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Implementation of a Laptop Initiative:

Preservice Foreign Language Teachers and Factors Influencing their Computer Use

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Implementation of a Laptop Initiative:

Preservice Foreign Language Teachers and Factors Influencing their Computer Use

by

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Implementation of a Laptop Initiative:

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Influenced by the development of state and national technology standards as well as the increased availability of computers in school settings, the expectations for educators to use computer technology has become a part of preparing future K-12 teachers. In the efforts to better prepare and meet these demands to prepare technologically savvy future teachers, one large university in the southwest implemented a laptop requirement for their teacher preparation program in the fall of 2002. This qualitative case study, conducted at the beginning of the third year of this program, focuses on the experiences of a cohort of 7 foreign language preservice teachers participating in this requirement and serves as benchmark for gauging the success of the program. Through interviews, questionnaires, and observations, the study explores their experiences as end-users and depicts how the requirement was developed, adopted, and implemented. Successful implementation of a technological innovation is influenced by several conditions; dissatisfaction with the status quo, existence of knowledge and skills, availability of resources, availability of time, rewards or incentives, participation,

commitment, and leadership (Ely, 1990, 1999). By using these conditions as a framework and inventory for analysis, the findings discuss the perspectives of the administration, the faculty, and the students who are all involved in the implementation process in different ways. The foreign language preservice teachers' computer use during their student teaching semester influenced by the computer skills and knowledge they acquired as a result of the laptop requirement and by the exposure to models provided by their professors in the university setting, models from their cooperating teachers, and the access and availability of computer resources in the schools where they did their practicum. The findings support previous research on computer use by preservice teachers, as they must be placed in technology-rich environments in order to connect their technological training with sound pedagogical practices in an authentic setting. Recommendations for improvement of the program, pedagogical implications, and suggestions for further research are also discussed.

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Chapter 1
Introduction

Overview

Computers appear in today's public schools in a variety of forms as individual machines in classrooms, in clusters in the individual classrooms, or as labs in a separate classroom or library. According to the United States Census Bureau in 2000, 51 percent of households had one or more computers. By the fall of 2003, there will be 13.6 million available for classroom use by the 53.4 million students in the nation's elementary and secondary schools thus creating a ratio of 1 to every 4 students (Cattagni, 2001; Newburger, 2001). Additionally, they reported that 98 percent of public schools have Internet access which is an increase from a 1995 figure of 50 percent.

With the increase in computers and Internet access in the U.S. public schools, there has also been an increased awareness that preservice teachers need training to use technology effectively. At the national level, the International Society for Technology in Education (ISTE) has created a series of essential conditions for teacher preparation and technology that maps out goals for each step of the preparation curriculum from general preparation through professional preparation and field experiences to the first-year of teaching. At the local level technology expectations for beginning teachers on state certification tests have increased awareness at the university level which requires future teachers to be equipped to use available technologies to enhance their teaching.

In response to the growing need for technology literacy among future teachers, one public university in the southwest, Large Public University (LPU), adopted an

initiative requiring all students seeking teaching certification through the College of Education to purchase a laptop computer. Effective in the fall 2002 semester, any student accepted into the elementary or secondary Professional Development Sequence (PDS) was required to purchase a laptop.

LPU is not alone in requiring teacher certification candidates to purchase a laptop. As a part of the ubiquitous computing movement, over 100 college campuses have implemented similar laptop requirement either as a campus wide initiative, a college or department specific requirement (R. Brown, 2005). In 1993, the University of Minnesota at Crookston was one of the first universities in the U.S. to implement a campus-wide laptop requirement. Dubbed the "Crookston Experiment" and funded by a technology fee added to the students cost, the program provided all full-time students and faculty with a notebook computer (Sargeant & Svec in Brown, 2003). Another program at Wake Forest has received much attention when in 1995, it provided a new laptop and printer every two years to every student and faculty member with the cost for students built into the tuition (Brown, 2003). These are just two examples of other university initiatives that have been successful and continue today.

Brown (2003) defines what ubiquitous computing means in a university setting, "ubiquitous computing means that all teaching and research proceed on the assumption that every student has appropriate access to the Internet, nothing more and nothing less" (p. 2). First-year college students may arrive to college with their own computer, borrow their roommate's computer, or have access to computer labs in residence halls or in other campus buildings. In order for a ubiquitous environment to exist, according to Brown,

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access to the Internet must be part of having access to a computer. As more universities and colleges have adopted campus wide laptop programs, access becomes portable which, "provides flexibility of location, collaboration and communication despite complex student and faculty schedules" (Brown, 2003, p. 7).

One-to-one computing initiatives are not unique to college and university campuses and have been implemented at the elementary, middle school, and high school level. Schools across the nation have adopted 1:1 laptop programs over the last 10 years such as the Henrico County, Virginia and Maine initiatives (Levin, 2004) providing each student with his/her own laptop.

The process of adopting and implementing an initiative, such as the one at LPU, is complex and lengthy process. It involves careful consideration of a product, the development, adoption, and implementation of the program. In the case of the laptop initiative at LPU, from the perspective of the students required to purchase this new product, the laptop is an innovation. According to Rogers (1995), "an innovation is an idea, practice, or object that is perceived as new by an individual or other unit of adoption…If the idea seems new to the individual, it is an innovation" (p. 11). Innovations come in many forms and can be products, such as computers, texts, or assessments, or processes, such as constructivist teaching techniques, principles of self-esteem in character education, or student teamwork (Hall & Hord, 2001).

The implementation of the laptop requirement goes beyond purchasing a laptop. With this initiative, several goals are required in integrating technology into the preservice teacher curriculum and attempting to change the way people are teaching and

learning. Hord and Hall (2001) describe the conditions as a "bundle of innovations" (p. 8) which is several innovations frequently masquerading as one. The authors state, "the integrated use of technology in reading and science instruction might entail the use of word processing, spread sheets, e-mail, the World Wide Web, laptops and CD-ROMs, each an innovation with its own requirements for implementation, training, and user supports" (p. 7).

The process of development and implementation of a policy involves various stages. Havelock (1973) describes change in a cyclical manner beginning with some initial disturbance, the feeling of need and decision to do something about the need, diagnosis of the need as a problem, search for solutions, an application of a possible solution to the need, and the satisfaction that problem is solved or dissatisfaction resulting in the repetition of the cycle.

Typically, potential adopters must pass through five states in the diffusion process as detailed by Everett Rogers (1995); they must learn about the innovation, they must be persuaded of the value, they must decide to adopt it, the innovation then must be implemented, and finally the decision must be reaffirmed or rejected.

The development includes steps and actions involved in creating and testing as implementation includes learning how to use the innovation (Hall & Hord, 2001). Implementation occurs when an individual or decision-making unit puts the innovation to use. Eventually at the end of the implementation process a point of institutionalization is reached where the innovation is part of the ongoing operation and loses its separate identity of newness (Rogers, 1995).

Time is needed to achieve this status of integration into the ongoing operation. Policies are implemented with the goal of change or reform in the existing program. According to Hall and Hord (2001), "change is a process through which people and organizations move as they gradually come to understand, and become skilled and competent in the use of new ways" (p. 4). Most changes in education take three to five years to be implemented at a high level and to achieve visible change. If change is a process, then the plan for change will be strategic in nature, policy makers should allow at least three to five years for implementation, and need to budget the resources needed to support formal training and on-site coaching for the duration of this phase (Hall & Hord, 2001).

Policy implementation is a complex and lengthy process involving not only careful consideration of the innovation and procedure for implementation, but also requires support of the process at many levels. Support is needed from those who have planned and adopted the policy, those who are significant in implementing the policy, and the end users who are affected by the policy in both the adoption and implementation.

According to Fullan (2001), reform is not just putting into place the latest policy. Fullan describes reform as a means for changing the cultures of the classrooms, the schools, the districts, and the universities. He also stresses the importance of understanding the complexity of the system and supporting that system,

> There is much more to educational reform than most people realize. If any one or more factors are working against implementation, the process will be less

effective. The more factors supporting implementation, the more change in practice will be accomplished. Finally, we should avoid thinking of sets of factors in isolation from each other. They form a system of variables that interact to determine success or failure. (p. 69)

Purposes of the Study

This study investigated both the laptop initiative itself as well as the effects on a group of preservice teachers. Data describes the policy implementation and the use of technology in the classroom. The study examined the laptop initiative at LPU during the last part of the 2nd year and at the beginning of its 3rd year of implementation and investigates the implications specifically for foreign language preservice teachers affected by the requirement. The time of this study is important in the implementation process of the laptop program. Narrowing the time to the beginning of the 3rd year, the study hoped to shed light on the status of the implementation as possible type of formative assessment. Spanning the last two semesters of these preservice teachers experiences from February 2004 to May 2004 and August 2004 to December 2004, the study examined these foreign language preservice teachers experiences in the last semester of their coursework and into their field experience as student teachers. The study specifically investigated how they used computer technology during these semesters, how they used the computer for their teaching, and how they fit into the larger system of the laptop requirement as the implementation of a policy.

Research Questions

When a computer laptop requirement is put into place by an institution, what is the trickle-down effect on the students required to purchase the laptop? In order to answer this the questions guiding this research were:

1) In what ways were the preservice foreign language teachers using computer technology during the preservice teaching field experience (student teaching)?

2) What factors influenced the preservice foreign language teachers' knowledge and use of technology?

These questions were addressed by examining the major findings as they connect to Ely's conditions as a framework for discussion. One of the goals was not only to describe the experiences of the participants in this laptop requirement but also demonstrate how and why things are as they are at this point in the initiative.

Framework for the study

In considering the implementation of the laptop requirement as a total system of factors, the discussion of the findings is guided by Ely's (1990, 1999) framework of eight conditions that facilitate the implementation of educational technology innovations. By conducting a meta-analysis of the literature that discussed the conditions that seemed to facilitate change and with his personal experiences as a consultant and change agent, Ely's first series of conditions were directed toward libraries in the early 1970s. This first set of conditions served as a foundation for Ely's research. In 1989, Ely tested the appropriateness of the conditions by applying them to educational technology in

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Southeast Asia and Latin America (1990). By conducting interviews in Indonesia, Chile, and Peru with at least 25 individuals in each country identified as leaders in the field of educational technology, he confirmed and revised the conditions that facilitate change when implementing educational technology innovations (1990). Since the 1990 study, nine dissertations have used Ely's framework for studying implementation in difference contexts (1999). In his continued research in combination with the findings from the dissertations, Ely concluded the eight conditions emerged from each study and were confirmed by other studies (1999).

The eight conditions are dissatisfaction with the status quo, existence of knowledge and skills, availability of resources, availability of time, rewards or incentives exist, participation, commitment, and leadership. These conditions are a step toward understanding the implementation process. He argues these conditions should be present to some degree in order for the implementation of an innovation to be successful and if any element is missing the chances for successful implementation are reduced (Ely, 1990). To explore the status of implementation of the LPU laptop initiative, the data collected from the administrative, faculty, and student levels were applied to each of the eight conditions to gauge the existence of each condition throughout the system that created and is implementing the initiative. Ely stresses that there is no hierarchy of the conditions and the strength and importance of the conditions emerge as functions of the context and innovation (Ely, 1999).

Keeping in mind that change is a process taking three to five years, according to Hall and Hord (2001), Ely's framework of conditions will highlight the status of the

implementation process at the time of the study while examining the existence of the conditions in order to suggest recommendations for further success.

Rationale for selection of Ely's framework

Ely's model is useful because it strives to explain what happens specifically during the implementation phase of establishing an innovation in an educational setting. Other established models, such as Everrett Rogers' *Diffusions of Innovations* (1995), Hall and Hord's Concerns Based Adoption Model (2001), the Apple Classroom of Tomorrow (1991), and Moertsch's Levels of Technology Implementation (1998) were considered. Rogers' *Diffusions of Innovations* focuses on the adoption phase of implementation and in the diffusion of an innovation through five stages, which includes implementation but does not focus on that phase. The other models focus more on how individuals react to change, Rogers (1995) presents adopters and their receptivity (Innovators, Early Adopters, Early Majority, Late Majority, and Laggards), and Apple Classroom of Tomorrow (ACOT) found there are similar stages of teachers learning about the use of technology in their classrooms (Entry, Adoption, Adaptation, Appropriation, and Invention) (Dwyer, Ringstaff & Sandholtz, 1991). Hall and Hord's (2001) Concerns Based Adoption Model (CBAM) focuses on the individuals who implement a change and focuses on their stages of concern, levels of use, and innovation configurations. The CBAM approach and Moertsch's Levels of Technology Implementation (1998) also present levels of use of individuals in order to assess where members are in their use of educational technologies. For the purposes of this study and in considering the research

questions, the use of Ely's conditions that facilitate the implementation of educational technology innovations seemed to be a way to describe and make sense of the experiences of the student participants within the overall context of the program and requirement.

Context of the Study

To understand the study and the context, it is necessary to look at the pieces of the teacher preparation program that affect the foreign language preservice teachers as well as other students seeking secondary certification in the liberal arts areas of history, social studies and English. This section discusses the history of the laptop initiative at LPU and the sequence of courses in the teacher preparation program.

The Laptop Initiative at LPU

The LPU laptop program is not a college-wide initiative; rather it is program specific in that the students who are seeking teaching certification are required to buy their own laptops. While many laptop programs are a part of private university initiatives and the cost of the computer is included in tuition, the program at LPU requires that students purchase a laptop individually at the predetermined stage of their professional development sequence. In the College of Education (CoE), the number of faculty and students required to have laptops has increased each semester of the program. In the first semester of the program, fall 2002, 250 students and 30 faculty members had laptops while a year later in fall 2003, 700 students and 75 faculty members had laptops and by spring 2004, 750 students and 80 faculty members were required to have laptops. The

college admits about 500 new teachers per year in the professional development sequence, 350 elementary generalists and 150 secondary or all-level subject specialists whose major degree is in Liberal Arts, Natural Sciences, or Fine Arts.

History of the Laptop Initiative at LPU

Four years before the laptop requirement was put into effect in the fall 2002 semester, the Laptop Initiative began as a pilot program in the elementary certification program. The first group of 25 students used laptop computers for two semesters of the professional development sequence. The first pilot group of students and faculty checked out laptop computers that the College of Education purchased with student technology fee money. The attempt was made to incorporate the laptops in their courses and field experiences. The students checked out the laptops for two semesters and returned them upon graduation. Instead of rotating the laptops through various cohorts, more laptops were purchased as more cohorts were added. Rather than continuing to fund the program, purchase more laptops, retire others, and add more cohorts, the Dean, other Chairs within the College of Education, and the Director of the Technology Center decided to pursue a larger requirement for students seeking certification.

In fall 2002, students entering the professional development sequence in the CoE at both elementary and secondary levels were required to purchase a laptop computer. Each certification program defines the beginning of their professional sequence. The elementary program follows a different sequence of courses and has different major requirements from the secondary programs, thus each student purchases his/her computer

at a different time. In the spring 2004 semester, the university facilitators, graduate students holding Teaching Assistant positions who supervise intern and student teachers in the field, were also required to borrow or purchase laptops as part of the program.

In preparation for the requirement, infrastructure development to prepare the education building for the laptops and negotiation with computer companies to establish the type of computer the students would purchase began. The building and outside areas were equipped with wireless capabilities. The Technology Center was reorganized to meet the anticipated needs that would be created by the requirement. A help desk where students can take their laptops for troubleshooting and assistance was created in conjunction with the faculty assistance office to support faculty in incorporating and integrating technology into their courses. Additionally, negotiations and decisions were made about the kind of computer the students would buy. Apple made the most competitive and cost effective bid for the program, thus eligible students purchase an Apple laptop package that includes multimedia applications installed on their computer, wireless modem, word processing, spreadsheet and PowerPoint software, and a 3-year warranty plan at a discounted rate.

According to information from the LPU program website, teachers are required to be proficient in the use of technology for instruction and special emphasis has been placed on the use of computers. The program is a comprehensive effort to immerse future teachers in technology-rich environments so that they become competent in using technology-learning tools in their instruction. The program is driven by general goals in order to create a cohesive program. The goals as presented on the LPU program website

are to seamlessly integrate technology standards throughout the professional development sequence, maintain state-of-the-art technology infrastructure, secure resources to facilitate the continued implementation, establish partnerships with local school districts in the efforts to integrate technology into novice teachers' experiences, establish networks for all teacher preparation programs, foster faculty ownership of the initiative so that faculty drive integration, build a virtual community of practice for faculty, preservice students and induction teachers, and to demonstrate and disseminate the positive impact of the program.

The Preparation Sequence - Teach Liberal Arts Program through Professional Development Sequence

Teach Liberal Arts (TLA) is a program for students seeking certification in middle and high school grades in the subject areas of foreign language, social studies and history, and English. A similar but separate program exists for students seeking certification in Natural Sciences. The TLA program is collaborative between the university's College of Liberal Arts, the College of Education and local public schools to introduce students to teaching a variety of grade levels. Through the program students are able to complete their bachelor's degree and teacher certification. Students wanting to complete their certification after they have earned a bachelor's degree can do so through the post- baccalaureate (post-bac) program. The TLA program consists of three semesters of coursework combined with observations in the local schools. The students take an advanced teaching methods course in the CoE combined with more observation hours in a school, and finish their program with a semester of student teaching and enroll

in a student teaching seminar. The combined program gives the students five semesters of practice and observations combined with coursework in order for them to relate and reflect on what they are learning in their classes with what they are seeing in the local school classrooms. The transition to the TLA program began in the fall semester of 2002, and by the fall of 2003, students working toward certification at the secondary level in liberal arts were following the TLA sequence of classes.

The TLA100 course, Introduction to the Teaching Profession, is a one-hour seminar that includes information related to learning styles, classroom management, lesson planning, and assessment. The students in the 100 course come from a variety of disciplines. The fieldwork is completed in an elementary classroom and includes a total of 10 hours in the classroom comprised of observation hours and teaching three lessons. The technology component focuses on e-mailing, attaching documents, and specific web activities, such as looking for information about schools or national and local standards. The work done by the students in this course is turned in as a portfolio at the end of the semester.

The TLA200 course, Introduction to Teaching in the Middle School, is oriented around teaching in the middle school and builds on what the students learned in the previous 100 course. In the two-hour seminar, students discuss creating a positive classroom environment, classroom management styles, learning theories, addressing diverse student populations, and professional development.   Although the students in the class are from varied disciplines, the fieldwork is completed in a middle school classroom and relates specifically to the subject area of interest. Students spend 20 hours in the

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field observing their mentor as well as teaching approximately six lessons. The technology component builds on what the students completed in their 100 course and includes sending e-mails with attachments, word-processing class materials, and searching the Web for materials and resources. This course also includes a portfolio of the work done throughout the semester.

The TLA300 course, Teaching in the High School, focuses on high school teaching and in the subject area that the student is interested in teaching. The 300 course is a three-hour beginning teaching methods course specific to foreign languages, social studies or English. During the course the students discuss specific standards for their subject area, developing curriculum, lesson design, legal issues, professional organizations, materials, and resources. Students complete 30 hours in the field, which include observing their mentors and teaching nine lessons. The instructor expects that students continue communicating via e-mail, attach documents, and type assignments for class. The technology component also includes creating multimedia lessons and exploring subject specific Web resources and materials. A final portfolio for each student is submitted at the end of the semester. Although not officially admitted into the PDS at this time, students in the 300 course are required to have purchased their laptops for this course.

After completing the TLA courses, the students are officially accepted into the College of Education Professional Development Sequence (PDS) and they take an advanced teaching methods course that is subject specific for foreign languages, social studies or English. In the advanced methodology course, students focus on relating

theory to practical applications in their specific discipline. The Foreign Language Methods course focuses on foreign language pedagogy, second language acquisition, and theoretical principles of language teaching and learning. Students reflect on their own language learning experiences, explore professional journals specific to the study of foreign languages, design lessons, and develop a final project of teaching activities. Technology related tasks include communicating via the internal CoE system (TeachNet), creating PowerPoint presentations, and searching websites for teaching materials and resources.

In addition to the coursework, students are considered intern/observers and complete 40 hours of fieldwork in a classroom. They teach a minimum of six lessons and complete various assignments related to their experiences in the schools, such as developing their own philosophy of education, observing other teachers, and interviewing staff within their schools. The fieldwork can be done at either the middle or high school level depending on the interest of the student. Interns are required to videotape themselves teaching a lesson, import the video into iMovie, and burn it to a CD for review by the intern coordinator.

The final semester of the teacher certification sequence is the traditional student teaching field experience. By this time, students have completed their coursework for the certification sequence and in their major discipline. Students spend 12-15 weeks with their cooperating teacher in either a middle or high school foreign language classroom. They also attend weekly seminars which are designed to discuss their experiences, brainstorm with their fellow students, and address any other issues such as discipline,

management, lesson activities, technology, special education, school law, résumé preparation and interviewing. The group of foreign language student teachers began their field experience in the local public schools the first day of the district semester and completed their student teaching assignment around Thanksgiving break of 2004.

Significance of the Study

The use of technology in the foreign language classroom is nothing new. The radio, phonograph, telephone, teleprompter, television, filmstrips, video, blackboard, overhead projector, and audio-tape have all found their way into the foreign language classroom over the years (Salaberry, 2001; Warschauer & Meskill, 2000). The demise of the traditional audio-tape based language lab and the audio-lingual approach gave way to computer-assisted instruction (CAI) with the emphasis on the communicative method in the 1980s (Warschauer & Meskill, 2000). The audio-tape based language lab was ideal for the listening and repetition drills used with the audio-lingual methodology. As communication became the focus in language teaching, CAI and CALL developed as a replacement for the traditional cassette recorders providing a more interactive experience for the language learner.

With the development of better computers, Computer Aided Language Learning (CALL) software has developed, the use of the Internet has grown, and other technologies such as digitization of photos and music, course management programs such as Blackboard and WebCT, and authoring software such as PowerPoint have made their

way into the foreign language classroom (Goodwin-Jones, 2002; Salaberry, 2001; Singhal, 1997; Warschauer & Meskill, 2000).

In preparing foreign language teachers, there is a distinct difference from other subject areas; the foreign language teacher has the challenge of creating activities for students in which the content and the language to talk about the content are the lesson (Hammadou Sullivan, 2001). In essence, the medium is the message; they must teach a second language while using that language as the medium for instruction. As computer technology has made its way into the classroom, foreign language teachers not only need subject-matter knowledge and pedagogical content knowledge (Schulman, 1986 as cited by Hammadou Sullivan, 2001), but they now need to be prepared to integrate computer technology, especially if they are teaching in a school where there is access to computers and an expectation of computer use.

Chapter 2
Literature Review

Chapter two is a review of literature focusing on several major areas of research; preservice teachers use of computer technology, laptop initiatives, and foreign language education and technology. The scope of the research on preservice teacher education is extensive thus the review of literature focuses on research in the area preservice teacher education and technology. In the area of foreign language education, the review will cover foreign language teaching with computer technology, preservice foreign language teacher education and technology preparation of preservice foreign language teachers.

Definition of Technology

Technology can be broadly defined and interpreted. In a traditional sense, an overhead projector or television could be considered technology but, for the purposes of the literature review and study, technology will focus on the use of the computer. Often, the use of the computer technology in the educational setting is referred to as Instructional Technology (IT). IT includes hardware and software, the networks connecting the machines, and can include the effective use of digital information to extend human capabilities (Morsund & Bielefeldt, 1999).

The concept of teachers' technology use is also broadly defined. Technology use is specific to the use of computer-based technologies to deliver instruction (Russell, Bebell, O'Dwyer & O'Conner, 2003). There are various examples; one could be a math teacher using graphical software on a computer connected to a projector in order for the

entire class to see what is being demonstrated and another may be a teacher requiring students to use technology to develop a product that facilitates learning such as a PowerPoint presentation. Yet another teacher may have students do research on the Internet and another teacher may define computer use as emailing, preparing lessons, and maintaining records such as grades and attendance on the computer (Russell et al., 2003). For the purposes of this study and review, technology defined as the use of the computer will be the focus.

Preservice Teacher Education and Technology

Two large-scale reports on new teachers and their preparedness to use technology in the classroom as a result of their teacher education programs appeared in the review of literature. Both reports found that preservice teachers' use of technology is influenced by the kind of technology courses preservice teachers have at the university level, the kind of modeling they are exposed to by faculty members, and the kinds of field experiences to which they are exposed.

The 1995, study by the Office of Technology Assessment (OTA) on teachers and technology reported that most technology instruction conducted in the colleges of education is focused on teaching about technology, not teaching with technology across the curriculum (OTA, 1995). The study concluded, "telling students about what is possible is not enough; they must see technology being used by their instructors, observe uses of technological tools in classrooms, and practice teaching with technologies themselves if they are to use these tools effectively in their own teaching" (OTA, 1995 p.

185). The 1995 OTA report also found the majority of teacher education faculty do not model technology use to accomplish course objectives, nor do they teach students how to use the technology for instruction. Additionally, students are not placed in technology-rich environments with technologically proficient teachers for their student teaching who can provide an 'hands on' experience in regards to being able to use technology for their teaching (OTA, 1995).

Morsund and Bielefeldt (1999) had similar findings from their national survey of over 400 institutions. At the university level, individual stand-alone technology courses are not as effective in preparing pre-service teachers as an integrated approach to technology training. In order to increase technology proficiency of new teachers, training should be integrated across all coursework. Faculty skills tend to be comparable to the skills of their students and most faculty do not model use of those skills in teaching. In the field, some kind of instructional technology is available in the K-12 classrooms where student teachers get their field experience. Most student teachers, however, do not routinely use technology during the field experience and do not work under master teachers and supervisors who can advise them in using instructional technology (Morsund & Bielefeldt, 1999).

