reports on everyday technology, peer-reviewed and non-peer reviewed journal articles, as well as other pieces of literature concerning the importance of using students' everyday technology devices as learning tools. They also experienced modeling of various ways to use the everyday tools coupling with the education technology course instruction. Between September 2006 and November 2006 (middle adopters) students were in their field placements, where they were experiencing how technologies were being used in their field placements. They were also participating in debates about using everyday technology tools as well as workshops on how to couple the everyday tools with instruction. Emphasis was more on the practical use of tools, than on the philosophical belief of using everyday technology tools in teaching. In December 2006 (late adopters) the preservice students were asked to reflect on their learning experiences in the entire course.

Early adopters declared the significance of everyday technology instruction in their future teaching between July 2006 and the end of August 2006. Middle adopters declared the significance of everyday technology instruction in their future teaching between September 2006 and November 2006. Late adopters declared the significance of everyday technology instruction in their future teaching at the end of the course in December 2006. Interested adopters never declared adoption, but they never stated that they were opposed to everyday technology instruction in their classroom teaching. Therefore, they are in a gray area between adoption and non-adoption. Non-adopters overtly declared by the end of the course that they were not going to use the everyday technology tools in their future teaching.

Adoption Group Characteristics

After I placed each preservice teacher in an adoption group, I wanted to find out if there were any significant differences in characteristics of the preservice teachers between the adoption groups. Therefore, I began to compare characteristics of the five groups. Using the initial three dimensions of preservice teachers' content areas, self-identified comfort with technology, and age, I compared each adoption group with these dimensions. See Table 4.1 in Chapter 4 for a comparison of the % of preservice teachers in each content area in each adoption group, the % of preservice teachers self-identified comfort with technology in each adoption group, and the % of preservice teachers in each age dimension in each adoption group.

Adoption and Timeline of Class Activities

Next, it was important that I understand the ideas, activities, and concepts that were referenced when the preservice teachers' adopted. Therefore, I created a timeline of the class activities and when each preservice student adopted. The timeline (see Appendix F) demonstrates what the preservice teachers referenced in their web blog posts when they adopted and if there were class activities that coincided with the adoption. The timeline in Appendix F represents the blog post date when each preservice teacher adopted (EA=Early Adopters, MA=Middle Adopters, LA=Late Adopters). Additionally, it shows the class activities that occurred between July 2006 and December 2006.

Comparing Preservice Teachers in Their Own Adoption Group

Once I created the timeline, patterns began to emerge unique to each adoption group. Therefore, I realized that I needed to look at the individual adopters in each group in relation to the timeline of class activities. I wanted to find out if there were similar characteristics of

adoption among the preservice teachers within each adoption group. Thus, I created timeline charts for each of the 45 preservice teachers web blog and final reflection posts between July 2006 and December 2006 (see an example of a chart for an early adopter in Appendix G, a middle adopter in Appendix H, a late adopter in Appendix I, a non-adopter in Appendix J, and an interested adopter in Appendix K). In addition to including the specific class activities and everyday technology tools that the preservice teachers referenced in their blog posts, I also included five other categories that I found in my original content analysis of the web blogs and final reflections; moments of change, the preservice students' weekly level of interest in everyday technology instruction, an awareness of the 21st Century student and their technology tools, class connections, and off-topic posts. I included these particular categories because as I was coding, I began to notice similar patterns in each adoption group. For example, I noticed that the non-adopters seemed to have more off-topic posts than students who had adopted. Therefore I thought that these particular categories might show similarities and differences among the students in each adoption group, helping me to characterize the students in each adoption group.

Moment of Change Category

Moments of change I characterized as occasions when preservice students wrote about their original "foundational" ideas of technology changing or readjusting because of their experience (see Appendix G for an example of the coding for moment of change category).

Weekly Level of Interest Category

Included in the individual charts were each preservice student's level of "interest" in using technology in their future classroom. I used a scale from 1 to 4 to interpret interest level from the students' posts. A score of 1 meant that the preservice teacher had stated that she did

not like the idea of using the everyday tool for teaching. In Appendix H a non-adopter scores 1 because she does not show any interest in using the cell phone audioblogs in her future teaching.

A score of 2 meant that the preservice teacher was undecided and needed more information on the everyday tool. Appendix I is an example of a preservice student who had a new experience with cell phones in her student teaching placement and as a result is uncertain about her opinion on whether or not to include them in her spectrum of learning tools for her own teaching. Thus she has not made any final decisions on the tool positive or negative.

A score of 3 meant that the student was interested in the everyday technology in a positive way, but did not specifically say she was going to use the technology in her future teaching. Appendix J shows a preservice student who reported a positive experience with online chatting in class—that it shed a new light on how chatting and instant messaging can be used for learning. Yet, this student did not describe how she would use chatting in her own teaching. Therefore she received a score of 3 and not a 4.

A score of 4 meant that the preservice teacher planned on using everyday technology tools in his future teaching. Appendix K represents a preservice teacher who describes not only a positive learning experience with wikis, but goes on to describe how he plans on using wikis in his future teaching, therefore, earning the highest score of a 4.

Awareness of the 21st Century Student Category

I coded any time a preservice teacher expressed ”awareness” of the 21st century student. An awareness of the 21st Century student meant the preservice teacher wrote about recognizing that their students are growing up in a digital world and that many often use and rely on their everyday digital toys such as cell phones and iPods to communicate with the world around them.

In Appendix L, this student teacher shows awareness by stating, “I didn't grow up dependant on cell phones, computers, or iPods but the students we will be teaching have.”

Class Connection Category

Additionally, I coded each time the preservice teacher made a post that reflected a class activity. Since the preservice students could post on anything, it was important to designate when they were making a specific connection to what we were doing in our teaching with technology course. Appendix M represents a post made by a student who is referencing class activities.

Off-Topic Post Category

I also coded any “off topic” posts. These were any web blog posts that were unrelated to teaching and/or technology. One example of an off topic post is found in Appendix N: this preservice teacher spent his entire post describing the Detroit Tigers and their playoff position. Not one word about technology or teaching appears in the entire post.

Individual Charts

I developed a timeline chart for each preservice teacher. Figure 3.6 is one example of the charts that were created for each preservice student (see Appendix O for more chart examples). These charts include any time a preservice teacher posted about a class-related activity, an everyday technology tool, a moment of change (as mentioned above), an off-topic post (as mentioned above), an awareness of the 21st Century student (as mentioned above), and any class connections (as mentioned above). Additionally, the charts include the level of interest in using these everyday technology tools (as mentioned above) that the preservice teacher displayed in their post, represented by the red line on each chart. The preservice student in Figure 3.6 started the course in July 2006 with a strong level of interest (3) and an awareness of the 21st Century

student (3 of the first 4 posts referenced this). They also had no posts that were off-topic. Therefore, we can see why the preservice student in Figure 3.6 is considered an early adopter.

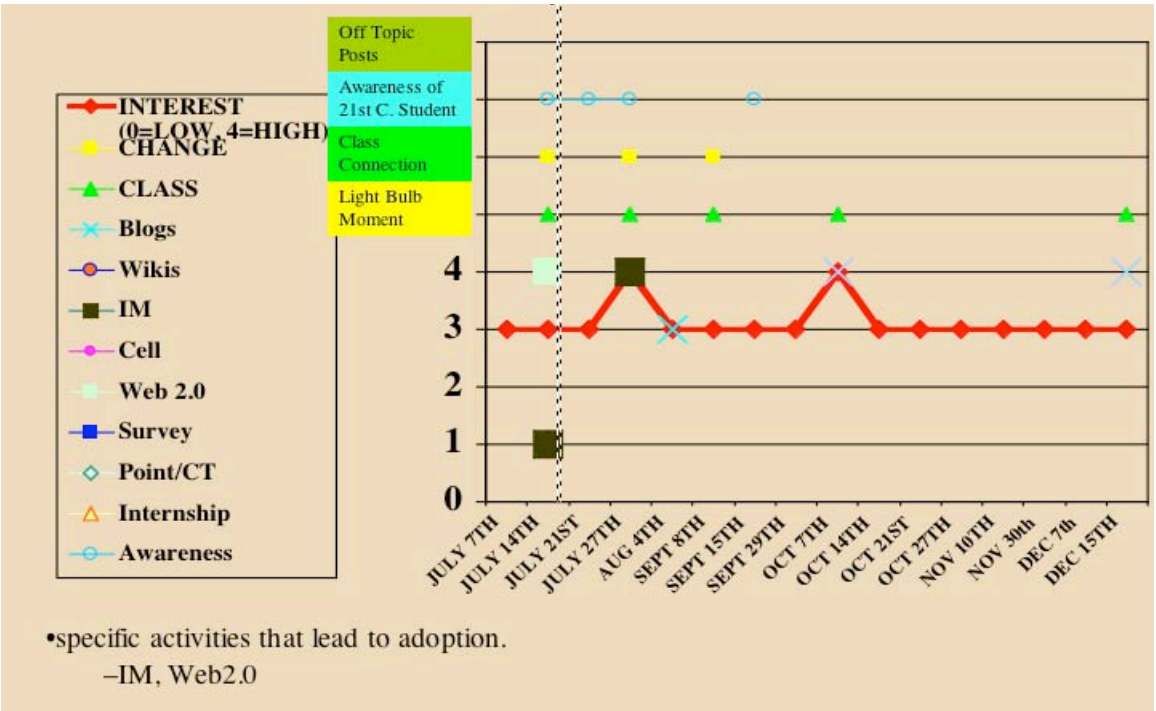


Figure 3.6. An example of an early adopter's chart

Compare Characteristics of Adoption Groups

Given that the students were falling into certain adoption groups, I wanted to look within each adoption group to see if there were characteristics shared by the students in each particular group. Therefore, I arranged in a matrix the individual timelines of each adoption group in order to compare general characteristics of the five adoption groups. See Appendix P for the coding matrix of the number of off topic posts, light-bulb moments, class connections, and awareness of the 21st century student posts. See Appendix Q for the coding matrix of the everyday technology tools that were mentioned in the blog posts for each adoption group. See Appendix R for the coding matrix of the class activities that were posted in the preservice teachers' web blogs.

Validity and Reliability

It was important to the validity of my study that I emically allow patterns or categories to emerge rather then look for specific categories that had previously come up in the research or other data analyses. By having each participant create his or her own lists and drawings on blank paper, I meant to allow the most independence of choice possible in sharing their technology knowledge, as opposed to inferring what they believed about technology and everyday technologies. According to Johnson (1997), there are some strategies that a qualitative researcher can use to promote validity in research. I used the following strategies: extended fieldwork, direct quotations, methods triangulation, theory triangulation, peer review, reflexivity, and inter-rater reliability.

In order to get more accurate results, I extended the fieldwork time span on my research. I researched the preservice teachers for six months, which was more than half of their teacher education program in order to see if and how changes occur over their entire experience in teacher education.

All participants developed their own weekly blog to reflection on their own thoughts about the course and their teaching. As a result, I was able to use their direct quotations as evidence in my research.

I used multiple methods to gather data (see Appendix A). As a result, I was able to use those different resources to triangulate my evidence and the results. For example, I allowed the preservice teachers to express their initial beliefs with both a drawing and list of their future classroom and everyday technology use. I also collected the web blog reflections, final course reflections, and video taped each class session.

In my literature review, I found many theories about teacher beliefs and knowledge, how beliefs are driven by prior experiences and potential ways that beliefs can change. I was able to utilize these theories in developing the education technology coursework as well as in my assertions when I begin to uncover and analyze the data.

I have been discussing my on-going research with my academic peers including; my education technology course co-instructor, my committee co-chairs and other PhD students at the university.

Additionally, it was important that others check my interpretation of the web blogs, drawings and lists for appropriate inter-rater reliability. Thus, I asked my co-instructor and another graduate student (who was not associated with the course) to code a sampling of 4 of the web blogs and final reflection pieces. I gave them a list of "codes" but did not tell them which codes go along with the definitions of the codes. Additionally I gave them some codes that were not used in any of samples and some were false codes. I then asked them to code the web blogs into adoption groups as well as levels of interest, awareness of the 21st Century Student, and off-topic posts. There was only one "code" discrepancy on the adoption groups. This occurred when the guest coder added an "interested" adopter into the late adopter group, possibly demonstrating that I was being less generous in my coding of who adopted and did not adopt.

Finally, it was important that I continue to look at my own self-awareness about what is going on in the research as well as constantly checking my own biases. I did two things to focus on my own reflexivity. First, I created a web blog and posted along with the students after each class session. The blog was a public journal concerning my thoughts on the course, and the students were invited to comment. Second, I jotted

private memos about the course after each session or significant interaction with the students involved in the course. Since this is an exploratory study, I also relied on my ability to reflect on the development of the course and learning environment in order to revise and improve the design.

Trustworthiness

There are some potential risks with issues of trustworthiness in my study. Therefore, the ethics I employed in this research study is an extension of the ethics I apply in my daily life as a graduate student, researcher, teacher, and professional (Deyhle, Hess, & LeCompte, 1992). My own personal bias about the purpose of technology integration into classrooms is a potential risk in my study. Marshall & Rossman (1999) state that, "The qualitative researcher's challenge is to demonstrate that this personal interest will not bias the study" (p.28). I think it was important that I acknowledge my personal interest in conducting this study, and making sure that my interest did not bias the outcome. Another potential risk was the close relationship I developed with the participants in the study, having a dual role as both their researcher and their instructor. As a result, I was concerned that it might be more difficult for me as the researcher to state something negative in an interview or investigate a controversial issue about one of the participants if we have a strong relationship. To address this concern of having too close a personal relationship with the participants I protected the anonymity of the participants by using numbers instead of names. Because total anonymity is difficult in this situation, the purpose of the research project was fully disclosed to the participants. The participants were not deceived in any way and had an opportunity to drop out of the study without their grade being affected prior to, and after

the beginning of the research being conducted. In addition, to make sure I was not interpreting their thoughts and beliefs incorrectly, I used direct quotes as often as possible in analyzing the evidence.

There was also a concern that I would be promoting my own bias/knowledge about technology integration into the classroom teaching so that the students would feel uncomfortable expressing their own opinions. I tried to address this concern by writing reflections on my classroom instruction. I also found many signs of dissent and constructive criticism in the participants' blogs. This demonstrated that I was able to create an environment where students felt comfortable expressing their opinions. Furthermore, there was another instructor in the room and he was able to provide another perspective for feedback and to corroborate impressions of class activities.

Summary of Chapter

In this chapter I described the reasons for using a qualitative grounded theory approach to the data collection and analysis of this study. I explained the setting, participants, and the procedures that I used to collect the data and the reasoning behind using lists, drawings, and web blogs. In addition, I illustrated the process I used to analyze the data, and the logic of reasoning for my coding scheme. Finally, I detailed the ways I addressed issues of validity and trustworthiness in the study. In chapter four, I will present the findings from the lists, drawings, and web blogs to understand the preservice teacher's entering beliefs concerning everyday technology tools, and if there was adoption of everyday technology instruction during the education technology course.

CHAPTER 4: FINDINGS

Overview

In this chapter, I describe the results of my data collection and analysis by focusing on my original research questions. In order to address the first research question, what everyday technology knowledge do preservice teachers bring with them into their teacher education program, I highlight the results from the 45 preservice drawings and lists to show what these entering preservice teachers consider to be technology in their future classroom and how they view everyday technology tools inside and outside of classroom teaching. The second research question, how can I, as a teacher-educator, use my preservice education courses to foster change in preservice teacher beliefs regarding everyday technology instruction, is addressed by describing results from the content analysis of the web blogs that demonstrate which preservice teachers were able to adopt everyday technology instruction and how they adopted. The second question is also addressed by describing the course strategies that helped foster change from the preservice teacher's web blog postings. The third question, if technology belief change occurs in my preservice teachers, can I pinpoint when, how and why it occurred, is addressed by highlighting the findings from the individual preservice teacher's timelines that were created through the content analysis of the individual preservice teacher's web blogs. In addition, I describe the characteristics of the preservice teachers who did not adopt.

Preservice Teacher Beliefs and Technology Tools

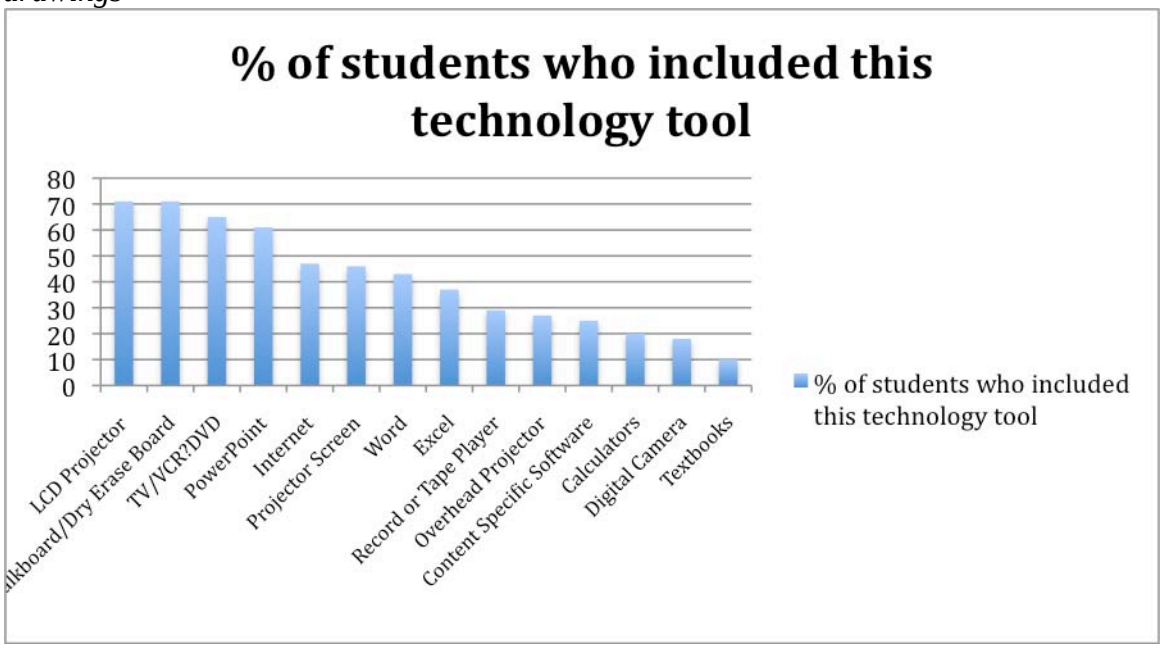
In this section, I address the first research question, what everyday technology beliefs do preservice teachers bring with them into their teacher education program? In

order to answer the question, I present the relationship between entering preservice teachers, and their beliefs about the technology tools they will use in their future classroom teaching. I also present the relationship between the everyday technology tools that preservice teachers use in their daily lives compared to how they view everyday technology tools in their future classroom instruction.

What Types of Technology Tools did Preservice Teachers Identify as Essential in their Future Classroom Teaching?

Entering preservice teachers ages 20 to 53 have a vision of technology in their future teaching that reflects common technology tools and resources currently found in the K-12 setting. For example, the technology tools that the preservice teachers included in their lists and drawings of their future classroom were tools found in classrooms over the past decade or more. Table 4.1 shows a sampling of the technology tools that students identified as tools they would like to have in their future classrooms.

Table 4.1
The most popular technology tools identified by students in their initial lists and drawings



All of these technology tools in Table 4.1 can be found in just about every American school for the last decade, some of them (books and chalkboards) since the beginning of public schooling. I interpret this to mean that the technology tools preservice teachers envision in their future classrooms are technology tools that they have used as students or that they have seen their own K-12 teachers using. According to Cuban (1986), technology integration in schools has been most successful when it can reinforce traditional models of teaching.

Figure 4.1 is an example of a preservice teacher's drawing of her ideal future classroom and her list of technology for the ideal future classroom she envisions. During the content analysis coding of the Figure 4.1 drawing, the categories that emerged were: one computer in the classroom, teacher laptop or desktop, LCD projector, Internet access, projector screen, traditional student rows, teacher in front of classroom, technology with students, TV/DVD/VCR, and graphing calculators (see Appendix D for more examples of preservice teachers' drawings of their ideal future classroom and their list of technology for their future classroom). Notice the emphasis on the traditional technology tools in the classroom, such as the VCR, the LCD projector, and graphing calculators. There is no sign of social networking sites, web blogs, cell phones, MP3 players, video games, or other popular everyday technology resources.

Coded categories include; one computer in the classroom, teacher laptop or desktop, LCD projector, Internet access, projector screen, traditional student rows, teacher in front of classroom, technology with students, DVD player, TV, and graphing calculators.

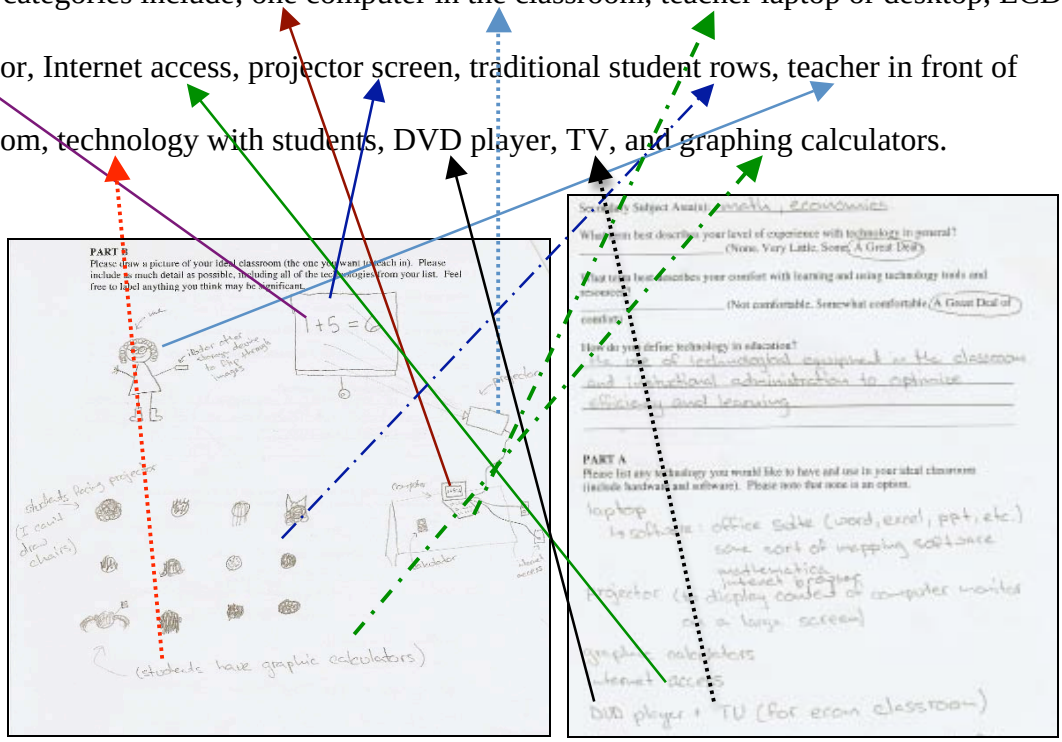


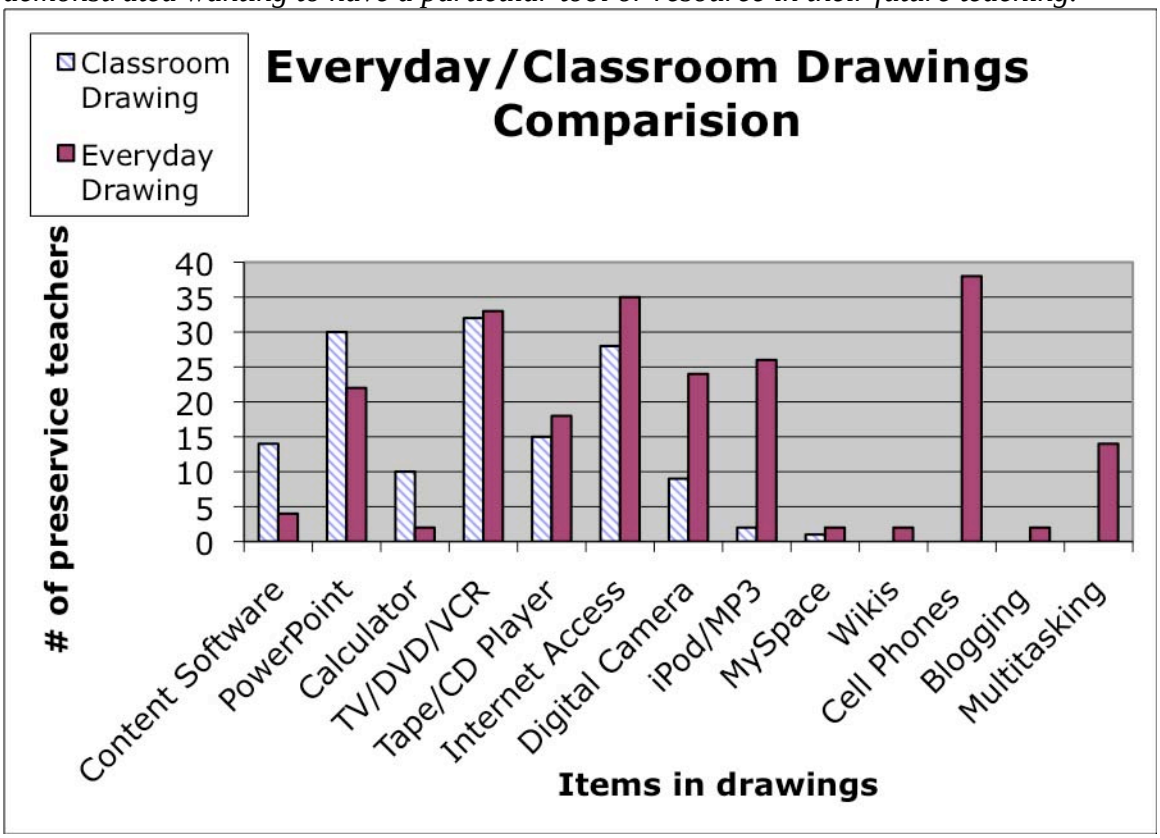
Figure 4.1. A preservice teacher's drawing of their ideal future classroom and their list of technology for their ideal future classroom.

What are the Beliefs that Entering Preservice Teachers have Concerning Everyday Technology Use in their Future Classrooms?

If beginning preservice teachers are identifying traditional technology tools for their future classroom teaching, then do they think students' everyday technology tools have a place in classroom learning? Beginning preservice teachers generally do not consider everyday technology tools, specifically cell phones, instant messaging devices, MP3 players, video games, web blogging, wikis, or social networking tools as resources for their future classroom teaching. This is evident from the initial data collection where only 2 of the 45 preservice teachers included an everyday tool in their classroom lists or

drawings (see Table 4.2). None of the preservice teachers included cell phones, wikis, or web blogging in either the classroom lists or drawings of any of the entering preservice teachers. Looking across all 45 preservice teacher lists and drawings there is no single reason for why everyday tools are not included, but it does seem clear that these teachers do not enter the program with an obvious vision to use everyday technology tools in instruction.

Table 4.2
Data gathered from the July 2006 ideal classroom drawings and ideal list of technology for all 45 preservice teachers' future classrooms and the everyday technology drawings and lists. The table shows the number of times that any of the 45 preservice teachers demonstrated wanting to have a particular tool or resource in their future teaching.



What Types of Everyday Technology Tools do Preservice Teachers use in their Everyday Lives?

Although none of the preservice teachers foresaw themselves using, wanting, or

needing everyday technology tools in their classroom teaching, most of them interact with these technology tools on a daily basis outside of the school setting. For example, in Table 4.2, 84% of preservice teachers included the cell phone as an essential everyday tool outside of the classroom, while 58% of them use mp3 players in their everyday life. A smaller percentage admitted to participating in online social networking sites, web blogging, video games, and collaborative wikis. Yet, none of them mentioned using chalkboards, projection screens, overhead projectors, LCD projectors, or content specific software in their everyday lives. I interpret this to mean that these preservice teachers use everyday technology tools to interact with the world around them, but do not see them as possible learning tools in K-12 classroom teaching. Figure 4.2 is one example that is fairly representative of the preservice teachers' everyday technology lists and drawings. Notice the high use of cell phones, video games, iPods, and blogging in their everyday life.

Coded categories include: Blogging (LiveJournal), website creation, Photoshop, cell phone, video games, Microsoft office, iPod, iTunes, Internet, TV, DVD, VCR, and Sewing Machine.

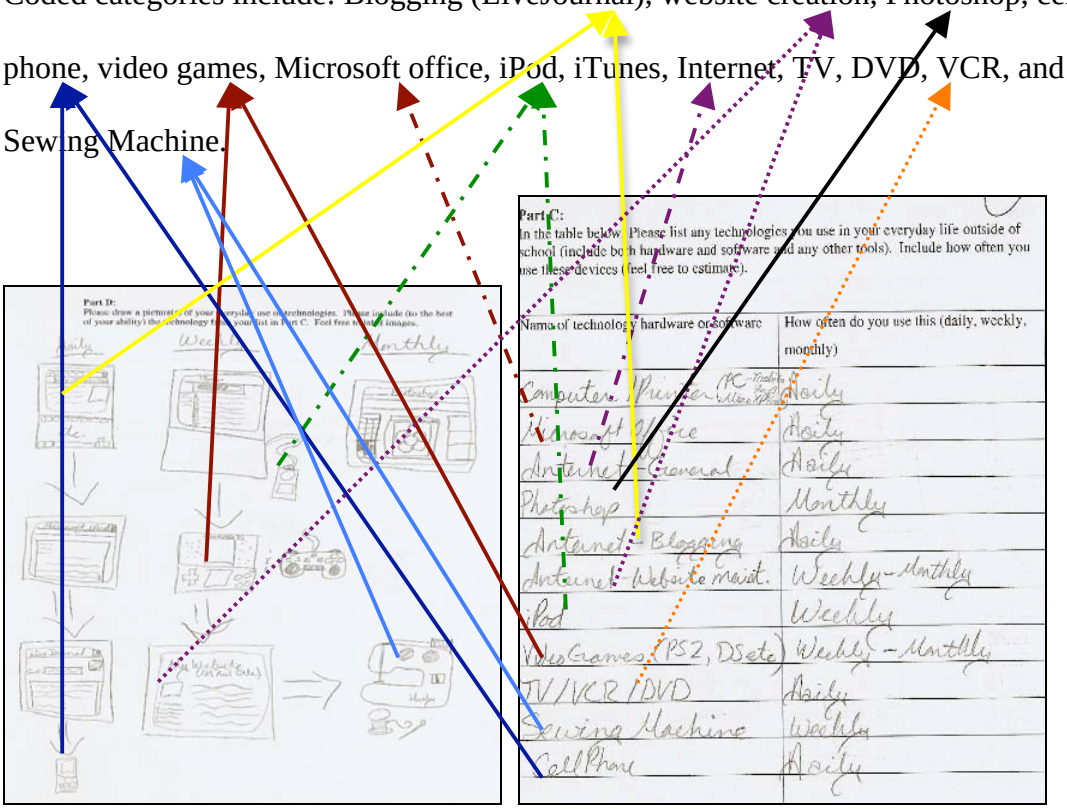


Figure 4.2. A preservice teacher's drawing and list of their everyday interaction with technology

How do Preservice Educators Portray their Future Classrooms?