In-service Teachers and their Use of Technology – Obstacles

If student teachers are not placed in field experiences where their cooperating teachers may be using and modeling the use of the computer, then it is important to consider the research that examines the reasons why in-service teachers may or may not

use computer technology. Because these models in the field experience are important to the development of beginning teachers reviewing some of these studies is essential in understanding how and why practicing teachers are or are not utilizing the computer.

Several studies on practicing teachers indicate reasons why they do or do not incorporate the use of the computer into their classrooms and the implications for in-service and preservice training. The research varies from first year teachers' use of technology (Strudler, McKinney, Jones & Quinn, 1999), to studies on specific schools and districts and their quest to incorporate computer technology (Norris, Sullivan, Poirot & Soloway, 2003; Russell, Bebell, O'Dwyer & O'Conner, 2003; Barron, Kemker, Harmes, & Kalaydjian, 2003) and includes some of the more general obstacles teachers face in adopting technology in educational settings (Leggett & Persichette, 1998; Rogers, 1999; Granger, Morbey, Lontherington, Owston & Wideman, 2002).

Leggett and Persichitte (1998) suggest five critical factors practicing teachers face in implementing technology. The critical factors are Time, Expertise, Access, Resources, and Support (TEARS). These factors tend to be obstacles for teachers. Not enough time for planning and training, lack of expertise in technology integration, lack of access to computers, lack of resources in the areas of staff, hardware, and software, and ensuring administrative and technical support are key for teachers. The authors conclude that classroom teachers will be successful at implementing technology when each of the critical factors must be addressed and considered.

Similar to TEARS, P. Rogers (1999) also addresses barriers to technology adoption in educational settings. She identified internal barriers such as teacher attitude

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and perceptions about technology as well as external barriers, such as access to resources, support, and staff development and skill building. She also included lack of time and funding as crossing the external and internal barriers. These barriers were significant in that teachers who had a negative attitude towards computers or lacked the confidence in their abilities were less likely to use computers in their classrooms. Without access to computer resources or money to purchase resources, the time to develop computer-based activities, and specialized training, teachers were less likely to integrate computer technology in educational settings.

In a study with first year elementary teachers, Strudler et al. (1999) identified one of the top ten problems in the first year of teaching as lack of adequate access to computers. Additionally, they found that the preparation for teaching with computers was the lowest on the list of the impact their education coursework and student teaching had in their preparation to become teachers. The authors suggest that technology should be modeled throughout university coursework and applied in the field experiences.

The body of current research conducted specifically in school districts or states on teachers' technology use includes studies in the curricular use and access (Norris et al., 2003), the extent of use in and out of the classroom for instructional purposes (Russell et al., 2003), how teachers are using technology as a tool for students' education (Barron et al., 2003), and conditions that indicate success in the classroom (Granger et al., 2002). Within this research, a common theme was the availability of access to computers as a significant factor in how teachers use technology in the classroom.

Through a "snapshot survey", Norris et al. (2003) analyzed responses from 3,665 teachers from four states in the area of curricular use of computers and the Internet. They found the strongest predictor of teachers' technology use was access. Overall, they found that one out of six teachers had no computers while almost two-thirds had no more than one in his or her classroom. They concluded that teachers' use of technology for curricular purposes is directly related to their access to the technology and the lack of access will limit their opportunities.

In researching the ways in which teachers are currently using technology and the factors which influence them, Russell et al. (2003) conducted research within 22 Massachusetts school districts analyzing data from 2,894 teachers in K-12 math, English or language arts, science, social studies, and self-contained elementary classrooms. They found teachers used technology regularly for preparation and email and less frequently for instructional purposes in the classroom and they tended to do a substantial amount of work in preparation and email outside of the classroom. They found that newer teachers, those having one to five years of teaching experience, are more confident with technology, utilize it more for professional purposes outside the classroom but require their students to use technology less than more experienced teachers, and they have stronger beliefs about the negative impacts of computers on students than teachers who had been teaching for more than 5 years. They concluded that the assumption that a higher level of comfort will translate into increased instructional use does not hold.

Another large-scale study conducted in a Florida school district with 2,156 elementary, middle, and high school teachers focused on the extent to which individual

teachers in this district were incorporating technology as a tool for their students'
education (Barron et al., 2003). The authors linked their analysis to the NETS for
students (ISTE standards) in the areas of problem solving, communication, productivity,
and research. All of the teachers used the computer for communication most,
productivity and research next, and used the computer least for problem solving with the
teachers in science using the computers more than those teaching social studies, math,
and English. The authors concluded that although teachers were using technology as a
tool the technology integration across all subject areas and grade levels was yet to be
achieved. The teachers in the study received technology training through in-service
workshops and had access to technology specialists.

A qualitative study of four Canadian schools (Granger et al.,2002) found the
relationship between teachers' skills and attitudes, philosophies, communication, and
access to be significant factors in their use of computer technologies into the curriculum.
Like the other studies, they report that none of these matter unless access to computers is
available to these teachers.

Technology preparation during university sequence

As computer technology has become more prevalent in university coursework, the
research over the last ten years shows different approaches to training future teachers in
the area of technology. These studies are mostly empirically based and employ both
quantitative and qualitative methodologies. Inclusion of technology in these studies
ranges from having a single course dedicated to using technology for teaching, a more

integrated approach where technology components are included in a teaching methodology course, while other programs achieve an infused approach by offering specific technology courses connected the skills to the content area and field experiences. Some research on preservice teachers who have access to laptop computers has been conducted. Generally, most of the studies have been conducted with preservice elementary teachers rather than prospective secondary teachers and do not have a focus in foreign language preservice teacher development.

Single Course Approach

One study presented findings on the effectiveness of a redesigned course where students met once a week for a three-hour class where 50% of the class-time was lecture and 50% was hands-on practice in a computer lab (Gunter, 2001). The students were education majors in a required preservice technology course at the University of Central Florida. This course was redesigned so that students would have an opportunity to practice with the particular technology after participating in a lecture about that piece of technology. Faculty wanted to instruct students on how to use the technology and how to integrate the technology into the K-12 curriculum. The findings concluded that students reported less anxiety after the completion of this type of course, were positive about the course, and had positive attitudes toward technology. This study was solely based on the students' experiences in this particular course and did not report on how they were applying the new information in the field.

Another study focused on a single course approach (Kovalik, 2003), where the course was designed to educate students in technology applications and connect teacher education students with practicing teachers so that the students could have the opportunity to integrate technology into the curriculum before participating in their student teaching semester. The Technology-Enhanced Learning Outcomes (TELO) project in Ohio paired 20 undergraduate teacher education students in a technology applications course with four elementary teachers to help new classroom teachers in the integration of technology. In teams, the K-12 teacher selected the topic and the students designed an instructional unit that integrated technology meeting specific curriculum goals. The practicing teacher implemented the instructional units created by the students in their classroom and provided feedback to their group. The teachers reported the units lacked cohesiveness, relied on teacher-centered strategies, and employed technology in predictable low-level ways suggesting that undergraduate students have difficulty in transferring knowledge and skills gained in prior courses to the project.

Technology in the methods course

Other university based certification programs choose to integrate technology into the teaching methodology courses in the attempt to link the content area with technology. Typically these types of programs provide the students with the opportunity to apply what they have learned in a classroom setting during some kind of practicum experience.

Preservice math majors or minors at BYU were required to take a course on teaching mathematics with technology (Francis-Pelton & Pelton, 1996). This was not the

only computer course these students took but this was a course specific in unifying teaching math utilizing technology. The course included topics such as spreadsheets, databases, graphing tools and calculators, geometry tools, Hypercard, software evaluation and the Internet. The study focused on the attitudes of these students related to gaining skills and knowledge of computers during this course. Through the surveys on attitudes toward technology, the importance of, and confidence in using computer technologies, the authors concluded generally preservice teachers had positive attitudes toward technology, perceived it as important, but lacked confidence in their skills and abilities in teaching situations.

A case study focused on one student and his experiences learning about the creation of multimedia units for classroom instruction during a methods course (Smithey & Hough, 1999). The coursework was connected with the opportunity to integrate the unit during the student teaching experience. Although initially skeptical, with the hands-on practice provided within his course on developing multimedia units at Vanderbilt University and the opportunity to implement his ideas in the practicum, he was able to take what he had learned, apply it to the teaching practice and subsequently, into his first year of teaching. Steve was able to find available computers for his students, had the background and knowledge in careful planning, and was enthusiastic in helping his students create high quality projects that showcased their learning. This article highlights the value of being able to implement technology into the practicum and shows the successful results of Steve in his first year of teaching.

A study of preservice elementary teachers at Mississippi State University in a course specifically focused on integrating technology practices into the elementary methods course demonstrated the effect on their confidence in integrating technology into the classroom (Pope, Hare & Howard, 2002). The instruction was delivered in three-part parts; the teachers were taught to use technology as a part of the program rather than as a prerequisite, they were required to apply their knowledge in elementary classrooms, and the university faculty modeled technology for the preservice teachers. Because the confidence of these students increased over the course, this study revealed the importance of learning about the technology, seeing the technology modeled by the faculty, and having the opportunity to apply the skills in a classroom setting.

Northern Arizona University developed a program called the Integrated Secondary Teacher Education Program (I-STEP) which integrating technology into the 13-hour block of professional study during the semester (Willis & Raines, 2001). During the course, the students focused on learning experiences and incorporated technology objectives such as understanding technology, the role in diverse learning environments, understanding the ethical implications of technology, and were exposed to a variety of applications to develop class projects. The students met on campus and at school sites for this course. The authors did not detail any empirical research of this program, rather reported on the various aspects of the program.

A more general study on preservice teachers enrolled in an interdisciplinary methods course investigated a more in-depth understanding of these teachers' practices and attitudes with computers (Whestone & Carr-Chellman, 2001). The participants were

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from all disciplines of study including math, science, English, social studies, and second languages. These students were either enrolled in a self-contained computer course at the time, had taken the course previously, or had been exposed to a computer component integrated into their subject area methodology course. They had either learned computer skills in a methods course or identified self-taught experiences as the primary mode of building computer skills. The preservice teachers primarily used word processing programs to type papers, email, and to access the university library system. They also accessed the Internet, graphics programs, spreadsheets, content area software, databases, and statistical programs. The study did not address how these preservice teachers integrated computers in classroom teaching situations but the participants were generally positive about their computer skills, confident in their abilities, and positive about the role of computers in schools.

Integrated approach

A more integrated approach to technology within the university based teacher preparation programs usually involves more than one isolated course and includes hands-on experiences both in the university setting and in the classroom setting.

A longitudinal study from 1991 to 1995, in a five-year teacher education program shows the effects of time and computer training on the attitudes and self-efficacy of two cohorts of prospective teachers through their program at the University of Virginia (Milbrath & Kinzie, 2000). Course requirements included three two-hour hands-on computing tools class sessions and an Introduction to Instructional Technology course.

Students also participated in various technology activities, had faculty who demonstrated computer technology in the methods course, and teaching internships that provided opportunities to apply computer technology in their classroom teaching. The authors suggest that as future teachers have more training and practice with computer technologies, their attitudes toward those technologies will be more positive and they will feel more comfortable. Prolonged exposure to and frequency of use has a direct impact on the perceived self-efficacy and the development of positive attitudes toward computers.

Another study examined the impact of technology infusion activities for elementary preservice teachers in the college and the public school classroom as part of a teacher technology infusion project that created links between education faculty, content faculty, and K-12 teachers with preservice teachers (Beyerbach, Walsh & Vannatta, 2001). The students participated in various technology activities in their methods courses, observed the modeling of technology in other education courses, and were placed in technology-rich classrooms for field experiences. The findings suggest that some students found the activities positive and wanted more activities, while others needed more direct instruction in computer applications. Collaboration was essential to their learning, they viewed technology as something to enhance their teaching, and they expanded their visions of what is possible with technology in the classroom. The authors conclude that this type of technology infusion approach takes time, support, and collaboration from all parties involved, students, faculty, and practitioners.

Technology use during student teaching

The Ed-U-Tech project at the University of Minnesota implemented a content-specific approach to technology and sought to create a connected strand of preparation focused on integration from the required technology course to the methods and into the field experiences (Dexter & Riedel, 2003). The study focused on the factors contributing to technology use during student teaching. They found the essential contributing factors to be university-based such as in preparation and expectations to use technology and clinical factors such as quality and availability of technology in the field. Student teachers were required to take a specific instructional technology course as part of the Ed-U-Tech program, and at the end of this course, the students reported being most comfortable in completing professional tasks and less prepared in instructional enhancement or troubleshooting. Students were encouraged or required to use educational technology during student teaching by their student teaching supervisor or university instructor. The availability of technology in their student teaching was primarily for their own use rather than their students' but their cooperating teachers were able to provide them with technological support. During the student teaching, they reported using the computer more for their own use in word-processing or accessing the Internet and less often with their students. The authors conclude that at the university level, expectations of technology need to be set for students and access to technology in the field is essential if student teachers are going to implement technology with their students. They also must have the necessary support from their cooperating teachers.

A case study of two middle school preservice teachers during their student teaching semester as part of a 5th year graduate certification program described their experiences in attempting to integrate technology into their classrooms (Bullock, 2004). This study described these two teachers' experiences in the classroom and the influences in using technology during their student teaching experience. Suzanne was completing her certification in language arts and Nancy was preparing to be a math teacher. Both received the same training at the university, they participated in a technology course, had methods courses which integrated technology, and were exposed to modeling of technology in instruction. They also participated in technology workshops throughout their program and attended a three-day technology "institute" with their mentors at the beginning of their program. Despite similar training and background, each had different experiences in their student teaching in their efforts to incorporate technology. For these student teachers, some of the enabling factors were having mentor teachers who encouraged and collaborated with them, instruction provided by the university, student enthusiasm and desire for using technology, access to technology, and successful experiences working with technology. Some of the disabling factors were lack of mentor use and support, lack of modeling in university coursework, lack of faculty expectations, lack of technology access and support in the school, fear, and past negative experiences working with technology. Bullock concluded that the combination of effective mentoring and modeling, clear expectations of students, easy access to technology, and positive experiences working with technology will enable student teachers to practice and incorporate technology on a regular basis (2004).

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Laptops

As laptops in university programs have gained momentum, articles have emerged describing on how these programs are organized and in how laptops are incorporated specifically in the context of teacher education.

Laptop Initiatives and Ubiquitous Computing Movement

Weiser is credited for first using the term "ubiquitous computing" in 1991, at the Xerox Palo Alto Research Center to describe a vision of technology that would always be available and would also be invisible (Keefe & Zucker, 2003). Ubiquitous computing has taken the form of not only computers and laptops but can also be handheld devices such as Personal Digital Assistants (PDAs) or calculators. Generally, ubiquitous computing in an educational setting refers to environments where all K-12 teachers and students have access to computers at school and possibly at home (Keefe & Zucker, 2003). In the university setting, all faculty and students would have their own computer and now in most cases, this computer is a laptop (Brown & Petitto, 2003).

Laptop requirements at universities and colleges can be both campus-wide, college wide, or program specific and have been implemented at institutions on an international level. Generally, the first laptop programs began in private institutions as campus-wide initiatives where the cost of the equipment was built into the tuition or partially subsidized by technology fees. The University of Minnesota at Crookston started their program in 1993, Wake Forest University implemented their program on a campus wide level in 1996, and Acadia University became the first Canadian notebook

university in 1998. Professor Ray Brown has compiled a list of institutions that have some sort of notebook or laptop computer initiative (website, updated April 2005). Of the almost 200 programs on his list, some are on-going while others have been discontinued, some are campus-wide initiatives and others are program specific or have been implemented in specialized schools such as in technical colleges, law schools, or medical schools.

There are several lists, reports, and books of this nature. Persons at the administrative level have written most of these publications where they describe how their universities have implemented their programs.   They also provide lessons learned for others thinking about initiating such programs and planning and implementation considerations for administration, faculty, and students. Smith (2003) surveyed 22 institutions, public and private, and the dimensions involved in these ubiquitous computing environments. Brown (2003) compiled a book with chapters written by key administrators from 13 U.S. and international campuses that have laptop programs on their campuses. Each account describes the history of the programs, the rationale for laptops, and explains some of the decisions they faced in the development and implementation of the requirements such as financing and operational issues. The administrators also include lessons learned and suggestions for others such as, coordination, getting students and faculty involved from the beginning, and provide training on a regular basis. A panel described in 1999, at the World Conference on Educational Multimedia, Hypermedia, and Telecommunications described how five national and international universities had developed and put into place their computing

initiatives (Blurton, San Chee, Long, Resmer & Runde, 1999). Each participant discussed how and why the laptop programs were implemented and they stressed the importance of long-range planning for success.

More recently, specific laptop requirements for colleges of education have emerged in order to prepare their teacher candidates in the integration of technology for the classroom. Ball State University and The University of Texas at Austin implemented their College of Education laptop programs in 2002, California State University at Sacramento began its program in 2003, Wayne State University College of Education launched a wireless laptop program in 2004, the University of Missouri, Stillman University, Brigham Young University, University of Houston, University of South Florida, and many others have implemented laptop computing requirements within their colleges of education. The existence of these programs specifically within Colleges of Education are important because it suggests an institutional awareness of the need for teacher candidates to be computer literate.

Laptops in Teacher Education

Empirical research on preservice teacher technology preparation is starting to emerge from Colleges of Education within university-wide laptop programs as well as individual college of education laptop programs. Most of the research has only been completed within the last five years as laptop computers have become more prevalent on college campuses and much of the research has been presented at conferences. There

seems to be little empirical research published specifically on the experiences of secondary student teachers involved in laptop programs.

Some of the studies presented at conferences simply describe various programs. A study within Acadia University's School of Education, described the changes between 1996-2000 as they adapted to new technologies and made efforts pedagogically to incorporate IBM laptops into their two-year, post-bac teacher education program (Brown & MacKinnon, 2001). Another Canadian university, Simon Fraser, also has established a wireless network in conjunction with laptop computers (Buker & Zandvliet, 2002). The authors describe how they integrated technology into their curriculum with their mobile lab of Apple laptops. Kuo (2004) described a study on the perceptions of faculty and students at Ohio University concerning the use of wireless laptops in higher education but did not present any results from this pilot study.

The laptop program at Wake Forest is a campus-wide requirement and subsequently the laptops are used in the education program in an integrated way (Cunningham, 2003). Technology is a part of all courses in the professional preparation portion of the teacher education program at Wake Forest. The faculty model and scaffold technology integration, the foundations of education and educational psychology courses integrate strategies appropriate for teaching and learning with technology, and telecommunications tools are used for research, collaboration, document sharing, and communication. Courses take an authentic task approach to technology integration and emphasizes appropriate integration and instruction. Cunningham points out that one of the unique features of the Wake Forest program is the deliberate alignment of the

methods and technology courses because the professors collaborate on projects that require students to integrate technology appropriately for productivity, instructional practice, and professional development. Students are expected to integrate technology during their field experiences. When students graduate, they leave the university with their laptop, software, and a printer ensuring that these new teachers will have means to continue their work with the laptop.

Students and professors at King's College also use laptop computers in their teacher education program as a part of their campus-wide initiative. A case study within the program focused on the perspectives of the preservice teachers and their professors using laptops in a wireless environment during their education courses (Drazdowski, 2004). The students did not own the laptops but had access during class. The author found the classes were engaging, the students were collaborating and working together in constructing knowledge, and they were learning with technology as opposed to learning about technology. The short study concluded that the professors were key in the modeling and development of activities and learning scenarios that encouraged this type of learning utilizing the laptops.

Another study conducted during a laptop pilot program in a one-year Bachelor's of Education program with forty preservice teachers (Kariuki & Weeks, 2003), focused on their experiences with the laptops throughout the year. These students spent time at the university taking courses combined with practice teaching practicum in the schools. The students received their laptop computers at the beginning of the program and completed ten hours of computer instruction. Some of the suggestions from the students

were that they needed more time with the laptop, they needed more computer training, and they needed the faculty to provide more modeling of the software. During the practice teaching placement, only 20% of the students used their laptops all the time but there was an increase over the year as students had more time with their laptops and became more comfortable with them. The students created lesson plans, completed assignments, conducted research, communicated, and kept notes on the laptops. One of the biggest limitations of this study was the condensed time of the program.

Foreign Language Education

Foreign Language Education and Technology Overview

As foreign language methodologies have evolved, so have the technologies used to support those theories of teaching. Grammar-translation was supported by the blackboard and overhead, the audio-lingual method was supported by audio labs which used audio-tapes for drill and repetition exercises, and with the shift toward communicative language teachings in the 1980s and 1990s, computers have become the technology of choice (Warschauer & Meskill, 2000). Foreign language pedagogy has shifted with the influx of technologies (Lixl-Purcell & Team, 1996). The influx has proved the necessity to examine teaching styles and techniques as they relate to the technologies. Lixl-Purcell and Team (1996) described different technologies and combined them with the pedagogical advantages of those particular resources for teaching those language related skills. Garrett (1991) wrote one of the first comprehensive overviews of the types of technology available to support language

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learning.   Videotapes and satellite transmission of video, videodisks, computers, databases, networks, interactive video on CD, digitization, and software were all included in this article as ways to incorporate technology into the language classroom. She noted the potential of technology in the foreign language setting but that potential can only be realized by training teachers to "take the initiative to think through what the technology should be able to do for them and for their students" (p.95) and that selection of any technology will require a teacher's analysis from a pedagogical and theoretical view for integration. Appropriate implementation and use "allows for a more thorough integration of language, content, and culture and provides students with unprecedented opportunities" (Warschauer & Meskill, 2000, p. 311). The key to successful use of technology is in the teachers' ability to plan, design, and implement effective educational activities that goes beyond having the resources (Warschauer & Meskill, 2000).

Salaberry (2001) traced the history of technology in foreign language teaching based on articles published in the *Modern Language Journal* from 1916 – 2000. In this review, the technology was connected to pedagogies and methodologies from phonograph and radio for transmission and exposure to listening in the 1920s and 1930s to filmstrips and video-based technologies to the evolution of computer-based exercises. One of the main conclusions from this review is the focus on the pedagogical objective of technology-based teaching, as the success of a technology-driven activity depends more on how the activity is designed than on the type of technology(Salaberry, 2001).

Associated with the potential, Blake (2001) debunks some of the myths and discusses the advantages about the role of technology in the foreign language classroom.

According to Blake, there are certain things language professionals need to know about technology such as there is not one technology best suited for language study, language professionals need to know something about the interface design and pedagogy before they can review software in a meaningful way, teachers must be trained to recognize well-grounded pedagogy, there is no single formula for the use of technology to teach languages, and technology will not replace teachers. In order for any of the advantages of technology to be fully realized, theory must be combined with practice and language professionals "need to take advantage of technology when its application proves consistent with best teaching practices and SLA theories" (Blake, 2001, p. 98).

Liu, Moore, Graham, and Lee (2003) complied a literature review spanning from 1990-2000 about the research on computer-based technology in second language learning. Of the 246 articles that were selected for the review, the authors categorized the research and non-research based articles, and they included 70 research-based articles employing qualitative and quantitative methodologies. Of the non-research based articles the topics included were the potential of computer technology, software tools, the importance of applying pedagogy and design, and computer-assisted language testing. Of the research-based studies, five were qualitative in nature and 65 were quantitative, mixed-methods, or experimental. Within these articles, the authors found that the research on supporting language learning with computers mainly focuses on multimedia capabilities in providing authentic learning situations, increased research on the Internet, and on software and design principles. They indicated that more research needs to be

conducted at the K-12 levels and little research in the area of teacher and faculty training with technology has been conducted.

Studies on using the Internet/WWW in Foreign Language Teaching and Learning

The literature on the incorporation of the Internet and World Wide Web (WWW) in foreign language teaching and learning can be grouped into categories of descriptive articles and research-based articles. Some of the articles describe different Internet applications and the possibilities (Blake, 1997; Fidelman, 1996; Kost, 1999; LeLoup & Ponterio, 2000; Marcos, 1994; Rosen, 2002; Singhal, 1997) while other articles examine what kind of effects these applications can have in language learning environments (Lam, 2000; Lee, 1998; Osuna, 2000; Osuna & Meskill, 1998).

The Internet can encompass the following; electronic mail (email), electronic lists (listervs), electronic journals, streaming audio and video, WWW, search engines, remote access to libraries and databases, instant messaging, web-based course management systems (WebCT and Blackboard), and file transfer (Blake, 1997; Marcos, 1994; LeLoup & Ponterio, 2000). The educational potential of the Internet is immense (Singhal, 1997), providing students with a travel abroad experience via the computer and allows them to be active agents in the learning process (Blake, 1997), and it can enrich the language classroom through access to authentic materials such as texts, sound, video, and images (LeLoup & Ponterio, 2000). With the amount of resources available, both teachers and students can easily become overwhelmed with the amount of information and many

teachers do not know how to effectively integrate the World Wide Web into their curriculum (Kost, 1999).

Incorporating culture with the Internet (Lee, 1998; Osuna & Meskill, 1998; Osuna, 2000) was the main focus of several of the research-based articles. Lee (1998) incorporated on-line newspapers and on-line chat rooms to create opportunities for students to read authentic materials and gain cultural understandings, enhance cultural exchanges via the chat rooms, and to improve students' writing and speaking skills (1998). Students were positive about the on-line resources, their cultural and reading skills improved as a result of accessing on-line newspapers, and they enjoyed the live experience the chatrooms provided (Lee, 1998). One of the constraints of this study was the inadequate numbers of computers available for students and slow access to the Web. Osuna and Meskill (1998) and Osuna (2000) also used the WWW as a vehicle for accessing authentic materials and a way for students to increase their cultural knowledge. In both studies, the students accessed the Internet to research topics and prepare projects. The conclusions of both studies were similar, students were positive about the Internet, cultural learning was enhanced, and motivation and collaboration increased among the students (Osuna, 2000; Osuna & Meskill, 1998).

Studies on other technologies in Foreign Language Teaching and Learning

Similar to the articles published about the Internet and WWW, articles on other types of technologies can be grouped in the same way, descriptive articles (Chávez, 1997; Earp, 1997; Fraser, 1993) and research-based articles incorporating multimedia into the

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language classroom to promote cultural activities (Blyth, 1999; Spodark, 2001), for listening in a French course (Weinberg, 2002) and examined learner interactions (Bradley & Lomicka, 2000).

Multimedia applications include software programs on CD-ROM such as *Daedalu*s, a writing program, authoring tools that assist in managing computer-delivered instructional modules and exercises, language lab systems, networked multimedia in connection with a server so that materials and be dispersed and shared, and distance learning via satellite (Earp, 1997). Fraser (1993) created her own HyperCard programs based on videos for her German classes at the university level. She also created databases of vocabulary to assist first and second year students with reading activities. By comparing student evaluations over several years, she concluded that students' satisfaction in the technology-enhanced courses was higher. Chávez (1997) described her experiences in incorporating a writing program, *Daedalus*, into a Spanish composition course. By allowing students to focus on the process of writing through various stages in a networked environment, students were in control of their own work, enjoyed having the freedom to think about their writing before sharing it through the program, and were motivated to improve their writing skills (Chávez, 1997).

Spodark (2001) incorporated multimedia such as PowerPoint presentations, CD-ROM with video clips, video segments, and the Internet to create a student-centered lesson on French fashion. Blyth (1999) included the Internet and CD-ROM activities in a first-year university French course. Both studies found that students agreed that the computer was an effective tool for language learning, students were generally positive

about their experiences, they were motivated by the activities, and the students' skills were enhanced by the integration of the technology. Weinberg (2002) utilized multimedia in an advanced French listening comprehension course at the University of Ottowa. Students accessed video and audio files in the course and accessed web-based activities as an assessment tool. The students had both positive and negative reactions to the multimedia lessons; the negative responses were typically frustrations with the technology such as slow access, low quality of sound or video and technical difficulties, while the positive responses were related to the learning experience and the hands-on nature of the activities. Students also liked the control the computer gave them in their language learning.

Bradley and Lomicka (2000) studied student interaction in a case study of two French students and three Spanish students who had weekly computer lab sessions for their language courses. They used writing programs, email, WWW, video and listservs during the semester. Because students worked in an independent way in the labs, student interaction was low. However, they did find that students working in the computer labs were able to work with partners, consult with others as a source of information and security, the lab offered them a relaxed work environment, and the students enjoyed their lab experience. When implementing computer-based activities, the authors encourage instructors to carefully consider the issue of task design and the goals of activities suggesting they must go beyond getting information (Bradley & Lomicka, 2000).

Foreign Language Preservice Teacher Education

The review of literature includes several comprehensive articles on the research in foreign and second language teacher education (Bernhardt & Hammadou, 1987; Schulz, 2000; Crandall, 2000; Vélez-Rendon, 2002), and research that highlights the challenges of foreign language teacher education (Hammadou-Sullivan, 2001; Schick & Nelson, 2001; Schulz, 2002).

In response to the 1986, Holmes Group Report, which called for major reform in teacher education, Bernhardt and Hammadou (1987) reviewed the literature spanning a decade of research in foreign language teacher education from the American Council on the Teaching of Foreign Languages (ACTFL) publication, *Foreign Language Annals*, in order to provide a summary of the state of foreign language teacher education at the time. They reported that little importance had been demonstrated through the research on foreign language education (78 articles), the research contained no theoretical frameworks, essentially no data existed on effective teacher education programs, no genuine concern had been exhibited for the preservice education of foreign language teachers, and the research showed a lack of awareness of teacher education literature in general. They concluded if research is going to respond and solve the problems identified by reports such as the Holmes Group, "solutions that are tailored to the uniqueness of foreign language education" are needed and "the time has come for subject matter specific research in teacher education" (Bernhardt & Hammadou, 1987, p. 296).

Similarly, Shulz (2000) reviewed literature published in *The Modern Language Journal*, from the years 1916-1999 on foreign language teacher development. In

examining the research, she described the current status of the area of foreign language teacher education. In the last decade (1992-1999), "no major changes in foreign language teacher development were reflected in the pages of the MLJ during the last decade of the 20th century" (p. 516). Over the last century, gains have been made in the transformation of how teaching is viewed, teacher preparation is now the domain of applied linguistics and foreign language specialists, in foreign lagnague or linguistics departments or in colleges of education, methods preparation and student teaching have become part of preparation, and a more interdisciplinary approach has been taken in preparing future foreign language teachers. Despite these gains, the progress in the area of teacher development has been small as "we are still discussing many of the same issues that were discussed 80 years ago, and we have not found solutions to many of the problems that plague the development of FL teachers" (p. 516). Some of these problems are due to a lack of empirical research in the areas of testing traditional practices and there is a lack in the research on ways to develop and guarantee adequate linguistic proficiency in teachers. As the preparation of new teachers is of utmost importance in the survival of the field, Schulz (2000) suggested there is a need for extended study abroad experiences, the need to research and define teacher behaviors, and that the responsibility of teacher development should be shared equally by schools, departments, and colleges of education.

Crandall (2000) also reviewed literature on foreign language teacher education over a ten-year span. Her review was organized around four shifts in language teacher education. These trends are a shift toward constructivist learning and teaching, a growing

sense that language teacher education programs have failed to prepare new teachers for the realities of the classroom, a recognition that prior experience play a powerful role in teachers views of effective teaching, and a concern that teaching should be viewed as a profession.

Vélez-Rendon (2002) conducted a meta-analysis of literature on second language teacher education ranging from 1997 – 2001 and found the research focusing on second language teacher education missing from the large amount of literature on general teacher education. Despite this lack of research, "the future of second language teacher education research looks promising" (p. 459). She addressed five areas of research: teachers' previous experiences, the programs and preservice practices, teachers' beliefs and instructional decision-making, reflection, and collaboration. Some of the suggestions for future research are paying more attention to how the process of learning to teach develops in new foreign language teachers, the need for second language specific teacher education research on the uniqueness of foreign languages as a subject, and a need for more research into contextual factors influencing development of new teachers such as cooperating teachers, school cultures, and the collaboration between schools and universities (Vélez-Rendon, 2002).

Several articles illuminate the changing perspective of foreign language education (Schulz, 2002) and the challenges of foreign language teacher preparation (Hammadou Sullivan, 2001; Schick & Nelson, 2001). By answering questions posed by Brecht in the 2001 Northeast Conference Report, Schulz (2002) frames major issues facing foreign language education. These questions reflect changes in school populations, the growing

popularity of Spanish as a second language of study, the role of technology, and the role of schools and universities in training new teachers. With positive developments in the improvement of foreign language education such as an increase in study abroad enrollment, use of the American Council on the Teaching of Foreign Language (ACTFL) standards and proficiency guidelines, and an increased awareness of assessment of new teachers the future looks promising according to Schulz. Despite these improvements, she raises more questions regarding coming to a consensus on what constitutes the content of foreign language education and ensuring our new teachers have the linguistic proficiency necessary for target language use in the classroom.

Hammadou Sullivan (2001) and Shick and Nelson (2001) address the challenges of foreign language teacher preparation in the 21st century. Foreign language teachers have specific needs that are often unaddressed in general teacher education standards in that foreign language teachers are attempting to teach a second language while using that language as the mode of instruction (Hammadou Sullivan, 2001). As a result, the foreign or second language teacher has the challenge of creating activities in which both the content and the language to talk about the content together are the lesson. Hammadou Sullivan (2001) and Schick and Nelson (2001) discuss similar challenges for foreign language teacher preparation programs; specific pedagogical content knowledge is left unstated in generic teacher standards (Schulman, 1986 as cited in Hammadou Sullivan, 2001), the challenge of teaching culture (Schick & Nelson, 2001) using authentic materials that are not "dumbed down" (Hammadou Sullivan, 2001) in combination with responding to the varied cultural backgrounds of their students, increasing the emphasis

on communication to maximize target language use, and encouraging more study abroad as a way to accomplish and increase in cultural and language proficiency (Schick & Nelson, 2001). Both articles highlight the need for educators in teacher preparation to focus on the importance of discipline-specific goals and the quality of the field placements (Hammadou Sullivan, 2001; Schick & Nelson, 2001).

Foreign Language Preservice Education and Technology

The research on foreign language teacher preparation and the integration of technology is limited. This section begins with an overview of some of the general issues and concerns in targeting pedagogy and integrating technology into foreign language preservice teacher preparation (Goodwin-Jones, 2002; LeLoup, 1998; Zhao & Tella, 2002), includes two articles focusing specifically on computer-assisted language learning (CALL) and the implications on teacher training (Egbert, Paulus & Nakamichi, 2002; Mat Daud, 1992), and how technology is integrated into university based foreign language teacher preparation programs (Cunningham & Redmond, 2002; Wildner, 1999).

Several articles provide an overview of foreign language teacher education and technology which highlight issues related to this topic (Zhao & Tella, 2002; LeLoup, 1998; Goodwin-Jones, 2002). The concerns raised by these authors are similar, understanding the technologies and knowing how to use them is not sufficient, as teachers must also integrate technology into their curricula in a meaningful way (LeLoup, 1998). In order for teachers to effectively evaluate technology and how it is used, they need to add to their pedagogical knowledge of how computers work (Goodwin-Jones,

2002), and teachers should be prepared to utilize technology as a pedagogical tool and have an understanding of technology interacting with sound pedagogical approaches (Zhao & Tella, 2002).

Mat Daud's early study in CALL (1992) focused on three ESL teachers in Malaysia and their experiences with their English classes. He provided a training session for each of the teachers who each had different computer access in their educational settings. As "there is more to teaching than just showing students the software" (p. 75), he suggested including CALL methodology and training as a part of the teacher training in order to improve and solve some of the problems that these teachers faced when trying to implement CALL activities with their students.

Egbert et al. (2002) studied 20 ESL and foreign language teachers who had taken a graduate level CALL course and were currently teaching in order to explore how these teachers transferred their knowledge from the classroom to practice. They found that many of the participants who took the CALL course were already incorporating similar activities in their classes previous to taking the course. After the course, 70% of the teachers incorporated at least one CALL activity. Of those who did not use CALL activities in their teaching the influences on lack of computer use were lack of time, administrative or curricular restrictions, lack of resources, and lack of knowledge. Those same participants identified that having more time, better resources, better support, better training and rewards, and more flexibility in the curriculum would enable them to incorporate more CALL activities in their teaching. Because the course was able to provide the teachers with an opportunity to learn about technology through a hands-on

approach and have the chance to integrate it into their classroom teaching, the authors suggest that there should be a shift away from isolated coursework to a situated learning environment.

Wildner (1999) presented an overview of how technology is integrated into foreign language preservice teacher education programs as they are responding to the "pull", advances in what technology can do, and the "push", changing views of learning as reflected in standards and assessments that drive instruction (Fulton, 1998 as cited in Wildner, 1999). In the effort to train new teachers appropriately, universities take different approaches to integrate technology into their programs: a single-course approach, technology infusion approach, individual student performance approach, and case-based approach. The program at Wildner's university opted for an eclectic approach where the teaching of foreign language courses, the practicum, and the technology were integrated and aligned. They were able to provide their students with the skills and the experiences to practice those skills in the field.

An article presenting a content-focused curriculum within the Wake Forest University foreign language education sequence (Cunningham & Redmond, 2002) demonstrated how a supportive technology environment could enhance the curriculum. Wake Forest supports their technology curriculum with a campus-wide laptop program. Their program is aligned with the ISTE Technology Standards for Teachers and technology is commonly integrated across the curriculum in the various colleges and departments including within the language departments. A partnership between the professor of the Educational Technology course and the professor of the foreign language

methods course was created in order to focus on appropriate technology integration from a content and pedagogical perspective. Students incorporate the ACTFL standards through project-based learning and authentic tasks and technology is encouraged in the field experiences. The reorganization of their program on an institutional level allows Wake Forest to "prepare future foreign language teachers to be content, pedagogy, and technology experts while modeling our expectations throughout the teacher preparation programs" (p. 53).

Conclusion

This review has provided an overview of the research in the areas of teacher preparation and technology integration. The literature suggests that foreign language preservice teacher education is missing from the general teacher preparation literature. Foreign language preparation has specific needs that must be addressed not only in preservice teacher preparation but also in training these teachers in the integration of technology for teaching foreign languages. The research on foreign language preservice teachers and laptops is also limited. As computer technology becomes a part of society and educational settings at both the university level and K-12 level, it will become necessary for teachers to be trained in how to effectively incorporate technology into their teaching and the research should reflect this shift.

Chapter 3
Research Design and Methodology

In order to answer the research questions, a descriptive case study was used. Yin (2003) outlines several designs appropriate for case studies; exploratory, explanatory, and descriptive case studies. The goal of an exploratory study is to develop a hypothesis and propositions for further inquiry and may be useful as a pilot study when planning a larger more comprehensive investigation. An explanatory case study is useful when conducting causal studies in complex studies of organizations or communities. Because explanatory case study questions deal with operational links traced over time they tend to use case studies, histories, and experiments as research strategies. A descriptive case study requires the investigator to present a descriptive theory establishing the overall framework. In this approach, the researcher produces a rich, thick description of the phenomenon under study.

Case studies can explain causal links in real-life interventions that are too complex for an experimental strategy, describe an intervention and the real-life context in which it occurred, illustrate topics within an evaluation, explore situations in which the intervention being evaluated as no single set of outcomes, or present a meta-evaluation which is a study of an evaluation study (Yin, 2003).

I elected to use a descriptive case study since I wanted to capture the complexities of the laptop initiative. I also wanted to understand the process of that specific policy implementation. Using a descriptive case I was able to investigate the many factors that contributed to the initiative, to examine the diverse personalities of my participants and

their contributing roles in the initiative. The characteristics of a descriptive study illustrate the complexities of a situation, the fact that not one but many factors contributed to it, show the influence of personalities on the issue, show the influence of the passage of time on the issue, includes vivid materials such as quotations, interviews, and information from a wide variety of sources, and presents the information in a variety of ways and from the viewpoints of different groups (Olson as cited in Merriam, 2001).

With such a design I followed my participants over two semesters and documented the changes that occurred over that period of time, from the early stages of implementation, to the modifications and continuous efforts by the decision makers to ensure the successful implementation of the initiative. Finally, a descriptive case study allowed me to use a number of data gathering instruments. I conducted in depth interviews as well as focus group interviews. I also examined archival data, analyzed documents, and ultimately provided a detailed account of the phenomenon under study (Merriam, 2001).

Participatory research allows the researcher to assume a variety of roles within a case study situation and provides for certain unusual opportunities to collect data (Yin, 2003). Gaining access to events and having the ability to view the case from the inside are several unique opportunities afforded to a researcher in this situation. The researcher can observe and interact with the members establishing an insider's identity without complete participation in those core activities (Merriam, 2001). Additionally, there is the opportunity to observe naturally unfolding events, such as spontaneous conversations

(Berg, 2001). My role as a researcher and participant-observer is detailed later in this chapter.

Participants

The participants of the study were a group of preservice foreign language teachers seeking certification at the secondary (8-12) level in a foreign language as their subject specific area. Six of the students were seeking certification in Spanish; one in French. They were a cohort of students and were required to purchase a laptop as part of their professional development sequence. The seven principle participants were interns during the spring 2004 semester and student teachers in the fall 2004 semester. For the student teaching field experience they were placed in middle and high school classrooms in the same public school district. All participant names are pseudonyms.

The group was selected by purposeful sampling, which is based on the assumption that the investigator wants to discover, understand, and gain insight and therefore must select a sample from which the most can be learned (Merriam, 2001). With purposeful sampling, researchers use their special knowledge about some group to select subjects who represent the population to ensure that certain types of individuals are included in the study (Berg, 2001).

In addition to being purposeful, it is also a convenient sample meaning that it relies on available subjects or those who are close at hand or easily accessible (Berg, 2001). The group was convenient because I worked with them during two semesters at the university as their facilitator providing access to them as a group and as individuals.

At the time, I worked with this group as their facilitator while they were taking their advanced methods course and while they were doing their internship/observation experience in the public schools. I knew I would be able to follow the group from interns to student teachers, as they were student teaching during the second semester of my data collection. Additionally, the group was a cohort. Although they did not start at the university at the same time nor did they take their classes together, they did complete the last three semesters together. They were together starting in the TLA300 course through the intern/observation semester, and they were student teaching during the same semester.

A second group of participants was also identified. These informants were the administration, staff, and faculty interviewed and observed with the goal of getting a sense of the entire laptop program and the sequence of preparation related to this group of preservice foreign language teachers. The administrative and faculty participants were identified through snowball, chain, or network sampling which is a form of purposeful sampling where each participant is asked to refer to you to other participants (Merriam, 2001).

The administrative participants provided background and historical information about the laptop program, still influence the continuation and coordination of different aspects of the program, and are instrumental in supportive roles within the Technology Center. They were also identified as members of the Laptop Committee, which holds regular meetings to discuss various aspects of the program. The faculty group was identified as the faculty with a direct connection to the secondary foreign language

sequence and was comprised of the professors who directly taught and worked with the foreign language teaching methodology courses.

Student Participant Profiles[1]

Maribelle

Maribelle, an in-state student in her early twenties, attended a small private school from kindergarten until 12th grade before deciding to come to LPU after a campus visit. She chose LPU because of the school spirit, the environment, and the unity. She began her college career majoring in Radio/TV/Film and while in one of her core classes she decided that she was not concerned about how to spot or light a person and use reflective screens. She realized that what she had been searching for was a relationship with young people. At the beginning of her sophomore year, she changed her major to English and decided to pursue the secondary certification program. After participating in a mission trip to Mexico during that semester's spring break, she reconnected with the language and culture that she had studied in high school. After this trip, she decided to change her major to Spanish and continue with the certification program. Although her native language is English, she wants to teach Spanish most likely at the middle school level. For her student teaching, she was placed at a local middle school in a Spanish class. She graduated from the university in December 2004.

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[1] See Table 1 at the end of the chapter for a summary of participant descriptions.

Connie

Connie, another in-state student in her early twenties, always wanted to be a teacher. In an early interview she mentioned always being interested in becoming a teacher from as long as she could remember. Her favorite pastime was playing school and she took her game so seriously she had her parents buy her the biggest chalkboard they could find. She admitted to even having an overhead projector at one point. After graduating from high school, Connie traveled to Spain and she loved the experience. Before her freshman year of college, she took the Spanish placement test and tested out of some of the basic courses. As a result she decided to major in Spanish and to pursue the teaching certification program in addition to her Spanish major. After graduating a semester early in December 2004, she went to Argentina to live with family friends and work on her Spanish. Her native language is English and she was placed in a Spanish classroom at a local high school for her student teaching experience.

Xochitl

Xochitl graduated from high school in three years and then graduated from college a semester early in December 2004. Also an in-state student at the university, Xochitl received scholarship money to attend college. Her first language was Spanish, she grew up speaking Spanish at home, and spent a lot of time in Mexico visiting family. She commented that while her father speaks English well, her mother barely speaks English, and she socialized mostly with Spanish speakers. Xochitl always knew that she

wanted to be a teacher and thought it would be perfect to also study Spanish. A self proclaimed nerd, she was always trying to teach her sister or cousins new things and she always enjoyed learning. She started the teaching certification program at the beginning of her second year of college and liked the program. In her free time, she worked as a tutor in a local high school. Xochitl completed her student teaching in a local high school Spanish class.

Lauren

Lauren, an out-of-state student, grew up on the East coast and attended a private school from kindergarten through high school. She chose to come to LPU because she wanted to attend a large school after being in such a small one. The school spirit, a winning football team, and a university with a proud reputation were appealing. She arrived at college knowing that she wanted to study Spanish because she had a fabulous Spanish teacher in high school. Lauren was convinced on being a foreign language teacher after she took a literature course and realized that learning other languages could open new doors and expand her horizons. Lauren placed out of the lower level Spanish courses and decided to major in Spanish and minor in Italian. Although she did not always know that she wanted to be a teacher, she said a teacher's lifestyle appealed to her. As a child, worked at camps and enjoyed interacting with kids. She started the teaching certification program in the spring semester of her sophomore year. During the spring semester of her junior year she traveled to Seville, Spain for a study abroad program. Lauren said her experience in Seville gave her cultural insight about the people

and the way they live that she will take to the classroom. Lauren's native language is English and she was placed in a local high school Spanish classroom for her student teaching.

Marie

Marie was originally from a southeastern city in India that used to be a French colony. She grew up speaking French and Tamil and most of her relatives live in either France or India. She, her husband and her two children have lived in the city where the university is since 2001. She began her studies at the university in the fall of 2002 and was in her mid-thirties. Marie has always loved the French language and culture and she has always loved to travel even working in the travel industry while they lived in Canada. Through her travels and living in several different cities and countries she has observed different school systems and she has also realized through her children's schooling and her experiences in the teacher certification program that U.S. schools are very different. She completed her student teaching in a local high school in a French classroom and graduated in December 2004. Marie did not purchase a laptop.

Mia

Mia was born in Korea and Korean is her first language. She and her family moved to Saudi Arabia when she was in elementary school and then to the United States when she was in high school. She started learning English when they were in Saudi because she attended an international school. Mia began studying Spanish in high school

but her interest actually began in Saudi because she had a Guatemalan friend and she would ask him how to say things in Spanish. She began her college career in 1999, as a nursing major but after a semester decided that she didn't like it so she changed to Spanish and decided to pursue the teaching certification program. She studied in Guadalajara, Mexico for two semesters after the Teach Liberal Arts 200 course. Mia went to Mexico in order to improve her Spanish; she lived with a family and loved her experience there. She thought that her experience living in Mexico would help her in the classroom, especially in sharing her knowledge about the Mexican culture. She completed her student teaching in local middle school classroom and graduated in December 2004. Mia did not purchase a laptop.

Lea

Lea was the only student who completed the teaching certification program and took some additional Spanish courses as part of the post-baccalaureate option for certification. Lea graduated from the same university with a major in History and Spanish in May 2003 and decided to return to the university the following fall so that she could earn her teaching certification. She was able to complete the program in three semesters, which according to her was "a lot of work". She completed the program in December 2004 and was in her early twenties.

Lea's family had a live-in maid from Honduras and she said she liked to talk and practice speaking Spanish with her. When she started college, she didn't really know what she wanted to major in, so she "majored in a bunch of things" before deciding to

major in Spanish and History She spent a semester during her junior year in Barcelona, Spain where she lived with a Spanish family. During the semester she learned about Spanish culture and traveled throughout the country. She hoped to share her experiences with her students. Although Lea was focused on earning her teaching certification in Spanish, she planned on taking the certification tests for History as well. When she returned to do the post-bac program, she had to complete a few Spanish courses, but most of the courses were for certification. During her student teaching, she was enrolled in one course in order to complete the requirements for certification. Her native language is English and she was placed at a local middle school in a Spanish classroom.

Faculty Informants[2]

Each of these faculty members taught the cohort of participants during the program. Ms. Master taught the student participants in their 300 TLA course, Dr. Nueva taught their methods course and supervised their intern experience, and Dr. Methods coordinated and supervised their student teaching field experience and met with the group weekly during the seminar.

Ms. Master teaches the 100 TLA and 300 TLA courses. The 300 course is the beginning foreign language teaching methods course. She was a Spanish teacher for over 20 years at a local public school before coming to the university to work with the TLA program. She is considered a master teacher in the program and she also teaches courses in the Spanish department at the university.

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[2] See Table 2 for summary.

Dr. Nueva taught the advanced foreign language teaching methods course. She was hired for the 2003-2004 year after she completed her Ph.D. As a lecturer, she taught the advanced methods course for the student participants during their intern semester and acted as the coordinator for the foreign language student teachers during the year she was involved in the program. She took a tenure track position at another university starting in the summer 2004.

Dr. Methods was the coordinator for the secondary Foreign Language group for the 2004-2005 school year. She was hired as a lecturer in the summer of 2004 after completing her Ph.D. She taught the advanced teaching methods course and coordinated the intern and student teaching field experiences. She was the direct coordinator for the group of participants during their student teaching experience in the fall 2004 semester and led the weekly student teacher seminar.

Administrative Informants[3]

Each of the administrative members interviewed were instrumental in some facet of the laptop initiative. In this study, I began by interviewing Dr. Tech and Dr. Curry and they referred me to the other individuals. Dr. Tech was the director of the Technology Center for the College of Education. Dr. Curry was the chair of one of the departments in the College of Education and was instrumental in the planning of the Laptop Program as associate dean of teacher education. Dr. Education was the current associate dean of teacher education. Mr. Idea was the head of the faculty assistance studio where faculty

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[3] See Table 3 for summary.

can go to get help and ideas for incorporating technology into their classes. Ms. Development was the coordinator for the Laptop Program.