Preservice teachers envision themselves teaching in a traditional classroom setting with the teacher in front of the classroom who is controlling the learning tools used in the classroom. These findings align with current research which states that teacher candidates' own schooling experiences contribute to their beliefs on teaching and learning (Albion & Ertmer, 1992; Richardson, 1996; Borko & Putnam 1996). Additionally, these beliefs guide instructional decisions and actions that will make up a teacher's future classroom (Pederson & Liu, 2003; Richardson, 1996). Therefore, it is not surprising that most of the preservice teachers' classroom drawings in this study

reflect a “traditional” classroom setting, which possibly reflects preservice teachers’ schooling experiences (see Figure 4.3). For example, 71% of preservice teachers drew their future classrooms with the teacher or the teacher’s desk in the front of the classroom. 63% depicted the technology in the classroom being controlled only by the teacher. Additionally, very little student-centered activities were depicted with the technology tools. For example, 43% of the preservice teachers had only one computer in the classroom (usually on the teacher’s desk), and a mere 14% of teachers showed students with the technology equipment and even fewer demonstrated “activity” occurring with technology (6%). There were no drawings where multi-tasking with technology tools and class activities were demonstrated. Figure 4.3, depicts a classroom drawing with the teacher’s desk and all of the technology (such as the DVD/TV/VCR, whiteboard, projection screen, overhead projector, and computer) in the front of the room. Additionally, there was no activity occurring in this drawing.

The following categories of teaching and technology are identified: technology in front of the room, teacher or teacher's desk in front of room, no activity or movement in room, overhead projector, whiteboard, one computer in the classroom, TV/VCR/DVD, and projector screen.

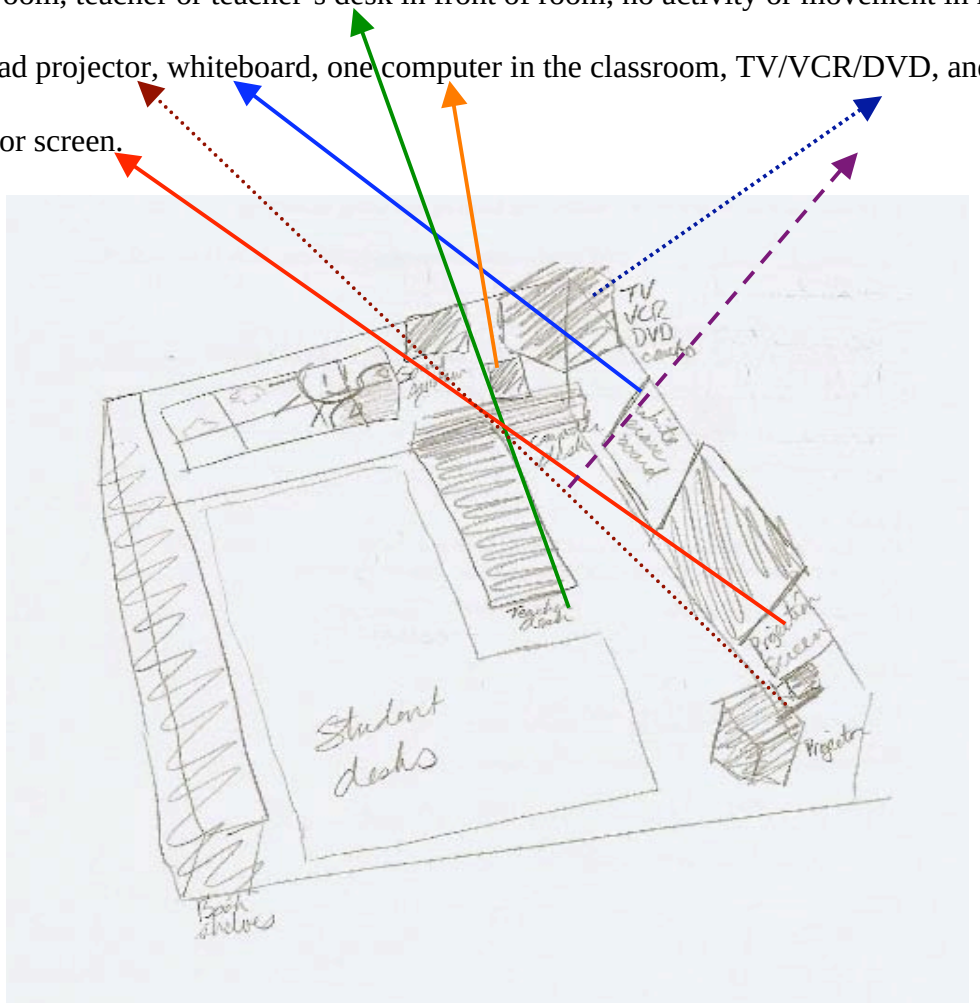


Figure 4.3. This preservice teacher drawing is representative of many of the classroom drawings from the 45 preservice teachers.

How do Preservice Educators Portray their Everyday Interaction with Technology?

While most preservice teachers did not show any activity occurring in the classroom drawings, none of them demonstrated themselves and/or their students multitasking with the classroom tools. Yet, 29% of preservice teachers drew themselves multi-tasking with different technology tools in their everyday use of technology tools drawing. This multi-tasking was defined by the fact that the preservice teacher was using

more than one technology tool at the same time in their drawing. For example, they may have shown themselves sitting on a couch, watching TV, listening to their iPod, while using their laptop. Figure 4.4 is an example of a preservice teacher's everyday drawing that demonstrates multi-tasking. In the drawing, the preservice teacher portrays himself or herself watching TV, getting a cell phone call, and working on a laptop computer all at the same time. These multitasking images demonstrate how future teachers are media multi-taskers along with today's youth (Rideout et al, 2005). Yet, the lack of multi-tasking images in the classroom drawings is a reminder of the disconnect between technology resources preservice teachers use outside of academics and the resources they plan to use for teaching and learning in their future classroom.

The teacher in the drawing is typing on a laptop, watching TV, and listening to her cell phone at the same time.

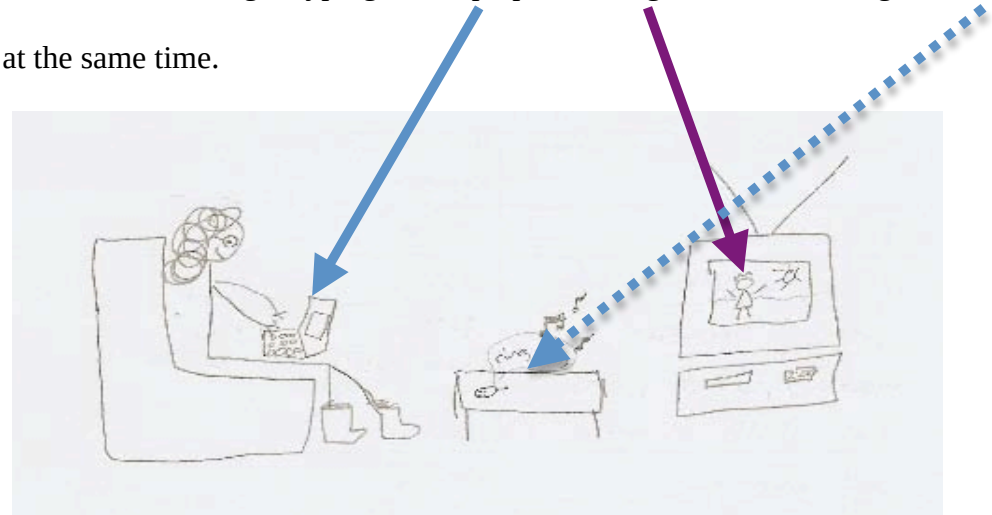


Figure 4.4. A preservice teacher's everyday drawing that depicts multitasking.

Preservice Adoption of Everyday Technology Instruction

In this section I address the second research question: how can I, as a teacher educator, use my preservice education courses to foster change in preservice teacher

beliefs regarding everyday technology instruction? To address this question, I present the findings concerning the entering preservice teachers who adopted and did not adopt everyday technology instruction during the six-month education technology course. I also present the results for preservice teacher age and secondary content specialty as potentially related on adoption or non-adoption.

During the Education Technology Course, did the Preservice Teachers Adopt Everyday Technology Instruction?

While the preservice teachers entered their teacher education program not considering everyday technology tools in their future teaching, by the end of the six-month technology education course 87%, or 39 out of 45, of the preservice teachers demonstrated some form of adoption of everyday technology instruction. All the preservice teachers fell into one of five "adoption" groups; 10 were early adopters, 5 were middle adopters, 13 were late adopters, 11 were interested adopters, and 6 were non-adopters. Despite the same curriculum and similar academic experiences in the education technology course, the preservice teachers did not all adopt at the same time, while some adopted the first day of class, and others never adopted. Next I will describe the characteristics of each adoption group.

Early Adopters

Early adopters declared the significance of everyday technology instruction in their future teaching between July 2006 and the end of August 2006. Blog Post 4.1 represents an early adopter at the point of adoption, which was their first blog post in July 2006.

Blog Post 4.1
Early Adopter (Cory, July 11th 2006).

Text that hints at adoption	Why this is adoption
"I am excited for Ed Tech class in the sense that I hope to be able to bring pedagogical techniques integrate technology into my future classrooms. I am particularly interested in harnessing extant student enthusiasm for the internet, cell phones, and personal .mp3 players and manipulating these tools for further learning."	By stating "I am particularly Interested in harnessing extant student enthusiasm for the Internet, cell phones, and personal .mp3 players", this early adopter immediately acknowledges her interest in using everyday tools such as cell phones and MP3 players in her future classroom teaching and learning.

Middle Adopters

Middle adopters declared the significance of everyday technology instruction in their future teaching between September 2006 and November 2006. Blog Post 4.2 represents a middle adopter at the point of adoption, which was their 7th blog post and second Fall blog post in September 2006.

Blog Post 4.2
Middle Adopter (Kimmy September 26th 2006)

Text that hints at adoption	Why this is adoption
"After having browsed through this weeks' recommended assignment, I'd have to admit that I don't think using video games as a tool for teaching English, etc is too far off. As the old saying goes, "when you can't beat 'em, join 'em!" This is how I feel about technology. First of all, it's not going far any time soon. If nothing else, technology is only going to become an increasingly intricate part of our lives.	The preservice teacher is expressing her belief that teachers will eventually be using video games to teach. In addition. she mentions, "when you can't beat 'em join 'em!" Demonstrating that she believes video games are "youth tools" but does not think they need to be banned from education, rather they should possibly be embraced by teachers.

“Secondly, kids love it! And since when did school hav be all about what kids didn't like? (ok, it's unfortunately been that way for a while - but largely due to images/ideas of school produced by the media - slightly ironic, n'est pas?) So why not bring what kids enjoy into the classroom?” I think that language learning is an especially great medium to use video games in. I think it would be great to have a video game about Napoleon's conquests that is conducted partly (or mainly!) in French. Or how about the Spanish conquest of Latin America in Spanish? Or even a video game about Greek Spartan/Athenian wars in modern Greek? Anything to get students to think in a medium other than English. Plus, I think that most kids would get a kick out of his/her Naoplean character saying "sacre bleu!", or the equivalent of "I will conquer the world!" in French - a little phrase that they could easily memorize and say to their friends that would spur interest in the language. But video games with languages would not have to stop there. In fact, most foreign language textbooks have websites that students can log onto and play grammar, vocab, speaking and writing games on. Granted, they're not as fun as war games, but they still make learning a little bit more interesting than your run-of-the-mill grammar lesson on the overhead projector.”	The preservice teacher is expressing her understanding that “kids love” video games, and, therefore, how bringing the games into the classroom may be a positive learning experience for students. In addition, she is giving examples of how videogames could be useful in learning new languages.
“Video games in foreign languages - as they say in Fren suis pour! (I'm all for it!).”	An overt expression of wanting to use video games in her own teaching.

Late Adopters

Late adopters declared the significance of everyday technology instruction in their future teaching at the end of the course in December 2006. Blog Post 4.3 represents a late adopter at the point of adoption, which was their 12th blog post in December 2006.

Blog Post 4.3
Late Adopter (Lou December 14th 2006)

Text that hints at adoption	Why this is adoption
"The more I thought about it, the more I started to realize and ponder how many other technologies that we could be using in the classroom that are essential to learning and improving our own teaching styles, but we just do not know about them."	The preservice teacher recognizes fact that technologies that are not traditional in the classroom can also be used for learning.
"How about AIM? Could we use AIM with another class daily to improve language? There are probably countless technologies that we are missing out on that we may find later are essential to our teaching styles and goals. So, keep looking! Go to that workshop about Smartboards or using AIM in the classroom. The more we learn, the better the teacher we will become."	The preservice teacher mentions using the popular student instant messaging tool AIM (AOL Instant Messenger) as a potential learning tool. The preservice teacher again mentions that there are other tools that may also be helpful in teaching and would like to learn about them. He declares his openness to learning more about non-traditional technology tools for teaching.

Interested Adopters

Interested adopters never declared adoption, but they never stated that they were opposed to everyday technology instruction in their classroom teaching. Therefore, they are in a state of limbo. Blog Post 4.4 is an example of an interested adopter's final reflection at the end of the course. The interested adopter does not overtly reject everyday technology, yet they also do not overtly accept it; rather, at the end of the reflection, the preservice teacher states, "These are the sorts of questions I am left with." I inferred this final statement to mean that they were interested in potentially adopting everyday technology instruction in the future, but not ready by the end of the education technology course.

Blog Post 4.4:
Interested Adopter's Final Reflection Piece (Christie, December 15th)

Text that hints at being interested in adoption but still uncertain.	Why this is interested adoption
"Through observation in my placement and time spent in my tech internship, all of the use of technology I have seen has centered around one main goal—to engage. The examples of educational technology usage I have seen in my placement have been few and far between. The main instance focused around a presentation one class did on the Dark Ages in England and around the world. My mentor teacher had originally planned for them to do traditional (i.e. book-based) research in the school library, but circumstances forced her to have her students do online research in the computer lab. She encouraged their search for interesting pictures and later admitted that her students got more out of it because of their enthusiasm for using the computers. when it came time for students to present what they had learned, my teacher decided to have them use PowerPoint. students were thus able to look at the television screen projecting the image of the presentation rather than just watching people stand in the front of the class and talk. The class ended up much more engaged in this presentation because of the use of PowerPoint and the computer/television connection."	The preservice teacher gives examples of positive lessons she has participated in or observed with technology in the classroom. Showing her understanding of how the students were more "engaged" by using these technology tools.
"My technology internship made the benefits of using technology to promote engagement even more clear. The teacher I worked with there used technology on a number of occasions to keep students engaged. Oftentimes, the concept she was teaching, whether it be parts of speech or verb tenses, could have been taught without the use of technology. However, by using online Mad Libs or a CPS unit, students became highly engaged and motivated in what they were learning. Students were much more enthusiastic, attentive, and cooperative when they had this level of engagement. I feel that this was a much more effective way to teach these often dull concepts. Even my own plans have revolved around engagement. My school has a Smartboard that no one uses, and I recently (after experimenting with one at Stevenson Middle School) got the idea to use it for paper editing. One could put a paper up on the screen and "write on it" to make editing papers more fun and engaging for students."	The preservice teacher gives more examples from her student teaching experience where students' did become more engaged and motivated by the technology tools. She even gives an example of her own use of a Smartboard to help engage students.

"However, I can't help but wonder if I'm missing somethi engagement really the only purpose I can see technology used for? Are there some things which cannot be taught without using technology? I'm sure that there are; I just haven't yet seen a project that develops those skills. In my Smartboard plan, I wonder if there really is additional benefit to making physical marks on a screen. Is there an argument that the kind of physical action involved reinforces the knowledge, that a student crossing out an unnecessary apostrophe will learn punctuation rules better simply by making that mark rather than just saying that the apostrophe is out of place?"	The preservice teacher questions whether engagement is the only purpose for using technology tools in teaching. She is questioning what other benefits there are to using technology in teaching. She is also not mentioning specific everyday technology tools. Demonstrating that she is still grappling with the purpose and usefulness of technology in teaching.
"I am also troubled by limited resource. _____High School is by no means the poorest school in Michigan and we don't have nearly as many computers as we need. How much worse must it be in De If technology creates these new skills, what happens to stu who cannot access this technology? Are there other ways t create the sort of engagement I describe, and are they better? Moreover, are there ways to combine these additional methods with technology to create super-engaging lessons? These are the sorts of questions I am left with."	By ending her blog post with "these are the sort of questions I am left with." She demonstrates her uncertainty about technology in teaching.

Non-Adopters

Non-adopters overtly declared by the end of the course that they were not going to use the everyday technology tools in their future teaching. Blog Post 4.5 represents a non-adopters final blog reflection post on December 14th. The non-adopter clearly states, "I think the use of cell phones in schools is causing a major problem in schools." There is no evidence that she has adopted the idea of using these tools as learning tools for her future classroom teaching.

Blog Post 4.5
Non-Adopter (Rena, December 14th 2006)

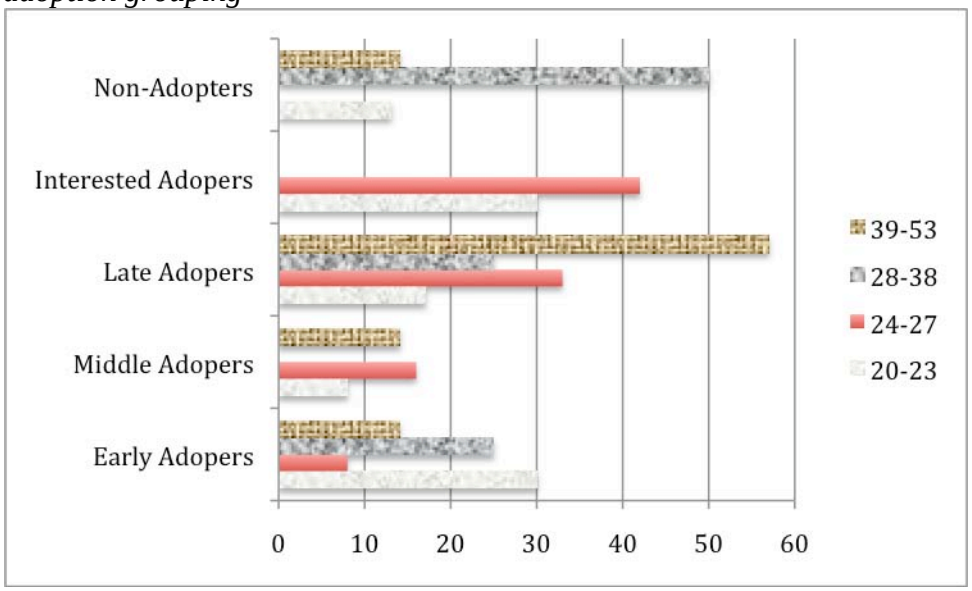
Text that hints at non-adoption	Why this is non-adoption
"A setback I have noticed in my placement classroom with technology is the aspect of student laziness. Students moan and groan when they have to take hand written notes, do written assignments, or do research assignments where they can not use internet resources."	The preservice teacher immediately identifies "Internet" resources as a problem that contributes to students being "lazy".
"Besides computers, I think the use of cell phones in schools is causing a major problem in schools. In every class, there are students pulling out their phones, text messaging friends before class begins, and occasionally phones ringing in the middle of class."	The preservice teacher overtly states that cell phones are causing "major problems" in schools.
"Though our school has a "no cell phone policy" during class hours, students don't always follow it as they should. With the explosion of cell phone users, I think this will only become more of a problem as time goes on."	The preservice teacher thinks cell phones will only create more problems in schools in the future.

Did Age Play a Role in Adoption?

I examined a number of factors that might be related to adoption, one of which was age. Since a preservice teacher's age often relates to their own schooling experiences with technology tools inside and outside of the classroom, it was important to find out whether age played a role in determining if a preservice teacher adopted. Although the preservice teachers in this Masters and Certification program ranged in age from 20 to 53, because there were so few students in the study it is unknown if age would play a significant role in whether or not adoption occurred (see Appendix E for the summative matrix comparing the number of students in each age dimension). However, an interesting finding is that the oldest age group of preservice teachers was the group

found to be the most likely to adopt everyday technology instruction. According to Table 4.3, the highest percentage of adopters came from the 39 to 53 year olds with 86% of them adopting. It is also interesting to note that the majority of these adoptions were late adoptions. While about half of 20 to 38 year olds adopted, the youngest group, 20 to 23 year olds, dominated the early adoption group. Additionally, the youngest group also had the highest percentage of interested adopters who were still considering adoption at the end of the education technology course.

Table 4.3
Comparison of the % of preservice teachers in each age dimension and where they fell into adoption grouping

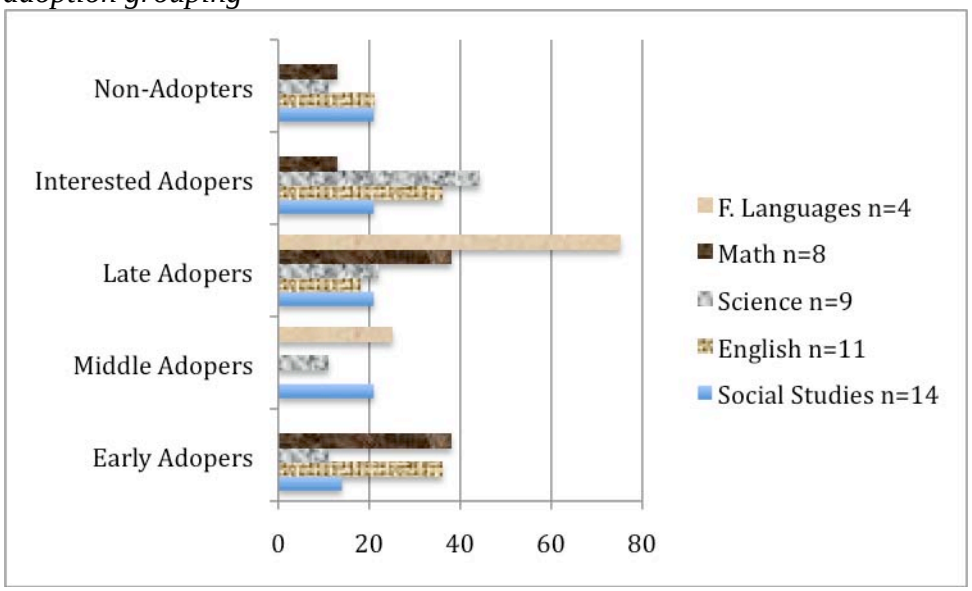


Did Content Specializations Play a Role in Adoption?

Besides looking at age, I was also interested to determine if a secondary preservice teacher's content area of expertise may have played a role in determining adoption (see Appendix E for the summative matrix comparing the number of students in each content area). I found that content specialization did seem to play a minor role in whether or not adoption occurred. According to Table 4.4, Mathematic and Foreign

language preservice teachers tended to adopt fairly consistently with 75% of Math specialists adopting and 100% of future Foreign Language teachers. In social studies and English content areas only about half adopted (57% and 55% respectively), with future science teachers being the least likely to adopt a philosophy of everyday technology instruction with less than half adopting at 44%.

Table 4.4
Comparison of the % of preservice teachers in each content area and where they fell into adoption grouping



Reasons for Adoption

The following section addresses the final research question, if belief change occurs in the preservice teachers, can we pinpoint how and when it occurred? To answer this question, I focus this section on the 39 preservice teachers who adopted everyday technology instruction and the reasons they gave for their adoption. Although there was not a "magic bullet" strategy or tool that caused immediate adoption of everyday technology instruction, there were 10 significant course activities or experiences that played a role in adoption for many of the preservice teachers. Since students

demonstrated adoption at different times throughout the course, all 10 activities will be highlighted in this section.

A Philosophical Foundation: Teaching with Everyday Technology Tools for 21st Century Students

The preservice teachers in each adoption group had different reasons for adoption. For example, every preservice teacher in the early adopter group cited philosophical reasons for adoption. Early adopters often cited the course syllabus, the first couple of articles concerning everyday tools that they read, or a class discussion about 21st century students and their tools. Figure 4.5 shows a timeline concerning the moment in the education technology course that each of the 28 preservice teachers adopted, and what class activities they cited in their adoption blog post. In Figure 4.5, the EA represents the early adopters, and the aquamarine blue line next to each early adopter represents the early adopter citing a course article/discussion/syllabus around the philosophical understanding of using 21st century students' everyday technology tools. By all of the early adopters citing the importance of philosophy around 21st century student technology, it may mean that some students enter their teaching program already "predisposed" to accept the 21st century student and their everyday tools. Therefore, an article or discussion that introduces everyday technology instruction is all the early adopters need to accept and adopt everyday tools as potential tools for their future teaching. In Blog Post 4.6, early adopter Dannie cites an article from the initial course readings as a reason to adopt 21st century everyday technology tools in her future classroom teaching.

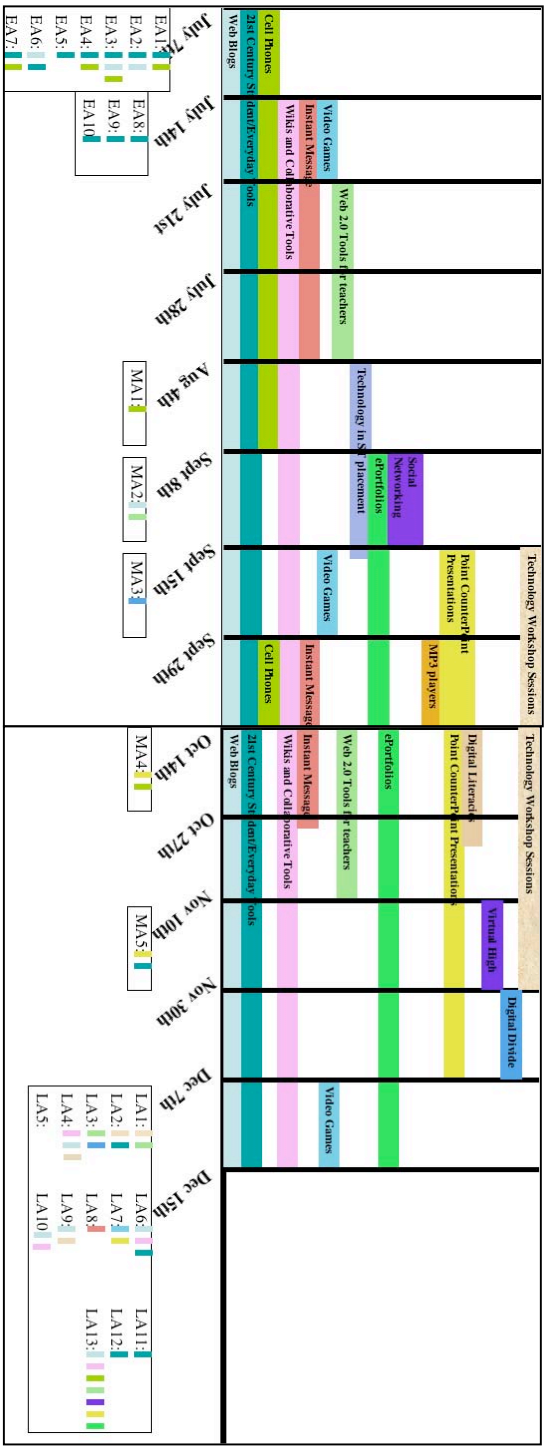


Figure 4.5. Timeline represents the blog post date when each preservice teacher adopted (EA=Early Adopters, MA=Middle Adopters, LA=Late Adopters). Additionally, it shows the class activities that occurred between July 2006 and December 2006. Each class activity is color-coded. Using the color-coding next to the adopter also shows the class activity that the preservice teacher referenced when adopting. For example, EA1 referenced the readings on 21st century Tools and Cell Phones in Learning.

Blog Post 4.6
Evidence of early adopter's (Dannie, July 14th 2006) appreciation of the necessity of technology

"The comments following the "A Pencil Is a Word Processor" article made for some great reading. I'm getting afraid that fellow teachers will be one of the greatest obstacles to technological advances in schools. I can't say I blame them, because after a few years, I may find it frustrating to continue learning the latest technologies. But I think it's necessary if we want to speak the same language as students and teach them from as many angles as possible."

Additionally, early adopters displayed less skepticism of class activities and everyday tools introduced throughout the course, probably because they "bought in" to the everyday instruction within the first month of the course. Early adopters mentioned the introduction articles and class philosophy of 21st century digital student more than any other group, and they had the most posts concerning an understanding of the 21st century student and their everyday tools (see matrix in Appendix P). Early adopters had the least amount of off-topic posts from any adoption group and 83% of their off-topic posts came before October 1st (see matrix in Appendix P). Early adopters had the highest percentage of positive posts concerning the everyday tools introduced in class and the highest percentage of class connection posts that occurred before October 1st. Early adopters had the majority of their light-bulb moments before October 1st, early on in the course, demonstrating their moments of change or "ah ha" came early in the course as they adopted early (see matrix in Appendix P).

Exposure to Everyday Technology Tools in the Learning Setting

While early adopters overwhelmingly relied on philosophical reasons for adopting everyday technology instruction, middle and late adopters needed more than an article or class discussion about everyday technology instruction in order to adopt. Instead of

course philosophy or an article about everyday technology tools, the preservice teachers in the middle and late adopter groups most often cited specific class activities using everyday tools that led to their adoption. The timeline of adoption in Figure 4.5 shows that of the 18 middle and late adopters, only 5 of them cited philosophical reasons for adoption, while 15 of them cited specific class activities with everyday tools. For example, in Blog Post 4.7, a middle adopter cites a tool called Gabcast, which couples with cell phones to create podcasts. This is a direct result of an activity from their education technology course with cell phones and Gabcast. This demonstrates that an article or discussion about everyday tools may not be enough to convince middle and late adopters to use everyday tools in the classroom; they needed to see examples of how everyday tools could be utilized in order to adopt.

Blog Post 4.7
A middle adopter (Kimmy, September 26th, 2006) cites a class activity with cell phones that helped lead her to adoption.

"So, I just finished checking out the Gabcast website - very cool! I thought I'd bullet point the interesting facts that I found for the few faithful who read my blog (Liz..)...

* First, it's totally cool how a person can record for an extended period of time. I could really use this as an assignment for my more advanced French students! And honestly, speaking in another language for 5-10 minutes non-stop on a consistent basis (like once a week) will really improve a person's overall language capability. I'm seriously considering using this next semester =)

* Second, I like the three-tiered system that they have. If you only want a few megabytes of storage, it's free. If you want your "channel" to be private and a few more mb's, it's $6/month. The last tier is even more mb's with a few other bells and whistles for $12/month. I think I'd probably use the $6/month one (for a bit of privacy) for my classes.

* With my own personal "channel", I could record greetings for those who wanted to leave messages (my students). A person could also give interviews or be a "citizen reporter", something I haven't quite figured out yet."

Additionally, Middle and Late adopters displayed more skepticism in their blog posts, probably because they did not immediately adopt. Unlike early adopters, middle

and late adopters did not give only positive reflections on the everyday tools introduced in class. They had some negative posts on these tools, showing their skepticism of the potential of the tools in the classroom. Middle and late adopters also had more light-bulb moments and class connections than early adopters (see matrix in Appendix P). Late adopters had the most off-topic posts of any adoption group and they were mostly in the early portion of the course. This demonstrates their non-adoption status at the beginning of the course and the need for more than a reading on philosophy to "buy in" to using everyday tools. By the end of the course, late adopters had very few off-topic posts. Late adopters displayed significantly less occurrences of being aware of the 21st century student and their everyday tools than early and Middle adopters, although they did have more occurrences than non-adopters. Additionally, only 20% of late adopters displayed "awareness" in their first or second blog post in July (see matrix in Appendix P).