Data collection timeline[4]

This study was organized into phases over two semesters, the spring and fall 2004 semesters. The main focus of the research, done in the 2004 spring semester, while the students were interns was to gather background information from the participants on what coursework they had completed, what technology components were included in their previous courses, what they did during their intern field experience, what they studies in their advanced foreign language teaching methods class, and to get their opinions on how prepared they felt to use technology in the foreign language classroom. This data was instrumental in building a foundation for the second phase of the research that was conducted during their student teaching semester. It was necessary to find out what their background and preparation was before observing them during their student teaching.

The second phase of the research was collected during the 2004 fall semester while the students were student teaching in local public schools. During this phase of the data collection, written questionnaires were collected via email, the student participants were observed during weekly student teaching seminars, and they were observed in their schools while student teaching. The focus of this semester's data collection was to explore their computer use and laptop implementation in their student teaching experience.

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[4] See Table 4 for a summary of the data collection timeline and instruments.

Data collection instruments

During the study I used several data collection techniques. I used observations, individual interviews, focus group interviews, written questionnaires, document collection, and e-mail exchanges as data collection tools. All data was kept by me and was marked so that it was not traceable to any particular participant. All interview tapes and written observations were kept for analysis at the researcher's home.

Building trustworthiness

By using a variety of data collection techniques throughout this study, I was able to increase the trustworthiness of the research. Erlandson, Harris, Skipper and Allen (1993) explain a series of strategies to increase the credibility of naturalistic inquiry. The strategies that can increase the credibility are prolonged engagement in the context being studied, persistent observation of the events and relationships, triangulation achieved by collecting information from different points of view, referential adequacy materials in collecting materials which represent a holistic view of the context, peer debriefing, and by conducting member checks. By following some of the strategies suggested by Erlandson, et al (1993) I was able to ensure the trustworthiness and the credibility of the study. I achieved prolonged engagement by collecting data for 10 months, during which time I was able to include persistent observation providing depth to the scope of the study. I achieved triangulation by using multiple data collection instruments from multiple sources and by taping the interviews and taking field notes during observations,

I was able to collect referential materials. Lastly, I conducted regular peer debriefing sessions and member checks with all participants and informants.

Triangulation is the process of using multiple investigators, multiple sources of data, or multiple methods to confirm the emerging findings (Merriam, 2001). Triangulation is the use of several data sources to investigate the same phenomenon. This is interpreted as a means of mutual confirmation of measures and validation of findings (Berg, 2001). Gall, Borg and Gall (1996) describe triangulation as "the process of using multiple data-collection methods, data sources, analysts, or theories to check the validity of case study findings. Triangulation helps to eliminate biases that might result from relying exclusively on any one data-collection method, source, analyst, or theory" (p. 574). Berg (2001) notes, by combining several lines of sight, researchers obtain a better, more substantive picture of reality.

As another way of enhancing the internal validity of the study and to ensure I was reporting and analyzing the data accurately, I conducted member checks with the participants and informants. Merriam (2001) describes member checks as "taking the data and tentative interpretations back to the people from whom they were derived and asking them if the results are plausible" (p. 204). During the data analysis phase of the study, I sent the findings and emergent themes to the participants and informants in the effort to check my findings and interpretations of the data.

An additional method of increasing the internal validity of this study was to conduct peer examination (Merriam, 2001) or peer debriefing (Erlandson, et al, 1993). Peer debriefing allows the researcher to step back from the context of the study, consult

with other professionals, and receive feedback that helps refine the inquiry process. Throughout the study and analysis, I met regularly with my advisor where we discussed the findings as they emerged.

Questionnaires

As one data collection instrument, I used a variety of written questionnaires throughout the entire study. The first questionnaire was distributed to the students at the beginning of the study as a background questionnaire. I used e-mail as a way to collect data from the student participants during their student teaching semester in the second semester of the study. I felt like the students had limited time to be able to meet with me on an individual basis during their student teaching experience to participate in multiple interviews. E-mail was a way for me to send them questions throughout the entire semester and the format allowed them time to think about their responses and elaborate as much as desired. Additionally, they had the choice of responding via email or printing out the questions and turning in a hard copy of their answers. I sent them five questionnaires over the fall semester. The questionnaires are included in the appendices.

Interviews

I conducted interviews with all of the participants and informants. In the beginning of the study I conducted a 30-minute background interview with each student participant. During the spring and fall semesters, I conducted individual interviews with all the administration and faculty. I also conducted a group interview with three of the

seven students at the end of the spring 2004 semester and with two of the administration at the beginning of the fall 2004 semester. See appendices for interview guides.

When possible, the interviews were audio-taped for later transcription and analysis. The interviews were both individual interviews and also focus group interviews. The interviews were semi-structured which is a mix of more and less structured questions (Merriam, 2001). A semi-structured or semistandard interview involves a combination of predetermined structured questions and probing questions which allows for the freedom to enquire more deeply in order to obtain additional information.

A focus group is defined as an interview style designed for small groups. Focus group interviews also provide a means for collecting data in some settings and situations where a one-shot collection is necessary and allows the researcher to address questions to a group of individuals (Berg, 2001; Gall, Borg & Gall, 1996). The focus group employs a more relaxed and informal style of interview, is conducted by the moderator (interviewer) and is intended to encourage subjects to speak freely (Berg, 2001). While sometimes being used as a "one-shot" method of collecting data, the focus group interview was used as a method of data collection for this study as a way of speaking to a group who had limited extra free time to meet with me or as a way for them to speak freely as a group about their experiences and opinions.

Observations

During the observations I was acting as an observer as participant where the researcher's observation activities are known to the group and participation in the group is definitely secondary to the role of information gatherer (Merriam, 2001). Field notes were taken during these observations for later use and analysis.

During the spring 2004 semester, I observed these students during their advanced teaching foreign language course. I attended their once a week class in order to get a better sense of what they were learning, how they presented material, hear about their experiences, and get to know them on a more personal level. I observed them once teaching during their intern field placement. During the fall 2004 semester while they were student teaching, I observed them teaching in field placement four times during the semester.

Document Collection

Document collection included written assignments from their intern and student teaching semesters such as teaching philosophies and lesson plans, published information about the teacher certification program, published information about the Teach Liberal Arts program, published information about the laptop program, syllabi collected from the various Teach Liberal Arts courses, and informational flyers about trainings and technology resources in the college.

Data analysis

To analyze the data I used the constant comparative method. Developed by Glaser and Strauss (1967), the basic strategy of this method is to constantly compare data in order to link categories, properties, and grounded theory (see Merriam, 2001). According to this strategy the researcher "begins with a particular incident from an interview, field notes, or documents and compares it with another incident in the same set of data or in another set" (Merriam, 2001, p. 159). By comparing these incidents in the data, I was able to make categories that were then compared to other categories. The themes were compared and triangulated in order to make sense of the data, identify major findings, and to draw conclusions about what occurred during their experiences.

As a framework for discussion I used Ely's eight conditions of successful technology innovation implementation. Ely developed and recognizes these conditions to be essential for a program to be successful during its implementation stage. These conditions are dissatisfaction with the status quo, knowledge and skills exist, resources are available, time is available, rewards or incentives exist for participants, participation is expected and encouraged, commitment by those who are involved, and leadership is evident. By using this framework, I was able to answer my research questions, evaluate the success of the implementation of this laptop program at this time, and make suggestions and recommendations for the continued success of this program. Within this framework, I categorized the data from the students and was able to compare their

perspective with that of the administration and faculty involved in this implementation process.

Role of researcher

As the researcher I was the primary instrument for data collection and analysis. As the main data collector and the researcher, it is important that I acknowledge my possible assumptions and biases and by recognizing these biases and assumptions researchers can keep these in check during the study (Merriam, 2001). Merriam (2001) and Borg et al. (1996) discuss researcher bias. Merriam states one way of enhancing internal validity of a study is for the researcher to clarify assumptions, worldview, and theoretical orientation at the outset of the study. Because the main instrument in qualitative research is human, all data collection and analysis is filtered through that human's worldview, values, and perspective. By recognizing this possible conflict and bias before starting the research, I was able to make my assumptions explicit and view the research in a more objective manner. Because I had little knowledge of what these particular future teachers' opinions on technology were, what they did in their classes and field experiences, and what their previous experiences had been, I had less personal bias regarding the data they provided. No data was discussed during any event or group meeting. The students' grades were not be affected by their choice to participate or not participate in this study, their participation was totally voluntary, and had no impact on their final evaluation.

As the intern facilitator, I observed them in their teaching, gave them feedback on their lessons, made comments and provided feedback on various un-graded assignments, and attended several intern seminars with them during the semester. I was not responsible for their school intern placements nor did I assign them a grade for this practicum. As the student teacher facilitator, I assisted in their school placements, observed their classroom teaching during the semester, provided them with feedback on their lessons and teaching, attended weekly seminars with them during the semester, answered questions related to certification and state testing, and acted as a liaison between them, the university, and their mentor. I was not responsible for assigning them a grade for this field experience. Although I assisted in making their school placements, I was not solely responsible for this task.

As the researcher and as a TA, I began this study not knowing exactly what kind of information the participants and informants would provide. However, I worked with this program and with previous groups of students and had been part of the changes of the sequence and the delivery of the laptop requirement. Based on these previous experiences, I did have some assumptions as to how the students would be using their laptops and computers during their student teaching. In the previous semesters, I had not observed a majority of students using the computer for teaching languages. I was anticipating that they would utilize the computer for daily administrative tasks, for personal and professional research and preparation, and the Internet as a resource tool. I began this study hoping this particular group of students would have more integrated experiences as a result of the laptop requirement. As this study began during the third

year of the program, I hoped I would see more computer use during their student teaching, and more integration of computers during their coursework.

As a TA in this department, I was also required to have a laptop. Before the TAs were required to have a laptop beginning in the fall 2004 semester, I chose to purchase one the first year the discount was offered. TAs had the option of purchasing a laptop at the same discount offered to the students or checking one out on loan for the semester.

Conclusion

This chapter serves to provide an overview of the methodology used for this study, the types of data gathered, a profile of the participants, and how the data was collected and analyzed. This chapter also includes a description of the role of the researcher and the methods employed in increasing the trustworthiness of the data.

Table 1: Student Participants

Name	Age	Native Language	Origin	Student Teaching	Study Abroad Additional Experiences	Laptop	Grad Date
Xochitl	20s	Spanish English	In-state student	High School Spanish	Spends time with family in Mexico	Purchased before required	Dec 2004
Connie	20s	English	In-state student	High School Spanish	Visited Spain after high school, lived in Argentina 3 months after college	Purchased for required	Dec 2004
Maribelle	20s	English	In-state student	Middle School Spanish	Mexico mission trip during college	Purchased before required	Dec 2004
Lauren	20s	English	Out-of-state student, East Coast	High School Spanish	Junior year, one semester in Spain	Purchased for required	Dec 2004
Lea	20s	English	In-state student	Middle School Spanish	Junior year, one semester in Spain, live-in maid from Honduras as a child	Purchased for required	BA May 2003, program as post bac, Dec 2004
Marie	30s	French, Tamil	Former French colony in Southeastern India	High School French	Relatives in France, India, lived in Canada	Did not purchase, 3 computers at home, preferred PCs	Dec 2004
Mia	20s	Korean	Born in Korean, family lives in-state	Middle School Spanish	Lived in Saudi Arabia in elementary school, sophomore year in Mexico	Did not purchase, new computer at home	Dec 2004

Table 2: Faculty Informants

Name	Course taught with student participants	Semester
Ms. Master	TLA300 Teaching in the High School	Fall 2003
Dr. Nueva	Advanced Methods	Spring 2004
Dr. Methods	Coordinator of student teaching placement, weekly seminar	Fall 2004

Table 3: Administrative Informants

Name	Administrative Role
Dr. Curry	Department Chair in College of Education, former Dean of teacher education
Dr. Tech	Director of Technology Center
Dr. Education	Current Dean of teacher education
Mr. Idea	Head of the faculty assistance studio
Ms. Development	Coordinator for laptop program

Table 4: Summary of data collection timeline and instruments

Date	Collection Instrument	Participant
Background questionnaire	February 2004	Preservice Teachers (PST)
Individual interview	March 2004	Dr. Curry
Individual interview	March 2004	Dr. Tech
Individual background interviews	April 2004	PSTs
Individual interview	April 2004	Ms. Development
Individual interview	April 2004	Mr. Idea
Individual interview	April 2004	Ms. Master
Individual interview	April 2004	Dr. Nueva
Focus group interview	May 2004	Maribelle, Connie, Marie
Observations	February – May 2004	Methods course
Observations	February – May 2004	Interns in field experience
Assignments	February – May 2004	PSTs from Methods course
Individual interview	June 2004	Dr. Education
Questionnaire 1 (Q1)	August 2004	PSTs
Focus group interview	September 2004	Dr. Curry and Dr. Tech
Questionnaire 2 (Q2)	September 2004	PSTs
Questionnaire 3 (Q3)	October 2004	PSTs
Individual interview	November 2004	Dr. Methods
Questionnaire 4 (Q4)	November 2004	PSTs
Questionnaire 5 (Q5)	November 2004	PSTs
Assignments	August 2004 – December 2004	PSTs from student teaching experience
Observations	August 2004 – December 2004	PSTs in student teaching seminar
Observations	September 2004 – December 2004	PSTs in field experience
Documents	February 2004 – December 2004	Program information, syllabi, websites

Chapter 4
Data Analysis and Findings

This chapter presents the data analysis and major findings. The data were

gathered through in-depth interviews with administrators, faculty members, and students.

Other data collecting instruments included open-ended written questionnaires completed

by the students, document collection, and personal observations of the students. In this

way I ensured triangulation of the data. Each data set was examined for emerging themes

and those themes were compared across data sources. The data from administrators,

faculty members, and students were analyzed separately and compared for similarities in

emerging themes.

The findings are reported in two sections. The first part of this chapter presents

data from the interviews with administration, faculty, and students in regard to the

planning, adoption, and implementation of the laptop requirement. To fully answer the

research questions, I took a closer look into the reasons and manner in which the laptop

requirement was developed and implemented. I considered this to be an integral part of

understanding the system as a whole. In trying to understand how this program

functioned I looked at the data from all participants involved. I examined the initiative

from the points of view of the administrative efforts, the faculty involvement and the

students' attempts to implement the initiative in the ways they transferred the skills

learned from the university setting to their school placement. I also interviewed some of

the key figures on the technology staff who were instrumental in the development of the

program and who continue to make the program function upon the adoption of the requirement as a component of the certification program.

The second part of the chapter focuses on the foreign language preservice teachers' technology experiences in their student teaching and the factors that influenced their uses of computer technology in the field. This part of the chapter answers the research questions, In what ways were these preservice foreign language teachers using computer technology during the preservice teaching field experience (student teaching)? and What factors influenced the preservice foreign language teachers' knowledge and use of technology in the university and student teaching settings? The data in this section are from student interviews, observations, and questionnaires and faculty interviews.

Framework for analysis

As a way to organize the emerging themes, I used Ely's eight conditions that facilitate the implementation of educational technology innovations. By using these conditions, the emerging themes fit into categories to depict the status of the laptop initiative at the time of this study and show which conditions are present and to what extent.

The conditions suggested by Ely (1990, 1999) that are necessary to facilitate the implementation of educational technological innovations were evident when examining the development and continuation of this program and were used to organize the emerging themes from the analyzed data as a way to shed light on how and why the program was developed and how it continues to evolve. Ely concluded that these

conditions are present in varying degrees when studied in terms of successful implementations of innovative programs and products. The conditions serve as guidelines of implementation and although there is no hierarchy, the conditions can be used as an inventory after an innovation has been adopted. According to Ely (1990), "if any element is missing, the chances for successful implementation are reduced. The goal is to attain each of the eight conditions during the implementation" (p.304). By using the conditions to organize the data and findings, I hope to reveal which conditions are present and which conditions are possibly lacking as a way to check the status of the implementation at the time of this study.

Implementation of the Laptop Initiative

1. Dissatisfaction of the status quo

This condition is described as one of the reasons for implementing change, "Something is not right. Things could be better. Others are moving ahead; we are standing still. There must be something we can do to improve our situation…it is an emotion that calls for change" (Ely, 1990, p. 301). In talking with the LPU administration, there were several reasons why this type of requirement was deemed necessary; the development of national and state technology standards for beginning teachers, the realization that one computing tools course was not enough to produce technologically savvy teachers, and the need to remain one of the leaders as a university were some of the "dissatisfactions of the status quo" at the time this laptop requirement was developed, adopted, and implemented.

Standards

In 2000, the International Society for Technology in Education (ISTE) developed National Educational Technology Standards (NETS) for Teacher Preparation programs, students, and teachers. ISTE developed essential conditions for teacher preparation programs as a guide for each phase of the teacher preparation process in university-based programs. The guidelines detail factors and conditions necessary in general preparation, professional preparation, student teaching/internship, and in first-year teaching in order to support the effective use of technology. In coordination with the essential conditions, ISTE developed performance profiles for technology-literate teachers in general preparation, student teaching/internship, and for the first-year of teaching. These profiles detail what prospective teachers should be able to demonstrate after each phase of their preparation. In addition to the NETS for the Teacher Preparation programs, they also developed NETS and performance indicators for teachers as standards that all classroom teachers should be prepared to meet.

Along with the ISTE national standards, the certification test for this state includes technology competencies in their pedagogy and professional development test for certification. As of 2002, there was one competency cluster in the effective use of technology to plan, organize, deliver, and evaluate instruction for students. Beginning in the fall of 2005, the certification test will include a more in-depth technology applications standards for all beginning teachers as part of the certification testing.

Being able to prepare the students to meet these standards was an integral part in the decision to require the purchase and use of laptops in this teacher preparation program. Dr. Tech and Dr. Curry consistently mentioned these standards and tests in both their individual interviews and later when they were interviewed together. There have been expectations on the part of the state and plans within the program that teachers should be able to use technology, "The state has steadily increased the expectations and continues to do so in terms of how this is reflected in the certification process and how it is reflected in terms of expectations for requirements and experiences in our certification program" (Dr. Curry interview). The fact that students must be prepared to meet these standards in their certification tests was a concern, "The standards on the state teacher exam are based on the national standards developed by ISTE. Next year that will be incorporated as part of the testing for all graduates who are leaving certification programs. We have those standards that our graduates need to meet" (Dr. Tech interview).

Both Dr. Tech and Dr. Curry were aware of the state standards and expectations long before the laptop requirement was put into place. Dr. Tech had been working with the local districts before the state teacher technology competencies were established and they looked at the national standards as well. The college, in collaboration with the local school districts, adopted technology competency standards in conjunction with the state standards. According to Dr. Tech they " basically had translated the national standards to a state school context"

One course was not enough

There also seemed to be dissatisfaction with the way students were prepared to use technology before the laptop requirement. Before the requirement was implemented, there was a course requirement in the College of Education called Computing Tools for Teachers. This was the only technology course required and it focused on developing basic technological skills. Dr. Curry believed that even though the basic skills were important, the students also needed to understand how these skills could be integrated across their curriculum, in their preparation process and in their field experiences. Dr Curry believed that failure to do this could send a mixed message to the students that the development of the technological skills was sufficient. It was left to the students to decide whether or not to transfer the skills classroom pedagogical skills, integrating the technology with instruction in their own content areas.

Dr. Curry was convinced that the course was not providing the students with the needed skills. He said that it did not provide that level of access and expectation that was reasonable. He felt there was a disconnect between what the students were learning in the one computing course and what they did in their field experience, "the faculty and the assignments and the field experiences were geared toward using technology. So, the computing tools course was not adequate."   Dr. Curry had, in fact, collected data from a previously conducted pilot study which provided him with data to make such statements.

Maintaining Leadership Reputation of the University

Another catalyst for adopting the laptop requirement was that the university needed to keep up with what was going on at other universities. In addition to university laptop programs, school districts across the nation are beginning to implement one-to-one laptop programs at the K-12 levels. During the interviews, this emerged as another reason for considering a laptop requirement for this university. Many other universities have university wide or program specific technology expectations and requirements. Universities such as Drexel were indicating the power of what happens when all the faculty and students have the same tools. Dr. Tech pointed out that there were a lot of things going on, there was a growing recognition because of work done at other institutions, and there was a need to prepare the new generation of teachers to use these tools effectively.

In conjunction with what other universities were doing, there was also a vision that the state and other school districts are moving to a one-to-one computing environment and LPU wanted to remain at the forefront of preparing teachers to handle these types of teaching situations,

> If you want to prepare teachers with 21st century skills, if you step outside of this university society is infused with technology, the one place where we haven't seen it as much is in education…The long-range plan for [this state] is for 1 computer to 1 student and districts are looking at that. The state of Maine has initiated that. This is where things are going and you can either be at the tail end

of this or you can be at the front end of this. LPU definitely wants to be at the front end of things. (Dr. Tech interview)

2. Availability of resources

This condition refers to the things that are required to make implementation work. It includes hardware, software, publications, audiovisual media, and other teaching materials. Resources are defined as those tools and other relevant materials that are accessible to assist learners to acquire learning objectives. Without the resources, it is almost impossible to implement changes that require such support materials (Ely, 1990, 1999).

Through discussions with the administration and staff, the necessary resources were carefully considered and put into place before the requirement was implemented and these resources were continually maintained and improved to evolve with and support the program.

Dr. Tech was instrumental in re-organizing the technology center and established the proper infrastructure before the laptops took over. A year before the requirement, Dr. Tech thought about what needed to be in place to make this program successful. One of the critical pieces was making the education building a wireless facility, "the summer before the laptop requirement was initiated we had completed making the entire building as well as the outside areas wireless" (Dr. Tech interview). He was also aware of the support system that needed to be in place for the students and the faculty. For the students they started a laptop help desk, "we came up with the concept of the laptop help

desk which is actually manned by technology savvy students and any technical problems that students have they can go to the laptop help desk and get help, the staff can diagnose whether it's a hardware problem or a software problem" (Dr. Tech interview). For the faculty, they incorporated the help area managed by Mr. Idea. The faculty help area was established independently before the inception of the laptop initiative. The concept behind the faculty help area was to provide faculty with a place and resources to assist them in the creation and implementation of their ideas for teaching with technology. It was described as a "do with" area rather than a "do for" area where the faculty member could work with Mr. Idea and the staff in efforts to collaboratively create and build their lessons and skills.

The existing technology center was also reorganized to better support the laptop initiative. Ms. Development was hired as part of this reorganization. She was continuously involved behind the scenes in ensuring that all the technical pieces were in place and accounted. She mentioned all of the little things that are a part of the infrastructure, "basic stuff, a help desk, plugs, a loaner for students when they have to get their computer serviced, the wireless network." The infrastructure and the resources in the College of Education were constantly evolving to meet the ongoing needs created by the students all having a laptop,

> There were things that were causing huge problems, for example no place to plug in, it's such a tiny thing and in the grand scheme of a multi-million dollar project and there is no place to plug your computer in when your battery is dying. If you can't turn on your computer what's the point? We got 40 power strips and issued

them to some of the cohorts. Now we are working to put in wireless projectors into some of the classrooms so the faculty can come in and wirelessly project their materials. The idea is to make the infrastructure as invisible as possible. (Interview with Ms. Development)

The reorganization of the existing computer labs also evolved as a result of the laptop requirement. With the wireless infrastructure, there was no longer a need for as many defined computer labs because the education building and front lawn essentially became a computer lab. Ms. Development was aware of how the needs change and as a result how the space changed. They changed some of the labs by removing all the PCs and replaced the computers with power adapters so students can plug in their laptops, "It's a shift away from purchasing new desktops and having more traditional labs" (Ms. Development interview).

Mr. Idea, who was in charge of the faculty help area, spoke of the evolvement of the resources that were necessary to support this type of program,

We are one the first College of Education or teacher preparation program to have this laptop requirement on this level. We have a 1000 laptops walking around and that is changing how the technology center operates. We are closing down labs and replacing the desktops with tables and plugs so that more students will be able to bring in their laptops and get to work. We are building spaces that are usable. (Mr. Idea interview)

It was clear that the resources for the education students and faculty were carefully planned. With the laptop requirement in place as a program-wide initiative, there were other pieces that emerged as important considerations. Ms. Development was aware of these needs, such as being able to provide resources to be taken out to the schools, "We need more projectors in the field and if they don't have them it doesn't matter. Until you can share your ideas it doesn't really make a difference and a lot of schools do have the projectors" (Ms. Development interview).

Another resource made available to the students was the *Atomic Learning* website (www.atomiclearning.com). *Atomic Learning* provides users with web-based software tutorials for both Windows and Macintosh. There are a variety of software tutorials available including Microsoft office applications such as Word, Excel, and PowerPoint, Apple specific applications such as iTunes and iPhoto, and multimedia authoring software such as Dreamweaver and Adobe Photoshop. Students and faculty have free access to this site.

The planning did not stop at ensuring the resources were available for the students and the faculty. Once the infrastructure and resources are in place then the focus can shift away from the technology toward, "enabling the teachers to use technology to increase the learning of their students. It's not about the technology anymore, we are finally there, here we are 4 semesters into it and we are at the point where we can focus on the integration of the technology across the curriculum in the PDS" (Ms. Development interview).

Beyond resources available in the university setting, one of the determining factors as to how preservice teachers will use computers in their student teaching are the resources available in the schools where they are placed. These resources will be discussed later in the chapter.