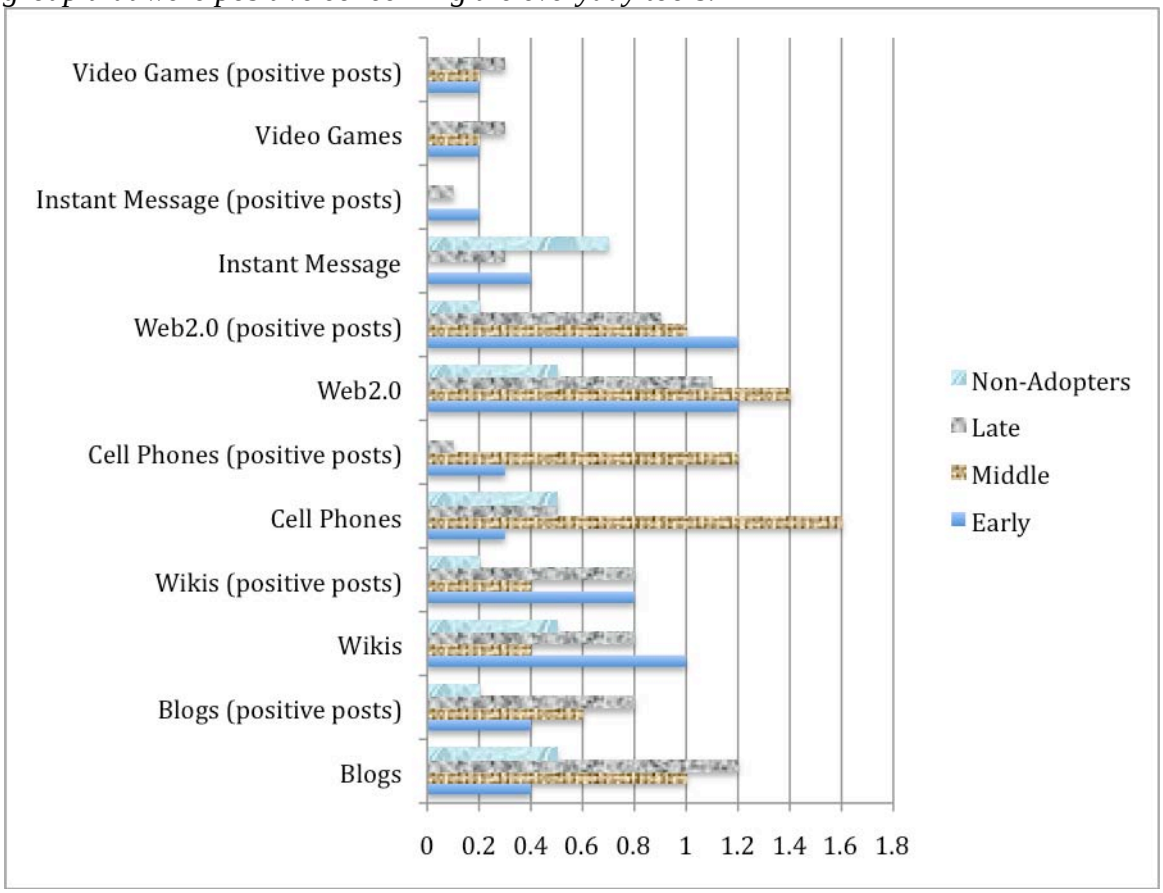
Exploring Wide Variety of Everyday Tools

As previously mentioned, no one specific everyday tool led to adoption for any group. This is known because each adoption group had its own unique "most" mentioned everyday tool in their web blog posts. For example, in Table 4.5, each adoption group had the most posts (positive or negative) concerning different everyday tools; early adopters posted most about Web2.0 tools; middle adopters posted most often about cell phones; late adopters posted most often about web blogs. Additionally, each adoption group had the most positive posts concerning different everyday tools; early adopters had the most positive posts about Web2.0 tools, cell phones, blogs, and video games; middle adopters had the most positive posts about wikis and video games; late adopters had the most positive posts about web blogs. Each adoption group had the most negative posts

concerning different everyday tools; early adopters had the most negative posts about instant messaging; middle adopters had the most negative posts about web blogs; late adopters had the most negative posts about wikis and video games. Given that the most posts (positive or negative) in each adoption group concerned different tools, I found no evidence that a specific everyday tool had a greater impact on adoption than other everyday tools.

Table 4.5

The average number of posts for students in each adoption group related to the everyday tools studied in class. Also, included are the average number of posts in each adoption group that were positive concerning the everyday tools.



Exploring Everyday Technology Tools Multiple Times from Different Perspectives

Some preservice teachers who adopted did not adopt until after multiple interactions with an everyday tool, one blog or one wiki experience were not enough for

them to “buy in” to the idea of using the tool in their future classroom. For example, in Blog Post 4.8, an early adopter, Marsha, had a change of opinion concerning wikis. When she was first introduced to wikis, she was uncertain of how they would have educative value in her future teaching (see July 18th post). After participating in a class assignment where resources were gathered in a “treasure hunt” on a class wiki, she changed her opinion (see August 2nd post)

Blog Post 4.8
Early adopter had multiple interactions with a tool before adopting. (Marsha, July 18th, 2006).

“I guess my trouble with wikis in class is their exact purpose? I really like the idea of having a community learning space but I am unclear as how exactly they would be used. I know when I was in high school I never used webpages that my teachers said that we could post on and so I think motivating students to actively post would be difficult. I am interested in learning more about how wikis work and the research that has been done that supports this in the classroom.

I am forgetting exactly what we talked about on Friday (it's been a long weekend..) but I am enjoying learning about the various uses of technology and am looking forward to learning more.

It seems there is a place for collaboration and sharing and a place for private thoughts. I'm wondering how others feel about public journals, or if anyone has examples of public journals that worked well...”

(Marsha, August 2nd , 2006)

“This blog comes after I have spent some time trying to find a resource for my Web Treasure Hunt project. Although I have not yet decided on which resource to use I am going to add to our class wiki, I am impressed with the variety of resources my classmates have added thus far. Just browsing through I see that many of the sites will be very useful when I start to plan my lessons and move towards having my own classroom. The idea of a wiki for a use such as this is a really great idea. I can see this as being very useful in my own classroom as I could have students contribute in order to facilitate learning for the entire class. I appreciate that this project will be beneficial to our teaching careers and it is something that I think I will use in my own classroom.”

Students Using and Modeling Authentic Everyday Tool Activities that they Could in Turn Recreate with their own Students in their Student Teaching

In the technology education course, the preservice teachers not only interacted with everyday technology tools, but they also participated in modeling of lessons to demonstrate authentic ways to use everyday tools in the learning setting. The models were based on activities that the preservice teachers could actually replicate in their own K-12 teaching. For example, in the technology education course the preservice students were asked to maintain a web blog throughout the entire course, as a result some preservice teachers decided to "adopt" the same course methods of an informal web blog reflection in their own student teaching placements. In Blog Post 4.9, Emmie, an early adopter declares her excitement about creating a "new blog" to use with her students in her student teaching classroom.

Blog Post 4.9
Early adopter (Emmie, December 15th, 2006) final reflection post on how she is excited to start using web blogging in her student teaching placement.

"So I'm jumping on the blogwagon for real now, with my new blog that I expect to maintain this year.

Thanks, --- and --- I really feel like I left Ed Tech with ideas I will use in the future and products (like my e-portfolio and teaching website) that I am proud of. Great job!

I'm also think about having students submit final term papers on a class blog, where they will all be 'published' eventually."

Informal Web Blog Journaling

The education technology course allowed students to reflect each week on topics of their own choosing, hoping that they would focus on teaching with technology experiences and issues. Often, the web blog journal seemed to help some students reflect and eventually use these reflections as a trigger for adoption. One example is late adopter

Kendra. In Blog Post 4.10, she describes how going back through all of her blog posts for the semester allowed her to see how her experiences and thoughts on everyday technology tools led to her adoption.

Blog Post 4.10
Late adopter (Kendra, December 14th, 2006) reflects on all of her web blog entries and uses those reflections to justify adoption of everyday technology instruction.

"I have had plenty of opportunity to reflect upon the usefulness of technology in the classroom. Reading over my weblog postings for the last five months filled me with conviction that technology is in fact, desperately needed in the classroom. Nearly every single post that I wrote discusses some way that the "technology of the week" that I was working on would benefit students. Some of these benefits were hypothetical, but still accurate. For example, I wrote about how a class wiki, or any other type of online discussion forum could provide students with a means of participating in class without the pressure of speaking in front of 30 people. I know that technology would provide students with a much needed outlet in that situation. My weblog also contains postings about the concrete benefits of technology in the classroom, namely increased student engagement. This is a trend that I have actually seen in action. I described one class that was really lacking in student engagement for weeks. The students displayed only partial interest in classroom activities. However, one lesson plan which included a video and music, captivated these students to such a degree that they were actually singing in a class that they had been loathe to even speak in before.

These are only two examples of the wonders I've seen technology work in the classroom. I cannot describe how differently students behave when a teacher uses a PowerPoint slide show to accompany a lecture instead of simply lecturing. Thus, even the simplest incorporations of technology are a welcome sight for students. Whether technology is just inherently more interactive than other mediums of instruction, or we are simply working with the digital generations in schools today, I know now that a good teacher must incorporate technology into the classroom.

During this Educational Technology course, I have regularly reflected upon the technological teaching tools to which I have been introduced. To read my in-depth reflections on these various topics, please visit my weblog:"

Exploring Controversial Issues Related to Everyday Technology Tools in Schools

In the technology education course, the preservice students participated in Point & Counterpoint debates where they were responsible for presenting multiple facets of a controversial issue surrounding many everyday technology tools. Allowing the students to explore multiple perspectives on a controversial issue in technology education, such as

using cell phones for learning in schools, allowed some of them to see a new point of view, and led some to adoption. For example, in Blog Post 4.11, middle adopter Ellie found that the cell phone Point & Counterpoint debate presentation gave her a new perspective on a tool that she thought had no educative value. Additionally, in Blog Post 4.12, late adopter Vicky found the wiki Point & Counterpoint debate presentation useful on giving more ways to use Wikipedia as a research tool.

Blog Post 4.11

A middle adopter (Ellie, December 14th, 2006) found the class Point & Counterpoint debate presentation changed her view on cell phones as a learning tool.

"I also especially enjoyed the point-counterpoint presentations. My group's topic, cell phones in the classroom, helped me to see the educational value of an often annoying piece of technology. The digital divide presentation taught me about the One Laptop Per Child project, which I found astounding. I felt excited to be part of an era of such rapid technological advancement and increasing accessibility to people across the world.

Change is always hard to implement. People become set in their ways, the learning curve becomes steeper and motivation is not always there. However, in some cases, there are no excuses. If we as teachers can utilize tools that will make our students more enthusiastic about learning, then we absolutely must do so. We owe it to our students to change with the times and to learn all that we can in order to make our classrooms current and interesting.

I know that I underwent a drastic change in attitude with regard to using technology in the classroom over the course of this semester. It went from a seemingly insurmountable task to something I look forward to utilizing in my own classroom."

Blog Post 4.12

A late adopter (Vicky, October 18th, 2006) found the Point & Counterpoint debate on wikis give her a new perspective on how to use Wikipedia as a learning tool

"We had two really great presentations this past week. Both raised the bar for 504 point/counterpoint presentations by using technology to raise questions about technology. They were well-researched and well thought out in terms of presentation. I was especially interested in the presentation on Wikipedia. It gets a little tiresome hearing people dismiss it as a useful tool, while at the same time using it regularly. As I said in class, I think Wikipedia stands out from other attempts to do "familiarizing" on-line research in that it is very transparent about its methods and levels of accuracy. It allows the reader to judge for herself the credibility of what she is looking at, and provides links to many other sources for further reference. I think the class fairly concluded that Wikipedia is a

useful starting tool for research but should not be relied upon exclusively to fully understand a topic."

Opportunities to work with and observe teachers at the university and in K-12 schools in an internship setting, who are using everyday tools in their teaching

While the direct class activities may not have caused adoption for all students, many middle and late adopters were influenced to adopt by interactions they had in K-12 schools and other non-technology education course settings. These experiences were the result of an internship set up as part of the technology education course, where the students could observe, participate, and even create learning activities that centered around everyday tools in authentic settings. For example, in Blog Post 4.13, late adopter Lou wrote about how his experiences with instant messaging in his internship helped led him to adoption.

Blog Post 4.13
A late adopter (Lou, December 5th, 2006) describes how his interaction with instant messaging in his internship has led to adoption.

"I am writing this post, because I am looking for ideas on how I can help incoporate my friend, an English teacher in Germany, into my own classroom. We learned about the use of AIM in our classrooms in my LRC tech internship. We could take AIM, and build actual chatrooms that we could then use to speak in groups. You could assign people groups and then have them perform an exercise.

We, the four of us, worked individually, and created chats with certain people and then "looked for an apartment." We were each given a card that said what we were looking for; I was searching for an apartment on the ground level, that was in the city and was under a certain amount per month. So, I asked my chat buddies and if we were in an actually classroom, could have been doing a real world thing while practicing my German skills. If you as the teacher wanted to come in and actually help the students by correcting or giving advice, you could also enter the particular chatrooms. I thought it was a great exercise.

I would like to do that with my class and his class - one time they could look for something in English and other times we could look for something in German. Then the teacher would not even have to "butt in" because the students could be essentially correcting each other since they are more or less experts in their native language. We could have four people in a chat - two english, two german and they could work that way. That would be how we could use AIM."

Encouraging Preservice Teachers to Explore Technology in their Student Teaching Placements

During the entire education technology course, the preservice teachers were already placed in their student teaching classroom. The technology education course took advantage of this placement by allowing the students to participate in technology-related activities in their placement. This also helped connect the class activities and philosophy of everyday tools with real-world practice. One example of how their student teaching placement helped lead students' to adoption is in Blog Post 4.14 where late adopter Marg decided to attend an in-service on web blogging at her student teaching placement to see her the school's perspective on the tool. This experience helped her conclude that web blogging was something that she was motivated to learn how to use. These types of interactions documented in the web blog journals by the preservice teachers demonstrates how student teaching placement activities with everyday tools can reinforce and help to authenticate that everyday tools can be useful learning tools.

Blog Post 4.14
A late adopter (Marg, September 2nd, 2006) describes her experience with an inservice on blogging at her student teaching placement.

"In my new role as preservice teacher at ----------High School, I had the opportunity to attend an inservice on Blogging. I guess this is technology that my mentor teacher is interested in learning, and it made me sit up and take notice. It turns out ------- is a tech educator's dream district. They have in their mission statement something about being innovators with technology and education, and seem to own and have rights for everything from software to internet sites, to video streaming sites, etc. I learned you can take your pick of on-line grading systems, website makers and probably much more. The blogging seemed to be something that a lot of teachers wanted to incorporate in their classrooms, and I was so glad I knew what it was. I also read in Edutopia about how Blogging is the hot new word in education. Blogging came up enough in August that I'm motivated to learn how to do it well."

Another activity that the students participated in at their placements was allowing the preservice teachers to investigate the technology resources available, the legal issues, and the role of the technology personnel at their student teaching placement. This opened many of their eyes to what the veteran teachers were unaware of, and created opportunities for the preservice teachers to contribute their new everyday technology knowledge to their cooperating teachers. For example, in Blog Post 4.15, early adopter Amy learned that her cooperating teachers had never heard of collaborative wikis and took the opportunity to teach her cooperating teacher how to use them. Another example is in Blog Post 4.16 where early adopter Natasha not only taught her cooperating teacher about wikis, but also inquired about integrating them in future class activities. Additionally, in Blog Post 4.17, early adopter Cathy found that many teachers and administrators in the school were unaware of current technology legalities and resources, and she suggested they use the class survey as a tool for the teachers in their own school district.

Blog Post 4.15
An early adopter (Amy, September 12th, 2006) describes teaching her cooperating teacher about wikis

"Going through the technology survey with my mentor teacher made me feel much more techno-savvy than I usually do. (I guess everything is relative.) My teacher had never heard of blogs or wikis - her reaction when she heard Nese and I talking about a wiki was "A what?!?" - so I had to explain the concepts to her. I showed her our class wiki, and she thought it was great. She seemed to sense immediately that it could be a useful resource for a class. This little interchange was an example of the old (but still true) idea that teaching something actually helps you reinforce your own understanding of it. Now that I've taught someone else what wikis are, I feel more like I "own" my knowledge about them: I have a handle on it, and I can pass it on."

Blog Post 4.16

An early adopter (Natasha, September 18th, 2006) taught her cooperating teacher how to use wikis and suggested integrating them into the classroom

"I must admit, I was surprised at what I found at ----- High. Strikingly, as far as actual equipment, the school library was equipped with almost, if not all, of the items on the list! Mr. ---- is not trained to use a few of the items, including the LCD projector, which I didn't know of a special training for! He seemed to be quite skilled in the technological area, but he readily admitted that there were some things he'd like to know more of. I went to him to ask about the restrictions on the internet service, and many of the items he'd not heard of before. I took the opportunity to show him our class wiki, and explain to him how it worked. I hoped that he would see something that could be added to the schools internet activities."

Blog Post 4.17

An early adopter (Cathy, September 13th, 2006) was able to suggest technology management changes for her student teaching placement by using the education technology class activity survey

"When doing the technology survey this week, I was surprised to discover that it was very difficult to hunt down the acceptable use policies for -------- and the -------- Public Schools. Moreover, even the principle seemed a little unclear as to whether or not the school had an intranet and whether pictures and names could be posted on it. I was a little surprised at the degree of non-awareness of technology at --------. Some of this could be due to the reshuffling of the IT staff at the ---------- Public Schools in response to budget cuts. I made the suggestion to the IT staff member that I spoke with that they could use our technology survey as a framework for a handout to give all the teachers so they would be aware of the technology available to them. From reading -------'s blog it is clear that the teachers at ---------- High are kept better informed about IT at their school, since they have an entire meeting devoted to teaching them about it. Perhaps this goes on at ---------- as well and I have just missed it. Anyway, I wonder how easily other students found the information for the technology survey at their schools, since it was not easy at ----------."

Non Adoption

There were six preservice teachers in the study who overtly stated in their web blog that they were not interested in adopting everyday technology instruction. This section will highlight the characteristics of these six non-adopting preservice teachers.

What Were the Characteristics of Preservice Teachers Who Did Not Adopt?

Non-adopters showed a general disinterest in class activities or everyday tools for the everyday student. Non-adopters had the fewest "light-bulb" moments, class connection posts, and the fewest posts demonstrating an understanding of the 21st century student and their everyday technology tools. Non-adopters also had the highest percentage of off-topic posts of any group. They mentioned the everyday tools the fewest number of times compared to the other adoption groups, and they had the fewest positive posts for each everyday tool mentioned.

What Were Early Signs of Non-Adopters?

While it is probably unlikely that every student will adopt in any teacher education course, ideally that is the goal. In order to help non-adopters, teacher educators should look for the early signs of non-adoption in their courses. These early signs of a non-adopter include: many off-topic reflections, negative or no mention of the everyday tools from the course activities, and no mention of the 21st century student and their everyday tools. Most of the non-adopters displayed these signs early in the course. For example, in Blog Post 4.18, I display the first four or five blog posts of non-adopter Sarie (see Appendix S for another example of the first four posts of non-adopter Jill). The non-adopters tended to have similar patterns, where their initial posts include discussing a few general technology issues from class, mentioning their excitement for the course, and by their fourth or fifth blog post they are completely off-topic and making comments unrelated to technology and teaching.

Blog Post 4.18
Non-adopter Sarie
Sarie's 1st blog post
This is one of her few posts where Sarie is on-topic mentioning course activities. Sarie shows much curiosity about technology tools mentioned in class. She is excited and looking forward to interacting with the tools. She also mentions her lack of technology knowledge.

Wednesday, July 12, 2006
"Here's what I learned on Day 1: I don't know much about technology. I know that I don't have an I-pod or a blackberry, and that I still have a tape player, but I had no idea how clueless I really was. I had a lot of trouble thinking about what I would want in my classroom...heck, I'll be happy with a tv. Apparently there are things, very cool things, that I could have or at least wish for. Software to help with grading would be amazing...especially since I am not a big fan of figuring out percentages. I want my students to interact with students far away..I don't know if that's software or a computer game...I just want it. I am very curious to find out about all these new and exciting tools. The projects seem like they are going to be interesting and fun. I think this class will prove to be a really great experience and I think we'll have a leg up on the competition! Wait...can i get a coffee pot in my room too?"

Sarie's 2nd blog post
Sarie's 2nd post does mention technology and even some everyday technology tools such as iPods and cell phones. They are all mentioned in a negative tone. She does not mention any course related activities nor does she connect the everyday tools with learning.

Friday, July 21, 2006
"I just spent a very fast, but fun weekend in Lake Tahoe. This was my family's latest pilgrimage to somewhere awe-inspiring for a little bit of relaxation, eating, sight-seeing, eating, and bonding. I should explain my family a bit first. I have 3 uncles, 2 aunts and 6 first-cousins. Uncle #1 works for AOL, uncle #2 works for the college of Tropical Agriculture at university of Hawaii and uncle #3 is a software consultant...he is also a UM grad who worked for Ann Arbor software and invented a computer game that I have never played. My point is...they live technology.

We arrived at our condo, perhaps compound is a better word, with no less than 4 laptops, countless i-pods, something called a treo that beeped whenever my uncle got an email, cell phones for everyone over 14 and 2 GPS units. I shouldn't be surprised and yet I was. Uncle #1's wife edits for the Washington Post, so I guess she had to be "in-touch" or did she? Weren't we on vacation?

Tahoe is beautiful, peaceful, and even majestic (thanks to T.R.) Yet there was beeping, ringing and "I'm reading my email" expressions all weekend. It's impossible to be one with nature when your taking calls. Perhaps the hot tub I was in is slightly high-tech, but at least I could interact..right?

Now I'll admit, I love my cell phone. I have come to rely on it. But I love my family more. My favorite moment of the trip was when we played a simple trivia game that my aunt created. All the questions were about people in our family. We relied only on each other for the answers. We laughed over infamous moments in our history, like the time I didn't know who wrote Billy Bud and a trivia pursuit riot ensued. And we shed more than a few tears over my grandparents who passed only 3 months apart in 2004, and would have enjoyed every minute.

The best things in life, like Tahoe and my family, are just better without interruption."

Sarie's 3rd blog post

This post has very little to do with technology education and is mostly off-topic. The only mention of technology is at the very end when she mentions using it to communicate with her children. While she does mention technology in a positive light, it has nothing to do with education technology or the everyday tools from the technology education course.

Wednesday, July 26, 2006

"Miss Hannigan once sang, "Little girls, Little girls, everywhere I turn I can see them...Little girls, little girls, night and day I eat, sleep and breathe them"...

Such has been my life for the last 4 years...one little girl followed 16 months later by another one. Day after day of play-dates, sippy cups, Dora and Elmo. However, it's been a very different scene for us over the last 5 weeks. I actually set an alarm now and leave before they wake up. Yesterday, I got home around 5 p.m. and my oldest shouted "Mommy that was a short day!" It is? It felt like forever to me. Maybe kids really are as resilient as some say they are. Maybe my girls have adjusted to my absence already. It's possible that I am the only one who has yet to accept that the days of being at home are over.

When we start school again in September, my girls will live with their dad during the week. It's the only way that I can be in school until 8 o'clock and that they can be with a parent. While I am happy that I have the option, it's also breaking my heart. I lay awake wondering if my youngest will miss me or need me in the night. I think about my oldest getting angry with me and regressing or acting out. How do you make a toddler understand that one year is only one year in her very long life? How do you explain that mommy is doing this to make life better when life without mommy doesn't feel good? I have no clue.

This all brings me back to technology. The last time I posted I was in an anti-technology mood, today I feel like it's my ally. I know that come this fall I can call them every night or even send emails or e-cards. We've talked about getting a webcam so that I can see them before they go to bed. Of course it all pales in comparison to the real deal. But it might be all we've got at 9 o'clock on a Wednesday night.

There are moments that I want to quit, just so that I can be a "normal" mother again. Sometimes my stomach and my heart race each other....who's more anxiety ridden? During these moments I take a deep breath and think of next June. We've got to just get through this. Then, like Dora, we can say "lo hicimos!" We did it!

After all, one day they'll be teenagers, teenage girls, and I'll steal another line from Miss Hannigan..."Some women are dripping with diamonds, some women are dripping with pearls, lucky me, lucky me....look at what I dripping with....Little Girls"."

Sarie's 4th blog post

This post is her first truly off-topic post. She speaks of her interest in social studies, but not in anything related to the technology education course.

Friday, August 04, 2006

"This week in our ------ class we discussed popular misconceptions in our content areas. Those of us in Social Studies had a field day. Our list was a mile long and we barely scratched the surface. Examples were: Christopher Columbus was a great guy who discovered America..which by the way had no inhabitants. The conflict in Vietnam was won by the Americans. American entered WWII to free the Jews. These were just some of the misconceptions that we came up with. We realized that if other people were looking at our list we might be described as a bunch of pinko commies or at the very least, unAmerican.

That night, driving home I was listening to the day's news from Lebanon, Iraq and Israel. 60 people had died that day in Iraq and Lebanon had sent a record number of rockets into Israel. This was right on the heels of the tragedy at Qana where a laser guided missile hit a building filled with Lebanese civilians. Dozens of children were killed as they took shelter. It's impossible for me to imagine my girls and I having to take shelter from an attack, never mind the idea of being blown up. Furthermore, I don't understand the politics of hate or even the usefulness of war. Life's too short. We get one crack at this...Why make it miserable?

I did the only thing that would make me feel better. I ate. I stopped off at Trader Joes and bought a big chunk of Brie, some bread, a jar of blue cheese stuffed olives (notice a cheese theme), and two bottles of red wine. I got home and cranked the air up (to an acceptable degree, of course.) It was over 100 degrees and people were actually cooking to death here in the US.

As my boyfriend, ------ and I were eating, he said something about how lucky we were that we can eat the way we do. We don't have to walk miles for clean water. We can drink all the water we want to, right out of the tap. As we chatted, I was flipping through a magazine that is delivered only to people in my exclusive zip code. I always find the stories to be slightly trite, but this edition featured a woman who has parties for her king spaniel and his closest furry friends. Puke.

I felt exhausted by the heat, the bombs, the death and the party hats for dogs. It was one of those moments when if it wasn't for my addiction to the people I love, I would have thought about becoming a hermit in the middle of nowhere. I feel torn sometimes between a love for a country that I have always believed to be great and a country that makes me feel ashamed. As a teacher, I realize it's gone be very tough for me to keep these feelings in check. And maybe I don't have to.

Right now, I think everyone needs to take a cold shower and eat some cheese."

Sarie's 5th Blog post

Again, Sarah has a blog post that has nothing to do with teaching and technology, while it does show her interest in baseball, it also is very apparent that the course activities are not resonating with Sarah.

Sunday, September 24, 2006

"Today the Detroit Tigers clinched a spot in the playoffs. They haven't done this in 19 years...and I mean, 19 very long, disappointing years. My grandfather must be doing somersaults in his grave. My grandpa died in 2004, so he never saw another Tiger's Championship since the 1984 World Series. After '87 they were never really good again. Grandpa told me a couple years ago that a high school team could beat the Tigers. Not anymore.

I started thinking about how technology has changed since the days of "Tigers roar in '84"...

For starters, ticket sales can now be done online. Sure you can drive to the ballpark to purchase tickets, but that's only for people like my mother who still have dial-up and write checks. Now you can print off your E-ticket and walk right up to the gate. Then Comerica park employees use scanners to weed out counterfeit tickets. I'm not sure what they did in '84...maybe they used the honor system?

The ballpark itself has seen tremendous change. Comerica Park is a much different place than our beloved Tiger Stadium. The bathrooms are equipped with sensory toilets and faucets. I am also told that COPA has urinals and not troughs..which I understand is a bit of an upgrade. The day of the plain scoreboard is long gone (no pun intended)...now the scoreboard can be as entertaining as the game itself. A video screen dominates the outfield and can be counted on for instant replay and fan-cam. My grandpa would totally hate the scoreboard. I imagine he would accuse it of "muddying up the waters".

The suites in COPA, complete with plasma TV screens, didn't even exist in Tiger Stadium. And I have no clue how it works, but that thing that tells you how fast the pitch was thrown..that thing, that has to be new. I am barely scratching the surface with my list, and I haven't even mentioned that the beer garden sells Bell's Oberon, so feel free to post any that I have overlooked.

I was eight years old in 1984. I played atari, i wore leg warmers, and Chet Lemon was my favorite Tiger. The night the Tigers won the World Series, my family (minus my sister and I) went to the game. They returned with chunks of grass in their hands. To celebrate, my mom loaded us in her brown, Toyota corolla station wagon and we cruised Woodward. I actually remember being afraid of the "punk rockers" who were celebrating in the street. I imagine that if they should win this year, I will load my two girls into my red, Toyota matrix wagon and cruise Woodward. I also imagine that, to my kids, my hysteria will be considerably more frightening than any punker rocker.

Summary of Findings

In this study I found that entering preservice teachers do not consider students' everyday technology tools as potential or essential technology tools for their future classroom teaching. In addition, many entering preservice teachers are daily users of everyday technology tools especially cell phones and mp3 players. This highlights the disconnect between entering preservice teachers vision of appropriate technology tools for classroom teaching and the technology tools they use in their everyday lives.

After a six-month education technology course that infused multiple modeling and pedagogical methods for introducing everyday technology instruction into 45 preservice teachers, 87% of them ended up adopting or were interested in adopting the instruction. While the preservice teachers all gave reasons for adoption, there was not a "magic bullet" activity or tool that led to immediate adoption. But I did discover that the preservice teachers who did adopt, adopted into one of four groups; early (within the first few weeks of the course), middle (after the first couple of months of the course), late (within the last month of the course), or interested (leaning towards adoption but seem to need some more time). Additionally, those who adopted cited one of two reasons for adoption; a philosophical reason concerning the importance of the 21st century student and their digital tools or they cited a specific activity(s) around a particular everyday technology tool. Early adopters more often cited philosophical reasons while middle and late adopters were more likely to cite a specific class activity. There were ten activities from the education technology course which were described in some of the preservice teacher's web blogs as helping them to adopt an everyday technology instruction. In the next chapter I will discuss the implications of these findings.

CHAPTER 5: DISCUSSION AND IMPLICATIONS

Overview

The ultimate aim of this dissertation was to begin to understand how to better prepare preservice teachers to use everyday technology tools in learning, as a means of better preparing their future students for the demands of life in the digital age. In order to meet this objective, I began by examining entering preservice teacher beliefs concerning the technology they planned to include in their future classroom teaching. Next, I asked preservice teachers about the technology tools they use in their daily activities. Once I understood the beliefs of these beginning preservice teachers, I began implementing strategies in my preservice course on educational technology to help them develop their knowledge of everyday technology instruction. Ultimately, I found that many preservice teachers were able to adopt everyday technology instruction, and I was able to link changes in their beliefs to particular teaching strategies from the course (though it should be noted that there was not a "magic bullet" that led the preservice teachers to adopt everyday technology instruction, but rather a combination of strategies and activities). Additionally, since there were a small number of preservice teachers who did not change their attitudes towards everyday technology (did not adopt), it is important to consider what might be done differently in future courses to help lead them to adoption. In this chapter, I examine my original research questions, and re-examine my findings to see how well I was able to answer these questions. I discuss the implications that may be drawn from this study in order to help preservice and inservice teacher educators foster

everyday technology instruction in their students. I consider the limitations of this study and directions for further research in this area.

Discussion of Findings for Research Questions

Research Question 1: What Everyday Technology Knowledge do Preservice Teachers Bring with them into Their Teacher Education Program?

The findings reported in Chapter 4 indicate that entering preservice teachers of various ages, genders, and content specialties are using everyday technology tools in their daily lives. These everyday tools include cell phones, video games, mp3 players, and social networking tools. Despite their daily widespread use of these tools, these future teachers do not consider these everyday technology tools as potential learning tools in their future teaching, which indicates a disconnect on two levels. First is the disconnect is between the technology tools future teachers use in their everyday lives and the tools they envision as appropriate teaching and learning tools for classroom instruction. Then there is a disconnect is between their future students' everyday technology use and the technology tools they plan on using to teach these same students, consistent with previous research on teachers' attitudes towards everyday technology (Project Tomorrow, 2008). There are several plausible explanations for the disconnect. First, and probably most significant, is that previous research tells us that beliefs are formed from life experiences (Rokeach, 1972; Nespor 1987). Consequently, it is not surprising that the entering preservice teachers' prior experiences concerning everyday technology tools in teaching could easily be affected by the media, schools, and government's negative stance on these tools. The media frequently reports on abuses of web 2.0 tools, such as online predators in social networking sites, and on students using cell phones to cheat on exams

(Kirkpatrick, 2006; Bahrampour & Aratani, 2006). As a result, many entering teachers already have a negative image of these student entertainment and social networking devices, at least when they are found in classrooms (Gilroy, 2004; Staten Island Advance, 2007; Dawson, 2008). In addition, teacher candidates' own schooling experiences contribute to their strong beliefs about teaching and learning (Albion & Ertmer, 1992; Richardson, 1996; Borko & Putnam 1996; Kennedy, 1987). The preservice teachers in this study entered their teaching program with sixteen plus years of schooling where they most likely did not see models of everyday student technology being integrated into classroom learning.

Research Question 2: Can Teacher Educators use Preservice Education Courses to Foster Change in Preservice Teacher Beliefs Regarding Everyday Technology Instruction?

My findings indicate that preservice teachers can adopt everyday technology instruction during a teacher education course. I also found there is variation among preservice teachers in terms of what experiences or activities are helpful to them in deciding to adopt everyday technology, and also variation in when during the course they decided to adopt (or merely became "interested"). But even with this variation, the preservice teachers cited primarily two reasons for their adoption decisions. First, some cited a philosophical reason for adoption. For example, the emergence of the "21st century student," the emergence of digital culture, and a changing world were all cited as a reason to use everyday technology tools in teaching. Preservice teachers citing a philosophical were mostly early adopters. One way to interpret this is that the early adopters might have entered their teaching program already believing that there is something different about the "21st century student," so that they found using everyday

tools in their teaching as a natural fit to their own belief system. The second reason preservice teachers cited for adoption was particular class activities pertaining to particular everyday tools. These teachers cited a class activity(s) or observation(s) around a particular everyday technology that caused them to adopt. Most of these teachers were middle, late, and interested adopters. While a few of them also mentioned a philosophical belief in integrating the technology of the 21st century student when they finally adopted, many did not. These adopters probably did not enter their teaching program with a natural belief in the significance of the 21st century student, but were convinced to adopt by participating in or observing successful implementation of students' everyday tools. However, it is hard to determine if these preservice teachers really adopted everyday technology instruction, or simply adopted the *particular* everyday tool that they mentioned in their web blog post indicating adoption.

Research Question 3: If Technology Belief Change Occurs in my Preservice Teachers, Can I Pinpoint When, How and Why it Occurred?

Virgnia Richardson's (1994) research on belief change in education explains that experiences and reflections on these experiences may lead to change in beliefs. A change in a teacher's beliefs often requires new information presented repeatedly over time (Jensen, 1998; Nuthall & Alton-Lee, 1993). It has been found that challenging preservice teachers' prior beliefs about teaching and learning by allowing them to explore alternative approaches in their preservice education my also facilitate pedagogical belief change (Resnick, 1987; Bullough, 1991; Albion & Ertmer, 2002). Consequently, classroom experience, participation in alternative approaches, modeling alternative approaches, reflection on experiences, and repetition may lead to changes in beliefs. I

implemented all of these strategies into my preservice technology education course in order to stimulate belief change concerning everyday technologies in instruction.

By implementing web blogs, I was able to elicit the preservice teachers' thought process over time about their beliefs and ideas concerning teaching with technology. Specifically, by allowing the web blogs to be informal, I was able to observe preservice teachers' belief change as an emic process, emerging from their reflections on experiences rather than through being "forced" to document their learning process in their blogs. Therefore, by reading the informal blog posts, I was able to identify and code for the reasons and the time frame when belief change occurred. Additionally, by having the preservice teachers blog each week during the course, I could pinpoint where preservice teachers stood at any time throughout the education technology course in terms of their beliefs, how the class activities were affecting their beliefs, and if changes were occurring. This allowed me to adjust the course content to continually challenge their beliefs about everyday technology instruction.

Despite a wide percentage of preservice teachers adopting everyday technology instruction, there was not a single reason or single class activity that led to widespread adoption in the technology education course. Current research on belief change indicates that changing teachers' beliefs can require the same information to be presented multiple times over a long period of time (Jensen, 1998; Nuthall & Alton-Lee, 1993). Therefore, I modeled using everyday technology tools in multiple ways throughout the course. For example, rather than a one-time encounter with cell phones, the students were required to continually use these resources throughout the six months of the course. I found this to be most helpful with the interested, middle and late adopters, who often cited the multiple

interactions with these tools as a reason for adoption (or sometimes the last interaction), demonstrating that one method of using a tool was not always convincing enough.

Besides having multiple interactions with the same tools, research indicates that change in belief can happen by allowing preservice teachers to explore alternative visions and approaches to their own personal experiences or beliefs (Resnick, 1987; Bullough, 1991; Albion & Ertmer, 2002). Therefore, throughout the course, I used modeling to demonstrate how students' everyday technology tools could be integrated in the preservice teachers' own teaching. These modeling activities allowed for preservice teachers to get a vision and experience the use of these everyday technology tools in a learning environment. While I thought the modeling would be the best way to encourage entering teachers to adopt everyday technology, I found that the ones who adopted cited a variety of course related activities that led to adoption. For example, the preservice teachers were able to participate in a debate where they were forced to take an alternative view of a particular everyday technology tool. By considering the "other side" of the argument for using everyday resources in schools, they had to confront their pre-existing beliefs.

Implications

This section focuses on how my research can inform preservice and inservice technology education instructors, particularly as they work to design courses and technology education experiences to foster everyday technology instruction in future or current teachers.

Current data about the effectiveness of technology in education is fuzzy. There are a variety of challenges that contribute to the inconclusive role that technology plays in

improving student learning and preparing students for 21st century society. Technology tools specific to education have been oversold and underutilized in schools (Cuban, 2002). While most schools underuse these traditional technology tools, schools and government institutions have spent extraordinary amounts of money to purchase them (Cuban, 1986). In addition, education technology inside of the classroom is disconnected from students' everyday technology experiences outside of school (Rideout et al., 2005). Over the last decade, funding has continued to pour into research and development for creating and purchasing new educational hardware and software for K-12 classrooms (Zembar, 2007). Yet the disconnect between students' technology use in schools and in their everyday lives does not seem to be shrinking (Tell, 2000; Jacobsen et al, 2002; Levin et al, 2002, Project Tomorrow, 2008). The findings from this study indicate that while many entering preservice teachers use everyday technology tools in their daily lives, using them on a personal level does not naturally equate to preservice teachers wanting to include everyday technology tools in their spectrum of teaching tools. Past research on teacher belief and action indicates that how one teaches or views one's future teaching is closely tied to schooling experiences (Albion & Ertmer, 1992; Richardson, 1996; Borko & Putnam 1996). Entering 21st Century teachers also are influenced by their own schooling experiences (or lack thereof) with technology tools. Therefore, students' everyday toys such as cell phones, social networking sites, and video games were not included or allowed in their own schools and thus, preservice teachers do not envision everyday technology tools as classroom learning tools.

In chapter two I quoted Seymour Papert, "Some of the most crucial steps in mental growth are based not simply on acquiring new skills, but on acquiring new

administrative ways to use what one already knows," (Minksy, 1988 p. 102). I interpret Papert to mean that the key to learning new ideas or tools is often in teaching students how to redefine what they already know. The findings from this study indicate that this principle can work for encouraging everyday technology instruction in future teachers. In this study, I used the preservice teacher education technology course as a way to redefine everyday digital hardware and software as learning tools. When entering preservice teachers were given opportunities to confront their initial beliefs about the harmful or inappropriate nature of everyday student tools in learning, over time these confrontations did lead some preservice teachers to adopt everyday technology instruction. Furthermore, by continually participating in course modeling activities that included everyday technology tools as teaching and learning tools in multiple ways, it allowed more preservice teachers to adopt everyday technology tools into their spectrum of teaching tools.

A wide variety of strategies in the education technology course contributed to adoption. While the activities are described in detail in Chapter 4, there was one interesting factor in these activities: time. While time was not measured in this study, it is apparent that as time progressed in the course, more preservice teachers began to adopt. Ten students adopted during the first two months of the course. Five students adopted by the end of their sixth month in the course. The majority of students (13 in total) who adopted did not do so until the end of the course, seven months later. For example, in Blog Post 5.1, early adopter Emily describes how helpful it has been to continue blogging throughout the entire course. In Blog Post 5.2, early adopter Mena describes how her

multiple interactions over time with the same activity on instant messaging has slowly allowed her to see the usefulness of the tool.

Blog Post 5.1
Early adopter (Emmie, July 19th, 2006) describes how using blogs on a weekly basis is something she would like to replicate in her own teaching.

"On a happier note I am really enjoying using the blogs and reading what other people think about the class. I think this is a feature I would really like to use in my class one day so that my students could easily communicate with one another, the parents can see what's going on in class and I can follow up on what my students think about the class and adjust what I am doing accordingly."

Blog Post 5.2
Early adopter (Mena, July 29th, 2006) describes how helpful it has been to have multiple interactions with the same everyday tool (online chat rooms called Tapped-In).

"So earlier I wrote an invective about tapped-in being too tempting to pay attention to class. Well, in yesterday's class Andrea, Rachel and I had a pretty substantive conversation (ha!) about the presenters in Jeff's class. So I've learned a lesson about tapped-in...it can work. I guess that the initial bloom has worn off of off-topic conversation during class. I was really glad to have an outlet for these ideas during class. I was just so glad to see how these technology uses can affect students."

Additionally, by allowing preservice teachers to use everyday technology tools in authentic ways over an extended period of time, they were able to slowly experiment and gain new skills, as opposed to courses where you are expected to learn to use a blog or wiki in one class session. For example, in Blog Post 5.3 late adopter Marg discusses her ability to slowly experiment with web blogs over time.

Blog Post 5.3
After two months of using web blogs, a late adopter (Marg, September 20th, 2006) describes her scaffolding in learning new a feature of the web blogging tool.

"My goal this time is to successfully load a picture on to my blog. One might think an appropriate picture would be of me, or maybe my family in some Christmas card type pose."

In addition, there were 11 interested adopters still considering adoption at the end of the course. They seemed to need more time than the course allowed in order to make a decision on adoption. All of the interested adopters seemed as though they would eventually adopt with more activities and experiences over time. For example, in Blog Post 5.4, interested adopter Christie's final reflection blog post demonstrates her confusion on whether or not she should adopt.

Blog Post 5.4
Interested adopter (Christie, December 14th, 2006) describes how she is struggling with adoption at the end of the course.

"The examples of educational technology usage I have seen in my placement have been few and far between. The main instance focused around a presentation one class did on the Dark Ages in England and around the world. My mentor teacher had originally planned for them to do traditional (i.e. book-based) research in the school library, but circumstances forced her to have her students do online research in the computer lab. She encouraged their search for interesting pictures and later admitted that her students got more out of it because of their enthusiasm for using the computers. Later, when it came time for students to present what they had learned, my teacher decided to have them use PowerPoint. The students were thus able to look at the television screen projecting the image of the presentation rather than just watching people stand in the front of the class and talk. The class ended up much more engaged in this presentation because of the use of PowerPoint and the computer/television connection.

My technology internship made the benefits of using technology to promote engagement even more clear. The teacher I worked with there used technology on a number of occasions to keep students engaged. Oftentimes, the concept she was teaching, whether it be parts of speech or verb tenses, could have been taught without the use of technology. However, by using online Mad Libs or a CPS unit, students became highly engaged and motivated in what they were learning. Students were much more enthusiastic, attentive, and cooperative when they had this level of engagement. I feel that this was a much more effective way to teach these often dull concepts.

Even my own plans have revolved around engagement. My school has a Smartboard that no one uses, and I recently (after experimenting with one at Stevenson Middle School) got the idea to use it for paper editing. One could put a paper up on the screen and "write on it" to make editing papers more fun and engaging for students.

However, I can't help but wonder if I'm missing something. Is engagement really the only purpose I can see technology used for? Are there some things which cannot be taught without using technology? I'm sure that there are; I just haven't yet seen a project that develops those skills. In my Smartboard plan, I wonder if there really is additional benefit to making physical marks on a screen. Is there an argument that the kind of physical action involved reinforces the knowledge, that a student crossing out an unnecessary apostrophe will learn punctuation rules better simply by making that mark rather than just saying that the apostrophe is out of place?"

Time to let the philosophical ideas, activities, and interactions of the class marinate was important in getting the majority of students to adopt. For example, in Blog Post 5.5, late adopter Dalia reflects on how the many activities and over-arching philosophy of the course helped her move from being intimidated by new technologies to gaining a new confidence in using them. Dalia mentions a variety of tools she interacted with throughout the course at different times. I interpreted this to mean that the long-term interaction helped solidify Dalia's new confidence in using these tools as learning tools.

Blog Post 5.5
Late adopter (Dalia, December 14th, 2006) describes how the various everyday technology tools that she explored throughout the six month course helped her adopt everyday technology instruction.

"Having a class in the education curriculum dedicated to technology use is a wonderful idea for prospective teachers. I was able to try out technologies I had heard of, but was intimidated to check out on my own, for instance, wikis, blogs, web design, kiosk Powerpoint movies and picture editing in Photoshop. Understanding how to use these tools has given me a new confidence in learning how to use new technologies in general, which I believe is one of the most valuable things I have taken from this experience. I now no longer have a sinking feeling in my stomach and an immediate feeling of frustration when working with new software. Instead, through this class, I've seen that these technologies are often intuitive and can be mastered to a degree so that the technology becomes a helpful tool."

Limitations and Further Research

While I was able to answer my research questions, there were some unexpected

results that showed up in the data collection and analysis. Below I describe these data and how further research may help to shed light on their meaning.

Jon Margerum-Leys and Ron Marx (2000) found in their research that cooperating teachers could learn new ideas from their student teachers. I also found occurrences of this phenomenon in my study. I did not set out to collect data based on the give and take of preservice student teachers and their cooperating teachers on everyday technology instruction, but I did come across web blog posts that indicated an exchange of ideas was occurring between the preservice and cooperating teachers about everyday technology instruction. As a result, future research needs to be conducted on this particular topic, which may be a way for inservice teachers to learn everyday technology instruction. By re-conceptualizing what a cell phone or everyday tool is to preservice teachers, they in turn may be able to pass on their new knowledge to their cooperating teachers.

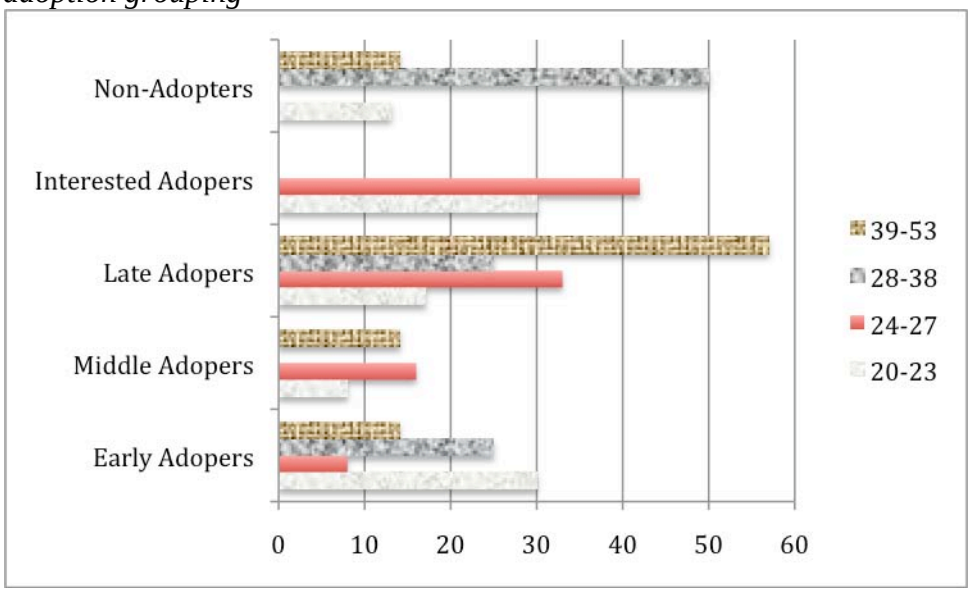
While this study indicates that time and multiple experiences with tools were factors in adoption, I am unable to make a claim about the impact of each specific course activity on all 45 students. Since this was a qualitative study, I did not have a control group, therefore, I am unable to assert how much of an impact the course strategies had on the whole group of students and their level of adoption or non-adoption versus other factors in their preservice training or everyday lives. In order for preservice educators to understand which strategies work best in helping entering preservice teacher's adopt an everyday technology instruction, the ten strategies outlined in chapter four should be studied further in both design-based and experimental research.

Additionally, while I was able to pinpoint characteristics of a non-adopter, this study does not indicate strategies that might convince these non-adopters to adopt. The findings from the web blog posts denote that non-adopters seem to disengage early on in their teacher learning and never seem to reengage. From this I infer that further research needs to be conducted on using early intervention strategies as soon as preservice students begin to display characteristics of a non-adopter. Future study should be conducted on different types of intervention techniques to combat these early signs of disengagement or non-adoption. A few ideas include: involving the individual students more, having them take responsibility to learn a new everyday tool and present a lesson with that tool to the class, pairing potential non-adopters and early adopters together for assignments, pairing potential non-adopters and cooperating teachers who are successfully using everyday technology tools for a long-term mentorship, including longer time lines. Rather than a six month focus in a single class, we might also try extending it to a 12 month focus, and trying to engage the personal interests of the preservice teachers.

Although age did not seem to play a major role in adoption, further research should be conducted on age as a possible minor cause in adoption. For example all preservice students between the age of 24 and 28 adopted, while there were some students between the age of 20-23 that did not adopt (see Table 5.1). This phenomenon should be furthered studied. I speculate that the phenomenon might be traced back to the Children's Internet Protection Act of 2001 (CIPA). CIPA (2001) required schools to install a filter on their Internet and to have students' sign an acceptable use policy concerning the rules and regulations around how the students' could use the digital

resources inside of schools. Many policies banned everyday student technologies and popular websites such as social networking or chatting sites online, calling them "harmful" to minors (CIPA, 2001). Both groups of preservice students age 20-28 did grow up with Internet, cell phones, and other digital devices (Howe & Strauss, 2000; Prensky, 2001) Yet, if preservice teachers age 24-28 grew up with unfiltered digital tools (No CIPA) in schools, then they may be less reluctant to think of everyday student tools as a negative in the learning setting. While students age 20-23 did were also in high school when CIPA emerged. Therefore many of these students had to sign acceptable use policies in their own schooling banning or strictly prohibiting the use of social networking sites, chat rooms, mp3 players, video games, and cell phones in schools (Children's Internet Protection Act, 2001). This may help explain why 24-28 all adopted and some of the 20-23 year olds did not. Another interesting age occurrence is with the 39 to 53 year old students. In Table 5.1 one can see that not all of them adopted, but the ones who did overwhelmingly adopted middle or late. These students were born between 1953 and 1967, which means they would have been in K-12 schooling between 1960-1985. Thus having almost no exposure to computer technologies in their learning experiences. Therefore, it may have taken them longer to get comfortable with teaching that includes everyday technologies. At the same time, they were never exposed to CIPA, so they were never given a specific message that these resources were harmful or negative to learning. Therefore, future studies should consider age and the impact that CIPA may have had on the attitudes of preservice students in regards to everyday technologies.

Table 5.1
Comparison of the % of preservice teachers in each age dimension and where they fell into adoption grouping



While the preservice teachers' content areas did not seem to play a significant role in adoption, there was an interesting pattern that emerged. Unlike the four other content areas (mathematics, English, social studies, and science), every foreign language preservice teacher adopted. Interestingly, each one of the foreign language teachers adopted as either middle or late adopters. One reason may be that the foreign language teachers had an opportunity to study with the instructors in the foreign language program at the University who specialize in using innovative technologies in teaching. For example the foreign language instructors demonstrated using online chat rooms and student cell phones for oral and written language lessons. This field experience occurred during the Fall semester, which may account for why the foreign language student teachers began adopting in the middle of the Fall term, rather than early in the Summer term. By observing other foreign language instructors using the same technologies that they were learning about in the education technology course, it may have reinforced or

solidified the practical applications that these technologies can have in their own teaching practice, thus leading to adoption.

This study focused only on secondary preservice teachers, therefore the findings can only apply to preservice teachers in a similar context. As a result, it is important to also consider elementary and other secondary preservice teacher programs that vary from the one in this study. I do believe that the secondary preservice teachers in this study tended to focus specifically on their content area before considering tools, where elementary preservice teachers may consider tools before content, since they teach all of the content areas. In addition, elementary preservice teachers often learn different strategies for teaching than secondary teachers, for example, the concept of using "centers." Therefore, if the everyday technology tools were modeled as part of the "center" activities, they may have a greater impact on elementary preservice teachers because the preservice teachers could experience how using only one everyday device (instead of needing every student to already own one) such as an MP3 player, cell phone, or video game in a center activity could connect to the young learners. The preservice teachers may understand that introducing the everyday technologies to students at a young age may be a way to begin teaching them how to use them as learning tools and use them appropriately, so that when the young learners begin to own some of these tools, they will have a different perspective on them (not just tools for entertainment, but also learning tools). On the other hand, elementary preservice teachers may assume their students are too young to really use some of these technologies at home, such as social networks, cell phones, or MP3 players. Ultimately more research on everyday technology instruction must be conducted on different types of teacher education

programs in order to construct a theory of how best to introduce everyday technology to preservice teachers.

Finally, to really understand if these changes in beliefs translate into actions in preservice students' own teaching, future research needs to follow the preservice teachers into their classroom teaching. Longitudinal study to evaluate progress in their teaching careers is also needed to determine if their instructional change continues as 21st century student technologies change. Ideally, we're not preparing teachers to use today's everyday technology, but preparing them to think flexibly about technology, in order to continuously adapt their teaching to take best advantage of the technology available to themselves and to their students.

Concluding Remarks

As the U.S. has progressed from the industrial age into the information age, the nature of what it *means* to prepare citizens has shifted. In the 21st century, much of life is entangled with the digital communications. Many citizens have been calling for the development of new forms of literacy, arguing that students need to be better prepared as communicators and critical thinkers (Partnership for 21st Century Skills, 2008). While many have pointed to using education technology as one possible tool for better preparing students' for the technical society, the history of educational technology has not been positive, for the most part. In fact, it is hard to find particular advances in the effectiveness of schools that are related to technology (Cuban, Kilpatrick, & Peck, 2001). In this dissertation, I examined one viewpoint on technology for learning, which I defined as "everyday technology" and the role that it can play in helping students become better prepared for life in the 21st century. As explained in Chapter 1 and 2, using everyday

technologies represent a significant break with prior thinking about technology in education. Everyday technologies have the potential to solve some of the challenges that have plagued education technology in the past including: determining the effectiveness of technology in education, preparing students for the workplace, addressing a digital disconnect between everyday technology tools and tools in school learning, and addressing resistance to change among teachers and administrators. In this study, I argued that how teachers conceptualize technology is central to its use in education, and I presented data from my study of pre-service teachers learning about everyday technologies that uncovered both their thinking about technology for education in general and how a pre-service education course focused on models of using everyday technology led, in the majority of cases, to changes in their thinking about technology in learning.

The findings from this study showed that most preservice teachers were able to change their beliefs and adopted everyday technology instruction by confronting their entering beliefs multiple times over a long period of time (Jensen, 1998; Nuthall & Alton-Lee, 1993; Resnick, 1987; Bullough, 1991; Albion & Ertmer, 2002). They were able to redefine their definition of these social tools that both their future students and they use on an everyday basis into a learning tool (Moje, 2000). The findings from this study indicate that preservice technology teacher education needs to confront and bridge the disconnect between everyday technology tools and classroom digital tools, ultimately finding strategies which help preservice teachers adopt everyday technology instruction.

This study provides the community of education technology instructors with strategies to include everyday technology instruction in their courses with preservice teachers. Education technology instructors should consider introducing a philosophy of

teaching 21st century students (to help early adopters), as well as modeling uses of everyday technologies repeatedly throughout the course of study. Most importantly, the preservice teachers should be given ample opportunity to reflect on their experiences in the courses, and instructors should use those reflections as insights into their students' beliefs, and as opportunities to challenge rigidity.

Resnick (2000) has called for more research on student literacy practices inside and outside of school, and teachers must accept that everyday student literacies are significant to learning and future professional growth. According to Bean et al. (1999), "Until we bridge this gap by tapping the multiple literacies in adolescents' lives, we will continue to see adolescents develop a disinterested cognitive view of in-school literacy functions and a more enthusiastic sociocultural view of out-of-school discourse functions" (p. 447). Therefore, my hope is that this study is a starting point to help preservice teachers understand the important place that students' everyday technology literacies can hold in their future classroom teaching. A better understanding of their students and how they use technology will ultimately result in better preparing teachers with the vital everyday technology knowledge that their students need to live, work, and thrive in today's digital society.

APPENDICES

APPENDIX A: ALL DATA COLLECTED FOR THIS STUDY

Data	Purpose	Timeline	From Education Technology Course Instructor	From 10-12 Purposefully Selected Preservice Teachers	From 51 preservice teachers
Syllabus for technology education course	Goals, objectives, assignments, timeline, and organization of the course	July 2006	Yes	No	No
2 Drawings of technology in the classroom (total of 51, one for each preservice teacher)	To document each preservice teachers' current orientation towards technology in their future classroom	July 2006, December 2006	No	Yes	Yes
2 Drawings of technology in everyday life (total of 51, one for each preservice teacher)	To document each preservice teachers' current everyday technology use	July 2006, December 2006	No	Yes	Yes
1 Interview of preservice teachers (10-12 preservice teachers)	To get an in-depth window into why the teachers use certain technologies (or not) and how that fits into their future classroom. Also to look for moments of "change" from the course activities.	July 2006	No	Yes	No
Reflective Memos and Jottings	To reflect on the everyday activities that pertains to the development and implementation of the course. As well as looking for any changes that occur with the students.	June 2006-June 2007	Yes	No	No
Course Reflection Blogs	To look for moments of "change" from the course activities.	July 2006-December 2006	Yes	Yes	Yes
Course Assignments and Products	To document the course assignments and final products.	July 2006-December 2006	Yes	Yes	Yes
Video tapes of each course session	To document teaching and learning activities in course.	July 2006-December 2006	Yes	No	No
Podcasts of	To document teaching and	July	Yes	No	No

each course session (total of 20 (Podcasts)	learning activities in course.	2006-December 2006			
Log of decisions made during Design Experiments	To help with the iterative process of the design experiment.	June 2006-June 2007	Yes	No	No
Instant Messaging Transcript	To document the in-class discussions the teachers have with Tapped IN	June 2006-December 2006	Yes	Yes	Yes
Emails between course instructors and students	To document teaching and learning activities in course.	June 2006-December 2006	Yes	Yes	Yes
Course Evaluation Survey	To document teaching and learning activities in course.	December 2006	No	Yes	Yes

APPENDIX B: DATA COLLECTION INSTRUMENT FOR FIRST DAY OF EDUCATION TECHNOLOGY COURSE.

Name: _____

Secondary Subject Area(s): _____

What term best describes your level of experience with technology in general?
_____ (None, Very Little, Some, A Great Deal)

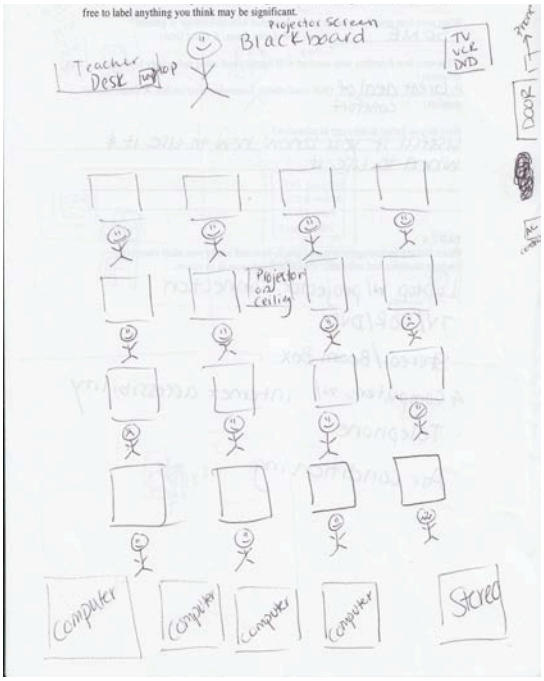
PART A
Please list any technology you would like to have in your ideal classroom. (Include hardware and software). Please note that None is an option.

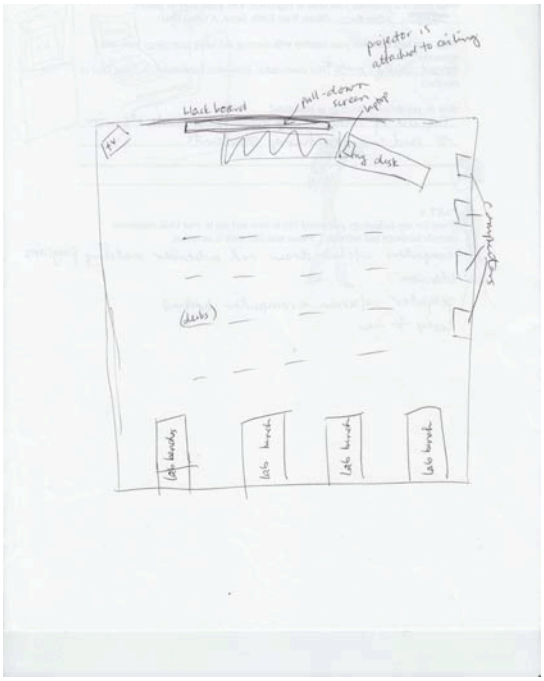
PART B
On the back of this page, please draw a picture of your ideal classroom (the one you want to teach in). Please include as much detail as possible, including all of the technologies from your list above. Feel free to label anything you think may be significant.

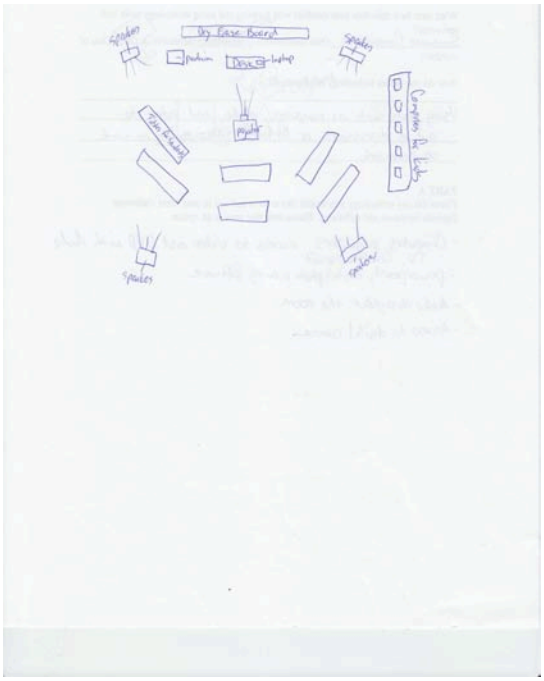
Part C
Please list any technology you use in your everyday life. (Include hardware and software). Please note that None is an option.

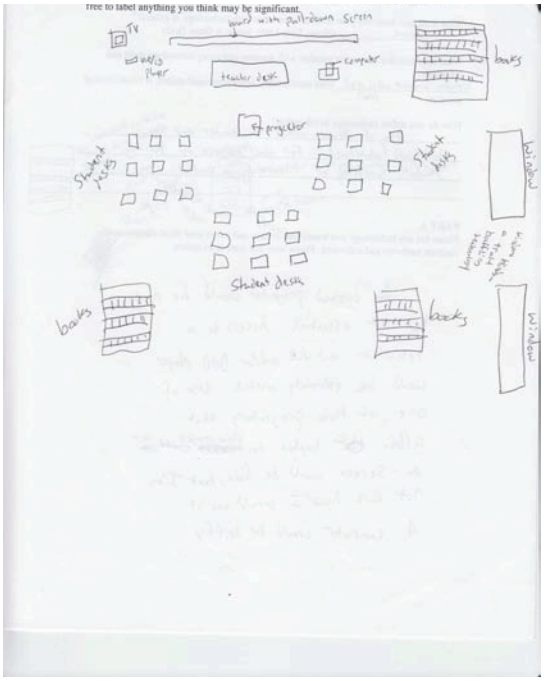
Part D
On the back of this page, please draw a picture that represents your everyday life outside of school. Please include as much detail as possible, including all of the technologies from your list above. Feel free to label anything you think may be significant.