3. Commitment

This condition demonstrates firm and visible evidence that there is endorsement and continuing support for implementation of the innovation. Ely (1999) describes commitment as "An unqualified go-ahead and vocal support for the innovation by key players and other stakeholders in necessary" (p. 25). He also points out that commitment occurs at all levels, and communicates support from a higher level. This condition ties in closely with the conditions of leadership and participation.

The long-term commitment of the administration was clear. They were committed to reviewing the program, revising the program, and to a long-range view of success. Dr. Education mentioned that in order for the laptop requirement to function successfully both within the college and in the field; there needed to be commitment from everyone involved. Dr. Education spoke of the need for complete commitment from all parties, including the students, the TAs, the faculty, and the cooperating teachers in the field,

> Everyone has to be a player, the cooperating teachers need to be familiar with the platform and the software so that they can model it and they can talk to their student teachers about it. We need to have projectors in those classrooms so that

when a student teacher creates something that they would like to show from their laptops, there are projectors there for them to do so otherwise it's futile. That our facilitators are knowledgeable and comfortable with technology so that they can look for it and expect to see it and can communicate with students about how to use it…I would say over the next few years that we will have more of those pieces in place, but it is a coordinated effort. (interview)

The coordinated effort and commitment to putting the pieces into place on the part of the administration were instrumental in the evolution and improvement of the program. Dr. Curry was optimistic and reported great progress over the first two years of the program. Despite some unanticipated problems, they managed them successfully and proceeded. With new initiatives, it is impossible to anticipate all the problems or difficulties but Dr. Curry was certain that they would be able to handle any unforeseen issues because of their commitment to the project, "it feels like even though we don't know what's coming next or exactly what's going to happen we have a group of people together and commitment on the part of those people to handle what might be coming next" (group interview).

Part of successful implementation with any policy is a commitment to investing the time is necessary to see change and initiatives required time to become established and create change. According to Hall and Hord (2001), if implementation is viewed as process, it will be strategic in nature and will need three to five years for implementation. Dr. Tech was aware of giving this laptop program the time it needs, "I think our first real

milestone should be in 5 years from now" (group interview). Dr. Curry agreed that change takes time and that the results of how the laptop is impacting the graduates will be another measure of success, "the real proof of the pudding isn't in yet, what we need to do is wait and collect and analyze the data that shows how teachers teach and students learn in classrooms of our graduates" (group interview).

4. Leadership

Leadership is necessary by the executive officer of the organization and by the project leader who is more closely involved in day-to-day activities. Even though individuals act alone, especially in classroom endeavors, they need the inspiration and continuing support of individuals whom they respect. Leaders should be easily identified and leaders provide initial encouragement to consider new ideas, they insure that the necessary training is given and that the materials to do the job are easily available, they are available for consultation, and they continually communicate their enthusiasm (Ely, 1990, 1999).

In the case of this laptop program, leadership at the executive level was evident. Dr. Tech and Dr. Curry were and continue to be the guiding leadership of this program. Additionally, they established a strong support system with Ms. Development and Mr. Idea as well as having a laptop committee which met regularly. The implementation of this type of program needed clear leadership from the early stages, "We had to work through the administration and Dr. Curry did an amazing job, I had more of a support role, he had to go through so many hoops with the administration a lesser person would

have given up before" (Dr. Tech group interview). Dr. Curry was committed to this program from the beginning, "the reason that I tried so hard at that time of being associate dean for teacher education was that I wanted to facilitate change and it wasn't that I believed so deeply that this had to happen it was that I was convinced by other people to make it happen" (group interview). Making the decision to implement such a program at a large university was not easy, "I think one of the biggest challenges that we face is that we are a pubic institution and we mandate that students purchase the computer at $1000 which is a tremendous investment and it's hard to do that and it took a lot of courage to jump in and do that and make it a mandate" (Ms. Development interview).

The other type of leadership, the project leadership, is more closely related to the day-to-day activities. Ely establishes that once the executive leadership is evident, then project leadership becomes even more important because the person who can help with the implementation is closer to the user (1999). In this case, the project leadership and day-to-day implementation responsibilities fall on the shoulders of the faculty. Lipsky defines these implementers of agency policy as "street-level bureaucrats" (1980). Lipsky's work primarily deals with individuals in public service roles, such as police, public school teachers or governmental employees. When these workers implement agency policy, there is certain amount of discretion they exercise in how they go about interpreting and carrying out the policy. The LPU faculty involved in the laptop initiative were not unlike these "street-level bureaucrats". The ways in which they decided to incorporate computer technology into their courses and assignments was largely their

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decision and under their discretion. How the faculty chose to incorporate computers into their coursework is discussed later in this chapter.

5. Participation

Participation means that there is shared decision making and communication among all parties involved in the process, as individuals should be involved in decisions that directly affect their lives. In education and policy making, decisions are often made and handed down for implementation. Policies are one thing but practices are another (Ely, 1990, 1999).

During the pilot study phase, participation on the part of the faculty and students was key in deciding to continue and expand the requirement as a program wide policy. The decision to move forward with the requirement was not viewed as a "top-down" decision, "My view is that it's more complex, it came first out of the bottom-up from the faculty who were involved in the pilot saying that this is the only way I want to teach" (Dr. Tech group interview). The faculty participation was an important part of deciding to move forward with the larger mandate,   "So if the faculty had said that this is a pain in the butt and our students aren't learning anything we would have absorbed the computers and used them somewhere else. There was excitement far beyond what we had anticipated and then in order to implement it" (Dr. Tech group interview).

Ms. Master, Dr. Nueva, and Dr. Methods were aware of the initiative, but because they were not part of the pilot program, they did not have input into the initial decisions to adopt the program. Ms. Master knew the requirement was in development, "I knew it

was coming, I had all the information on it so I knew that it was in the works. Our TLA students were not really required to have the laptop until last semester" (interview).

Dr. Nueva and Dr. Methods taught in the program after the requirement was already in place as a program-wide policy. Dr. Nueva knew about the requirement because of her TA work, "I knew about the laptop initiative and I TAed for a literacy acquisition class and a lot of them had already had their laptops and really through that professor and that class that I immediately started using TeachNet and that sort of thing or suggesting that they use PowerPoint" (interview).

Dr. Methods was involved with the computing tools class and the program as a TA while the laptop program was in development, "I used to work with the computing tool class which was the precursor technology component before the laptop initiative was implemented. I think I have a better sense of where students and the program came from, not these particular students, but the students before as far as the technology and where they want to be" (interview).

There was no data that indicated the participation of the foreign language preservice teachers at the decision-making level. At the end of each semester all students in the certification program completed a survey about the laptop program as a way for them to express their experiences and opinions about the program to the administration. The data from these surveys may be influential in how the program continues to develop.

The condition of participation, as suggested by Ely, relates more to the involvement at the decision-making phase but communication with all parties is

necessary for complete buy-in and support of any policy. A more traditional sense of participation is that everyone is involved. Part of participation as it applies to the laptop initiative, is the requirement for the students to purchase a laptop. In conjunction to purchasing the laptop, all parties should have a clear understanding of the purpose and the goals of the requirement. To have complete support for the program, the students needed to purchase the laptop and understand the goal of purchasing this machine.

To Buy or Not to Buy?

These students were required to purchase a laptop computer by a designated time in their professional development sequence and two of the seven participants chose not to purchase the laptop despite the requirement. Through interviews and questionnaires, the preservice teachers discussed their decision to purchase the laptops and their opinions on the advantages and disadvantages of owning one.

Maribelle purchased her laptop before she found out it was a requirement for the program because she wanted an iBook, "Actually, because I was a film major I loved iMovie and I went out and bought an iBook before the requirement" (Interview). For her there were advantages to owning a laptop, "One of the advantages to the laptop is that it's mobile. To me, that is the biggest advantage of a laptop and now, after owning one, I would not want to go back to a desktop" (Q1). The portability also presented some frustration for Maribelle, "Some of the disadvantages are that the battery life is a frustration, I am feeling like I am always having to plug mine in" (Q1). Despite the

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frustration, she was pleased with her purchase, "I wanted a Mac laptop anyway. I love Macs. I am happy that I bought one" (Q4).

Connie bought the laptop under the college requirement but would not have bought it if it had been optional, "I was excited because my computer at home was really old, but I didn't have the money for a new one, it's more loans that I have to take out so that was frustrating and still is because not everyone in our cohort has the laptop, so I like it but it's frustrating" (Interview). Some of the advantages for her were the convenience and the portability, "I can use it anywhere as long as it's charged. I keep pictures and music on my laptop" (Q1). Although a little skeptical at first, Connie reported being pleased with her purchase, "As much as I disliked having to buy the laptop at the beginning, it is good to have and easy to carry around" (Q4).

Xochitl purchased her laptop at the very beginning of the requirement, in fall 2002. She was in the first semester of the Teach Liberal Arts program, needed a new computer and had been considering a laptop, "I was very excited. I was all for it. I really needed a new computer, it happened at a good time for me" (Interview). Despite her initial enthusiasm, she had some technical difficulties when she first got her computer, "I had had it for six or seven months and something happened with the screen and it wasn't working…it was great and then I had to send it in to get it fixed. Last semester I had to send it in another time. I'm happy that we had the three-year warranty because I just sent it off and got it fixed. The warranty has been a lifesaver because I have gotten expensive things fixed for free. So, despite all the problems I am still satisfied and positive about it" (Interview). She saw some of the advantages as its size and portability, "It doesn't

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take up too much space and it is well equipped. The obvious advantage is that it is portable. The main disadvantage is that I am afraid to take it anywhere because I am afraid that I will break it, it is a very delicate machine" (Q1).

Lea bought her laptop because of the requirement and despite a lack of initial information about the requirement she was enthusiastic about her purchase, "They weren't too informative, basically it was you are going to have to get a laptop for the 300 course. In Spanish, I got the scholarship that helped me pay for the laptop. I think it would be tough without that money. I needed a laptop, a computer, because I had a really old computer. So, it was good timing for me" (Interview). Lea liked the portability of the laptop, "You can take it to places with you like school, trips, coffee shops, and it's compact. But, they can be stolen easily, and you always have to keep the battery charged. I had to buy a new charger when my dog chewed mine up – it was expensive to replace" (Q1).

Lauren bought her computer as a part of the requirement but would not have bought it if it were optional. She was ultimately happy with her purchase, "I'm glad that I did, I love it! I love my Mac and this was a great excuse to get it. Looking back, at the time, I didn't want to get it but I love it now" (Interview). She liked the size, "I can travel with it and it's small but it gets very hot and the battery runs out quickly" (Q1).

Mia and Marie decided not to purchase the laptop as both had access to computers at home and at the university and felt it unnecessary to purchase another computer. Mia chose not to purchase a laptop because she already had a computer at home, "I don't ever remember getting any information about a requirement. I just heard about it from other

people. I didn't feel the need to because I have a new computer at home. I couldn't afford another one" (Interview). Throughout the study, she maintained her opinion that she did not need a laptop, "I don't own a laptop and I never felt that I needed to buy one since I have my own personal computer at home and most teachers have a computer in their classroom, I don't think it's necessary to buy one" (Q4).

Marie also chose not to buy a laptop for the requirement. She and her family already had three computers at home so she didn't feel that it was necessary to buy another one. One of the factors in Marie's decision was the choice of the operating platform, "I wouldn't mind owning a laptop, but I would want it to be PC" (Q4). She felt it was unnecessary as, "I think the laptop will be more useful for personal use at home, not at work, since most teachers have a computer in the classroom" (Q4).

There were no negative consequences for these students who did not purchase the laptops. Because of the resources available at the university, they were able to check out laptops for training sessions, and in their classes they had access to computer carts for presentations. Ideally their courses would demand the use of the laptop in order to be completed successfully, but in the case of Marie and Mia, they completed their coursework without owning a laptop.

Understanding of goals and purpose

The students, faculty, and administration had differing understandings and opinions about the goals of the laptop program. During interviews and questionnaires,

the administration, faculty, and students expressed their views on the purpose and goal of the laptop requirement.

The communication of the goals and the purpose, although stated in on the program website, were not clear to the students in this study. Some understood the need to be technologically prepared while others thought it was a way for the university to make money. The students had a variety of perspectives about the goal of the laptop requirement, "I don't know exactly what the goal of the requirement is. Encourage students to buy Apple computers through the university? Speaking for myself, if I needed to buy a laptop, I would buy a PC" (Marie, Q5). Lauren had a similar idea, "Honestly, I think the university was looking to make money. I was told all schools use Apples so having a laptop which could be transported between school and home would facilitate lesson planning. You could work at home and then easily transfer it at school. The more I think about it the more I realize I don't know what the goal was" (Q5).

Other students recognized the need to become more technologically prepared but their views were not consistent with the stated goals of the program. Lea thought it had something to do with becoming familiar with technology, "It probably had to do with the growing incorporating of technology and wireless Internet into our society. They have a vision that all students will become more familiar with technology by having a laptop. The goal is that we use technology more in teaching and the College of Education is wireless so we could take our computers to class" (Q5). Xochitl thought it was a way to be exposed to more technology, "The goal is to produce tech-ready teachers that will be able to integrate technology into the classrooms. The information society that we live in

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and the growing need for students to be exposed and have access to technology" (Q5). Maribelle and Mia also thought the goal was to help them become familiar with technology, show them how the computer can be used in classes, and "to provide more teaching sources" (Mia, Q5). Connie thought it was to provide another tool, "I guess I can understand that it's a tool and there are so many great ways to use the computer but it's a matter of teaching us how to use it and giving us time to practice with it" (interview).

Ms. Master and Dr. Methods had a variety of perspectives on the goal of the requirement, "I hope it's in training the students, allowing the students the opportunity to see how technology can be used" (Ms. Master interview). Dr. Methods thought the goal was to have an integrated approach to the technology included in the program, to prepare students to be technology savvy when they complete the program, and for the instructors to include technology based assignments into their classes. With the laptop initiative, "they were spreading it [technology] across and then when you were done you would have a laptop and you'll be able to take it out in the field" (interview).

The administration also had their ideas about what the goals of the program were. Dr. Curry mentioned there were several pieces,

> This is one more step in the continuing effort to develop technology proficiency in teachers and it takes advantage of the number of features that strengthen that. It enables us to incorporate technology into our curriculum and it enables use to envision ubiquitous access, it pushes us to the dimension of having people so comfortable with technology they don't even think about the technology.

Thinking about applications that address fundamental teaching and learning

issues, it's not this revolutionary new direction that we are going to, it's a step

that we can take as a part of the teaching and learning process. (Interview)

In regard to the larger mission and future of the laptop initiative, he thought it the

important thing was to,

connect issues of subject matter, issues of individual instruction, issues of

teaching and learning in the most profitable way in terms of learning and teaching

and the big step we are taking is giving everyone the access and the responsibility.

We will continue to learn new ways and better ways to do things, whether its

presenting material or turning students loose to do their own work or doing

assessment or all the different aspects of teaching. I think this opens up new

avenues for research and experimentation and learning new ways of doing things.

(Interview)

Besides exiting the program with a computer, he hoped students would leave the program

with the experience of learning in a one-to-one ubiquitous computing environment,

that will serve as a model for them as they seek to promote change and improve

teaching. They will appreciate the resources that are available over the Internet

and the empowerment their students have when provided with technology that

they experienced in their classes and they will work toward that. They will have

an appreciation for the value and potential of change. They won't think of

teaching and learning and business in the schoolhouse as a fixed quantity, they

will have experienced so much change in their own teaching and learning that

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they will be able to value and plan for change and be agents of change. (Interview)

For Dr. Tech, achieving invisibility was a goal in the development of the program. He hoped the laptops would "become part of the furniture" (Interview). He expressed how he hoped the initiative would develop, "I use my computer for everything. I don't pay attention to the fact that I'm using a computer, its just part of my environment. When people aren't talking about the technology and they are just using it then we will know that we are there" (Interview).

For Ms. Development, the goal of the program was to produce technologically sophisticated users,

we owe that to our students that when they leave here they do understand how to use technology and they understand the usefulness of the technology…it's a responsibility that we have to our students as they have the technology component in their standards for certification. We have to prepare students. We are talking about the utilization of how to use the technology to improve their teaching. (Interview)

Mr. Idea believed the goal of the program was to make the technology part of what is done in the classes rather than as a separate piece, "the technology should be part of the course content rather than an add-on component, where the content is supplemented by the use of technology" (Interview). The ideal situation is that "all the

competencies are covered and they are integrated seamlessly into the curriculum" (Interview). When students leave the program, he thought students should be "confident to use technology, well prepared and we want them to believe in the value of incorporating technology which is interesting because they will be walking into settings that are going to have a wide range of resources" (Interview).

The bigger picture, according to Dr. Education,

Is that the faculty and our preservice teachers learn about, understand, and become proficient with the notion of integration of technology as part of pedagogy to teach the instructional and behavioral objectives, that faculty will model the notion of integration, that is really seamless and it's almost like it's invisible. It's a tool like any tool you would have at your disposal. (Interview)

She added that the program is moving "into the realm of integration…to focus on the curriculum and identify technology to enhance teaching and to look at different models."

6. Availability of time

As one of the conditions, Ely (1999) describes the condition of time as the need for to have time to "acquire knowledge and skills, plan for use, and adapt, integrate, and reflect upon what they are doing" (p. 25). Time overlaps with some of the other conditions in relation to the amount of coursework and in the coordination of the curriculum.

From the perspective of the faculty, time was discussed in relation to the curriculum. Dr. Nueva and Dr. Methods thought that the curriculum of what they had to

cover especially in the advanced methods course limited them in the time they had available to incorporate technology, "the curriculum is so jam packed…I think we need to stop thinking that technology as something that has to be taught but rather something that has to be integrated" (Dr. Nueva interview). Dr. Methods though it would be impossible to expect the instructor of the course to teach the content and be the teacher of the software and applications, "it's already a full curriculum and adding teaching with technology into that is too much…especially with our sequence, more things are going to get packed into the curriculum" (interview).

For the student teachers, time also emerged as related to the sequence and the curriculum. Maribelle was frustrated with the lack of time she had due to the overall workload, "other assignments take away from having time to try things…if we had more time to practice with technology that would be helpful" (group interview). For Connie, she thought that having more time to practice would have been helpful, "it's a matter of teaching us how to use it and giving us time to practice with it" (group interview). Maribelle also expressed the lack of time they had during their coursework at the university to learn how to use their laptops, "I have used the computer since the 6th grade, I feel like I know how to use a computer but teaching with a computer is not going to develop over two semesters" (group interview).

7. Rewards or incentives exist

Ely describes an incentive as something that serves as an expectation of a reward while a reward is something given for performance. There is an additional complication

with rewards in distinguishing between extrinsic rewards and intrinsic rewards. It can be difficult to measure the satisfaction that may be felt by the user of the innovation and Ely states that although this condition may be present, it tends to be of lesser importance in the overall implementation (1999). For some a reward may be satisfaction for a job well done and for others it may be better resources or better salaries (Ely, 1990).

Rewards and incentives emerged from the student perspective and from the administrative perspective but were not addressed directly by the researcher. The administration thought an appealing part of the program for the students would be the fact that they would have an up-to-date computer when they graduated from the program, "we see the students getting their computers three or four semesters before they graduate which means that the laptop is current when they graduate" (Dr. Curry interview).

For the students, they thought the discount made the computer a "great deal" (Xochitl), and some of them received a scholarship which helped pay for the laptop, "the computer purchase was facilitated by the money that I received" (Lea). Of the students who did purchase a laptop, they all expressed that they loved their laptops and they were happy they bought them, "I'm glad that I have it (Lauren)", "It's a wonderful computer (Xochitl)", "I'm happy I purchased my laptop (Lea)", "I'm happy that I bought one (Maribelle)", and "I like it, it's a great tool (Connie)". Other than the discounted price and the scholarship, they did not talk about any other rewards or incentives for buying or using the laptops. As demonstrated by Mia and Marie who did not purchase the laptop, they were able to complete the program without owning one, "I never felt that I need to

buy one since I have my own computer at home" (Mia), and "I feel like I'm prepared to use technology, I do not see it necessary to own a PC" (Marie).

Affects of the laptop on the preservice foreign language teachers

This part of the chapter describes the ways in which the preservice teachers used computers during their student teaching and explains the factors that influenced these uses as a condition of their knowledge and skills.

During the student teaching field experience, the foreign language preservice teachers used the computer for both professional and personal tasks. In the classroom, they completed administrative tasks and the types of computer-based activities were limited to the delivery of grammar and cultural lessons. Outside of class, they used the computer to plan and prepare lessons and for personal applications.

Administrative tasks

From observations and conversations with the student teachers, all used the computer in their classrooms on a daily basis for administrative tasks. Lauren and Lea used the computer daily for taking attendance, recording grades, and email. Xochitl primarily used the teacher computer for taking attendance and recording grades. Maribelle regularly used the computer at school to print materials for her classes, take attendance, record grades, and for email. At school, Connie and Mia used the computer daily to take attendance, record grades, and check email. During her student teaching,

Marie used the teacher computer to record attendance, grades, check email, and do Internet research.

In-class computer-based activities

Most of the foreign language student teachers were able to create at least one computer-based activity to use in their practicum. The computer-based activities that Lauren, Xochitl, Maribelle, Connie, and Marie designed and implemented during their student teaching were limited to the presentation of grammar and doing cultural research on the Internet.

Lauren's students typed assignments and toward the end of the semester they did a video/music project where they looked up lyrics on the Internet. She turned in a reflection of this project for the seminar assignments. In her reflection, she revealed that she was hesitant in creating this project using the Internet with her students because she was unsure of how to plan and execute this type of project. She created an outline and rubric for the project and was specific about her expectations to include reading, writing, listening, and speaking in Spanish as well as using higher order thinking skills. She included checkpoints for the groups so she could monitor what they were doing.

Upon implementing the assignment, her computer resources were limited and resulted in some problems and frustration for her. Lauren took her classes to a different room where there were a total of eight computers. She created a favorites folder on each of the computers of all the websites that the students could use. The problem with the

room was "all the computers are cramped in the back and an entire group couldn't fit around one or two computers. This made class management more difficult" (reflection).

Once the students had researched their song lyrics and found information on the singers, they filmed their group singing the song in a music video format. Despite initial concerns and limited computer access, Lauren thought the students had fun doing this project. She commented that some of the groups had a difficult time coordinating in order to film the video and other groups were not as focused as she would have liked.

Lauren learned a lot about planning, organizing, and implementing this type of project. However, her reflection on how she could improve this lesson was less focused on the use of the computer and more focused on the execution of the overall lesson, rubric and the video.

Lea was not able to require her students to use the computer for their assignments nor did she design any activities where the students were using the computer. Lea's students had one assignment where they had the option of typing it as part of the final product.

By the end of the semester Xochitl borrowed a projector from another teacher for presentations, "I have used PowerPoint for grammar and a Día de los Muertos[5] presentation. The students seemed to like my PowerPoint presentations for the verb tenses, they have been paying attention and doing well on the quizzes." (Q5).

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[5] Día de los Muertos, the Day of the Dead, is celebrated in a majority of Spanish speaking countries and occurs at the beginning of November. It coincides with the US holiday of Halloween. It is a popular theme for Spanish teachers in the fall semester.

Maribelle's students used the computer for various assignments. The 8th graders used the computer on their own time to type and add clip art to an assignment. She designed and implemented an in-class activity for her 7th graders where they went to one of the computer labs and used the Internet as part of the assignment. The goal of the activity was for the students to compare how people typically spend their time in the US and in Spain, "I had four websites for them to use and they were also allowed to search on their own. We were studying time in class…this activity helped the students get more familiar with searching the web, especially for something having to do with Spanish" (Q3).

Maribelle included a reflection of her Internet activity as one of the assignments for the seminar. She wrote that she had a difficult experience when trying to implement the lesson. She had clear goals in planning and wanted to bring culture into the classroom in an interesting way by allowing the students to apply their knowledge about time and think about what daily life is like in other countries. Despite careful planning, her students did not respond as she had hoped. She thought she provided clear instructions but they were still confused, "Some of them said, 'I don't understand the point'" (reflection). Her students did not understand what they were supposed to be searching for or looking at. She reported most of the students only tried the four websites she gave to them and they quit until she told them they were going to also have a related homework assignment. She was slightly discouraged after teaching the lesson, "I really wanted to open some doors for discussion and challenge their perspective, but really I think the students just felt like it was pointless. And now looking back, I feel like I have

an idea why: this was an idealistic lesson. Instead of easing into to presenting information and material like this, I just jumped right into it" (reflection).

Maribelle concluded even though the lesson did not go as she hoped, the experience provided her with a good learning opportunity. She learned what to expect and how to plan better, "I think I did this activity too early in the year and also complicated it too much for seventh graders. I was not very happy with the result, but I now feel like I know how to improve it in the future" (reflection).

Connie gave her students the option of typing drafts of projects and she took the students to the computer lab to conduct research on the Internet, "Students looked up information for Día de los Muertos, they had specific questions to answer, and they had to find a recipe" (Q4).

Marie incorporated several activities and assignments using computers. They researched menus and menu items using the Internet, she used the online program Quia with the French 1 class, and the French 5/6 students conducted research on literary characters from their readings. She primarily viewed the Internet as a good source for students to use in finding culturally related items, "I want my students to be able to create menus of French cafes, research regional dishes, etc" (Q2).

Use of the laptop during student teaching

Most of the student teachers did not take their laptops to their classroom during the semester. The laptop seemed to have a limited role during their student teaching experience.