APPENDIX C: ALL 45 ENTERING PRESERVICE TEACHERS' IDEAL FUTURE CLASSROOM DRAWINGS









PART B

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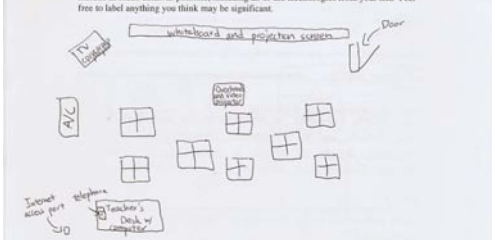

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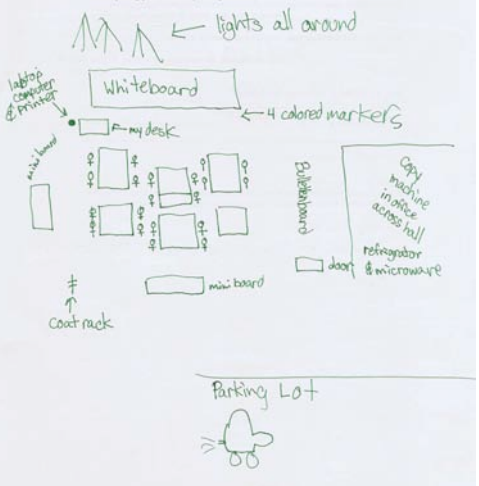

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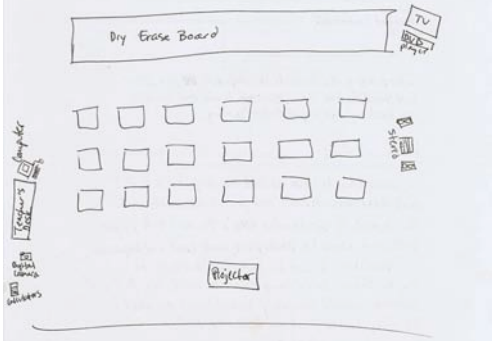

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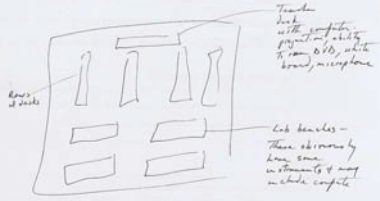

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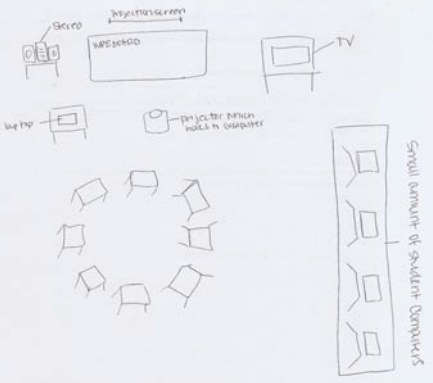

hopefully there is a media center with computers for student use close by!

PART B
Please draw a picture of your ideal classroom (the one you want to teach in). Please include as much detail as possible, including all of the technologies from your list. Feel free to label anything you think may be significant.

Desks
Chairs
Students
Board
Me

PART B
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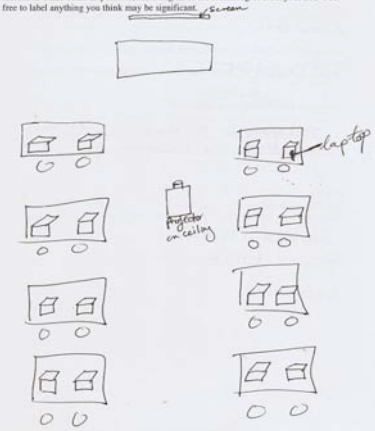

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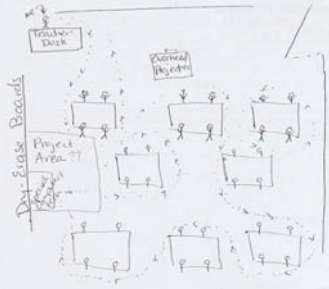
(Aerial View)



..... my path walking around the class

On each table: one computer, 4 copies of textbook/workbook, 4 calculators, colored drawing utensils

special tech = computers w/ special tech for simulations, projects, etc.

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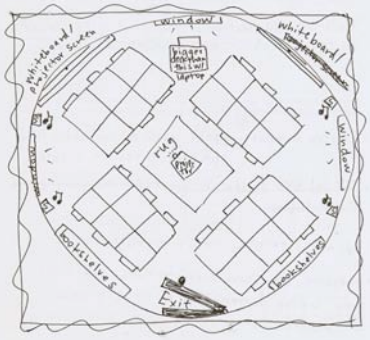

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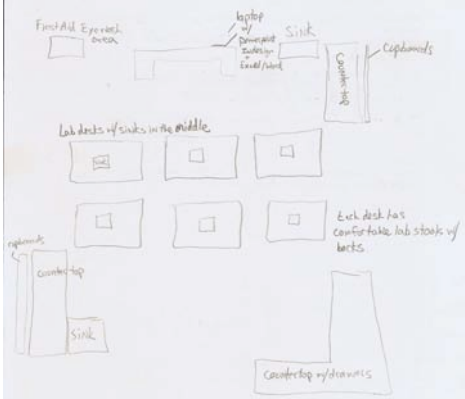

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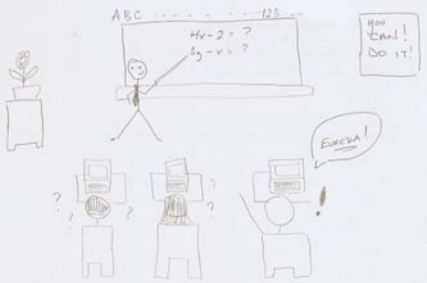

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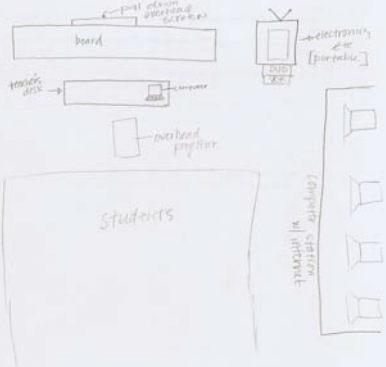

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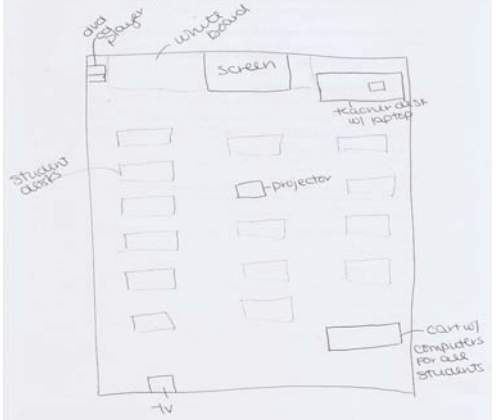

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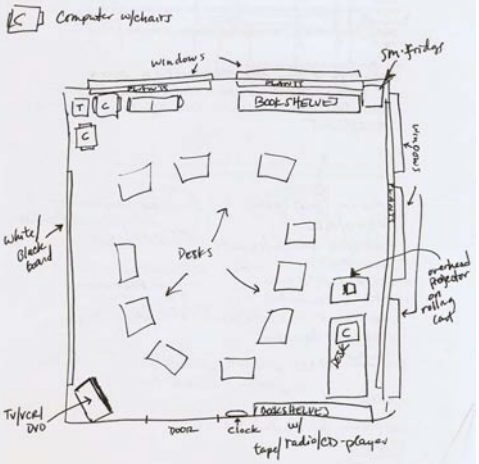

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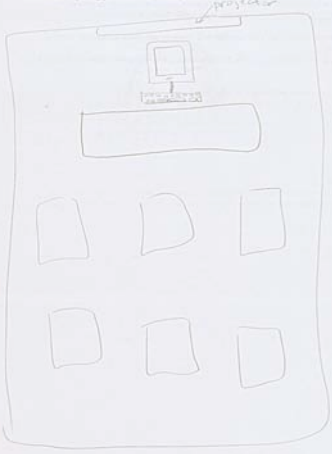

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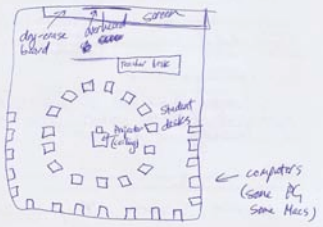

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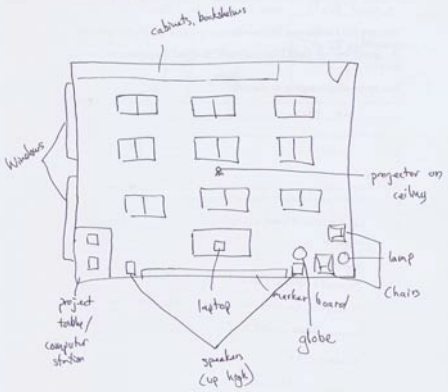

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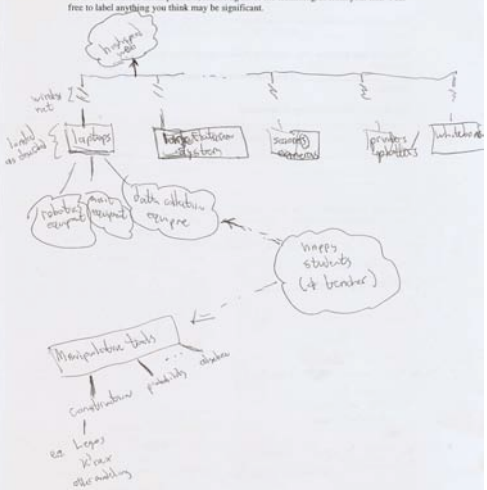

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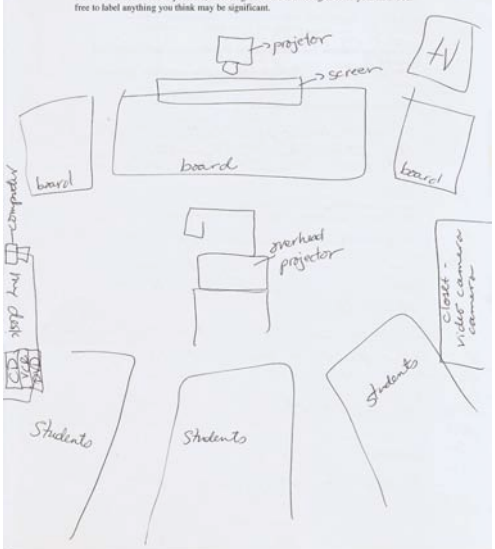

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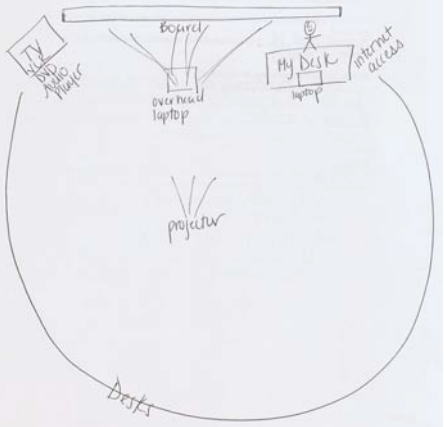

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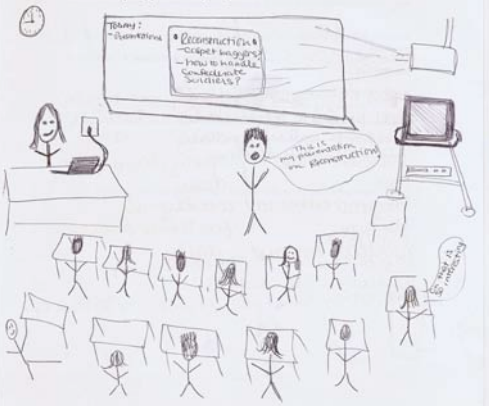

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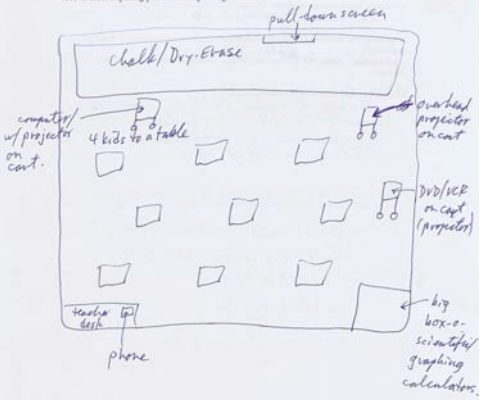

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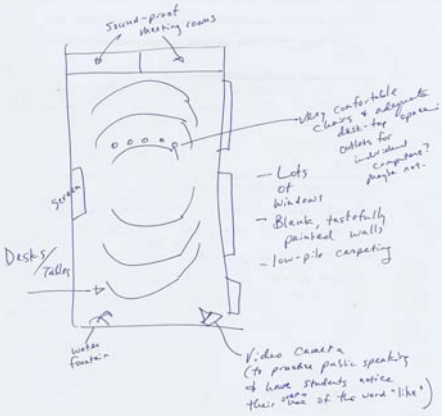

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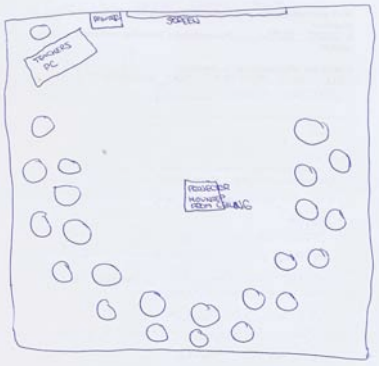

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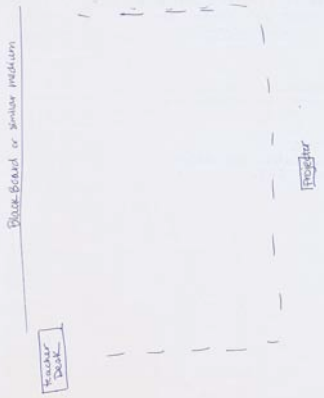

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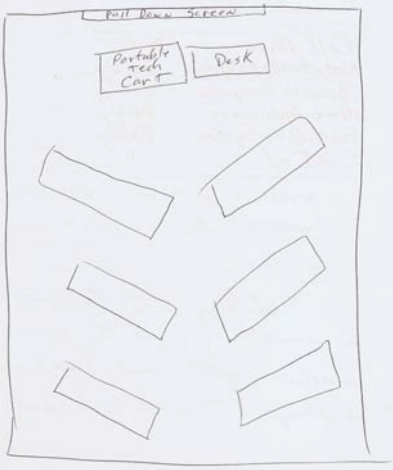

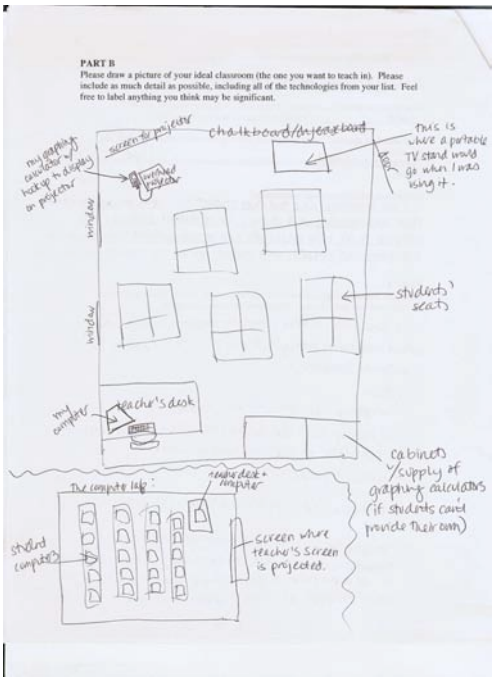
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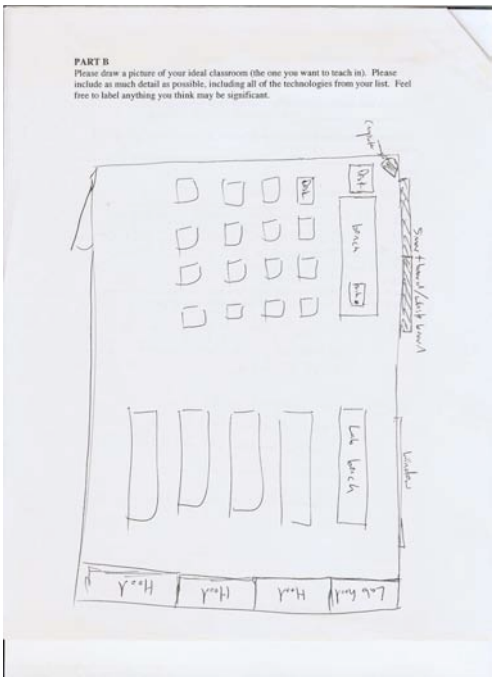
screen for projector
chalkboard/dry erase board
this is where a portable TV stand would go when I was using it.
my graphing calculator will hookup to display on projector
portable projector
window
window
door
students' seats
my computer
teacher's desk
cabinets w/supply of graphing calculators (if students could provide their own)
The computer lab:
teacher desk + computer
student computers
screen where teacher's screen is projected.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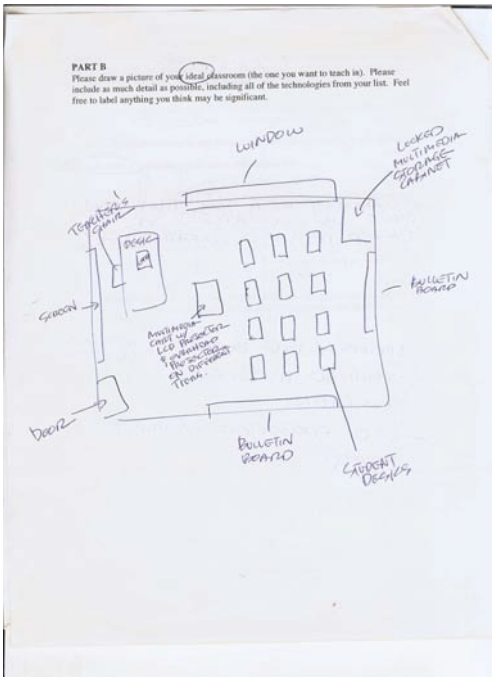
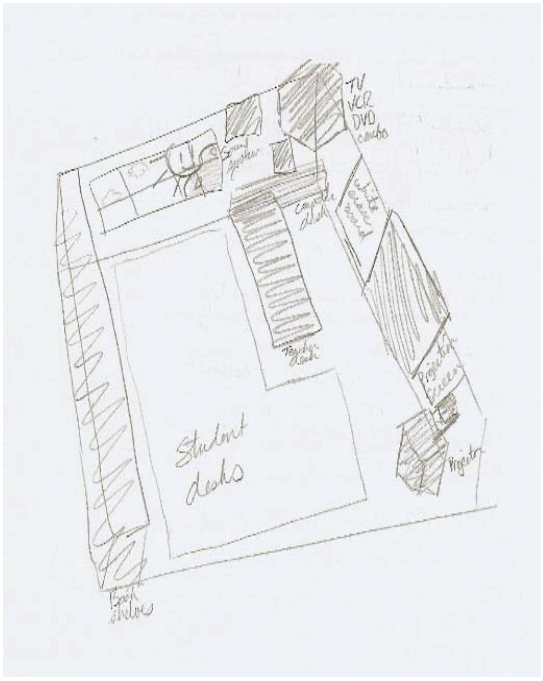
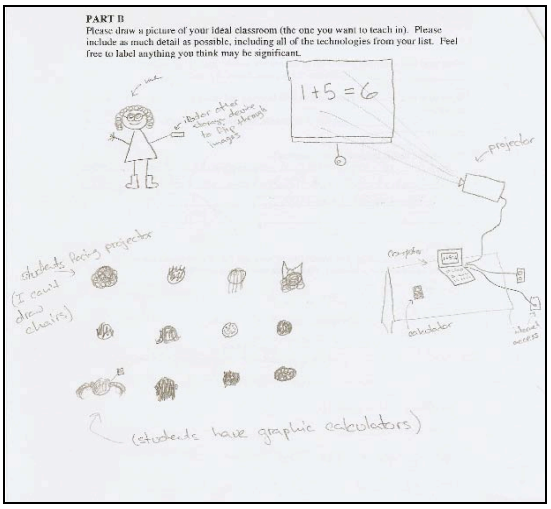
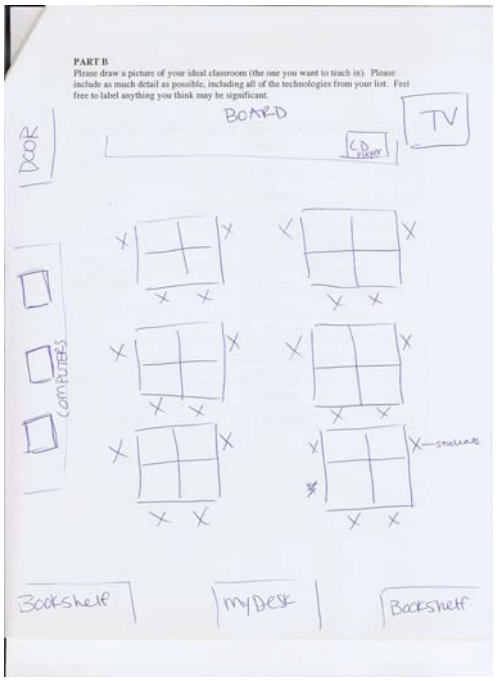
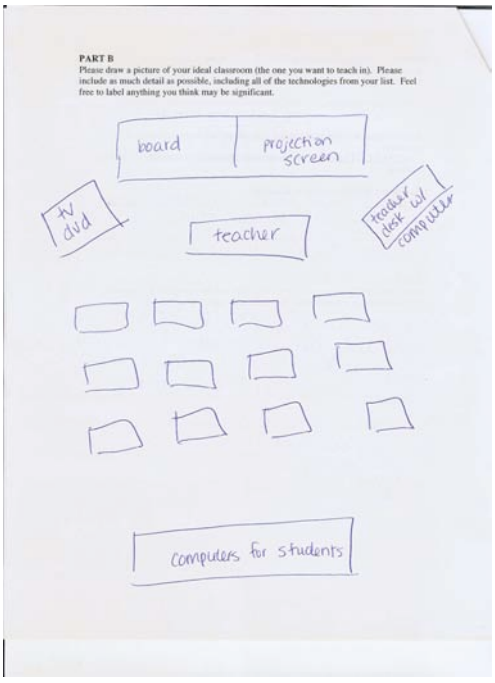
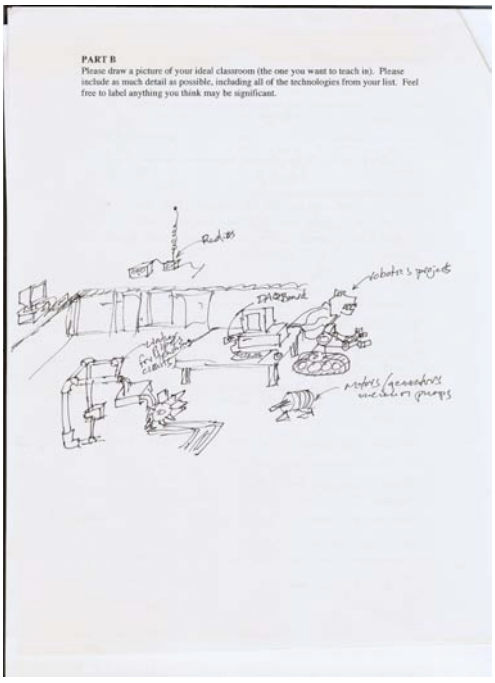

PART B
Please draw a picture of your ideal classroom (the one you want to teach in). Please include as much detail as possible, including all of the technologies from your list. Feel free to label anything you think may be significant.
WINDOW
LOCKED MULTIMEDIA STORAGE CABINET
TEACHER'S DESK
BULLETIN BOARDS
DOOR
BULLETIN BOARD
STUDENT DESKS

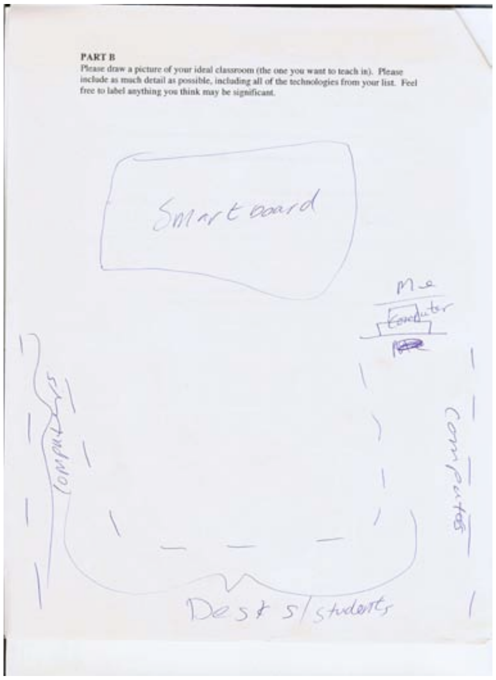

TV
VCR
DVD
Student desks

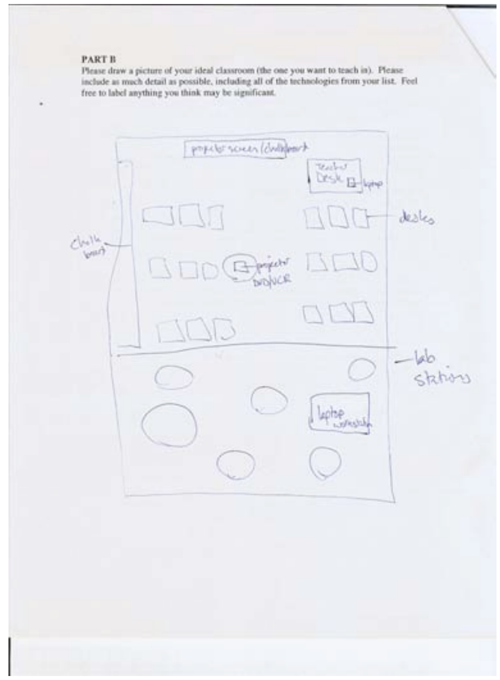

PART B
Please draw a picture of your ideal classroom (the one you want to teach in). Please include as much detail as possible, including all of the technologies from your list. Feel free to label anything you think may be significant.
1+5=6
Projector
students facing projector
(I could draw chairs)
(students have graphic calculators)

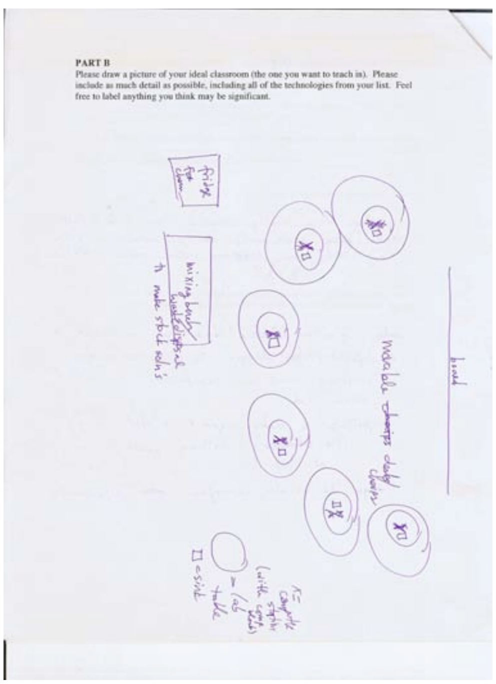

PART B
Please draw a picture of your ideal classroom (the one you want to teach in). Please include as much detail as possible, including all of the technologies from your list. Feel free to label anything you think may be significant.
BOARD
TV
CD player
DOOR
COMPUTERS
Bookshelf
myDesk
Bookshelf

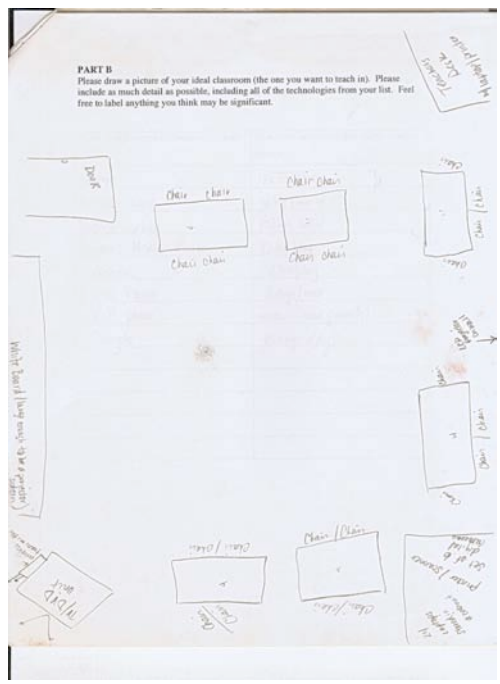

PART B
Please draw a picture of your ideal classroom (the one you want to teach in). Please include as much detail as possible, including all of the technologies from your list. Feel free to label anything you think may be significant.
board
projection screen
tv dvd
teacher
computers for students

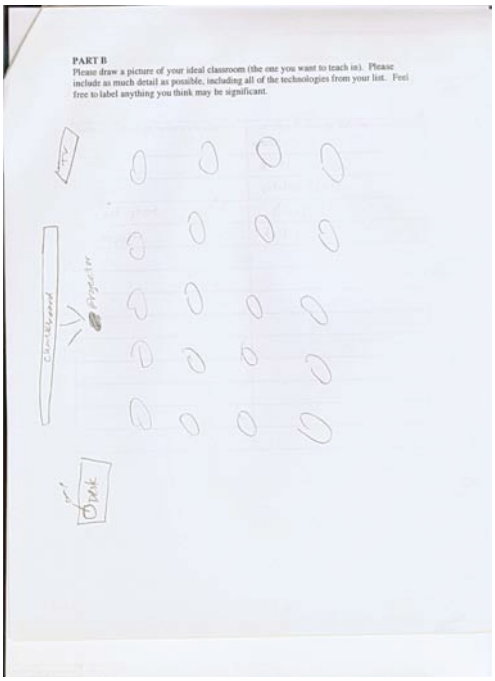

PART B
Please draw a picture of your ideal classroom (the one you want to teach in). Please include as much detail as possible, including all of the technologies from your list. Feel free to label anything you think may be significant.


PART B
Please draw a picture of your ideal classroom (the one you want to teach in). Please include as much detail as possible, including all of the technologies from your list. Feel free to label anything you think may be significant.
Smartboard
Me
computers
Desks/students

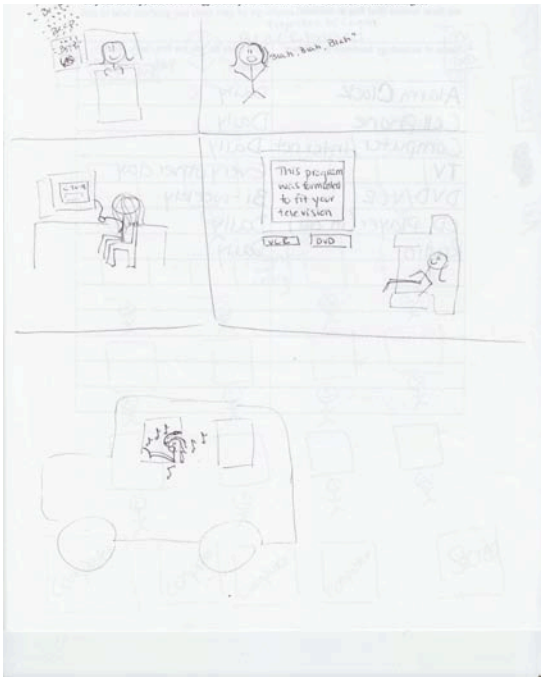

PART B
Please draw a picture of your ideal classroom (the one you want to teach in). Please include as much detail as possible, including all of the technologies from your list. Feel free to label anything you think may be significant.
desks
lab stations
laptop

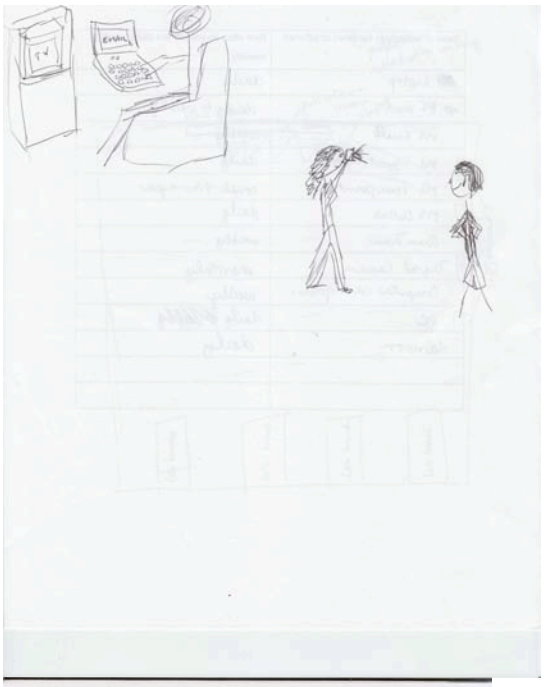

PART B
Please draw a picture of your ideal classroom (the one you want to teach in). Please include as much detail as possible, including all of the technologies from your list. Feel free to label anything you think may be significant.
board

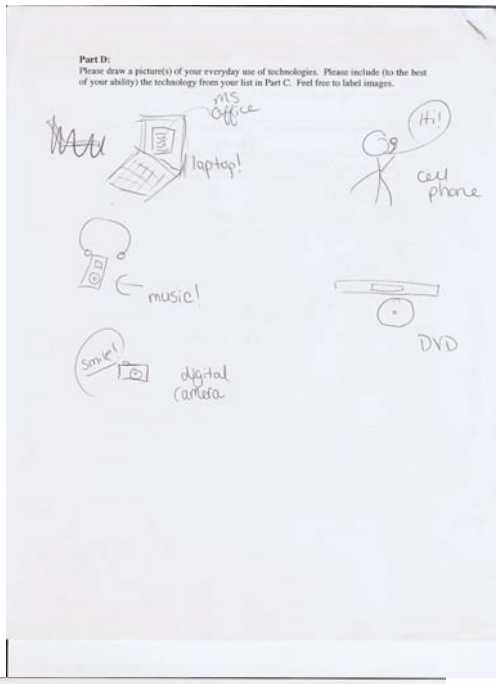

PART B
Please draw a picture of your ideal classroom (the one you want to teach in). Please include as much detail as possible, including all of the technologies from your list. Feel free to label anything you think may be significant.
Desk
Chair chair
Chair/Chair
White Board

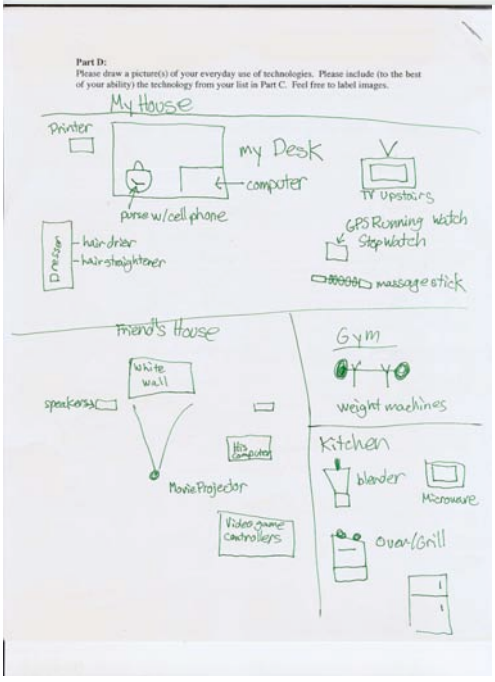

PART B
Please draw a picture of your ideal classroom (the one you want to teach in). Please include as much detail as possible, including all of the technologies from your list. Feel free to label anything you think may be significant.
Chalkboard
Projector
Desk

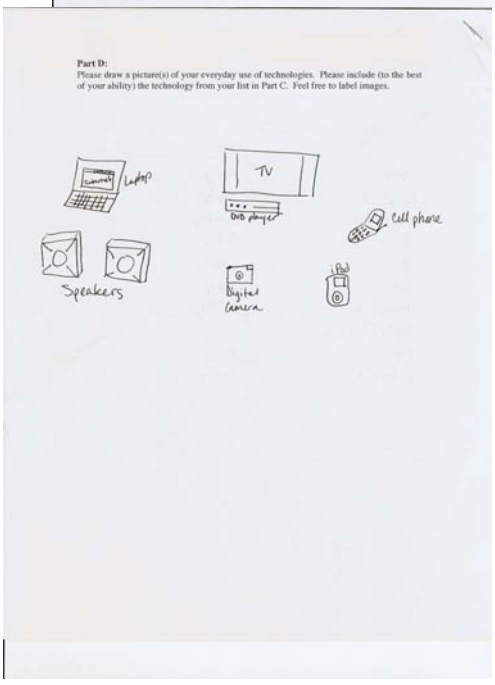
APPENDIX D: ALL 45 ENTERING PRESERVICE TEACHERS' EVERYDAY TECHNOLOGY USE DRAWINGS



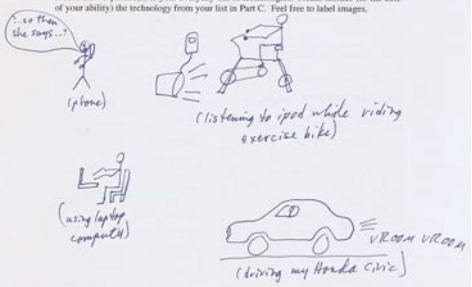

TV
Email


Part D:
Please draw a picture(s) of your everyday use of technologies. Please include (to the best of your ability) the technology from your list in Part C. Feel free to label images.
MS Office
laptop!
Hi!
cell phone
music!
DVD
Smile!
digital camera

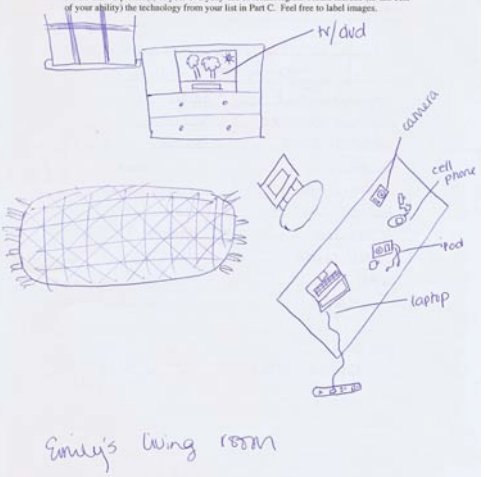

Part D:
Please draw a picture(s) of your everyday use of technologies. Please include (to the best of your ability) the technology from your list in Part C. Feel free to label images.
My House
Printer
my Desk
computer
TV upstairs
purse w/cell phone
GPS Running watch
Stopwatch
Dresser
hair dryer
hair straightener
massage stick
friend's House
White wall
speakers
His computer
Movie Projector
Video game controllers
Gym
weight machines
Kitchen
blender
Microwave
Oven/Grill


Part D:
Please draw a picture(s) of your everyday use of technologies. Please include (to the best of your ability) the technology from your list in Part C. Feel free to label images.
Laptop
TV
DVD player
cell phone
Speakers
Digital Camera

Part D:
Please draw a picture(s) of your everyday use of technologies. Please include (to the best of your ability) the technology from your list in Part C. Feel free to label images.



Part D:
Please draw a picture(s) of your everyday use of technologies. Please include (to the best of your ability) the technology from your list in Part C. Feel free to label images.



Part D:
Please draw a picture(s) of your everyday use of technologies. Please include (to the best of your ability) the technology from your list in Part C. Feel free to label images.

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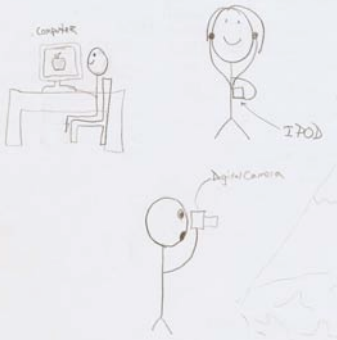
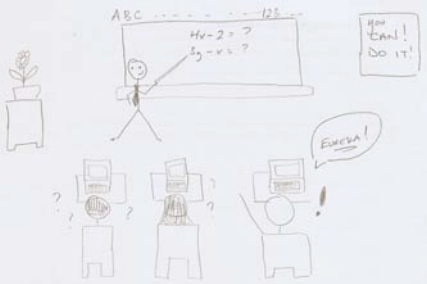
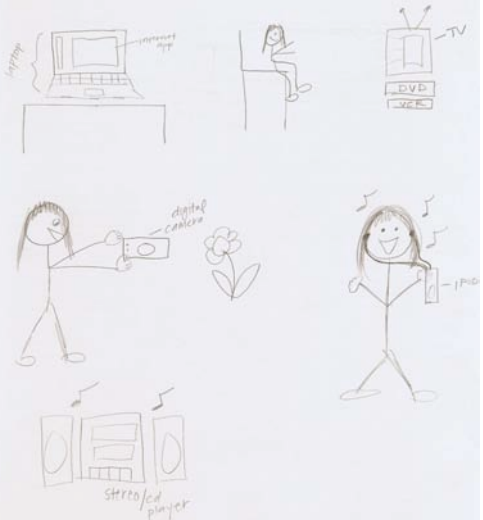
Please draw a picture(s) of your everyday use of technologies. Please include (to the best of your ability) the technology from your list in Part C. Feel free to label images.



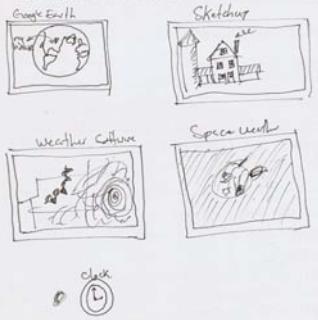
PART B
Please draw a picture of your ideal classroom (the one you want to teach in). Please include as much detail as possible, including all of the technologies from your list. Feel free to label anything you think may be significant.



Part D:
Please draw a picture(s) of your everyday use of technologies. Please include (to the best of your ability) the technology from your list in Part C. Feel free to label images.



Part D:
Please draw a picture(s) of your everyday use of technologies. Please include (to the best of your ability) the technology from your list in Part C. Feel free to label images.



Part D:
Please draw a picture(s) of your everyday use of technologies. Please include (to the best of your ability) the technology from your list in Part C. Feel free to label images.

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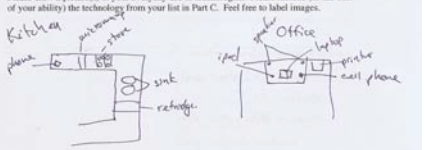
Please draw a picture(s) of your everyday use of technologies. Please include (to the best of your ability) the technology from your list in Part C. Feel free to label images.



Part D:
Please draw a picture(s) of your everyday use of technologies. Please include (to the best of your ability) the technology from your list in Part C. Feel free to label images.

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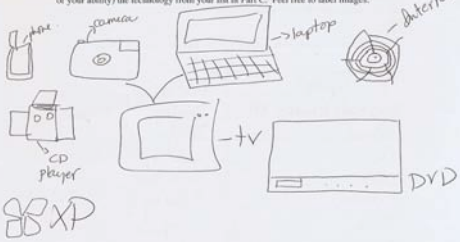
Please draw a picture(s) of your everyday use of technologies. Please include (to the best of your ability) the technology from your list in Part C. Feel free to label images.



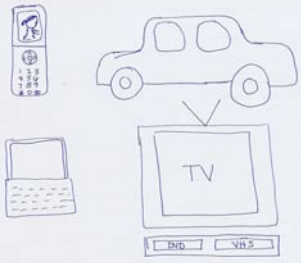
Part D:
Please draw a picture(s) of your everyday use of technologies. Please include (to the best of your ability) the technology from your list in Part C. Feel free to label images.

Part D:
Please draw a picture(s) of your everyday use of technologies. Please include (to the best of your ability) the technology from your list in Part C. Feel free to label images.

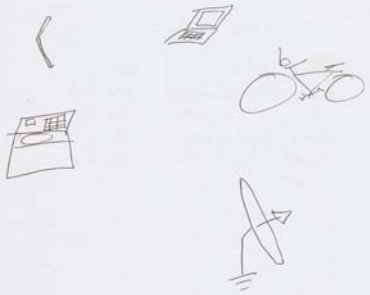
Part D:
Please draw a picture(s) of your everyday use of technologies. Please include (to the best of your ability) the technology from your list in Part C. Feel free to label images.

I'M NOT SURE HOW TO RESPOND TO THIS; SO I'LL JUST DRAW THIS:

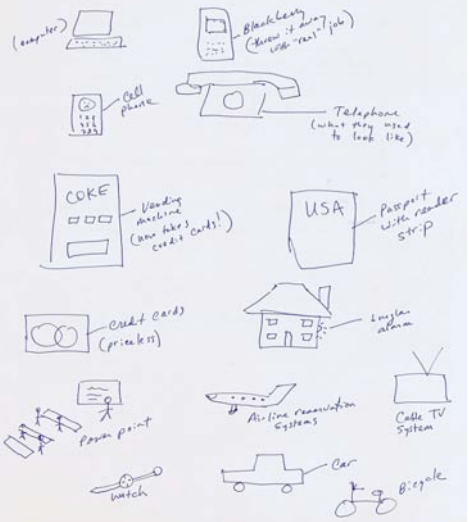
Part D:
Please draw a picture(s) of your everyday use of technologies. Please include (to the best of your ability) the technology from your list in Part C. Feel free to label images.



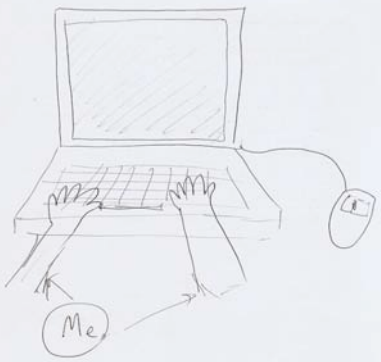
Part D:
Please draw a picture(s) of your everyday use of technologies. Please include (to the best of your ability) the technology from your list in Part C. Feel free to label images.



Part D:
Please draw a picture(s) of your everyday use of technologies. Please include (to the best of your ability) the technology from your list in Part C. Feel free to label images.



Part D:
Please draw a picture(s) of your everyday use of technologies. Please include (to the best of your ability) the technology from your list in Part C. Feel free to label images.



Part D:
Please draw a picture(s) of your everyday use of technologies. Please include (to the best of your ability) the technology from your list in Part C. Feel free to label images.

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Please draw a picture(s) of your everyday use of technologies. Please include (to the best of your ability) the technology from your list in Part C. Feel free to label images.

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Please draw a picture(s) of your everyday use of technologies. Please include (to the best of your ability) the technology from your list in Part C. Feel free to label images.

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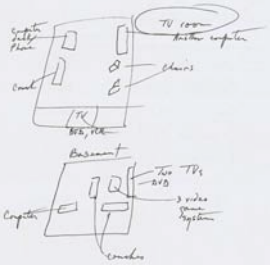
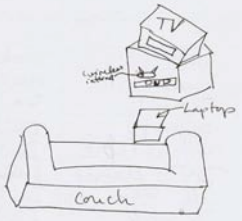
Please draw a picture(s) of your everyday use of technologies. Please include (to the best of your ability) the technology from your list in Part C. Feel free to label images.

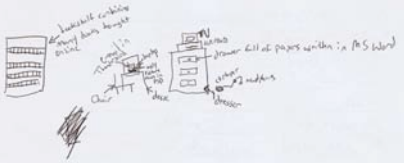


Part D:
Please draw a picture(s) of your everyday use of technologies. Please include (to the best of your ability) the technology from your list in Part C. Feel free to label images.

Part D:
Please draw a picture(s) of your everyday use of technologies. Please include (to the best of your ability) the technology from your list in Part C. Feel free to label images.



Part D:
Please draw a picture(s) of your everyday use of technologies. Please include (to the best of your ability) the technology from your list in Part C. Feel free to label images.

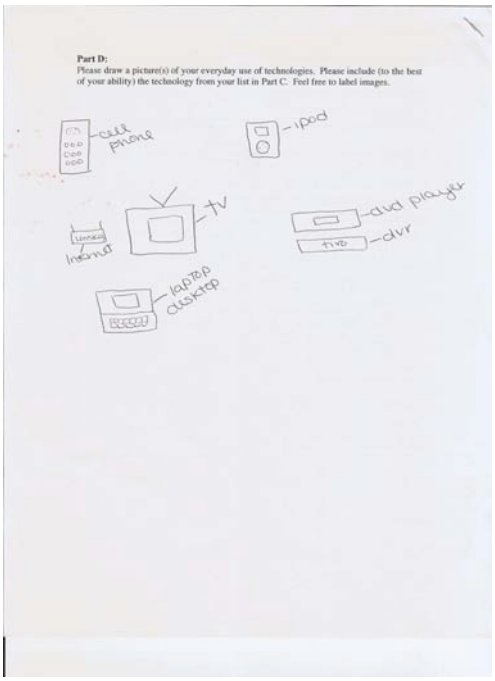


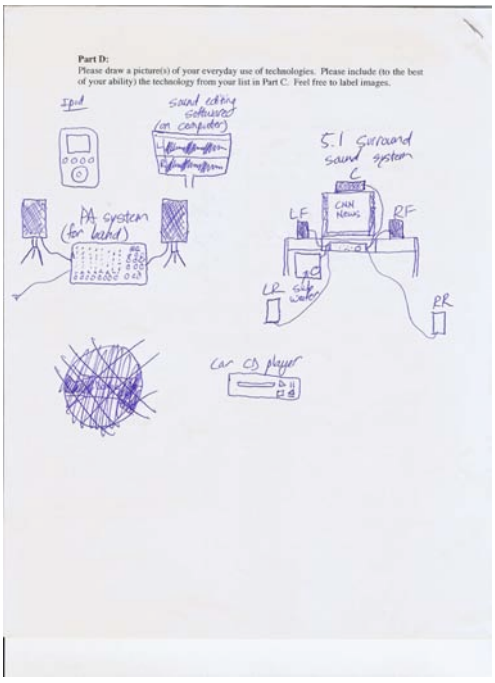
Part D:
Please draw a picture(s) of your everyday use of technologies. Please include (to the best of your ability) the technology from your list in Part C. Feel free to label images.

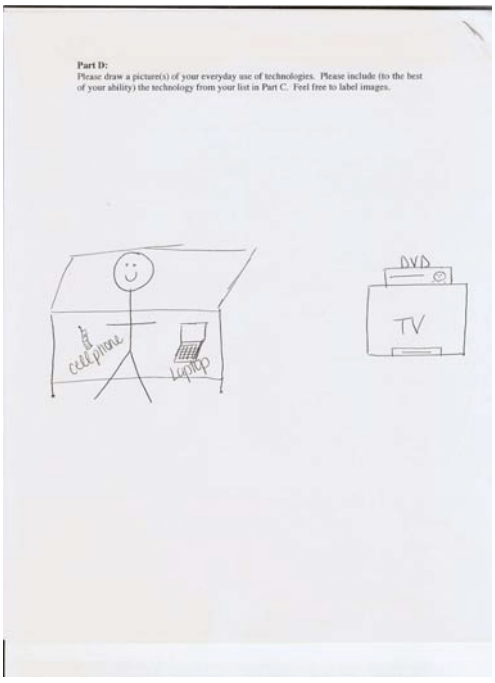
Part D:
Please draw a picture(s) of your everyday use of technologies. Please include (to the best of your ability) the technology from your list in Part C. Feel free to label images.

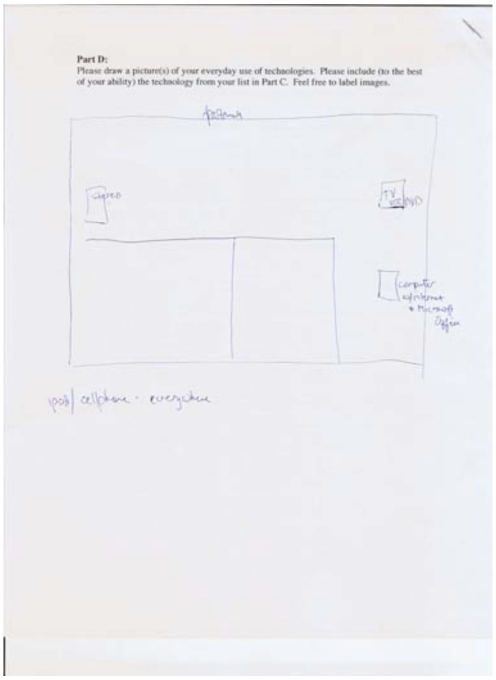
Part D:
Please draw a picture(s) of your everyday use of technologies. Please include (to the best of your ability) the technology from your list in Part C. Feel free to label images.


Part D:
Please draw a picture(s) of your everyday use of technologies. Please include (to the best of your ability) the technology from your list in Part C. Feel free to label images.
TV
computer


Part D:
Please draw a picture(s) of your everyday use of technologies. Please include (to the best of your ability) the technology from your list in Part C. Feel free to label images.
cell phone
ipod
TV
internet
dvd player
tivo
dvr
laptop
desktop

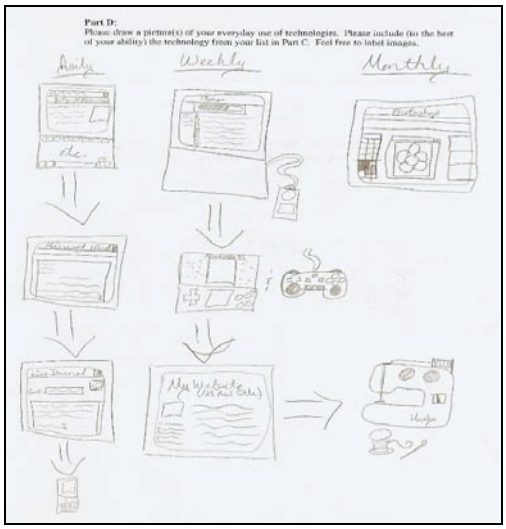

Part D:
Please draw a picture(s) of your everyday use of technologies. Please include (to the best of your ability) the technology from your list in Part C. Feel free to label images.
Ipod
sound editing software (on computer)
5.1 Surround sound system
C
CNN News
LF
RF
LR
RR
PA system (for band)
car CD player

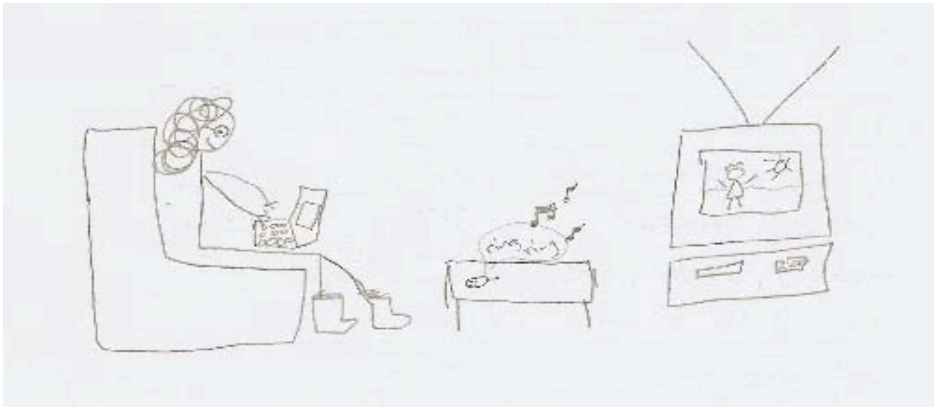

Part D:
Please draw a picture(s) of your everyday use of technologies. Please include (to the best of your ability) the technology from your list in Part C. Feel free to label images.
cellphone
laptop
DVD
TV


Part D:
Please draw a picture(s) of your everyday use of technologies. Please include (to the best of your ability) the technology from your list in Part C. Feel free to label images.
TV
computer
ipod/ cellphone - everywhere


Part D:
Please draw a picture(s) of your everyday use of technologies. Please include (to the best of your ability) the technology from your list in Part C. Feel free to label images.
ipod
laptop
cell phone
digital camera
wireless internet under a tree
television


Part D:
Please draw a picture(s) of your everyday use of technologies. Please include (to the best of your ability) the technology from your list in Part C. Feel free to label images.
TV/DVD
Stereo
Me
phone
stereo
CDs
Computer
internet
Car
Seat belts
Car seats
Kids
TV/DVD
Printer Scanner
Computer
internet

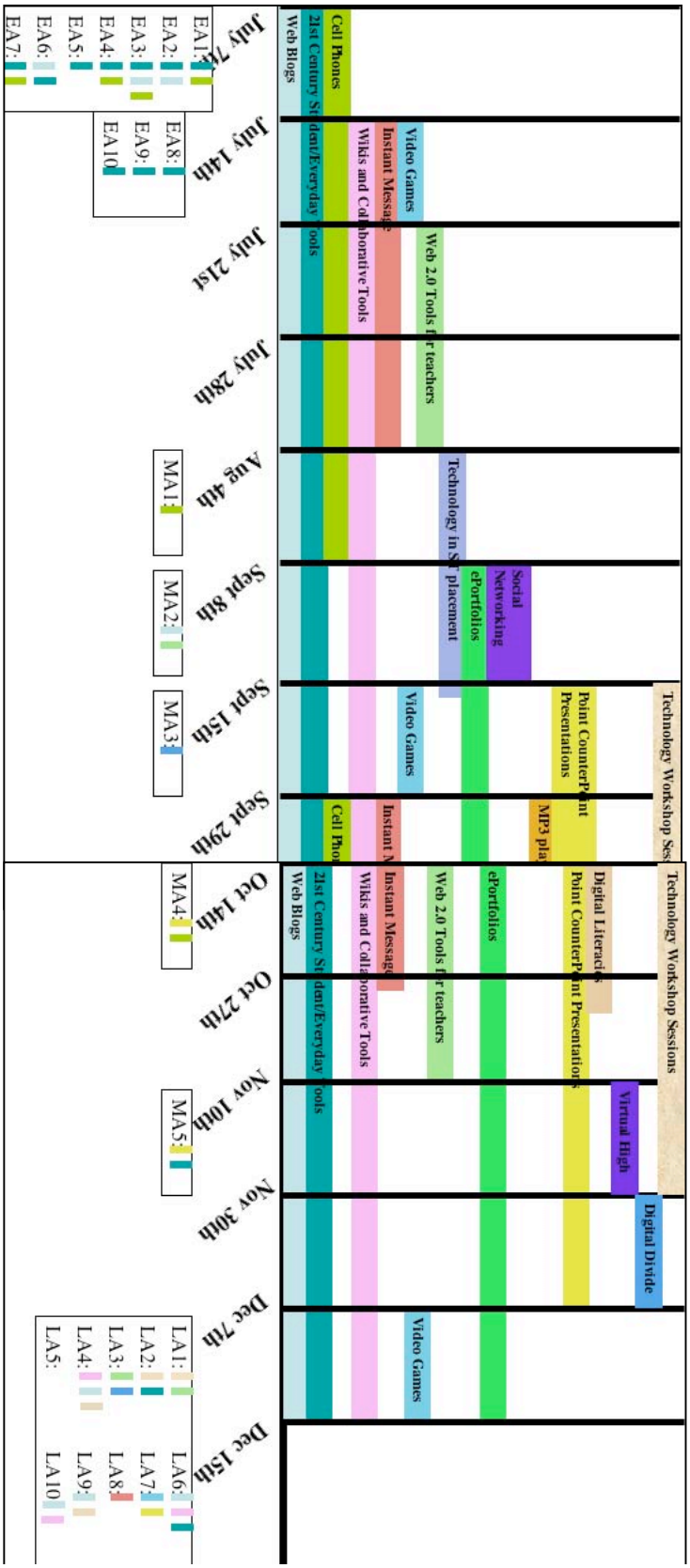

Part D:
Please draw a picture(s) of your everyday use of technologies. Please include (to the best of your ability) the technology from your list in Part C. Feel free to label images.
Daily
Weekly
Monthly
etc.



APPENDIX E: COMPARISON OF % OF PRSERVICE TEACHERS IN EACH CONTENT AREA, SELF-IDENTIFIED COMFORT WITH TECHNOLOGY, AGE AND HOW THEY FELL INTO ADOPTION GROUPINGS

	Early Adopters	Middle Adopters	Late Adopters	Interested Adopters	Non-Adopters
Content Area					
Social Studies N=14	14% n=2	21% n=3	21% n=3	21% n=3	21% n=3
English/LA N=11	36% n=4	0% n=0	18% n=2	36% n=4	9% n=1
Science N=9	11% n=1	11% n=1	22% n=2	44% n=4	11% n=1
Math N=8	38% 3	0% n=0	38% 3	13% n=1	13% n=1
Foreign Language N=4	0% n=0	25% n=1	75% n=3	0% n=0	0% n=0
Self-Identified Comfort with Technology					
A Great Deal N=18	17% n=3	11% n=2	44% n=8	17% n=3	11% n=2
Somewhat Comforta N=25	28% n=7	8% n=2	20% n=5	28% n=7	16% n=4
Not Comfortable N=2	0% n=0	50% n=1	0% n=0	50% n=1	0% n=0
Age					
20-23 n=23	30% n=7	8% n=2	17% n=4	30% n=7	13% n=3
24-27 n=12	8% n=1	16% n=2	33% n=4	42% n=5	0% n=0
28-38 n=4	25% n=1	0% n=0	25% n=1	0% n=0	50% n=2
39-53 n=6	14% n=1	14% n=1	57% n=3	0% n=0	14% n=1

APPENDIX F: TIME OF THE BLOG POST DATE WHERE THE PRESERVICE TEACHER ADOPTED AND THE COURSE ACTIVITIES THAT WERE REFERENCED IN THE ADOPTION POST. NOTE: EA=EARLY ADOPTERS, MA=MIDDLE ADOPTERS, AND LA=LATE ADOPTERS.



APPENDIX G: MIDDLE ADOPTERS “MOMENT OF CHANGE” BLOG POST

“So pretty much, this blog should be titled “------'s Hatred of Cell Phones" since that it apparently the only aspect of technology that I seem to find material to offer commentary on. However, I'm about to blow your minds, because I actually have a recent experience with cell phones that might be quasi-positive.