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At the beginning of the study, Lauren planned on taking her laptop to her school and did so a few times throughout the student teaching semester. Lauren said, "I took my laptop a couple of times, once because I wanted to burn a music CD and the time because I tried to burn a CD at home for an assignment but it didn't burn right so I played the song off my computer" (Q3).

Lea owned a laptop computer but maintained throughout the student teaching semester her doubts as to if she would take it to school. At the beginning of the study she predicted she would not take her laptop to school, "I probably won't take my laptop to my student teaching, I wish there was wireless there" (Q1). During the middle of the semester she said, "I have not used my laptop for student teaching yet, and actually I'm not sure that I really will" (Q3).

Initially Xochitl did not plan on taking her laptop to school, "I would like to take my laptop to my student teaching to be able to type things on it but there is no Internet connection for it and I am concerned about it's safety. I would like to do PowerPoint lessons and have it as a resource" (Q1). By the end of the semester, because she found a projector to borrow, she took her laptop a few times to do presentations for her classes.

Overall Maribelle found her laptop to be a valuable tool for both personal and professional tasks, "I love it and I will always be a laptop person from now on, the convenience of it, and I'm a coffee shop person so I can take my computer there and work on stuff" (Interview). Initially, she thought she might take her laptop to her student teaching to, "project websites, to check the weather in a foreign country, to project DVDs

through the TV, or just for my use" (Q1) but did not take her laptop to the classroom to do any of these things.

Lesson planning, preparing for class, and personal uses

The student teachers used their laptop or a computer on a regular basis for planning lessons, researching materials for class, creating documents such as quizzes, test, or handouts, for email, and other personal reasons.

Outside of the classroom, Lauren used the Internet to look up activities and resources for class. She used her laptop consistently for emailing and word processing to make quizzes and worksheets.

Lea used her laptop on a regular basis for email, word processing to create documents and type compositions for the class she was taking, and she used the Internet to look for lesson ideas and activities.

Away from the classroom, Xochitl used her laptop to type assignments, do research for class with the Internet, for email, and she used word processing to prepare worksheets and handouts for her classes.

Maribelle used her laptop for a variety of different purposes. She consistently accessed the Internet for lesson ideas and cultural information and games, "I have used specific foreign language websites, educational websites, and websites in Spanish to search for lesson plans, games, word searches and cultural information" (Q3). She used her laptop for email, music, keeping photos in iPhoto, and word processing to create activities, test, quizzes, and grading rubrics.

Connie used her laptop for a variety of school related tasks away from the school setting such as, word processing for making quizzes, tests and handouts, she used Excel for keeping grades and making verb and grammar charts, and she created seating charts. Connie also used it for keeping music and burning CDs and she used the Internet to research materials and creating extra activities (Q1, Q3).

Marie used the Internet as a personal resource for preparation, "I have always seen the Internet as a good resource for lesson planning" (Group Interview). Although Marie did not purchase the laptop, she used the computer regularly for personal tasks such as email, Internet, for her own class assignments, keeping digital pictures, and word processing for tests, quizzes, and handouts.

Mia, like Marie, did not purchase the laptop under the requirement but used her computer at home for various tasks. She used word processing to create quizzes and activities, she used email on a regular basis, and she did some research on cultural information such as Día de los Muertos to use with her classes.

All of the preservice teachers used the computer and their laptop in various ways both in the classroom for daily tasks such as taking attendance, recording grades, and checking emails and outside of the classroom. They used the computer to prepare materials and they used the Internet to do research and preparation for their teaching. Although they had different experiences in implementing computer based activities with their students, each one was able to use the computer in some way during the student teaching experience.

8. Knowledge and skills exist

One of the main purposes for conducting this study was to investigate how a cohort of preservice foreign language teachers used the laptops and computers during the "real-world" practice of the student teaching field experience. In addition to revealing how they used the computer during their student teaching, there are reasons why their practice resulted as it did. There are several factors involved in making sense of their experience; these students were required to purchase a laptop computer for their professional development sequence, the university their coursework was to integrate technology, in the public schools resources and modeling from their cooperating teachers varied, and the technological and pedagogical training they experienced was a factor in how they felt prepared to integrate technology into their own teaching.

One of the conditions facilitating the implementation of a technological innovation is the existence of knowledge and skills (Ely, 1990, 1999). The ultimate user of the innovation must possess sufficient knowledge and skills to do the job. In the case of computers in education, "a teacher must possess the competencies to teach students the use of these tools" (Ely, 1990, p.301). There are a variety of ways that a teacher may develop and acquire the necessary skills and knowledge in order to implement the use of computers effectively into their teaching In this case, the students were exposed to examples and assignments incorporating technology during their university classes, they participated in training sessions focused on how the applications work, and they worked with cooperating teachers in the field who did or did not utilize the computer for daily tasks and instruction.

Lortie (1975) concludes that teachers learn through a process of "apprenticeship-of-observation" where beginning teachers are influenced by their own learning experiences as students and by how they are taught. This is the concept that teachers will teach as they have been taught. Thus, these beginning foreign language teachers were influenced by all of their learning experiences, those at the K-12 level, in their university course, and by what they experienced and observed during the intern and student teaching experiences.

This section will answer the research question, What factors influenced the preservice foreign language teachers' knowledge and use of technology? Several factors influenced the future teachers in how they incorporated the computer into their teaching. The preservice teachers were exposed to models of teaching and computer integration both in their university coursework and in their various school observations and teaching experiences. Additionally, the training and preparation they received as part of the laptop requirement influenced them individually and was a factor in how comfortable they felt with their own technical and pedagogical skills using the computer for teaching the subject area of foreign language. These were all factors that influenced the way these preservice teachers integrated the computer into the classroom. All of these pieces come together to describe what the students' knowledge and skills were and how they used this knowledge in order to integrate computer technology into their own teaching.

The laptop initiative required the students and faculty to infuse technology into the courses. The data is from interviews with the preservice teachers and faculty members and student teacher observations and questionnaires.

Factors in the university setting

Technologic and pedagogic preparation

A part of developing the necessary knowledge and skills was from the training and learning about how to use various computer applications and how to use them for teaching the subject area, specifically for teaching foreign languages. These students participated in some specialized workshops where they learned the basics of the Apple specific applications like iMovie, iPhoto, and iTunes. The training these students received can be grouped into two different areas, technological training as in how to use the applications and pedagogical training which is more specific in how to integrate the use of the computer for teaching the subject area and was achieved more through practice and course assignments.

Technology Knowledge and Skills

The foreign language preservice teachers reported having some kind of specific technology training but overall they did not feel the training was adequate. As a whole, these students expressed they had a basic working knowledge of certain applications but lacked a more in-depth knowledge of some of the more advanced applications.

Although Marie did not purchase a laptop, she was required to go to the training sessions. She thought the training was too fast and condensed and the level of instruction was too above where her current level of understanding was at the time, "We had a iMovie training but [the person] who gave the training is so above us in the use of

technology. I don't think he could connect with some of us who had no idea about how to use these applications, on a basic level, I think there needs to be more and someone who can relate to us" (interview). She also commented, "I think the training is too fast for someone who doesn't have time to write anything down, a hand out would be helpful" (interview). She felt she needed more training with the computer, "I need more training in what you can do with the computer and show us how to do it" (group interview). At the end of the student teaching semester, Marie still only felt comfortable using basic programs and expressed an interest in having more training specific to how to use the programs, "I am only comfortable with basic applications like using the Internet, Word, Excel and PowerPoint" (Q5). She thought a course that covered both the basic and the more advanced operations would have been helpful.

Mia, the other participant who chose not to purchase the laptop, felt like she had received enough instruction to get through the program, "Although I don't have a laptop, I still know how to use them from the tech classes that I attended last year" (Q1). Mia felt like she knew how to use basic applications, "I know how to do the basics like use Word and Excel that help me in making up quizzes, exams, and slide presentations" (Q5).

Even though these twopreservice teachers did not purchase the laptop, they were able to complete any coursework that required them to use Apple specific applications because they had access to adequate resources on the university campus and they had knowledge in using the basic word processing and presentation programs.

Of the students who did purchase the laptop, they had similar responses to questions about the training and preparation they received, "I can use the basic programs

like Word, PowerPoint, Excel, and that kind of thing. I love to play with it and I wish that I had more time to play with it and learn, maybe more instruction" (Xochitl, interview). She added, "Teachers need to assign more things" (interview) expressing an interest in having more class assignments requiring the use of the advanced applications. Overall, Xochitl said, "I need more training in using the applications and we need more training sessions" (Q2).

Lea felt that the training sessions were adequate, "I didn't really have a lot of training. That guy came in and did some talks for all my classes. I knew the laptop well after all that." Lea also learned about how to use her computer through informal training, "My boyfriend knows a lot about computers and Macs. I had a PC so he showed me a lot. Everything is so easy because they come with everything on it" (interview). Lea recognized she did not feel like she knew as much about the computer as other people, "I think some people know a whole lot about computers and technology and then there are others, like me, that are still slowly learning about the ins and outs" (Q2). She remained optimistic that she would learn what she needed to know but also expressed her deficiencies, "I need more training in iMovie, Photoshop, Web pages. I'm sure as a teacher I will learn more about spreadsheets for student grades and attendance" (Q2).

Lauren also wanted more training, "We have done some but I don't feel like we have gotten there yet, we did do some things with iMovie and then we went to the lab and had to look up something and create a lesson. I think the Internet is more of a resource for teachers rather than students" (interview).

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Because Maribelle had been in the Radio TV Film program, she initially knew more about how to use the various Apple applications than some of the other participants but still felt a need for more training, "specifically on *your* computer, we read 'this is a way you can use the computer' but I want to know how I can use *my* computer to do those things" (interview). She argued there were not enough opportunities for training and linking the skills to practice, "I feel like the training was done pretty effectively, just not frequently. I feel like if the assignments had been done more consistently having to do with our particular computers and technology I would feel better prepared" (Q5).

Pedagogical Knowledge and Skills

The pedagogical training goes beyond just knowing how to use an application but involves linking that skill to the content area and making it relevant for teaching. The participants were very explicit on what kind of training they felt was lacking in their ability to incorporate computer activities into their teaching.

Connie needed more, "directions, guides, and examples" and "more training in websites and interactive activities." She said, "I use the computer everyday but not for the more high tech stuff like iPhoto or iMovie" (Q5). This shows that she had a basic knowledge of using the computer but was lacking the confidence in using more advanced applications for teaching.

Being able to create student-centered activities for the foreign language classroom was a common theme in the participants' responses to what kind of pedagogical training they needed. Lauren wanted more examples for the language classroom, "We need more

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interesting examples of technology activities for the foreign language classroom" (Q3). Maribelle wanted, "more training in PowerPoint and also stuff that the students can do like recording voices and interactive activities" (Q3). She could have used more exposure to resources like, "CDs with music and activities, DVDs and videotapes that are engaging, and fun activities that the students can do on the computer." Maribelle felt like there were some strengths in her preparation, "I got to work specifically with Mac features, iPhoto, iMovie, PowerPoint, etc. I like that in the preparation we also did it according to our subject that we teach and we were able to have some flexibility to create something that we could use again in the classroom" (Q5).

Mia commented, "I think we could have used more presentations about using technology to teach Spanish" (Q5). She felt she acquired enough basic skills to be able to use the computer in her instruction, "Now that I have the basic knowledge of the computer technology when I start teaching I think I'll be able to use it in my classroom instruction" (Q5). Marie wanted more guidance on creating student-centered activities, "I would have liked some kind of an instruction list to direct students, how to get started and finished with a project. More on websites and ideas for activities and grading" (group interview). Lea expressed a need for more knowledge of student-based activities for the foreign language environment, "I could use more classes on how to incorporate more technology based student learning, beneficial websites for both student interest and teacher interest, and the incorporation of more computers into the classroom" (Q5).

The training these students received and examples they were exposed to influenced their opinions of using the computer in the foreign language classroom. Some

of the participants viewed the computer and the Internet as a good resource for them and for their students. While Connie thought of the computer as a resource, she did not think she would use it daily or even weekly in the classroom because it is time consuming to use the computer for presentations in the classroom.

Marie thought there were a lot of possibilities in using the computer for her teaching but felt that she needed to be able to direct students more effectively, "The choices are limitless when you browse the Internet, it is very crucial that you give students precise directions and time for them to be able to do productive work. Printing the steps, reinforcing proper behavior and expectations are all necessary to ensure a smooth computer assisted lesson" (Q5).

Mia also thought the Internet would be good as a cultural resource and would be interesting for students, "they could take notes from PowerPoint to be involved. Or from slide shows or pictures, it would be more interesting then popping in an outdated video. It was boring for me as a student to watch videos. It's more interesting or more up to date, something with technology and culture" (Q5).

Most of the participants felt like they knew how to use the computer but were not always certain on using the computer for teaching foreign languages. They consistently expressed that knowing how to use the computer was not equal to knowing how to use the computer in their teaching.

Maribelle was concerned that she did not know how to use the computer for teaching, "There are certain ways that you have to adapt or use the computer particularly for the classroom. I feel like I know how to use a computer for personal reasons but am

still working on how to implement it in the best way for the classroom" (Q5). She was confident that she knew how to use the computer but was limited by time and exposure during the program, "I have used a computer since the 6th grade. I feel like I know how to use a computer but teaching with a computer is not going to develop over two semesters" (group interview).

Xochitl had a similar opinion about teaching with technology, "You have to know how to use the computer but also how to integrate it into your classroom. One does not necessarily equal the other" (Q3). Lea made a similar comment about her skills, "I don't think that knowing how to use a computer is equal to knowing how to teach with one. I still can use the computer but I can't teach with it. I would like to learn how to connect the computer to the overhead" (Q3). Lea expressed it would be important for her to use the computer but she was unsure of how to incorporate it into her teaching, "I would love to be able to use the computer in my teaching but I would want to be more informed and comfortable doing so" (Q3).

Some of the participants had their own recommendations for improving the training and the program. Their ideas focused on having specific training on using the applications possibly in the form of a separate technology course and in using the applications at an earlier point in the program. Connie, Lea, and Lauren presented suggestions for revising and improving the program. Connie said she, "would have liked to have an entire semester long class dedicated to using Apples with projects" and, "We need a weekly class on how to use the different applications and software. After the class we would have some kind of assignment to implement the material we learned" (Q5).

Lauren made similar suggestions, "I paid attention [in the trainings] and took notes so I can teach myself later. I wish we had more practice, like we only had methods class once a week. I think it should have been 1 hour to discuss readings, 1 hour discussing experiences, and 1 hour in the computer lab" (Q5). Lea commented she could have benefited from a separate technology course, "I think an actual technology class and how to incorporate it into teaching would be helpful or even a class that prepares you for the real world. I'd like to know how to make web pages" (Q5).

Maribelle suggested using the applications earlier in the program even before they had the laptops. She would have liked getting used to the idea of using technology in the classroom earlier. Also, having more experience with the applications as a way to bring technology into the classroom and more assignments beyond Internet ideas would have been ideal for her, "I think we should have had more assignments to come up with a lesson using technology specifically (and different forms of it, not just have the students surf online) and then share as a class so we could get ideas" (Q5).

In addition to the students' responses and opinions on the training they received with their participation in the laptop initiative, the faculty observed and facilitated the students' computer preparation. Ms. Master consistently saw more and more students using their laptops, "I can see that they are using their laptops. I see it being used more each semester." She also changed the sequence of when she introduced some of the training with the applications, "They have learned how to use iTunes, iMovie, all the iApps, and they have done training on that and we have moved that training to the beginning of the class so they can use it more later on" (interview).

For Dr. Nueva, providing students with a chance to apply the technology to their subject was important, "I provide them opportunity to use their language in class." She made an effort to share computer tips, "I let them know that they can change their language on their computer. How could they not know that? All of those things exist in Spanish and how can it be that they can be a Spanish major and no one has told them about spell check in Spanish?" (Interview). Dr. Nueva believed, "teaching technology within the context of integrating is a lot more valuable" and this influenced the way she designed her assignments. She was surprised there were several students who had never done a PowerPoint and that was one of the reasons she required the students in the methods class to create one. She thought jumping in with both feet was a way to begin, "I think sometimes you do have to force them because it is easier to sometimes to do things in the way that you are comfortable with. In Second Language Acquisition I do that too and at the beginning a lot of the students were freaked out about having to do a PowerPoint. They learned how to do it." (interview)

Dr. Methods expressed what she was observing with the student teachers and their abilities. She thought there was the general idea that student teachers knew how to use the computer, "but I think it's an erroneous one, I don't think the students are quite prepared, I know that they can use PowerPoint and I doubt they will be using anything else" (interview). One of the barriers to being able to do more technology assignments in the courses was specifically related to the skill level of the students with the more advanced applications. She thought it would be great to be able to do more assignments and it might be possible to build some of the things into the curriculum, but "you can't

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have the teacher of the class, especially if they don't know how to use the application, you can't have the teacher be the teacher of the software and the content, especially with our sequence, more things are going to get packed into the curriculum" (interview).

Another barrier she mentioned was the time required to learn about some of the technological skills the students would need before being able to design instructional materials. She liked the computing tools class because they had the time to cover how to create student-centered lessons, like "how to set up the computer so that students had limited access to Internet browsing…These students don't know how to do that. If you asked the student teachers right now to plan a student centered technology lesson they wouldn't know how to do it" (interview).

Before taking the position as coordinator, Dr. Methods was a TA and worked with the separate technology tools class where students learned about specific applications and how to implement them into their subject area. Although the class was not perfect, it was structured and taught them the steps necessary to accomplish larger technological implementation. She thought if the students were able to have a class where they could learn about the software on their laptop and have assignments that required the use of the software, they would be able to see what the possibilities are in using their laptops to create technology based lessons for their subject area. With the existing structure of coursework and technology exposure they do not know the intermediate steps involved to create a larger project,

> …you had to add pictures, so we had a unit on editing pictures. You can't tell
>
> them to put in a picture if they don't know how to scan it in, edit it and link it to

your website – if you don't know how to do those steps you would be completely

lost if you have to add a picture. You have to have an idea of where you are

going and the students at this point don't know where they are going. Some of

the students hated that class, but realized the usefulness of it after as they moved

through the program. (interview)

Models from university coursework

The foreign language preservice teachers were required to purchase their laptops

when they enrolled in the Teach Liberal Arts 300 course, one semester before beginning

the Professional Development Sequence (PDS) in the College of Education. While in the

PDS, they took the advanced teaching foreign languages methods course while

participating in 40 hours of observation in a public school classroom. They spent the last

semester of their coursework participating in their student teaching experience. In sum,

these preservice language teachers spent three semesters enrolled in university

coursework where they were exposed to the possibilities of using technology in their

teaching[6].

Each of the courses that these students took during the last three semesters of their

program incorporated some kind of specific technology component. In the 300 course,

they were to build on previous competencies of communicating via e-mail, word

processing, and searching the Internet for material and resources by creating multimedia

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[6] The scope of this study did not include an examination or exploration of other courses
where they may have used technology. The research focused solely on the foreign
language methodology courses they took during their teacher preparation sequence, but
not in their foreign language classes.

lessons, presenting multimedia lessons, exploring subject-specific software packages, and designing a web page (TLA 300 syllabus). In the advanced foreign language methods course, they were required to use TeachNet and PowerPoint (methods syllabus). While in the methods course, they had an assignment for the internship portion to video themselves teaching two lessons. The students used the video to make an iMovie of their sample lessons and it was submitted to the Intern Coordinator for her viewing (internship syllabus). During their student teaching, the participants were required to attend a weekly seminar. One of the assignments for that course was a technology project where they compiled a list of Internet resources for language teachers or activities for language students. They compiled the list of 12-15 links and submitted their list at the end of the semester (seminar syllabus).

Lea, Connie, and Xochitl were explicit about how they used computers during their coursework. Connie and Xochitl, both felt like the use of the computer was not a focus in their coursework and the assignments required limited practice, "I haven't seen a big use in my classes. I use it more for my own personal use, like the video that we had to do for the Internship, PowerPoint, I would love to know how to do more with it. I need to learn a lot. I see how it can be an awesome tool" (Connie interview).

Xochitl held a similar view on how the computer was incorporated into her coursework, "It hasn't been part of my classes, but everyone needs a computer. You have assignments to do, I have brought it to some classes where it has been helpful, it hasn't been a required thing for me to take to class. I think having a computer, especially a laptop, is a great resource for us. I do a lot of class work and assignments with it"

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(interview). Although she felt like the computer wasn't really part of her coursework, she had a positive view on using the computer for the course assignments, "I liked the times that we had to do something for class, like video ourselves for the Internship and make a movie." But she followed this comment with the opinion that she needed to be exposed to a wider variety of applications, "We need more instruction, we need to see things other than PowerPoint presentations being modeled in our classes" (Q5).

PowerPoint and TeachNet were a focus Lea's opinion, "I definitely see the computers used in class because most of the presentations are PowerPoint and we use TeachNet, you can see what is happening with your classes" (interview).

The implementation of the laptop requirement demands both students and faculty commitment in integrating computers. The three main faculty members who worked with this particular cohort of students from the TLA 300 course, the methods course, and in the student teaching semester all had their own perspective on integrating technology into their classes. The students' use and opinions may have been influenced by how the faculty members viewed technology in the foreign language classroom and was a factor in how they ultimately choose to utilize the computer.

Ms. Master – Teach Liberal Arts 300 course

Ms. Master is considered a master teacher in the Teach Liberal Arts (TLA) program and brought over 20 years of teaching experience with her into the program. For this study, she provided information about what the students did during the various courses in the TLA sequence and what kind of technology was infused into these various

courses, "Technology is a focus beginning in the 100 class. They have had a focus on technology from the beginning" (Ms. Master interview). During each of the TLA courses, they had different components that were introduced and each subsequent course built on the previous skills. Beginning in the 100 course, the students, "do email and attachments and web quests and it's really a very elementary level but I was surprised by the numbers of people who didn't know how to do these things, they were cutting and pasting into the body of the messages and that kind of thing was surprising" (interview). In the 200 course, the observation portion was subject specific and they observed a middle school foreign language classroom. The technology component incorporated into their class continued to focus on attachments and web quests. By the time the students were in the 300 course, they were required to have purchased the laptop. Ms. Master has seen an increase in enthusiasm by the students, "A lot of the students are getting them even before 300, and are putting their names on the list so they can purchase them earlier" (interview). She also commented that more and more students are bringing their laptops to class. Ms. Master scheduled her TLA300 class in the education building so that they could take advantage of the technology resources and the wireless capabilities. There were a variety of ways she incorporated the computer into the 300 course,

> I think it's a great tool, they can really use the technology in a Foreign Language class and it opens up the world for the teachers and the students. There is a multitude of things available and it seems like in languages it's a connection with the world and with native speakers. That made me think about what kinds of activities to include, like the one where they had a long list of websites where they

just go out and look at what's available. I don't even think they know. Another

thing we are going to do is with learning scenarios and creating a unit that

involves technology as well as all the other things that you can do. They can

choose sites and they choose one that is not in their language and they change it

so they could use it in their language. I want them to see that they need to be

doing this. (interview)

Ms. Master's practical experience teaching in pubic schools influenced the way she

incorporated technology into her classes. For her, technology was a tool in

accomplishing various objectives, from getting information to recording grades. Her idea

was, "to teach them how to use it to do those things in their classrooms". Some of the

specific assignments they completed were web quests and looking up information about

the individual schools. Another assignment was to "look up foreign language sites,

evaluate those sites and increasing the awareness that they exist" (interview).

Despite her efforts to incorporate technology into the 300 course, she encountered

problems with resources that affected the way she used the computer at times. For

example, when I interviewed Ms.Master, she was not using the projector in class because

the bulb was out and on backorder. The computer resources in the education building

allowed her to request a computer cart for her to use in class, if she so desired. As

another backup she had transparencies of class materials, "I have transparencies of

everything also because it's easier for me sometimes rather than making that effort to use

the projector" (interview).

Dr. Nueva – methods class

Dr. Nueva taught the advanced methods course to this group of participants. Before earning her Ph.D., she also had experience teaching high school in a public school setting. Her experiences influenced the way she chose to design her course and the way she had students use technology. The main applications she used during the course were PowerPoint and TeachNet. She made her students do a PowerPoint because of her own experiences learning about technology, "I'm not from the tech generation and so the first time I had to do one was when someone forced me to do one for a class so I flat out tell them that they have to do it and don't give them the option of using transparencies" (interview). Other professors may give them the option, "it's not that I think PowerPoint is the end all be all, in many ways it's like a glorified transparency, but on the other hand it makes students less afraid. I don't think twice now about doing one" (interview).

Through her work as a TA while pursuing her Ph.D., she was familiar with the available computer resources and tried to utilize those resources in her teaching, "I knew about it from my role as a TA and because I was familiar with it I automatically made it part of the SLA class and the methods class, like ordering a computer cart for every class" (interview).

Part of Dr. Nueva's frustrations with integrating the computer into the methods class was the demand of the curriculum. In this course, there was a lot of material to cover and so trying to find little ways of incorporating the computer was more realistic for her, "it does become more natural because I think that's better than having a day

when we talk about technology. Making it a part of each lesson and each class" (interview). From her discussions with other methods professors they were all trying to find little ways to incorporate the computer but she felt restricted by the demands of the curriculum, "the curriculum is so jam packed and I think that we need, or at least I need, to stop thinking that technology is something that has to be taught per se but rather has to be integrated" (interview).