Text that hints at “moment of change”	Why this is “moment of change”
“So pretty much, this blog should be titled “------'s Hatred of Cell Phones" since that it apparently the only aspect of technology that I seem to find material to offer commentary on. However, I'm about to blow your minds, because I actually have a recent experience with cell phones that might be quasi-positive. However, I'm about to blow your minds, because I actually have a recent experience with cell phones that might be quasi-positive.	The preservice teacher uses an expression to signify that her typical opinions expressed in her web blog have been adjusted as a result of an experience she had.
“I'm at the fishbowl typing a paper and the girl next to me starts conversing in a foreign language with a strange inflection. My knee-jerk reaction is to be really ethnocentric and think to myself, why can't she learn English? Just kidding...I'm an equal opportunity cell phone hater...I hate ANYONE who is obnoxiously using their cell phone, especially when I'm trying to be productive, regardless of the language in which they are speaking.”	
“A little sleuthing on my end revealed that she was actually calling somewhere else in the world (I know because I spied a +1 number) and she was using the computer to do so. As our wide world gets progressively smaller and more united by the second, I realized how cool this was that she could be using a computer to call somewhere (and I'm guessing probably saving some $$ in the process- although I	

wonder who is footing the bill in this case? certainly not -------?). Regardless. I knew that this innovation existed but to see it in practice caused me to realize that this girl is able to connect with her family, etc. in a way that even just a few years ago would have not been possible. The applications of this is the classroom are endless. I don't know the details of what a set-up like this requires, but I'm envisioning a social studies classroom where I could have my students talk to students in another country and really make the topics come alive. Imagine a Current Events class where the students could talk to people in real-time where the event is currently happening? The ideas are endless and especially in a subject area where the content can seem isolated and static, anything that can get kids excited about learning is a victory for teachers.”	

APPENDIX H: NON-ADOPTER'S BLOG POST THAT REPRESENTS AN INTEREST SCORE OF 1

A score of 1 meant that the preservice teacher stated that they did not like the idea of using the everyday tool for teaching. In Appendix H a non-adopter scores 1 because she does not show any interest in using the cell phone audioblogs in her future teaching.

Text that hints at level 1 interest	Why this is level 1 interest
"I've been frustrated lately with some aspects of our tech course. Technology should be used when it is needed and will save time and energy. That is, after all, its main purpose. I feel we often go out of our way to use technology where it is not needed."	The preservice teacher uses the word "frustrated" to express her feelings toward the technology education course.
"By best example would be the audio blogs. I do not understand the purpose of them. Why should I record thoughts on my cell phone when I can much more easily write it down and it is more accessible in print than in audio form. Another example are these very blogs. I understand that they are helpful, and can offer insights, but I sometimes feel we are using them simply because they are a course requirement, not because we need to use them."	The preservice teacher mentions "I do not understand the purpose" of using cell phones. The preservice teacher shows no interest in using everyday tools in her teaching, nor much interest in using them in the course.

APPENDIX I: INTERESTED ADOPTER'S BLOG POST THAT REPRESNTS AN INTEREST SCORE OF 2.

A score of 2 meant that the preservice teacher was undecided and needed more information on the everyday tool. Appendix I is an example of a preservice student who had a new experience with cell phones in her student teaching placement and as a result is uncertain about her opinion on whether or not to include them in her spectrum of learning tools for her own teaching. Thus she has not made any final decisions on the tool positive or negative.

Text that hints at level 2 "interest"	Why it is level 2 "interest"
"One thing I was really shocked to see my first at --------- was the liberal cell phone policy. During the first period of the day, Forum (like homeroom) a student received a phone call and was allowed to answer it. My mentor teacher was not in the middle of instruction or anything so nothing was said and the student continued to talk on his cell phone. His phone rang a couple of more times during the day but he was never asked to turn the phone off, the class and teacher just laughed at his cell phone ring (which was the Notre Dame fight song). It was only during forum that I heard phones ring but I definitely saw several more students with phones throughout the day. Students seemed to know when it was appropriate to use their cell phones and when it was not."	The preservice student expresses somethin and interesting with cell phones in her s teaching placement. But gives no opinion feelings about it.
"This experience yesterday made me question how I felt about cell phones schools. It seems that when students are allowed to use them at appropriate times it eliminates the temptation to use them at the wrong time. This is something I plan to continue monitoring throughout the school year."	While the preservice teacher mentions th experience with cell phones made her qu her own beliefs, she did not express a opinion on whether or not she was going them in her own teaching. Rather she sa would continue to monitor the cell phon throughout her student teaching year.

APPENDIX J: EARLY ADOPTER'S BLOG POST THAT REPRESENTS AN INTEREST SCORE OF 3

A score of 3 meant that the preservice teacher was interested in the everyday technology in a positive way, but did not specifically say they were going to use the technology in their future teaching. Appendix J shows a preservice student who had a positive experience with online chatting in class, and it shed a new light on how chatting and instant messaging can be used for learning. Yet they do not describe how they would use chatting in their own teaching. Therefore they received a score of 3 and not a 4.

Text that hints at level 3 interest	Why it is level 3 interest
"So earlier I wrote an invective about tapped-in being too tempting to pay attention to class. Well, in yesterday's class ------, -------, and I had a pretty substantive conversation (ha!) about the presenters in ----'s class. So I've learned a lesson about tapped-in...it can work. I guess that the initial bloom has worn off of off-topic conversation during class. I was really glad to have an outlet for these ideas during class. I was just so glad to see how these technology uses can affect students."	The preservice teacher expresses a revelation she had about a chat room used in the education technology course called "Tapped In". She mentions that chatting "can work." While she does not give an example of using chatting in her future teaching, she does draw a positive conclusion about the tool an it's potential impact on learning.

APPENDIX K: MIDDLE ADOPTER'S BLOG POST THAT REPRESENTS AN INTEREST SCORE OF 4

A score of 4 meant that the preservice teacher planned on using everyday technology tools in their future teaching. Appendix K represents a preservice teacher who describes not only a positive learning experience with wikis, but goes on to describe how he plans on using wikis in his future teaching. Therefore earning the highest score of a 4.

Text that hints at level 4 interest	Why it is level 4 interest
"My eyes were opened by today's section on creating our own wikis. I have used other wikis in the past, mainly for strategy video games such as Victoria: An Empire Under the Sun, but never thought that I could start my own or collaborate in an important capacity on one. While pbwiki seemed a bit difficult to handle, I am excited to use wikispaces in the future, especially in the classroom.	The preservice teacher expresses a positive experiences with using wikis in the technolog education course, by stated that he is "excited use wikispaces in the future, especially in the classroom."
I've already thought of a use for wikis among my history students. Throughout the year, students could write up mini articles in a wiki (either their own or the class wiki) that describe important figures, events, or define terms that we encounter throughout the semester. Then, near the end of the term, the students could use this information when creating a presentation or paper on a broad historical concept or theme. This way, students won't be deterred from a large project because much of the information they need will be at their fingertips, rather than in heavy books and reams of paper. In this way, students will be encouraged to convert their ideas into written text throughout the year while writing their articles, and develop organizational skills while compiling the wiki. Not to mention the benefits of drawing larger themes together.	The preservice teacher gives an example of h will use wikis with his future history students
While I do concede that Neil Postman's point regarding the distractions provided by and the overwhelming nature of abundant sources of information (such as wikis), I believe that teachers can play a	

large role in focusing students' attention so that they can learn effectively. Instead of just throwing students into the e-world of wikis and websites, teachers can show students how to selectively use these tools to aid them with their studies. Then, when they are comfortable with their abilities, they can branch out to discover other sources available to them.	
I wish that I had realized that a wiki is a great organizational tool for research before I wrote my thesis. I could have made my own wiki with my research points, references, themes, characters, and primary source quotations that was easily searchable and a lot less heavy than the five subject notebook I lugged around. At least I know it now for the next big project I will have to do, and for my students in the future! Bring on the wikis!”	

APPENDIX L: EARLY ADOPTER'S BLOG POST THAT REPRESNTS AN "AWARENESS OF THE 21ST CENTURY STUDENT AND THEIR TECHNOLOGY TOOLS"

Text that hints at "awareness"	Why this is "awareness"
"As I'm sitting here watching horrible reality shows on MTV I can't help but realize how consumed my life is with technology. I didn't grow up dependant on cell phones, computers, or ipods but the students we will be teaching have.	The preservice teacher expresses self-awareness that she did not grow up in a digital world. She also expresses her understanding that her future students are growing up in a digital world.
I feel that it is my job as an educator to realize this and to incorporate technology into my teaching. I don't want my lessons to revolve around technology or to be dependant on them but if I am preparing my students to be an active participant in modern society than some incorporation of technology is important."	The preservice teacher expresses her understanding that it is her "job" to prepare her students for "modern society."

APPENDIX M: LATE ADOPTER'S BLOG POST THAT REPRESENTS A "CLASS CONNECTION"

The preservice teacher in Appendix M is referencing a presentation they made for class called Point/Counterpoint and a workshop they took on how to make digital videos called "Lights, Camera, Action."

Text that hints at "class connection"	Why this is "class connection"
"I had a new experience with technology and education, and that was in the making of our point/counterpoint video. We got to write the screenplay, produce, act in and direct our own production. My roles were limited to the writing and acting, although I did hold the camera for a while. The filming of our movie was surprisingly simple. We borrowed a camera, started and stopped it when we were ready, etc. It took us about two hours to do the filming, but the finished product was only 15-20 minutes long, which was a little disappointing. I wasn't involved in the editing (although I heard the Lights, Camera, Action workshop was lots of fun) which I'm sure is the more complicated part of the whole process.	The preservice teacher mentions an activity that occurred in the education technology course.
"I have to admit I was a bit skeptical about doing a movie for the project. I thought it would just take too long, and be too hard to incorporate all the points of view, and salient information. So, the jury is still out on our treatment of the topic, and it probably doesn't qualify as academic heavy lifting, but making the movie was a lot of fun, and I think watching it will be too. And I've found myself wading deeper into the technology quagmire."	

APPENDIX N: NON-ADOPTER'S BLOG POST THAT REPRESENTS BEING "OFF-TOPIC"

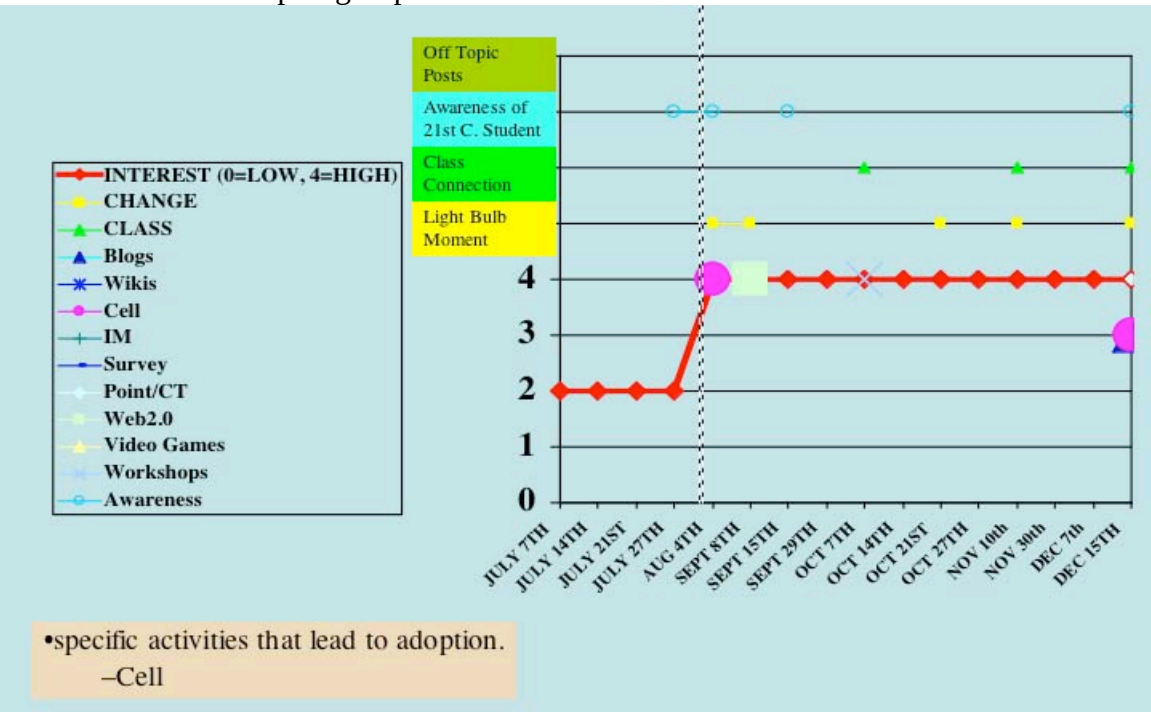
This preservice teacher spent their entire post describing the Detroit Tigers and their playoff position. Not one word about technology or teaching in the entire post.

Text that hints at "off topic" post	Why this is "off topic" post
"Today the Detroit Tigers clinched a spot in the playoffs. They haven't done this in 19 years...and I mean, 19 very long, disappointing years. My grandfather must be doing somersaults in his grave. My grandpa died in 2004, so he never saw another Tiger's Championship since the 1984 World Series. After '87 they were never really good again. Grandpa told me a couple years ago that a high school team could beat the Tigers. Not anymore. I started thinking about how technology has changed since the days of "Tigers roar in '84"... For starters, ticket sales can now be done online. Sure you can drive to the ballpark to purchase tickets, but that's only for people like my mother who still have dial-up and write checks. Now you can print off your E-ticket and walk right up to the gate. Then Comerica park employees use scanners to weed out counterfeit tickets. I'm not sure what they did in '84...maybe they used the honor system?"	The preservice teacher spends the entire po ing about her interest in the Detroit Tigers ba team, never mentioning technology or teach the post.

APPENDIX O: INDIVIDUAL CHART SAMPLES; MIDDLE, LATE, INTERESTED, AND NON-ADOPTERS.

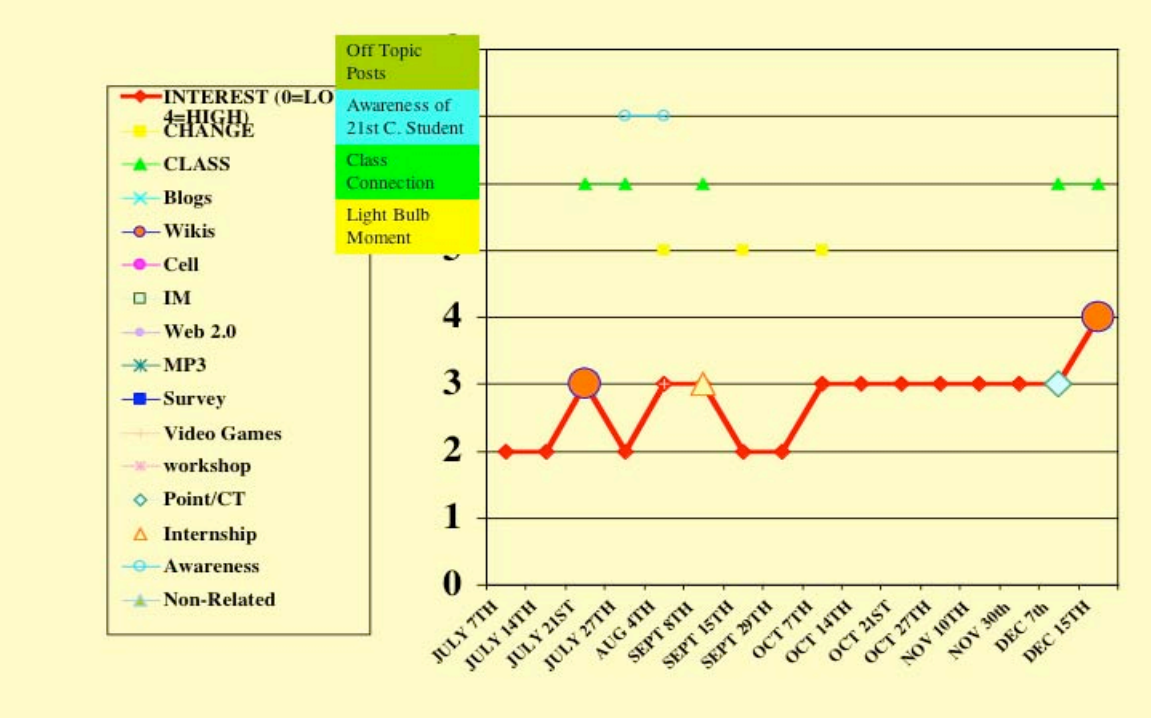
Example of a middle adopter

This preservice teacher started off in July 2006 at an interest of a 2, but then after some class activities with tools such as cell phones, her interest changed to a 4 in September 2006, therefore placing her in the middle adopter group.



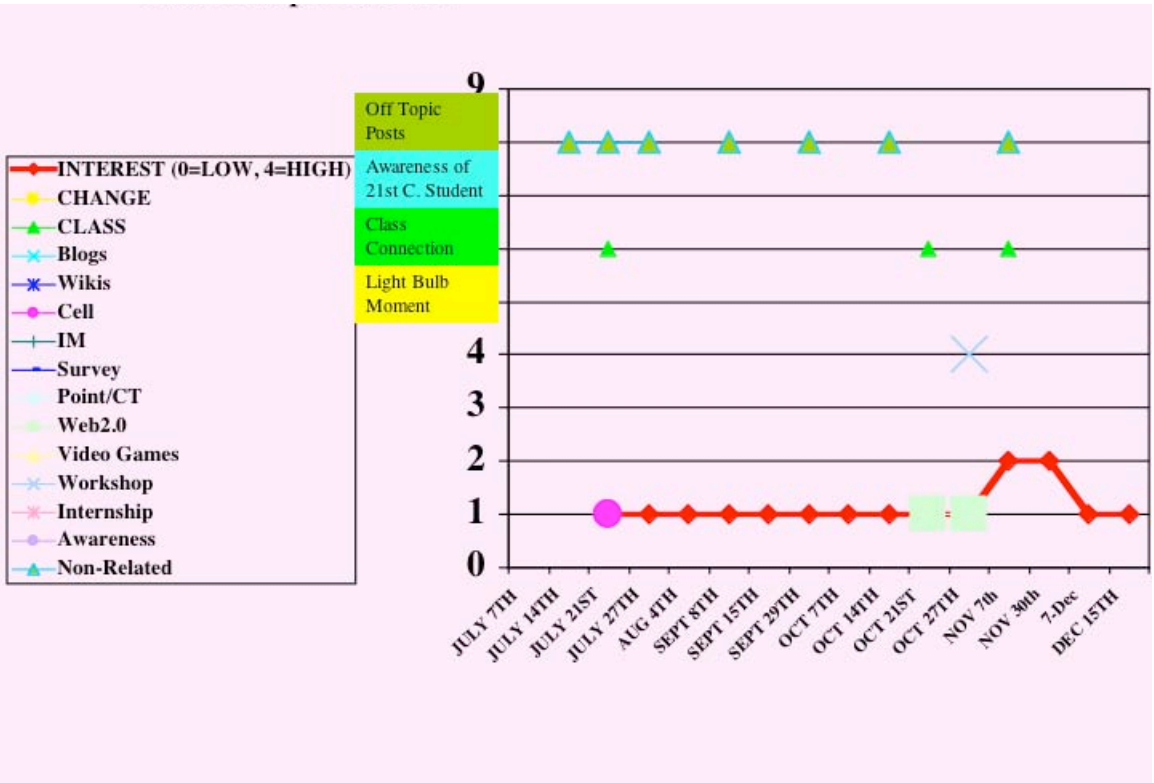
Example of a late adopter

This preservice teacher started out uncertain in his interest in using everyday technology tools, but by his last blog post he was at a 4 for his interest. Therefore we can see why he is a late adopter.



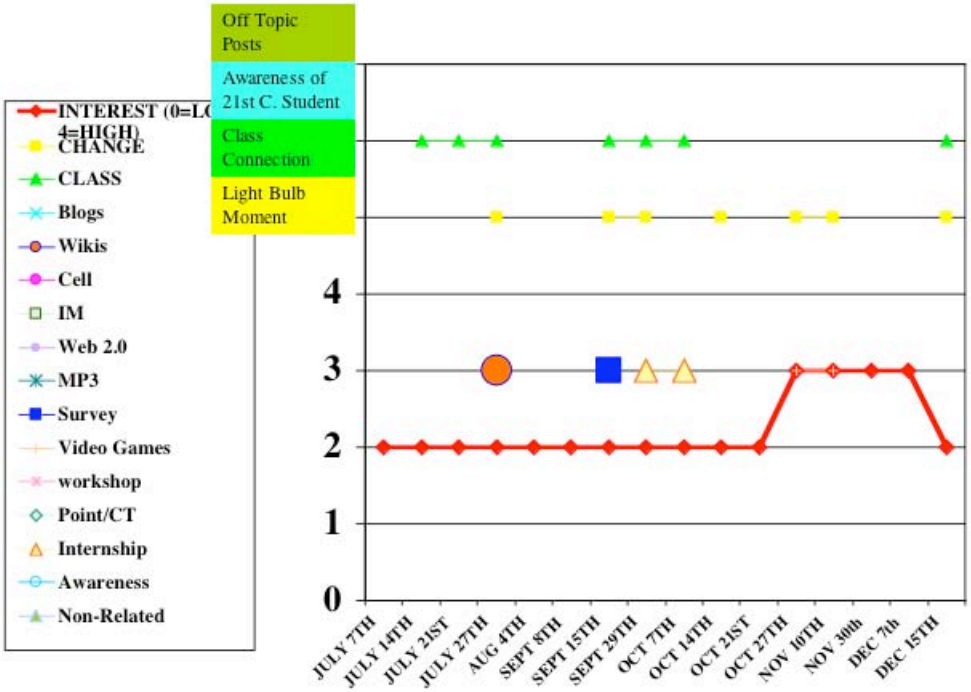
Example of a non-adopter

7 of the 12 posts for this preservice teacher were off-topic. Additionally, they did not have any moments of change or awareness of 21st century students. They also showed almost no interest in using the everyday technology tools. Therefore we can see why this teacher fell into the non-adopter group.



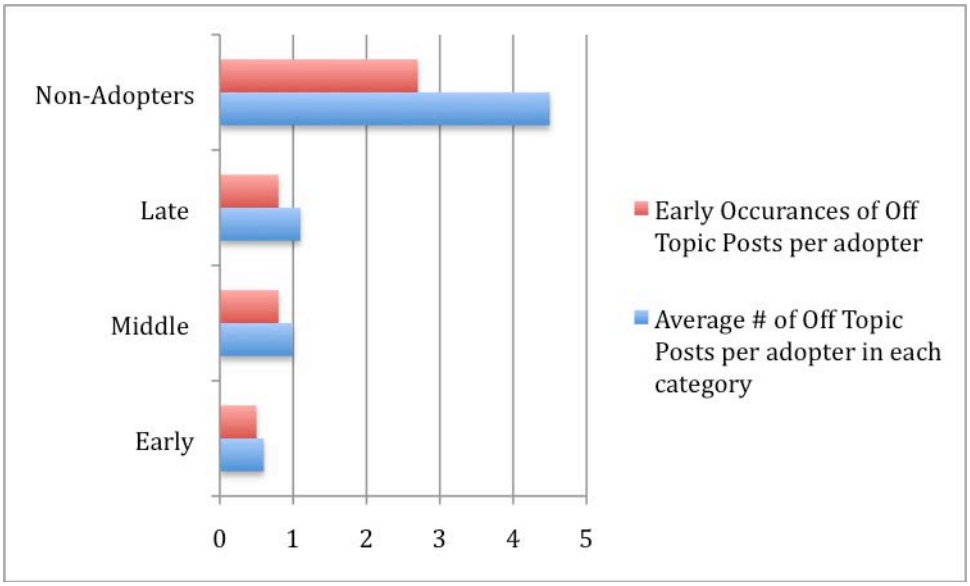
Example of an interested adopter

Notice that this preservice teacher shows interest in using some of the everyday technology resources (such as wikis and blogs) , and has had some positive technology internship experiences, yet they never once mention an awareness of the 21st century student. Yet, they never specifically declare one way or the other if they are planning on including these everyday technology tools in their future teaching. Therefore, we can see how this preservice teacher was in the "interested" adoption group.

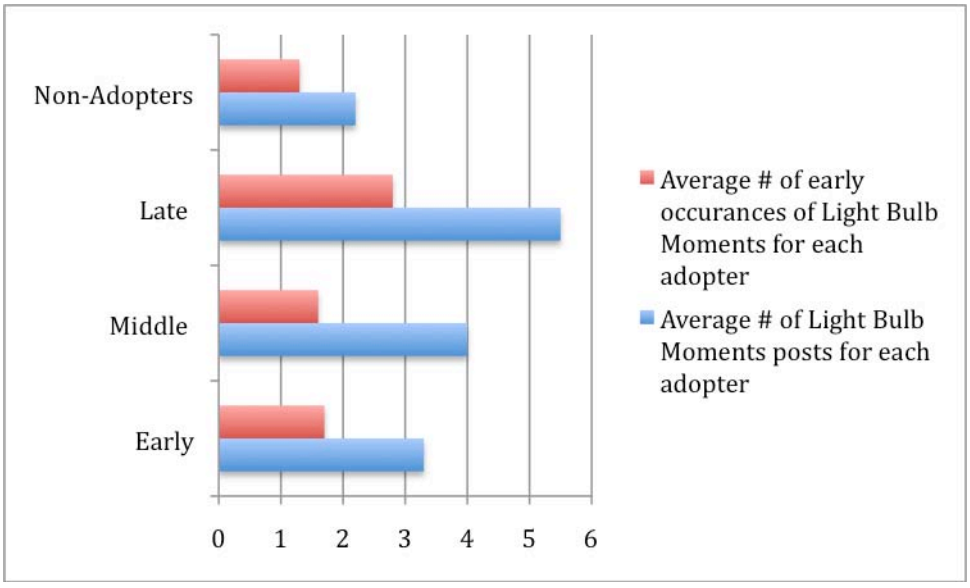


APPENDIX P: COMPARISON OF EARLY, MIDDLE, LATE, AND NON-ADOPTERS GROUP CHARACTERISTICS FROM THEIR WEB BLOG POSTS

The chart shows the average number of posts for students in each adoption group related to the category of Off-Topic posts. The chart also shows the average number of posts in each adoption group that came early in the course concerning Off-Topic posts.

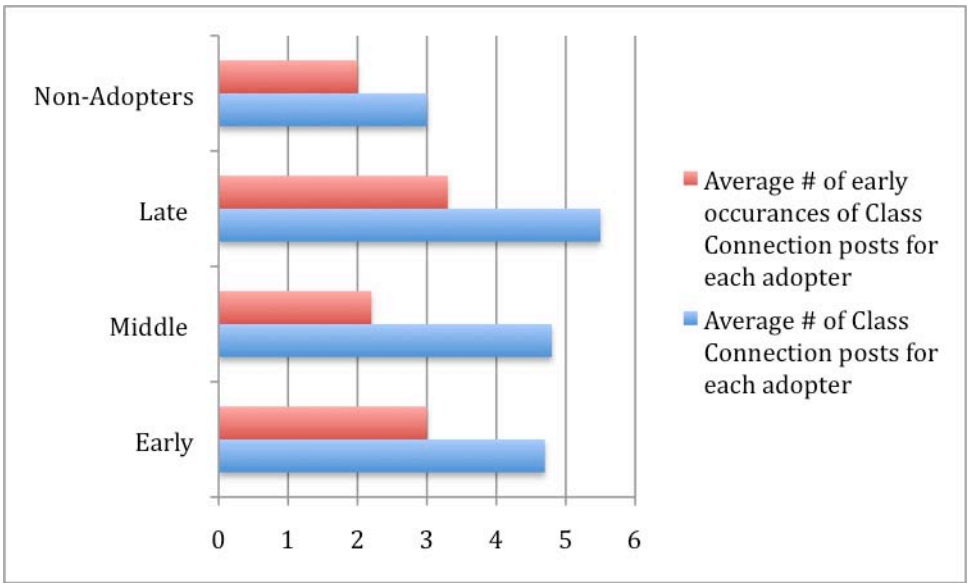


The chart shows the average number of posts for students in each adoption group related to the category of Light-Bulb Moments. The chart also shows the average number of posts in each adoption group that came early in the course concerning Light-Bulb Moments.

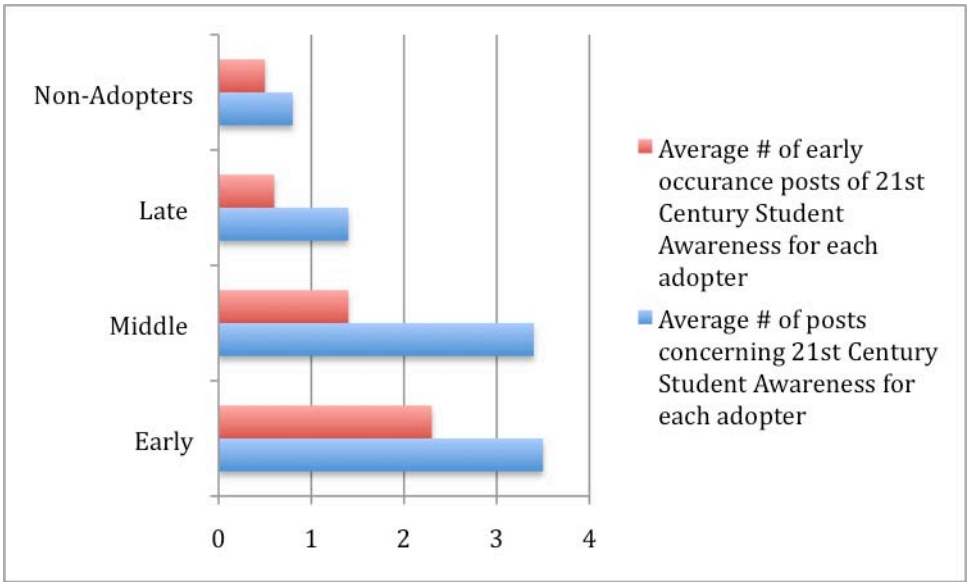


The chart shows the average number of posts for students in each adoption group related

to the category of Class Connections. The chart also shows the average number of posts in each adoption group that came early in the course concerning Class Connections.



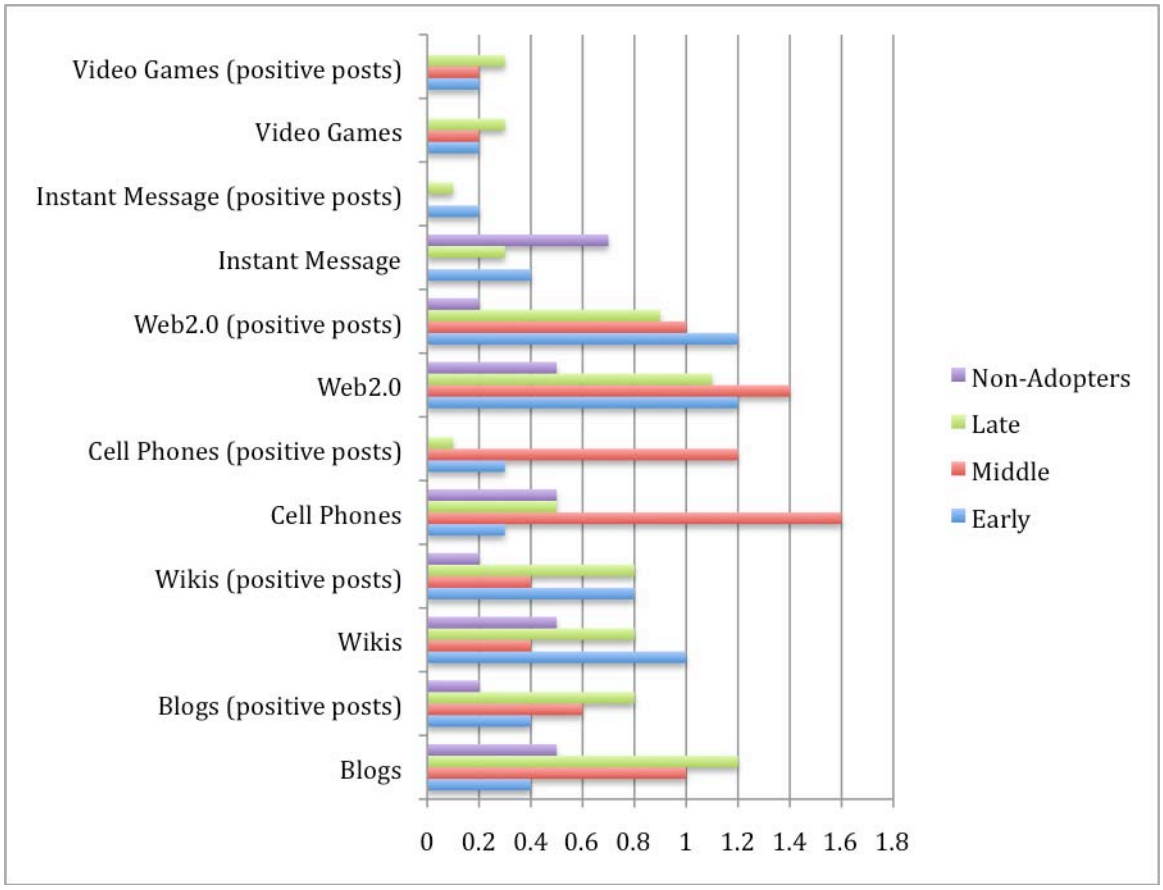
The chart shows the average number of posts for students in each adoption group related to the category of 21st Century Student Awareness. The chart also shows the average number of posts in each adoption group that came early in the course concerning 21st Century Student Awareness.