As a former high school teacher, she knew first hand students would rather discuss the latest gossip or singer rather than literature. Dr. Nueva definitely thought there is value in using the computer in the foreign language classroom as a tool and resource, "the potential is there and it's a fabulous resource because you can find any cultural information that you want, pop culture" (interview).

Dr. Methods – student teaching seminar

Dr. Methods worked with this cohort of students during their student teaching semester. She coordinated their field placements and held a weekly seminar where they discussed classroom management, discipline, and their experiences about student teaching. She also found frustration in the amount of material that was required for them to cover during the seminar. The curriculum and guidelines were also limiting as far as incorporating technology, "I know that they want to be doing a technology component, it's just unsure what they want for the requirement" (interview). In addition to using TeachNet for the class, the more specific technology component she chose to incorporate into the seminar assignments was a 'link list' that didn't require a lot of extra time. At

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the end of the semester each student submitted a list of 12-15 websites for teaching foreign languages. These lists were extremely varied and included everything from cultural sites to lessons and materials that had been created by other foreign language teachers.

Curriculum Coordination

Beyond the development and adoption phases, the resources and the infrastructure, how the implementation occurs is essential for creating change as how the requirement is carried out in practice is at the heart of the change. Careful planning was done as to what needed to be in place for the laptop requirement to work, however, within the secondary group of coordinators and methods instructors, it was not clear that they had direct guidance on what needed to be included in their courses or how they were expected to integrate as the project leaders. The lack of curriculum coordination could be a reason as to why the students received minimal modeling from their university courses and professors.

From an administrative view, faculty are expected to be the content experts and because of the laptops there is an increasing expectation for them to integrate the technology, "there is this group of students coming up who are expecting them to use the technology and it is difficult for the faculty to admit that they don't know that much about technology because they are experts in their field and they are paid to be experts" (Ms. Development interview). As technology infiltrates their fields, over the next 5 years or so, Ms. Development expected the faculty would become more comfortable with their knowledge of technology or more comfortable with their lack of knowledge in some

cases and they will hand a lot of responsibility for learning over to their students. As a result, "the faculty will become more trained in how to use the technology and the students will have the skills and the technology will be invisible. The technology supports them in another way, it will compliment the other methodologies that are already effective, it's not going to be the end all, it will be another way" (interview).

Because faculty were a key piece in how the implementation occurred and one piece in how students gained their skills, coordination amongst the faculty and programs was important. In the coordination there were two pieces to consider, one was the coordination between the Teach Liberal Arts program and the College of Education and the other was the coordination of technology components across the secondary subject areas within the College of Education.

The preservice teachers at the secondary level pursuing certification in the subject areas of foreign language, history and English must all complete the Teach Liberal Arts sequence of courses before being accepted into the Professional Development Sequence in the College of Education where they complete their requirements for certification. The students were required to purchase their laptops during the 300 course in the TLA sequence. The TLA program supported the use of the laptop as the associate dean was aware of it and supported the initiative, "Our students in 300 are now required to get the laptop, although I don't know if all of them have. We don't check them all, but we take them to laptop training and they have all had one, whether they borrowed one or owned one, they all had one for the trainings" (Ms. Master interview).

The TLA master teachers coordinated among themselves in order to provide the students with some exposure to computer technology during their various courses throughout the TLA sequence, "We have program benchmarks and that includes the technology, it's an integrated system. The Laptop Initiative, I think, has made everyone over here much more aware of what we need to cover and it still would have been a part of the curriculum but maybe not as big of a part (Ms. Master interview).

With the expectation that the preservice teachers are to experience computer technology, the TLA program must have a role in the computer preparation and needs to coordinate with the College of Education for this to happen successfully. Otherwise, students will only have one semester of courses in the university setting taking courses where they would be exposed to technology for their teaching.

Most of the coordination between the TLA and the College of Education in regards to the foreign language group of students and faculty seemed to happen more informally between instructors, "I think there isn't a lot of coordination, how do I put this, I think there is a lot of informal coordination" (Dr. Nueva interview). She credited her communication with Ms. Master to their good relationship but did not receive much direction in planning, "I wouldn't say that anyone gave me guidance on the best way to proceed. I just sort of attacked it as I would any other teaching job and did it by myself. I think there is some coordination between Ms. Master and I because we talk and I know what students are doing in her classes" (Dr. Nueva interview).

Another area of coordination was between the secondary methods faculty within the College of Education. Because faculty were attempting to prepare students and

integrate technology, they needed some kind of guidelines and direction. The two faculty members, Dr. Nueva and Dr. Methods, who were involved with this group of students, had their own experiences in coordinating with the other methods instructors and in planning what to include in their courses.

Dr. Nueva expressed, "I get along really well with the other methods professors but there isn't a lot of coordination. I also think that, we coordinate to present ourselves as a united front, but in terms of coordinating within the subject matter it's hard because the subjects are so different" (interview). There were discussions about what to include in courses but Dr. Nueva felt like there was a definite lack of time available during the course regarding the curriculum they have to cover,

> We have talked about making sure that students are aware of the resources that are out there and getting them to use those resources in the classroom but like I said that some of it is so subject matter specific. The curriculum is so jam packed as it is and we are all trying to look for ways that we can put more in but at the same time not sacrifice what is already there because as I said one of the things that has come out of our discussions is that the Social Studies preparation that they are getting in Liberal Arts is very different from the English and is very different than foreign language. (interview)

Even though Dr. Methods had previous experience working with the computing tools course as a TA, she had a similar perspective to Dr. Nueva when it came to coordination and guidelines, "I think that when I started for the methods class, I wasn't given any

suggestions from higher ups as far as what technology needed to be in the class" (interview). As some of the components, she decided to have her methods students create PowerPoint presentations and they also used TeachNet. For the seminar, "I know that they want to be doing a technology component, it's just unsure what they want for the requirement. Right now, the three coordinators are each doing a tech thing but they are pretty minimal, the link list that we are doing doesn't require a lot of time" (Dr. Methods interview).

Time for integrating the computer into the curriculum was a hurdle for the faculty but time for the students to learn about what to do with the computers was also a barrier. She thought the students would benefit from getting their computers earlier as "I don't think you can do it all in the semesters that we have them over here, especially if you want them to be savvy or competent by the methods course, that's only one semester" (Dr. Methods interview).

As a result of meeting with Dr. Education and the director of the field placement office, the coordinators were able to agree on some general guidelines for the students, the inclusion of a technology component for the student teaching seminar, and they discussed assignments. Each of the coordinators had the freedom to design their technology component appropriate for their subject area. Because of her experience with the computing tools course, Dr. Methods offered suggestions for the seminar. She discussed doing a type of e-portfolio during the seminar with the student teachers but felt they lacked the skills and the time to be able to develop such a product,

The students now based on our discussions about using an e-portfolio, they are interested in doing it but didn't want to take the time to learn how to do it and it's obvious that they don't have the skills to do it or they don't feel like they have the skills to do something like that. It needs to be facilitated through the course because they can't do it on their own, so that is something that I hope we are moving to in the seminar course but we'll see what happens. (Dr. Methods interview)

Factors in the school setting

Varied resources and lack of access

In the classroom, the computer resources available in each classroom and in each school varied from school to school even though all of the placements were made in the same district. While the computer access varied, all of the student teachers had access to CD players, TV/VCRs, and overhead projectors in their classrooms.

Lauren had access to three computer labs in the library, a few computers in the Foreign Language office, 1 teacher computer, and five iMacs in the classroom. She reported that the school had some PCs and some Macs. For Lauren, she found the lack of computers in her classroom was an issue in implementing computer-based activities, "There aren't enough computers in the classroom to be effective for an in class computer assignment. We could switch classes with another Spanish teacher who has 13 computers in his classroom but students would still have to share" (Q3).

Lea had access to one teacher computer in their portable classroom at the school where she did her student teaching. She also had access to some computers in the library but there were no computer labs for her students to use. All of the computers at her school were PC compatible. She found the lack of computer resources at her school to be a limiting factor as to what she was able to implement, "since we have a limited number of computers, it is impossible to have enough time set aside for them to each type their papers and we cannot force them to type their paragraphs because not all the students have computers at home" (Q3).

Xochitl had access to one teacher computer in her portable classroom but the classroom did not have any other computers for student to use. There were also computer labs at the school and all of the computers were PC compatible.

In the classroom, Maribelle had access to one teacher computer and two computers set up at the back of the room. In the school as a whole there were three computer labs and computers in the library. All of the computers were PC compatible.

Connie's classroom had one teacher computer and she had access to four student computers set up in the back of the class. Additionally, there were a number of computers labs in the school, one for each wing and computers in the library. All of the computers in her school were PC compatible.

Marie was placed in the same high school as Connie for her student teaching semester thus had similar resources. Marie had access to a teacher computer and five other computers in the classroom. These extra computers were in the back of the room and were blocked by bookcases preventing any possible student use (personal

observation). Like Connie, Marie had access to computers in the library and in the Foreign Language wing.

In the portable classroom where Mia did her student teaching, she had a teacher computer and two other computers in the classroom. In the school, there was one computer lab and the library was equipped with computers for students to use. All of the computers were PC compatible.

Ms. Master, Dr. Nueva, and Dr. Methods had been exposed to public school teaching situations. The reality of the situation is that some schools have more resources. The overall shared opinion was that students needed to be prepared to utilize these tools if they had them available but also need to be prepared in the event that they had little or no resources. Ms. Master spoke on the variety of access, "It varies greatly, at one high school for example, it's hard just to use an overhead. It seems to be that there is a great difference. It's not the same at all the schools." Access to regular use of computer resources is not always available to the teachers, "It's really a tool and there may not always be the resources and access. It's important that they know how to do something if they have the technology available to them, but they will find different resources in their schools" (interview).

Dr. Nueva had similar experiences when she taught in the public schools related to teaching foreign languages and being able to access the computer labs and resources. In her experience, it was typical for subjects other than Foreign Language to have more computer access and resources, "I can tell you right now that English teachers in the field are going to have more access than Foreign Language teachers do, because Foreign

Language teachers in the public schools are going to be starved out" (interview). Subjects such as English, math and sciences would have better access to labs and computers in the classrooms.

This view formulated by her own experiences teaching and observing pre-service teachers influenced her dialogue with students. She was aware of the realities in today's high schools, "the reality is that the computer labs are booked or English or science or math or even social studies will take precedence over languages the core curriculum is going to get first dibs" (interview). She suggested, "if they want to sign up for a computer lab they have to do it at the beginning of the year and make it part of their teaching, the chances of getting the computer lab when it's convenient for you are nil" (Dr. Nueva interview).

Dr. Methods held a similar view on the realities of the access and use of the computer in the foreign language classroom that ultimately affected the way the preservice teachers used computers in the field. In the student teaching semester, "I don't see it being used a lot, maybe in the future when we have more technology accessible classrooms in general" (interview). With the current resources they typically, "check email, record grades, attendance and have a traditional set up, overhead and blackboard. When you have that kind of set up its difficult. Especially if the kids don't have the chance to access it, it can be cool and novel to see a PowerPoint a few times but it's a teacher-centered lesson" (interview).

Need for additional resources in the field

All of the student teachers expressed if they had regular access to a projector to connect to the laptop, they would have used their laptop more in their student teaching.

Maribelle commented, "If we had access to a projector more regularly, I would have used it for PowerPoint, iMovie, iPhoto slideshows, surf the Internet in class to look up weather or current events in 'real time'" (Q5). Connie would have used a projector to display picture slide shows, videos, or PowerPoint presentations, "I maybe would have used a projector to do slide shows in class. I would have done little videos or more PowerPoints and activities centered around the computer" (Q5). Lea said she was not sure she knew how to work a projector but she had some ideas about how she could have used her laptop, "If I knew how to work a projector I would definitely used the laptop more for things like giving notes and presentations to students with PowerPoint, showing them Internet images, or movie clips" (Q5).

Lauren was not as certain that she would have used a projector with her laptop often but had some ideas about what she could have implemented, "With a projector I might have programmed notes on PowerPoint but I really don't think I would have used it that much. It would be cool to design interactive games like Jeopardy but I have no idea how to do that" (Q5).

Even Mia and Marie, who did not own a laptop, showed interest in being able to project from the computer for classroom activities. Mia thought that a projector would allow her to save time, "If I had a projector for a computer or laptop that would mean less

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printing and making copies. I could show PowerPoint notes and interesting sites on the computer. I could do cultural activities" (Q5). Marie was interested in presentations, "I would have used a projector for giving presentations on culture" (Q5).

At the end of the fall 2004 semester, each cohort coordinator was given a projector to be used by their students. Unfortunately for this group of students, they were almost finished with their student teaching experience and most were making the transition out of teaching consequently none of them had the opportunity to make use of the cohort projector.

Modeling and conversations with mentor teachers

Beyond the university classes, the preservice teachers observed public school classroom teachers. This was another model for these future teachers in how technology could be implemented in a foreign language class. As a whole, most of the students only observed their teachers using the computer to record grades, take attendance, and for email purposes and did not have conversations about technology with their mentors.

Several of the participants' cooperating teachers used the computer during their internship semester of observations and during other observations before their student teaching semester. Specifically, Lauren and Marie observed their internship cooperating teachers incorporate technology lessons with their classes. Lauren's teacher had the Spanish II class find information about San Antonio on the Internet outside of class to use in writing a paper. Previous to her internship, the class she observed did a video assignment, "I saw them do a video assignment like a day in the life of me and they had

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to video themselves doing their daily activities and we all watched it…Also, my mentor had her own website through the school and had all their assignments and homework listed so that if they missed a class they could just look it up" (interview). At the beginning of the study Lauren commented, "I'm not really a technology person, I don't want to shy away from it but I just don't have that many ideas about it" (interview).

Marie also observed her internship cooperating teacher incorporate technology into the French classroom. The teacher provided students with a list of websites for French clothing stores in all price ranges and a currency conversion site. The students choose five Internet sites, made a PowerPoint presentation on what they would purchase, and had a budget of 1000 Euros. In their presentations, they described the clothing items, the fabric, and the price. Marie thought that this was, "a neat way of introducing and exposing students to culture and a variety of other skills" (interview). It was also an engaging activity and was a way to incorporate authentic materials, "They all liked this topic, the authentic, real life experience, and they gained a broader perspective of media in France, the costs and could relate and explore teen fashion in other countries" (interview). The students also incorporated a variety of linguistic skills such as reading, writing, and speaking plus the PowerPoint was a way for the students to be creative.

During the student teaching semester, the students each had a different experience in how their cooperating teachers used technology. They also had different experiences being involved with conversations about computers in the classroom. Connie had little exposure to using the computer during her student teaching, "My cooperating teacher is not computer savvy. I had to show her how to set up the tasks in the grade book.

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Needless to say, she prefers not to use it, but she will use it to write up quizzes but mostly for emailing" (Q3). Xochitl, Lea, and Mia had similar exchanges with their teachers. Xochitl commented, "The only thing we have talked about this semester is the gradebook" (Q3). Lea and her cooperating teacher had limited computer resources in their school and this influenced their conversations, "We discussed having the students type their paragraphs but we cannot force them to because not all the students have computers at home" (Q3). Mia's cooperating teacher showed her about basic classroom tasks, "My cooperating teacher showed me how to take attendance and check school emails that the principal sends to inform the teachers about important meetings and other announcements" (Q3). Mia was frustrated by the lack of computers in her classroom, "I wish there was more access to the computers for the students in the Spanish classroom. There is only one computer that the students can use in our classroom" (Q5). Mia's overall experience in observations and field experience was, "when I have gone out in the classroom I don't think any of the teachers have really used the computer technology. I think it's good to do slide shows or something with iMovie. I haven't really seen it in the classroom setting" (Q5).

Marie spoke frequently with her cooperating teacher about using the computer in her teaching beyond basic daily tasks, "I've had conversations with my mentor teacher about using the computer for both students and teachers" (Q3). She wanted to put together a PowerPoint presentation about regional and specialty foods from France. She also wanted her students to do a project where they would be able to access authentic French sources and create a presentation.

Maribelle designed and implemented a computer-based activity for her students but commented she had not conversed with her cooperating teacher about using the computer labs. Her cooperating teacher thought her computer activity went "fine", but she did not think her cooperating teacher saw much value in the activity. One of the problems for Maribelle in planning computer-based activities was the competition to schedule time in the computer labs. She said in her student teaching school, there were two computer labs but there "is a long sign-up list and some teachers almost camp out in there because they do so much with their classes in the labs making it difficult for other subjects to reserve a time slot" (Q3).

In addition to the resources and the access to computers in the schools, the cooperating teacher and time were factors that influenced what kinds of examples student teachers observed. Ms. Master spoke about these factors, "There are two scenarios, there is the teacher who has been in the field and keeps doing things one way and thinking that there can't be any progress with computers. The other scenario is the time factor. You have teachers who want to do it but they don't have the time" (interview).

Dr. Methods was skeptical of the models provided by some of the teachers and that for beginning teachers using computer technology is not what they are focused on. Students are going to see their mentor teachers use the overhead or blackboard but very few teachers are going to be using laptops or even projectors due to the availability, "The availability is an issue, if you don't have the access, ease of use issues – what is available at the schools, even if you have it to bring in and you aren't used to it then it's weird to bring in" (interview). In their classroom, "they see that an overhead works just fine and

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they get into the groove of seeing that it works fine, but it's not the laptop" (interview).

The access and the models influence what the students will do during their placements, "If you don't have a mentor who uses technology and don't have those kinds of conversations and, for beginning teachers technology is not a priority, it's classroom management and discipline and timing. It's the last thing they are trying to do" (interview).

Personal interest and enthusiasm

Besides the training, modeling, and access, the preservice teachers personal enthusiasm and interest in using computers was a factor in how determined they were to incorporate technology-based lessons. Most of the participants expressed an interest in using the computer in the foreign language classroom.

By the end of the study, Lauren designed and implemented a lesson where the students used the Internet for research and she had an interesting point of view about using the computer in the classroom,

> Knowing how to use the computer does not imply that you know how to teach using the computer. I know how to use the computer to satisfy my basic needs and not necessarily the needs of 30 students. I don't feel like its important to me but I do think teachers should be computer proficient. (Q5)

Overall, Lauren thought the Internet was a great tool and teacher resource. At the beginning of the study, she had some ideas for how she might use the computer which were primarily based on her experiences as an Intern, "I think students should type up

some assignments but after this semester in the school, not every student has a computer at home and there are computers in the library" (Interview). Lauren thought the Internet is a great tool to find out about things and she was interested in learning more about instant messaging and emailing other Spanish classes or classes in a Spanish speaking country.

Lea had a positive attitude about using computers in the classroom and utilizing the Internet to do research, "I like the idea of having computers in the class. I think they are great for research projects, like finding out about different countries. You can get a lot of information from the Internet. It's tough though because of the numbers, like there are four computers and 30 kids, it's tough to figure out what to do with that" (Interview).

Although Maribelle did not take her laptop regularly to her student teaching placement, she had some positive ideas about how she might incorporate the computer into the classroom. She had ideas about creating photo slide shows or short movies from trips to Spanish speaking countries, "the ideas are endless with it, the possibilities are endless with it" (Interview).

Conclusion

During the planning, decision-making, and adoption phases the administration team carefully designed the laptop initiative requirement. There was a clear set of reasons why the laptop requirement was put into place (dissatisfaction with the status quo), the resources in the university setting were available in the form of student and faculty help, access to computers, and infrastructure (availability of resources), the

administration were continually involved in improving the program and working to ensure its success (commitment and leadership), and in the development of the requirement, students and faculty involved in the pilot program were influential in the decision to move ahead with the larger program requirement (participation).

In the trickle-down effect of the implementation, the experiences of the faculty and students seem to be more diluted. The goals and purpose of the requirement were not clear to the students (participation), the faculty did not feel that they had been given enough direction in integrating technology into their courses (participation and leadership), they felt the pressures of having a full curriculum which did not allow them to integrate more technology experiences (availability of time), students did not feel that having the laptop for two or three semesters was enough to develop teaching and integration skills (availability of time), the students felt unprepared by their university courses in the integration and teaching of their subject area utilizing computers (knowledge and skills exist), and the students saw no clear reward or incentive expressed by the students as to why they should purchase the laptop (rewards or incentives exist).

In the public school setting, the lack of access to computers (availability of resources) affected the ways in which the preservice teachers integrated technology into the classroom. During the field experiences, the students lacked modeling by their cooperating teachers in the integration of technology, the student teachers felt unprepared to teach with technology, and lacked the opportunity to practice the integration of technology as a result of these factors (knowledge and skills exist).

This chapter described the experiences of this cohort of pre-service foreign language teachers in their use of computers in their university coursework and in their field placements as student teachers. The chapter highlighted the kinds of models and type of training they received as a result of the implementation of the laptop requirement. The chapter also attempted to show the larger system of the policy including data from the administration and the faculty involved in putting the requirement in place. In using Ely's conditions, this chapter has discussed the eight conditions that are present at some level in the third year of this requirement.

In summary, the pre-service foreign language teachers use of the computer during their student teaching was less affected by the fact that they owned a laptop and more a factor of the technology training they received, how their university professors used the computer, the access they had to computers in the public schools, and how their cooperating teachers used the computer.

Chapter 5
Discussion, Implications, Recommendations, Limitations, and Future Research

This chapter discusses the major findings that emerged from the data analysis, presents the pedagogic implications of the research, suggests recommendations for the program, includes the limitations of the study, and areas of further research.

The eight conditions suggested by Ely can serve as an inventory of the setting after an innovation has been adopted and they can be used as a tool to identify potential problems, but they cannot be used in determining the exact cause of the problems. If any element is missing, the chances for successful implementation will be reduced (1990).

By using the conditions as an inventory, considering the experiences of the foreign language student teachers and their uses of the computer, and by examining their experiences as part of a larger mandate to purchase laptop computers, the discussion of the major findings will focus on the gaps in the conditions in the efforts to understand where the breakdown in implementation of the requirement was occurring during the last part of the second and the beginning of the third year of the laptop requirement.

Communication of the goals

Data from multiple sources used in the study revealed that the administrators who were the ones to create the initiative carefully designed the technical and technological aspects of the program. Dissatisfaction with the status quo led to the development of the program, they procured the desired resources, built in supporting infrastructures, employed qualified technicians and technologists, as well as conducted a pilot study and

received feedback from the students about their satisfaction with the initiative. The biggest omission on the part of the leaders was the failure to communicate the curricular goals and purpose to the students and faculty members involved in the foreign language methods course. Failure to do this resulted in the absence of technologically integrative activities as a part of the methods course. While the overall program goals were available on the LPU website, the more specific curricular goals were not communicated to the participants.

Within the framework of the conditions, communication is a part of participation among all parties involved in the process is essential (Ely, 1999). Understanding the goals and purpose of the laptop requirement is part of the communication. As the end users of the innovation, the students who are required to purchase the laptops need to have a clear idea of why they have to buy a new computer. Everyone affected by the requirement needs to be clear on the goal and the purpose of the requirement. These preservice teachers did not have a clear understanding of the goal. Each student had her own idea but none were certain and little alignment occurred with the stated program goals. Marie and Lauren thought that the purpose of the laptop initiative was to have students buy Apple computers and for the university to make money. Lea, Mia, and Maribelle thought it was to become more familiar with technology and to expose them to more teaching resources while Connie thought of it as an additional tool for teaching.

A lack of agreement was evident between the student, faculty, and administration perceptions of the goals and purpose of the program. Many of the members of the administration viewed the laptop requirement from a teaching and learning perspective.

In striving to achieve invisibility, many hoped the laptops would be seamlessly integrated into the content of the courses where the laptop would become like any other tool, the students would leave the program as technologically savvy teachers, and that by using the laptops during their coursework, the way they were teaching and learning would change.

The students did not comment that having the laptops had changed the way they learned nor had the laptops changed the way they taught. They also did not comment on seamless integration or feeling extremely technologically savvy. While the views held by the administration are commendable and should remain the larger mission of the program, smaller, well-defined goals for the students should be clarified and explained at some point of the process.

Purchasing the laptop

The preservice foreign language students in this study made a decision as to if they were going to purchase the laptop. All students were informed about the requirement of the laptop, but Mia and Marie decided that for personal reasons and platform reasons not to purchase the laptop. It is impossible to have complete implementation if there is a lack of participation by the end user. The findings indicated that the requirement was a top-down decision but it was not perceived as mandatory as the students had the option of purchasing the laptop despite being a requirement. Part of understanding the requirement and purchasing a laptop is feeling there is some kind of incentive or reward for participating in the implementation of the innovation. The condition of rewards or incentives can be a reason for participation (Ely, 1990). Why should these students buy a

laptop? If they are not sure about the goal of the program, why invest in the innovation?

The incentive to participate was not fully explored in the data collection, but the students commented that the discounted price was a "good deal" and some were able to receive a scholarship to assist them in the purchase. Of the students who did purchase the laptop, all of them liked the portability that the laptop provided them. During the student teaching, a small number of students took their laptops more than once to their placements but they liked being mobile. They also liked having the option of being able to travel, take their laptop to the university or to a coffee shop in addition to being able to take it to their school. In order for students to completely "buy-in" to the program they have to purchase the laptop, understand the goal of that purchase, and be motivated to participate by some kind of incentive.

Implementation

This study examined the initiative and found it to be largely successful. It is the responsibility of the college leaders to ensure not only the development and adoption of the program but also to plan for how students will acquire and utilize their computer skills and knowledge in the field of teaching. How students learned about technology and how they used the technology were essential to the overall implementation. Their experiences at the university and in the field contributed to the existence of their knowledge and skills. The foreign language preservice teachers learned about computers and how to integrate computers into their teaching in a variety of ways and in a variety of settings.