	Off Topic Posts	Early Occurrences of OT posts	Light-Bulb Moments	Early Occurrences of LB posts	Class Connections	Early Occurrences of CC posts	21st Cen. Student Awareness	Early Occurrences of 21st C. Aware posts
Early (n=10) average # of posts per person in EA	.6	.5	3.3	1.7	4.7	3.0	3.5	2.3
% of EA occurrences that were posted before OCT 1		83%		52%		64%		66%
Middle (n=5) average # of posts per person in MA	1	.8	4	1.6	4.8	2.2	3.4	1.4
% of MA occurrences that were posted before OCT 1		80%		40%		46%		41%
Late (n=13) average # of posts per person in LA	1.1	.8	5.5	2.8	5.5	3.3	1.4	.6
% of LA occurrences that were posted before OCT 1		73%		51%		60%		43%
Non A. (n=6) average # of posts per person in NA	4.5	2.7	2.2	1.3	3.0	2.0	.8	.5
% of NA occurrences that were posted before OCT 1		60%		59%		67%		63%

APPENDIX Q: COMPARISON OF THE EVERYDAY TOOLS MENTIONED IN THE BLOG POSTS FOR EACH ADOPTION GROUP

The chart shows the average number of posts for students in each adoption group related to the everyday tools studied in class. The chart also shows the average number of posts in each adoption group that were positive concerning the everyday tools.

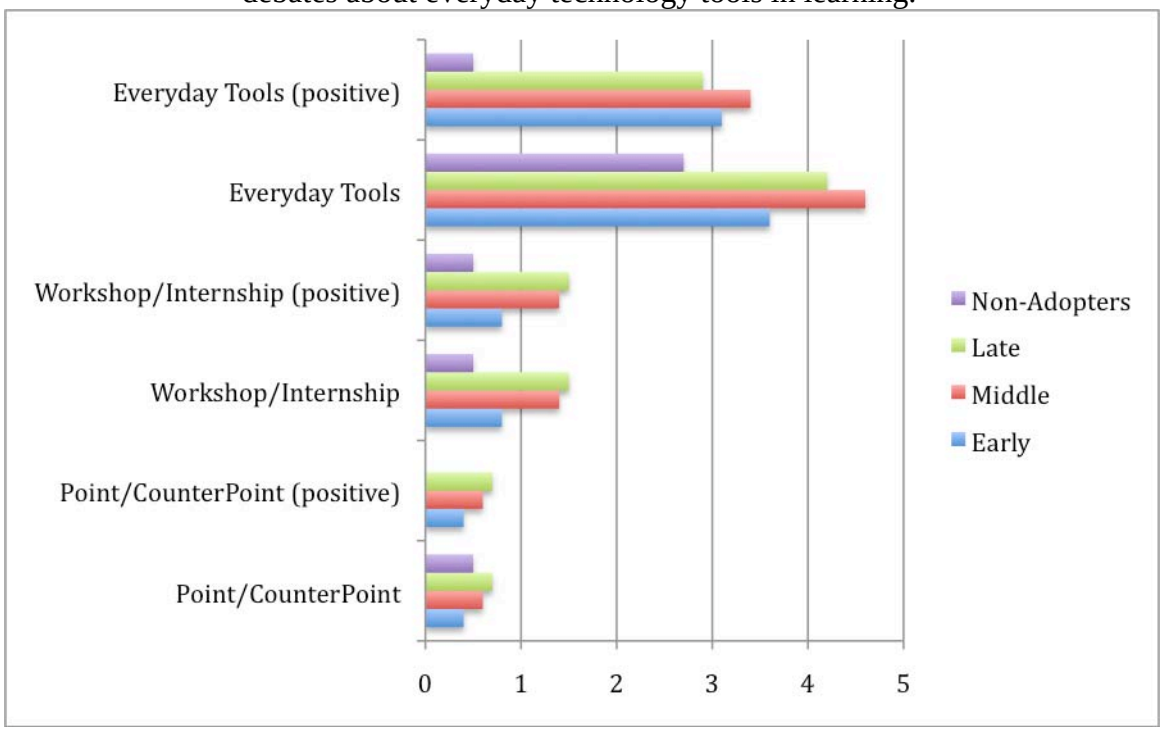


	Blog	Blog 3+	Wiki	Wiki 3+	Cell	Cell 3+	Web2.0	Web2.0 3+	IM	IM 3+	VG	VG 3+
Early (n=10) average # of posts per person in EA	.4	.4	1.0	.8	.3	.3	1.2	1.2	.4	.2	.2	.2
% of EA occurrences that were 3+ positive		100%		80%		100%		100%		50%		100%
Middle (n=5) average # of posts per person in	1	.6	.4	.4	1.6	1.2	1.4	1.0	0	0	.2	.2

MA												
% of MA occurrences that were 3+ positive		60%		100%		75%		71%		0%		100%
Late (n=13) average # of posts per person in LA	1.2	.8	.8	.8	.5	.1	1.1	.9	.3	.1	.3	.3
% of LA occurrences that were 3+ positive		67%		100%		20%		81%		33%		100%
Non A. (n=6) average # of posts per person in NA	.5	.2	.5	.2	.5	.0	.5	.2	.7	.0	.0	.0
% of NA occurrences that were 3+ positive		40%		40%		0%		40%		0%		0%

APPENDIX R: COMPARISON OF THE EDUCATION TECHNOLOGY COURSE ACTIVITIES MENTIONED IN THE BLOG POSTS FOR EACH ADOPTION GROUP

The chart shows the average number of posts for students in each adoption group related to class activities. The chart also shows the average number of posts in each adoption group that were positive concerning the class activity. The three class activities are everyday tool modeling, workshop/internship experience, and the Point/CounterPoint debates about everyday technology tools in learning.



	Point/Counter Point	Point/Counter Point 3+	Workshop/Internship	Workshop/Internship 3+	Everyday tools mentioned in posts	Everyday tools mentioned in posts 3+
Early (n=10) average # of posts per person in EA	.4	.4	.8	.8	3.6	3.1
% of EA occurrences that were 3+ positive		100%		100%		89%
Middle (n=5) average # of posts per person in MA	.6	.6	1.4	1.4	4.6	3.4

% of MA occurrences that were 3+ positive		100%		100%		74%
Late (n=13) average # of posts per person in LA	.7	.7	1.5	1.5	4.2	2.9
% of LA occurrences that were 3+ positive		100%		100%		69%
Non A. (n=6) average # of posts per person in NA	.5	.0	.5	.5	2.7	.5
% of NA occurrences that were 3+ positive		0%		100%		19%

APPENDIX S: EXAMPLE OF A NON-ADOPTER'S FIRST FIVE BLOG POSTS

Notice how the preserivce teacher, Jill, slowly moves away from on-topic posts (revolving around education and technology) to off-topic posts.

Blog Post 24: Non-adopter Jill's 1st four posts

In her first post, Jill is on-topic, she discusses an activity from class where she was asked to reflect on her ideal classroom and the technology she would like to have in it. Yet, she concedes that she really does not believe schools can provide "such content-specific tools". Additionally she does not mention any everyday tools from the class discussion or activities.

Tuesday, July 11, 2006

"Thoughts. I'd like to comment on the technology discussion we had this past Friday. Two points interested me: the technologies available specific to each subject area and the opportunity to have them based on a school's position to provide them.

It was fun to pretend that we had every resource available and imagine what dream products we would like in our room. Someone mentioned a digital chalkboard of sorts, which seems great for any kind of teacher. I thought it interesting how each teacher has totally different needs. Math, Science, Language Arts, and Foreign Languages each have fascinating technologies available. However, it is difficult to conceive a school being able to provide such content-specific tools.

One student in our class mentioned that their high school did not even have heat. I remember my own high school's technology did not go further than powerpoints and video tapes. It will be interesting to discover when I am student teaching, what

technologies are ready for me to use. It will also be interesting for all of us to compare our schools' technology resources with one another."

In her 2nd post, Jill does reflect on a class activity, a brief discussion on Dewey, but she reflects on has nothing to do with technology education. It is a bit off-topic and does not include any of the everyday tools that were also used and discussed in that particular class session.

Saturday, July 15, 2006

"A coincidence: Today I received a letter in the mail from our MIchigan State Representative, congratulating me on my recent graduation. A silly template letter I'm sure almost all graduates receive, but in the letter was a mention of John Dewey and his "education is not preparation for life; education is life itself." I found this funny, having just discussed it in class the previous day.

I really enjoyed the discussion on Friday, especially learning a bit about the history of education. What Dewey says is entirely true, we never stop learning. I looked up the rest of his pedagogical creed. Here are a few lines that reminded me of our classes thusfar:

"I believe that the image is the great instrument of instruction. What a child gets out of any subject presented to him is simply the images which he himself forms with regard to it.

I believe that if nine tenths of the energy at present directed towards making the child learn certain things, were spent in seeing to it that the child was forming proper images, the work of instruction would be indefinitely facilitated." - John Dewey

so although we have not been discussing images specifically, what he says goes along with teaching for concepts and understanding."

In her 3rd post, Jill mentions some everyday tools (such as blogs and cell phones which are the "audio blogs"), but she only has negative things to say about them as learning tools.

Tuesday, July 25, 2006

"I've been frustrated lately with some aspects of our tech course. Technology should be used when it is needed and will save time and energy. That is, after all, its main purpose. I feel we often go out of our way to use technology where it is not needed. By best example would be the audio blogs. I do not understand the purpose of them. Why should I record thoughts on my cell phone when I can much more easily write it down and it is more accessible in print than in audio form. Another example are these very blogs. I understand that they are helpful, and can offer insights, but I sometimes feel we are using them simply because they are a course requirement, not because we need to use them.

Lastly, playing off our discussion of facebook and myspace accounts from class on Tuesday: I dont feel we should delete these accounts. I think that would be making a sacrifice that we dont need to make. However, I do feel that most accounts should contain

the BARE minimum of information, so that (as we said in class) students or employers are unable to form impressions of you before meeting you."

In her 4th post, Jill does not talk about anything related to technology, similar to Sarah, it is the first of many off-topic posts.

Wednesday, August 02, 2006

"On a topic other than technology, I've been thinking quiet a bit lately about the strides the 50 of us have made as a group. What I love is that we have gradually been taught how to work as a cohesive group over these initial weeks.

We don't have to raise hands anymore. The professor often stands in the back of the class and let's us control our own discussion. One rarely begins a comment without saying, "Building on what so and so said," or "To go along with so and so...". We can arrange ourselves in groups in a matter of minutes. I love how this happened, and I'm not really sure how it did. How can I get my own students to work this well in groups??!?"

Education 504 - Teaching with Technology
Summer-Fall 2006

Instructors:
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Office hours by appointment

About the Course

We invite you to engage in a thoughtful exploration of some of the possibilities that exist for putting educational technologies in the service of your teaching and your students' learning. We are interested in your thoughts, investigations, discoveries and concerns regarding these key questions:

Where do you see possible benefits from the use of instructional technology in your teaching?

Where are you seeing potential sources of problems or concern as you engage in your design work, and as you contemplate integrating instructional technology into your teaching?

What seem to be important questions to be asking yourself as you consider the place of instructional technology in your teaching?

Whether you are doing design work, interning in classrooms, or doing other tech-related explorations, what educational purpose(s) does instructional technology seem to be serving? What is it enhancing? What is it making (or seem to be making) possible, or more possible? Conversely, what is/might it be constraining or inhibiting?

To facilitate a rich engagement with questions like these, we are going to be learning about and using a variety of tools. Each of you will create a blog to chronicle your reflections on your work in Ed 504, and you will also be involved in the creation of a group wiki in your content area. We'll all experiment with the use of cell phones, digital recorders and instant messaging in the context of our class, and we will take a look at web-based tools that allow you to design scoring rubrics, quizzes, surveys and polls. Depending on choices you make, you will either get a close, extended look at specific ways in which educators are using technology for educational purposes, or you'll gain some hands-on experience and expertise in utilizing a range of technology tools. We will also introduce you to some key professional organizations and resources. Finally, during our first class session in September, you'll learn about a web-based

portfolio creation tool that you'll use for the culminating project of your MAC year, your electronic portfolio.

It's important that you understand that your instructors are exploring (and even experimenting) right along with you. These new tools offer exciting opportunities for educators, and we want you to be exposed to them, but we also want you to keep your eyes on the prize: your students. Our sincere hope is not that you necessarily become an avid technology user, but that whatever you do with regard to instructional technology, you make your decisions thoughtfully, and we hope to model that kind of engagement in Education 504.

Course Structure

As you know, this course spans both the summer and fall. During the summer, we will look together at a variety of technology tools and web-based resources. You will be doing some investigations on your own, and some in small groups. Indeed, the structure of this course has been created to offer you, as much as is possible, the opportunity to explore your interests within the broad domain of educational technology. During the summer, we will conduct our explorations primarily as a group, as detailed in the schedule below:

Summer Sessions (Fridays 1:30-4:30)

With the exception of our July 21st session, all summer sessions will begin in Room 1309 (Whitney) for the first hour, and will then move to the 3rd floor sites lab classrooms (Room 3010) for hours 2 and 3.

July 7th

1. How do you see instructional technology in your classroom?
2. Course overview.
3. We'll talk about blogs and their use in teaching, and we'll discuss how we'll be using blogs in Ed 504. You'll also set up your own blog for the course.
4. Introduce CTools site.

Homework

Blog Reflection: Make the first of your weekly blog posts (what did the class discussions on the 7th or the readings for the 14th lead you think about?). Check out your colleagues' blogs, and post on a couple of their blogs.

Read articles in July 7th folder on Ctools (Blog On, A Pencil is a Word Processor, A History of Instructional Media, and Synching with the iKid)

Register with TappedIn (http://tappedin.org).

July 14th

1. Wikis: what are they? How are they used? Setting up your own.
2. Introduce Point/Counterpoint Project.
3. Introduce Web Treasure Hunt Project.
4. What is "Ed Tech"?

5. Introduce our chat room (Tapped In)

Homework

Blog Reflection: Write your own reflection. Reply to at least two other classmates posts.

Point/Counterpoint Interest Survey.
Read articles in July 14th folder on Ctools (NPR broadcast-listening activity and Postman Articles).

July 21st

Duderstadt Center, North Campus--Room 3336

1. Point/Counterpoint Project Group Meetings.
2. Online quizzes/polls/surveys.
3. Discussion of Postman article.

Homework

Blog Reflection: Write your own reflection and comment on at least two blogs of your colleagues.

Review Resources in July 21st folder on CTools.

Consider Tech Workshop & Field Internship possibilities (In July 21st CTools folder).

July 28th

1. Rubrics & checklists.
2. Close look at Tech Workshops and Field Internships.
3. Guest presenters—teachers and students from West Bloomfield High School's Instructional Project Design course.

Homework

Blog Reflection: Write your own reflection and comment on at least two different blogs of your colleagues.

Final preparation for your Web Treasure Hunt presentation.

Review Resources in July 28th folder on CTools.

Complete online Tech Workshop/Field Internship survey.

August 4th

1. Web Treasure Hunt Presentations (with special guest MAC grads).

2. Web as a research tool & lesson planning sites.
3. Getting Ready for the Fall.

Homework

Blog Reflection: Write your own reflection.

Review resources in August 4th folder on Ctools

"Instructional Technology in my placement" survey due by September 13th.

See you at our first fall session, on Friday, September 8th from 1-4, in the School of Education's 3rd floor sites lab.

Assignments & Evaluation

Blog Reflections (24 points)

For each of the five summer weeks, and seven more times during the fall, we ask that you do a blog assignment. A blog assignment includes a posting in your blog, and at least one response to a blog entry by a colleague. Liz and Jeff will read all of your blog postings, and will respond to as many as we can. In terms of evaluation, we'll want to see that you're doing your twelve assignments and that you're consistently engaging with the kinds of questions listed at the beginning of the syllabus. This assignment is designed to be open-ended, and to provide a place for you to express concerns, questions and connections you make as you make your way through the term. (Rubric available on CTools).

Web Treasure Hunt (15 points)

We would like each of you to explore the content-specific resources in your discipline that are available on the web, and to come up with one resource that you'll explore thoroughly and that you think has real merit. By August 4th, we'd like for each of you to have made a posting about this resource in your content area wiki, in which you give a link to your site and briefly describe the nature of the resource, indicating the resources that are available through the site, some specific ideas on how you might use them, and some comments about (and

commentary on) how the site is put together. Then, at our August 4th class, you will each have an opportunity to give a brief (5 minutes) in-class demonstration of the resource to other MACers in your content area, including at least one specific idea of how you could utilize the site in your teaching. (Rubric available on CTools).

Point/Counterpoint Project (25 points)

We would like each of you to be a part of a team that makes a 30-minute presentation to your colleagues on a controversial topic related to educational technology. After class on July 14th, we will ask you to complete a survey in which you can express your topic preferences, and then on July 21st we will announce the groups. You will have time in class that day to begin the process ofputting together what are sure to be compelling presentations conveying differing perspectives on each question, and framing issues for your colleagues to consider during a 15-20 minute discussion period that will also be a part of your presentation. You are cordially invited to make use of educational technology in your presentation. These presentations will all take place at our Thursday evening sessions during the fall. We place a high value on the creativity and the thoroughness of your presentation, and in your effort to engage your audience in what you consider to be the important issues relevant to your topic. (Rubric available on CTools).

Here are the point/counterpoint topics for your consideration (each of which is described in more detail in a reading in the "point/counterpoint folder on CTools):

- Is there a digital (Gender, Racial, Access, Ability) divide?
- Should we be podcasting in the classroom?
- Should schools have internet filtering?
- Can games be used to teach?
- Is PowerPoint crippling our students?
- Is open source the answer?
- Should schools strive to be on the leading edge of technology?
- Should we ban instant messaging in schools?
- Should we offer complete access to all grades at all times for parents?
- Virtual High Schools as an alternative to the classroom.
- Does Wikipedia represent progress or danger?
- Blogging in the classroom?

"Instructional Technology in my placement" (10 points)

During your first couple of weeks in your placement, we'd like for you to do some investigations into Educational Technology at your school. Talk to your mentor, find the person who is in charge of educational technology, and see what you can find out about questions like:

What equipment is available for teacher's use?

What facilities are available to me?
Do I need to schedule lab time and, if so, how do I do it?
What training do I need?
Who are the people who I need to know at the district office regarding ed tech?
What computer-based grading tools does my mentor use?
How does your mentor utilize educational technology in her teaching?
What is the Acceptable Use Policy for my school? Can my students email, instant message, post on WebPages for school purposes?
What is the protocol for troubleshooting my computer hardware and software when it breaks down?

By September 14th, we'd like for you to post an entry about your findings in an online survey that we have developed, and we will discuss your findings in class that evening.

Final Presentations (30 points)

We will have more detail on this in the fall (including an evaluation rubric), but on December 15th, we will ask each of you to give a 10 minute presentation about some of the work you did in your tech workshop or field internship, and some of your reflections on that work. We will have presentations all day on the 15th, and we will ask that each of you attend at least five presentations given by your colleagues.

Portfolio (25 points)

We will ask you to start your educational portfolio by creating a home page that includes the following items:

• A statement of your philosophy of teaching (which an include a picture, poem, quote, paragraph, video, etc...)
• A short reflective piece in which you share your evolving thoughts regarding the "big picture" questions listed at the beginning of the syllabus. We encourage you to draw upon your blog postings to carry out this assignment.
• Artifact(s) from fall workshop/internship (more in fall syllabus)

Class Participation (30 points)

We expect and encourage your active engagement with our class discussions, our tech training sessions, and your field internships and/or tech workshops. We know and understand that some people are more vocal than others, and although we hope to hear from everyone in class, we value focused listening just as we value speaking up. Most importantly, we value your earnest efforts to think about the issues we discuss and the tech tools you learn about, and to show diligence and initiative in your field internship placement and your tech workshops.

Fall Sessions

We will have a separate fall syllabus for you, but know that the fall will work differently from the summer:

1. There will only be three sessions that everyone attends during the fall (Friday, September 8th from 1-4 in the School of Education's 3rd floor sites lab; Thursday, September 15th from 4:30-6:30 (room tba), and Friday, December 15th—our final presentation day, details to follow).
2. There will be six additional Thursday evening sessions, from 4:30-6:30, of which each of you is expected to attend four.
3. You will be expected to devote 13 contact hours to your tech workshops, your field internship(s), or a combination thereof.

Tech Workshops and Field Internships

A central part of your Ed 504 experience during the fall will be your tech workshop(s) and/or field internship(s). The tech workshops are described below. The full list of field internships will be available by July 21st. You will be able to make selections after our July 28th class. We are hoping to have everyone's fall "plan" in place by the end of the summer. Your work here will be factored in to your class participation grade, and we will be looking for your dedicated, consistent involvement in your chosen work.

Field Internships

Our conjecture is that some of you may be less interested in the nuts and bolts of the various computer applications, and are more interested in what teachers do with technology, or with interesting uses of technology. We've made some contacts and set up a range of internship options for the fall, some of which will take you to other parts of the university, but most of which will take place in schools. We will discuss this at greater length in class, but field internship participants will make a series of regular visits to their internship sites where they will both be learners and participants, working with their teacher/mentor, creating resources, interacting with students, getting to know the environment and so on. The list will be finalized over the next couple of weeks (we're still firming up some additional possibilities), but here are some examples:

The Language Resource Center (LRC). The LRC develops and makes available a wide array of technology-based resources and programs to support language instruction at the university. The LRC is also engaged in supporting language instruction is area middle and high schools. Internship possibilities exist at the LRC both for those of you interested in foreign language instruction and for those of you with a special interest in world cultures. This internship is a kind of hybrid: you will be working directly with technology tools, but you'll also be exploring another educational setting with two inspired educators, Lynne Crandall and Philomena Meechan.

The Instructional Project Design (IPD) group is a collaboration between West Bloomfield High School and the UM Flint and Ann Arbor campuses. High School students are engaged in sophisticated technology design work intended to serve an array of pro-social purposes. One current IPD project will have students designing educational web resources for use by the UM Trauma and Burn Center, while another involves students interacting with returning Iraq War veterans. You will have the opportunity to be a part of a design team, and to bring your personal and content-area knowledge to bear on design planning and implementation.

Interactive Communications & Simulations (ICS). Jeff's group designs and facilitates a number of computer-mediated curricular projects for middle and high school students. Several teachers on our network have offered to host one of you as a collaborator in that school's engagement in one of the ICS projects. Opportunities will be available with our Place out of Time historical simulation

(Summers-Knoll School in Ann Arbor), the International Poetry Guild (West Middle School in Plymouth and Divine Child High School in Dearborn) and the Earth Odyssey social-cultural issues forum which will explore China (Tinkham Alternative School in Wayne).

MAC Tech Apprenticeships. We have arranged for several opportunities for interested students to spend some time working closely with practicing teachers, many of whom are MAC graduates. Opportunities include working with technology teachers, helping a MAC grad design and implement a course on the "Sociology of Genocide," working with a Special Education teacher who makes ample use of technology in a fully integrated classroom, and assisting a teacher who will be using a specialized web tool to help 10th graders create their own graphic novels.

Tech Workshops

Our speculation is that many of you will be interested in the nuts and bolts of the various computer applications, and specifically how to integrate those applications into your own classroom. The "tech workshops" offer a hands-on, in-depth understanding of how to use particular technologies and explore how they are integrated into today's secondary classrooms. You will go through a step-by-step process of how to take common technologies and creatively integrate them into your classroom. The workshop sessions will be held Fridays in the School of Education 3rd floor sites lab classrooms (specific times listed below). The goal for this track is to develop a classroom technology project, ideally for use in your student teaching, which you will present in December. The project will be based on either (or both) of the workshops you attend. There will be two additional Open Lab sessions, on December 1st and December 8th, where you can come to the computer lab to work with Liz on your final project.

Here is a list of the fall Tech Workshops:

Lights, Camera, Action!
PhotoStory, MovieMaker, Garageband, iMovie and iDVD
4 day workshop (9 contact hours)
Sept 29th (1-4:00), Oct. 6th(1-4:00), Oct, 13th(1-3:00), & Oct, 20th(1-3:00)
In this 4-day workshop, you will explore how video editing tools are being used in today's secondary classrooms. Also, you will learn the step-by-step process of creating your own movie and DVD with both Macintosh and Windows applications. Using GarageBand you will learn how your students can develop their own music for iMovie. You will also have time to develop a project for your own classroom teaching. In addition, you will learn some management techniques for movie producing in the classroom.

It's Interactive! Kiosk and Flipbook animated PowerPoints
2 day workshop (5 contact hours)
Sept. 15th (1-4:00) & Sept. 22nd(1-3:00)
In this 2-day workshop, you will explore how to develop 2 different types of interactive PowerPoint projects in the classroom. First, you will learn KioskPowerPoint. Kiosk mode works like a non-linear website rather than a linear presentation. Kiosk is a very powerful and flexible tool for the classroom. Second, you will learn how to create simple "flipbook" animations in PowerPoint (unlike basic PowerPoint animations, this is a unique and creative way for students to get involved in developing their own animations). Flipbook and Kiosk animations can also be converted into WebPages or QuickTime movies (this will be demonstrated in the workshop). Besides learning how to develop interactive PowerPoint projects, you will also look at many examples of how Kiosk and "flipbooks" have been integrated into the secondary classroom. In addition, you will learn some management techniques for developing Kiosk in the classroom.

If You Build it…WebPages from scratch
Dreamweaver, Adobe PhotoShop/ImageReady, 3-D Text Make, Gifworks
2 day workshop (6 contact hours)
Oct. 27th(1-4:00) & Nov. 3rd(1-4:00)
In this 2 day workshop, you will learn how to develop your own website using Dreamweaver. You will start from scratch in order to develop a website for your classroom. We will also use Adobe products (Photoshop) and some online free resources to create and develop your own animations and images for your website. You will learn how to upload your website to a server on the web (and your UofM webspace).

The Power of the Web…Webpages from templates
WebQuests, Online Student Activities, Hot Potatoes, iCHATav, Instant Messaging

2 day workshop (4 contact hours)
Nov. 10th(1-3:00) & Nov. 17th(1-3:00)
In this 2 day workshop, you will explore a variety of WebPage creation options for teachers and students. There are many fantastic online "templates" for teachers and students to use for class projects and management. You will look at how interactive WebPages are being used in today's secondary classrooms (such as class websites, student newspapers, and WebQuests). We will also look at simple and FREE podcasting and video conferencing options.

Fall Syllabus (ED 504)

Class Meetings

(all meetings to be held in the School of Education's 3rd floor sites lab classrooms):

Everyone is expected to attend the first two sessions, on Friday, September 8th from 1-4, and Thursday, September 14th from 4:30-6:30, and to attend and take part in the final presentation session.

Topics for these initial whole group sessions include training in the Sitemaker portfolio tool, discussion of legal issues related to internet use, coordination of field internships, and discussion of the "Instructional Technology in my placement" assignment.

As you know, you will have MAC course meetings on Thursday afternoons throughout the fall term. Several of these sessions are for ED 504. On the following Thursdays, we will have ED 504 sessions that will meet from 4:30-6:30. We will cover additional topics and/or have guest speakers at each of these session…details to follow.

Everyone is expected to attend four of the following six sessions:

September 28th
Point/Counterpoint presentations:
Cell Phones as Learning Tools?
Should We Ban Instant Messaging In Schools?
October 14th
Point/Counterpoint presentations:
Should Schools Be On The Leading Edge Of Technology?
Wikipedia
October 26th
Point/Counterpoint presentation:
Should We Have Complete Access To All Grades At All Times For Parents?
November 9th
Point/Counterpoint presentation:
Virtual High Schools
November 30th
Point/Counterpoint presentation: Digital Divide(s)
December 7th
Point/Counterpoint presentation:
Can Video Games Be Used To Teach?

Final Presentations

Friday, December 15th is our final presentation day. We will ask each of you to give a 10 minute presentation to your colleagues about some of the work you did in your tech workshop or field internship, and some of your reflections on that work. You may choose whether you will speak generally about all of the work that you did, or more specifically about one or another experience you had. We will have presentations all day on the 15th, and we ask that each of you attend at least five presentations given by your colleagues. By Monday, December 4th, please e-mail Jeff (stanz@umich.edu) with a one-paragraph description of your presentation. By the end of that week, we will disseminate a full schedule of the presentation descriptions and times.

Field Internships and Tech Workshops

• We ask that you keep a simple log of how you spent your 13 hours of tech workshop and/or field internship work, and hand it in on December 15th at our final class meeting.

• More importantly, because of our decisions about the kinds of experiences (and choices) that we want you to have, many of you will be planning and coordinating your own experiences, and will be working with people other than Liz and Jeff. This fact leads to two very important points:

• First, it is crucial that you contact one of us should difficulties arise. If you're having trouble coordinating with your field internship mentor, or if you're having difficulties in your internship that you can't resolve with your mentor, please let us know as soon as possible. We want your experience to be a rewarding and a satisfying one, and we're here to help.

• Secondly, virtually all of the field internship mentors are expecting you to take initiative, both in terms of making contact, and most importantly in terms of taking an active role in your internship work. We invite you to proactively seek out learning experiences of all kinds in your placement, including letting the students teach you about what they're doing.

"Instructional Technology in my Placement"

During your first couple of weeks in your student teaching placement, we'd like for you to do some investigations into Educational Technology at your school. Talk to your mentor, find the person who is in charge of educational technology, and see what you can find out about questions like:

What equipment is available for teacher's use?

What facilities are available to me?

Do I need to schedule lab time and, if so, how do I do it?

What training do I need?

Who are the people who I need to know at the district office regarding ed tech?

What computer-based grading tools does my mentor use?

How does your mentor utilize educational technology in her teaching?

What is the Acceptable Use Policy for my school? Can my students email, instant message, post on WebPages for school purposes?

What is the protocol for troubleshooting my computer hardware and software

when it breaks down?
By September 14th, we'd like for you to post an entry about your findings in an online survey that we have developed (details about the survey at our September 8th class meeting), and we will discuss your findings in class on the 14th.

Portfolio

We will ask you to start your teaching portfolio by creating a home page that includes the following items:

• A statement of your philosophy of teaching (which could include a picture, poem, quote, paragraph, video, etc...)
• A short reflective piece in which you share your evolving thoughts regarding the "big picture" questions listed at the beginning of the Ed 504 syllabus. We encourage you to draw upon your blog postings to carry out this assignment.
• Artifact(s) from fall workshop/internship. Such artifacts could include photographs from your internship placement, to activities or assessment tools that you created in a tech workshop, to brief audio interviews with a field internship mentor. Be creative!

Please note that this portfolio assignment is not directly linked to the e-portfolio you will build for Charlie and Pat. Many MACers have utilized pieces of this mini-portfolio in their final e-portfolio, or have taken the opportunity to get a head start on their professional portfolio for use in their job search. We're happy to be of help…

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