Lack of preparation and models at the university

Data indicated that while at the university there were two areas that contributed most to the preparation of the foreign language student teachers, one was in the technology workshops and training they received and the other was from the way they used the technology during their courses. In the university setting, adequate computer resources were available to the students, but it seems that the gap in their knowledge and skills was contributed to limited modeling in their courses, limited integration in their coursework, and that the availability of time was a factor for both the professors and the students.

During the teacher preparation sequence, these preservice teachers were required to purchase the laptop during the TLA300 course giving them the opportunity to use the laptops during that course and subsequently during the advance foreign language methods course and internship, and then in the student teaching semester. During the TLA300 course and the advanced methods course, they were exposed to technology training workshops, to their professors using the computer in class, and had specific assignments requiring the integration or use of computer technology. The findings are consistent with results of Morsund and Bielefeldt (1999). Typically, the technology training that preservice teachers get in the classroom is delivered either as part of other classes or in the form of stand-alone technology classes (Moursund & Bielefeldt, 1999). In this case, they received stand-alone exposure in the form of workshops and as part of other classes but they did not feel adequately prepared to enhance their students' learning in technologically-rich classrooms.

A majority of the students felt the types of courses, workshops, and seminars offered through their education program did not satisfy their need for relevant experiences using technology. Additionally, they did not feel proficient and knowledgeable about technology resources appropriate for their grade level and content area nor did they feel adequately trained to use computers in a classroom situation.

The students reported that they did not feel like the computer was a big part of their coursework and because of the heavy workload they did not have time to "practice with it". As a whole, their classes focused on delivering material via PowerPoint presentations, using TeachNet to post assignments and reflections, and exploring the Internet as a resource. Although Ms. Master reported that technology is a focus from the beginning of the Teach Liberal Arts sequence, the types of technology they used in the classes were basic; email, exploring webquests, evaluating websites, getting information, and recording grades. Ms. Master also mentioned that she had transparencies of everything because "sometimes it's easier than making the effort to use the projector". This indicated both that she was prepared for the absence of the computer technology and that she was more comfortable in using non-computer based materials. In Ms. Master's 300 class, they had a chance to explore the Apple specific applications such as iMovie and iPhoto and had one assignment where they could develop a lesson utilizing technology, some chose to do a PowerPoint while others created iPhoto slideshows. These assignments were minimal and only required a limited use of the computer applications.

In the advanced methods course, Dr. Nueva had the students develop one PowerPoint presentation, they used TeachNet as their primary medium for communication, and she had a computer cart in the classroom which was used during each class meeting. She mentioned that she was not from the tech generation so the first time she had experiences with some of the technology was when she was forced to develop something. Dr. Nueva felt like she was limited by the demands of the curriculum as in the advanced methods course they had a lot of material to cover.

Dr. Methods also expressed limitations as a result of the demands of the curriculum. In the student teaching seminar, they focused on classroom management and discipline and what they were experiencing in the classroom. The direction she received in integrating technology was vague, as she didn't feel she had a lot of guidance from administration on what to include in her courses. She had them use TeachNet to post assignments and they compiled a list of Internet links, which didn't demand a lot of extra time on the part of the students. Dr. Methods had a background in technology as a result of the work she did in the computing tools course and would have been able to integrate more technology, but she felt limited by the lack of skills that the students possessed by the time they were doing their student teaching and by the other material that they needed to cover during the semester.

In the implementation of the laptop requirement, each faculty member was responsible for what they incorporated into their classes. The faculty members coordinated among themselves in order to provide some consistency between the secondary subject areas. As the "project leaders", they are the members who are more

closely related to the day-to-day activities of the innovation being implemented (Ely, 1999) and they ultimately decide how the policy will be implemented. Lipsky (1980) refers to this level of implementers as "street-level bureaucrats". At each point in the policy process, a policy is transformed as individuals interpret and respond to it (Weatherley & Lipsky, 1977 as cited by McLaughlin, 1987). These faculty members were not free of rules and regulations but they do have a certain amount of discretion when it comes to how they design their courses and what they will include in those courses. Ms. Master, Dr. Nueva, and Dr. Methods understood that the goal of the initiative was to allow students the opportunity to see how technology can be used, to prepare students to be technological savvy, and to spread technology across the curriculum. Although they incorporated the use of computers into their classes as best they could given their individual knowledge and expertise combined with the amount of material they had to cover in the curriculum, technological integration did not occur in the methods course. Limited use of technology was observed and it was mostly used as an information presentation tool. The data revealed minimal use of other examples of how the computer can be used, for example how the Internet could be used to enhance learning about culture, or to develop reading or writing activities, or multimedia for oral skill development. How the faculty decided to incorporate technology into each course had some effect on how the students used the technology and how they learned about technology.

Teacher education faculty incentives must be revised to encourage greater use and integration of technology for instruction and they need help integrating technology

into the courses they teach (OTA, 1995). Constraints reported by faculty in the OTA study were time, limited resources, faculty comfort level and attitudes, and little institutional encouragement for technology use. Faculty do not feel they are encouraged by the incentive system to develop curricular innovations, lack of rewards for investing time in developing technology-based instructional materials instead of conducting traditional research activities (OTA, 1995). At LPU, this study demonstrated the faculty had the resources available and they also had support from the Faculty Help Studio. If these faculty members were hired to be the content experts is it reasonable to also expect that they be the technology experts? They did have institutional and administrative support but they lacked the time to integrate more technology, were limited by the demands of the curriculum and the skill level of the students, and were limited by their own lack of knowledge or comfort level in using technology. If faculty are expected to be the technology experts, there will need to be continued availability of time and resources for them so they can expand their expertise in what computer applications, uses, and software are available in the field of foreign language.

The students felt the training they received at the university was not adequate and they needed more training on using technology with relevant and challenging learning experiences for students. At the end of their experience, they felt like they had a basic knowledge of how to use the computer and could use it for what they wanted to accomplish such as lesson planning, creating word documents, spreadsheets, PowerPoint presentations, and searching the Internet for resources and information but they wanted more. Xochitl wanted more time to play with her laptop and thought that the professors

should have assigned more things for them to practice, Lea wanted more training in how to use iMovie and create webpages, and Maribelle thought the training was done effectively just not frequently enough. Marie thought that the workshops they attended were too fast, were not contextualized for their subject area, and were taught by someone who couldn't connect with them at their level. Time was also cited as a factor related to their training at the university. Maribelle explicitly said that she knows how to use a computer but being about to "teach with a computer is not going to develop over two semesters". The participants felt like there wasn't enough time provided to them in their classes to practice and play with their laptops and there was a lack of in-depth, contextualized technology based learning and teaching experiences.

The research on university based technology training suggests that students who have more training and prolonged exposure to using technology will have positive attitudes toward technology and perceive it as important (Francis-Pelton & Pelton, 1996; Gunter, 2001). The research also confirms previous studies in the importance in having opportunities to practice will increase preservice teachers' confidence and comfort level in using computers (Milbrath & Kinzie, 2000). An integrated curriculum takes dedication, time, and support from all parties in an institution (Beyerback et al., 2001). This approach seems to be most effective in training students to become effective and prepared teachers as there can be alignment with other courses and an expectation for use by both professors and in the field (Cunningham, 2003; Cunningham & Redmond, 2002).

Lack of computer use in student teaching placements

During the student teaching semester, students were limited in their computer use by the lack of computer resources in the schools and by their cooperating teachers. While the student teachers were placed with experienced foreign language teachers, these teachers did not necessarily serve as models for integrating technology into their teaching.

Teachers generally used the technologies that fit familiar routines and classroom procedures, and teachers have regularly used technologies to enhance their regular instruction but rarely to transform their teaching (Tyack & Cuban, 1995). All of the student teachers used the computer on a daily basis for administrative non-instructional tasks such as checking attendance, recording grades, and possibly checking email, which was how their cooperating teachers generally used the computer.

The computer resources varied greatly from school to school; most of the schools had computer labs or computers in the library that they could have utilized, but Lea only had access to the one teacher computer in her classroom, as there were no other labs for her to take advantage of. In their classrooms they did not have adequate computer resources in the form of individual computers for their students to utilize during class time. Additionally, all of the students reported that they did not have regular conversations with their cooperating teachers about technology and that most of the computers in their schools were PC compatible rather than Apple computers like their laptops. As a whole, their cooperating teachers did not integrate computers into their teaching.

The findings confirm results from previous studies as most students training to become teachers do not routinely use technology while in the field and do not work under supervising teachers who can advise them on using technology in the classroom (Moursund & Bielefeldt, 1999). In order for students to have a hands-on opportunity to connect the technology with the pedagogy, placing student teachers with technology-using teachers in technology-rich environments can provide valuable apprenticeships and can extend the quality and quantity of hands-on technology experiences (OTA, 1995). While this may be true, there are some limitations in trying to find cooperating teachers for these foreign language preservice teachers who meet the criteria of being both a good foreign language teacher as well as someone who integrates technology. If the resources in the schools vary so greatly, it is difficult to expect that all teachers will have access to the technology and if they do, that they know how to integrate it into their teaching.

Why are the cooperating teachers limited in their use of technology? According to Lam (2000), some of the reasons foreign and second language teachers do not use technology are due to a lack of knowledge about teaching a second language with computers, lack of access to computers, and lack of confidence in computer skills. Simply providing teachers with the equipment is not enough, it is necessary to convince them of the benefits of using it in the classroom, training can not be limited to the 'how-to' of technology rather as to how it can be effectively integrated into the curriculum. Many articles on practicing teachers and their efforts to implement technology find that teachers are constrained by the lack of time, expertise, access, resources, and support (Leggett & Persichitte, 1998), by internal barriers such as their attitude or perceptions of

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using technology in the classroom (Rogers, 1990), or that computers are viewed as extras rather than as tools to enhance their instructional practice (Strudler, McKinney, Jones & Quinn, 1999). If the cooperating teachers are not confident in using technology or lack the skills, do not have the time or access, and have a negative view on the use of computers, they will not be able to serve as good models for the student teachers in the integration of technology. There was no data collected from the cooperating teachers, however, the findings from previous research can serve as a possible explanation as to why the cooperating teachers did not use more computer-based activities in their classrooms.

Beginning teachers are more concerned with learning how to be teachers. Watzke (2003) conducted a longitudinal study of first and second year beginning language teachers and the areas of concern in their teaching. Their concerns during the first two years of teaching were centered around instructional techniques, elements central to daily instruction such as culture, developing speaking skills, vocabulary, balancing communication and grammar, promoting student confidence, promoting student performance in the language, and providing motivation for students. Some of the obstacles they encountered were with classroom management, time constraints, and students' prior grammatical knowledge. Nowhere in this study did he report that these beginning language teachers were concerned with integrating technology, they were mainly focused on instruction and delivery of material.

Despite being placed with cooperating teachers who did not use the computer for tasks other than recording grades and attendance, some of the student teachers were able

to experiment with technology activities utilizing the resources that they did have available and most used the computer outside of class in order to prepare for their lessons or do research for their classes. Lauren developed a music video activity where students researched song lyrics and singers on the Internet, Maribelle's students researched differences in time and schedules using the Internet, Marie's French students researched characters from works of literature and typical foods using the Internet, Connie's students researched holidays and food using the Internet, and Xochitl borrowed a projector from another teacher to present grammar via PowerPoint presentations with her laptop.

The laptop had little effect on what they did in their classrooms. Very few students anticipated taking their laptops to their student teaching classrooms and by the end of the semester, many of them had not taken their laptops to their schools. Lauren took her laptop once so that she could play some music from iTunes only because she could not burn a CD in time. Maribelle took her laptop at the end of the semester when she was transitioning out of teaching so she could use it for personal reasons. Xochitl took her laptop several times to school, as she was able to borrow a projector from another teacher to show PowerPoint presentations about grammar and have students take notes. Neither Connie nor Lea took their laptops to their student teaching placements but did use them outside of the classroom. Marie and Mia did not purchase laptops therefore did not take them to school and they were able to use a computer either at home or in school to support the daily administrative tasks required of them, to prepare lessons, and do research.

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For most of these students this was the first time they had done any type of computer-based activity with students in an authentic context. All of them were able to reflect on their experiences and were able to project how they could improve these lessons or create better lessons in the future. In their placements, they had the flexibility to take some initiative in creating these types of activities and even if their cooperating teachers could not give them the guidance they wanted, they were at least allowed the opportunity, which was important.

This study confirms the idea that teachers will teach as they have been taught, Lortie's "apprenticeship of observation" (1975) where beginning teachers learn from previous experiences is applicable to how these students develop some of their own skills as teachers. The types of activities they see in their university classes and in their field experiences have influenced what they do in the classroom. Their professors primarily used PowerPoint and the Internet and that was what the students felt comfortable using in the classroom. In their student teaching, their cooperating teachers used the computer to record grades and take attendance, and that was what they learned how to do as a result of working with these teachers. These students did have a number of other ideas about what could be possible in the foreign language classroom utilizing computers and they thought there is some value to using the computer for teaching and learning foreign languages. Once they have their own classrooms, they will have more freedom to experiment and implement their ideas into their teaching.

Importance of student teaching experience

The student teaching experience is important in the opportunity to transfer skills from the theoretical to the practical.   Darling-Hammond (2000) argues that teachers who have had more preparation for teaching are more confident and successful with students. People who have never studied teaching or learning often have a difficult time understanding how to convey material, thus preservice teachers benefit from the preparation program and the work they do in the field. Burstein, et al. (1999) also report that teacher candidates consistently think that their experiences in the schools are the most helpful in learning to teach.   Bond and Garza (2005) concluded that colleges of education do provide beginning language teachers with useful knowledge and skills and the combination of allowing preservice teachers to connect the theory and the practice in the field is essential to preparing teachers to be effective.

Although influenced by previous learning experiences, through the process of reflection that was practiced throughout their teaching preparation sequence, they were able to critically think about what they were observing and learn from the good and the bad examples they came across in the field. Through their reflections, they thought about their teaching, lesson planning, and lesson delivery in addition to what kinds of things their cooperating teachers did in the classroom. Many students agreed that they would not only take away the good examples of what their teachers did in their teaching but they also learned about what they would not do in their teaching.

A reflective approach is highlighted in recent research. In language teacher education Vélez-Rendon (2002), suggests that for a reflective model to be effective,

teacher candidates need opportunities to acquire both the relevant theory of the profession in order to make the connection between the theory and practice. The creation of meaningful and effective field experiences requires that teacher candidates integrate theory and practice, acquire first-hand knowledge about schools, and they need to start developing classroom management skills. As learning in student teaching can be seen as a form of experiential learning, Korthagen (2001) also promotes a reflective process for future teachers as a way to like practice and theory. Through a process of reflection that is linked to the experiences students are able to build on their perceptions, thinking, and feeling about concrete teaching situations.

Recommendations for the Laptop Initiative and Foreign Language Teacher Education

This study was focused on one cohort of foreign language preservice teachers in their experiences using and learning about the computer. In addition to finding out about their individual experiences, this study attempted to look more closely at the laptop requirement as a whole system of policy implementation, the effects on the faculty members and the students as a result of the mandate to purchase a laptop computer. One cannot assume that all the cohorts of secondary preservice teachers or all of the secondary coordinators had similar experiences. Nor can generalizations be made about the students in the elementary teacher preparation sequence and how they were affected by the laptop requirement. I have tried to depict this group of foreign language teacher candidates in the efforts to understand where we can improve in the implementation of this innovation. Based on the information gleaned from talking with the administration

and staff who were involved in the development, initial implementation, and continued implementation of the requirement, the faculty who worked directly with this cohort of foreign language preservice teachers, and the preservice teachers themselves, I can make some recommendations for improving the way the implementation trickles down from the "top" to the "bottom" in hopes of improving, strengthening, and continuing the program.

The first recommendation has to do with the administrators and the laptop program as a whole. The administration demonstrated a lack of consideration for the specific content areas and the technology needs of those subjects. When mandating a requirement such as this in any setting, before adoption and implementation, curricular considerations need to be made as to the subject area, the level of study, and how the use of technology is appropriate. Some types of technology may be more appropriate for some subject areas and may be less appropriate for others. A majority of the foreign language preservice teachers thought while computers could have a place in the high school or middle school foreign language classroom, they did not use their laptops in the student teaching semester and they agreed the laptop did not need to be a requirement for them. They agreed that there was a need to be computer literate, but did not understand the purpose of purchasing a laptop as they did not use them in the field for teaching foreign languages. Purchasing the laptop did not seem to have an effect on use in the field.

The second recommendation is that students should begin building the computer skills earlier in the program. Data showed minimal skill building at the beginning of the

teacher preparation sequence, primarily focused on email, Internet use, and presentation applications. Students expressed that they needed more time in learning about how to use the applications combined with hands-on experiences. This could be accomplished by integrating specific applications earlier in the program, even before the purchase the laptop, so when they do purchase the laptop, they already have some of the skills and knowledge in place. The addition of the RTF course may give future groups of students more of the stand-alone type technology training this group wanted as they thought the workshops were not conducted effectively. For this type of course to be successful, communication with the methods professors should occur in order to provide opportunities for hands-on experiences related to the content. Additionally, training needs to be related not only to how they can use it as teachers but in designing student-centered activities.

Several changes in the program have been made since this study; the secondary cohorts now each have access to a projector for the students to share and take out into the field, the TLA sequence includes a Radio Television Film course (RTF) which is now a requirement or can be substituted for another technology course and a section has been added that will be designated for students going into education, the TA facilitators are now required to loan or purchase a laptop, and students have free access to web tutorials such as Atomic Learning. An applications help desk was added to the student help desk where students can go for more assistance with specific applications in addition to general troubleshooting. These changes demonstrate a continued commitment on the part of the administration to the improvement of the program and could have some effect on

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how future cohorts of students are able acquire technology skills and knowledge and in how they use their laptops.

The next recommendation, on a language teacher preparation level, is that the students need more exposure and practice in teaching languages with computer targeting all the skill areas of listening, reading, writing, speaking, and culture. Future foreign language teachers need more emphasis on pedagogy of teaching languages with technology and exposure to ideas beyond grammar and cultural presentations. They not only need to see what the possibilities are but also have the opportunity to practice. There needs to be more collaboration between the advanced methods instructor and the TLA300 instructor in the mapping of technology components and overall curriculum. The individual who teaches the advanced methods course and serves as the coordinator for the secondary group of foreign language preservice teacher should have some experience in technology applications for the foreign language classroom. Dr. Methods and Dr. Nueva each worked in the position one-year at the lecturer level, before securing tenure track positions at other institutions. During the one-year, each had the challenge of teaching two courses (new to them), coordinating the school placements for two groups of students, and managing the student teaching seminar. These responsibilities did not allow the time in that year to concentrate on developing their courses and technology. Considerations need to be made to create more continuity in the program by making their position tenure-track in order to allow for the time and support necessary in integrating more technology into the foreign language teacher preparation sequence of courses. More collaboration is needed between the language departments and the

College of Education, as this is another model for students of how to integrate technology into the teaching of languages.

The next recommendation is for the field placements. Being able to place all students in technology-rich environments would be ideal but may not be realistic as all schools do not have equal resources and not all cooperating teachers use computers. Students should at least be placed with cooperating teachers who give them the flexibility to incorporate their own ideas and lessons during the student teaching. If the computer resources were available, student teachers would be able to take advantage of those materials. Student teachers also need more resources in the field and need more availability to computers in their classrooms. A related recommendation is that recent graduates and cooperating teachers should be provided with on-going professional development opportunities, such as summer workshops, so they can continue to collaborate specifically with other teachers in the efforts to create technology based lessons and exchange ideas. Overall, greater dialogue and collaboration is needed between the university and the school districts.

The final recommendation is for qualitative research. During the second semester of the study, I collected data from the student participants primarily through open-ended written questionnaires administered via e-mail. During that time of the study, because the participants were spending a majority of their time in the schools as student teachers and also had responsibilities as students to complete assignments, I anticipated they would have more flexibility in answering my questions through the e-mail format. I obtained usable data via these questionnaires, the format did allow me to send out

questions quickly and efficiently, and the students were able to answer when convenient, but I could have secured more in-depth data with the addition of several follow-up face-to-face individual or group interviews during the semester. Some of the participants provided more data than others when answering the questions and overall the data that I collected from them during individual and focus group interviews was more in-depth and descriptive. Having this experience, in the future, I will think more carefully about the technique appropriate for the type of data I would like to collect.

Use of Ely's framework

In utilizing Ely's framework of the conditions that are essential for the implementation of innovations, I found that it was helpful in determining and explaining how the implementation of the laptop initiative occurred at LPU. It was especially beneficial in describing the overall system involved in the study of the policy. It was also adequate in describing the perspectives of the administration and faculty and the experiences of the students. All findings were accounted for in the model but in describing such a complicated system, there were also some drawbacks in using the model.

Ely (1999) himself discussed some of the limitations of his model such as, "the definitions of the terms used to describe each condition are problematic, further descriptions of each term should be developed, with examples, to reduce the ambiguity" (p.26). Other limitations presented by Ely (1999) are related to the lack of a hierarchy of the conditions and the relative strength and importance of each condition when

considered together have not been determined. Strength and importance emerge as functions of the context and the innovation. An additional limitation of using Ely's condition is the overlap and interrelationship among the conditions, making it difficult to separate them. He argues the possible shortcomings should not reduce the utility of the conditions,

> While it is difficult to generalize about the existence of these conditions, it is clear that they differ in magnitude according to the innovation being studied and the environment in which it is used. They do offer useful indicators and serve as guidelines as we amble down the ambiguous artery that leads to implementation and change. The conditions are offered here as one more step toward understanding this thing we call implementation in the process of planned change. (1999, p. 26)

Ely (1990) cautions that the conditions can be used as a screening tool to identify potential problems, but cannot be used to determine the exact cause of the problem especially since the utility will be determined by the setting and context of the innovation being studied.

Pedagogic Implications - Technology meets pedagogy

The findings from this study suggest that these students knew how to use a computer but were lacking in connecting their knowledge with the teaching of foreign languages. Having the access to computer resources or owning a laptop will not equal knowing how to integrate the technology, simply having access to computers and learning to use them as tools is only part of the story of the educational use of computers.

The various uses of the computer will still require the integration and sense-making that a good teacher can provide (Tyack & Cuban, 1995).

In order to allow these students to develop their skills in choosing appropriate applications that match with their objectives in the foreign language classroom, they need more opportunity to practice, they need to be exposed to more language teaching examples beyond using the Internet, and they need more models of technology integration. Students are seldom asked to create lessons using technology or practice teaching with technology and models must be developed with technology supporting specific content areas (OTA, 1995). The OTA study finds that overall teacher education programs in the U.S. do not prepare graduates to use technology as a teaching tool. Telling students about what is possible is not enough, they must see technology used by their instructors, observe uses of technological tools in classrooms, and practice teaching with technologies themselves if they are to use these tools effectively in their own teaching (1995). In order for students to develop their use of the technological tools, a fully integrated curriculum in necessary where they are able to have models both in the university setting and during field experiences, an integrated curriculum infused with information technology required that teacher education faculty and cooperating K-12 teachers model effective technology use (OTA, 1995).

If PowerPoint and the Internet are going to be the main uses in the classroom students need to be educated on effective instructional design to maximize these applications for student learning. Future foreign language teachers need to have the ability, training, and practice in designing meaningful lessons and activities, with or

without technology. If they are going to use computers, they should be equally educated in instructional design and pedagogy so that they can recognize well-grounded pedagogy when they see it, hear it, and read it on the screen (Blake, 2001). No single formula for the use of technology to teach languages exists but if a language teacher wants to take advantage of technology when its application is consistent with best teaching practices and second language acquisition theory, they need to be able to evaluate when it makes good sense to use the technology (Blake, 2001).

Institutions should not lose sight of what is important in the purpose of a teacher preparation program, preparing teachers to teach. Preservice teachers must have solid content knowledge in their subject area and must be able to teach that subject area. If learning how to integrate technology is going to be a piece of this process, then they should have the opportunity to learn about how to use the appropriate applications, be able to practice using those technologies, and reflect and relate these applications to the teaching of their subject area. Learning how to use an application, such as PowerPoint, is not going to be enough, they must be able to develop their skills within a context of use and be able to experiment in an authentic setting in order to see how it works.

In order to connect the technology with the pedagogy, learning needs to take place in a contextualized, situated learning environment. Lave & Wenger (1991) call this type of learning experience "legitimate peripheral participation" where learning takes place via apprenticeships and within a community where there is a reciprocal relation between persons and practice. Within the current program, the student teaching sequence provides the students with an apprenticeship where they work with a master in developing their

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skills as teachers. Active and legitimate participation is achieved by the student through the process of observation and practice, as they gradually become part of the classroom community. The students are able to work with others throughout their program both in their university classes and in the field as they construct their knowledge and demonstrate their competency as teachers. Warschauer (2002) says for language teachers and educational technology, they need to be able to distinguish when the technology is appropriate, "whatever the technology is, let's involve learners in active use, constructive use, and mastery of the technology for producing content rather than just passively receiving it" (p. 5).

In the teacher preparation sequence at LPU, a community is formed within the cohort of students throughout their preparation, there is a university community, and there is a community formed when they spend a semester working with a cooperating teacher in an apprenticeship environment. Educators have an opportunity to extend the relationship between practice and theory not only related to good teaching but also in the area of technology.

Societal conditions continue to affect teacher education programs and have a direct impact on the way teachers are prepared, "teachers are being required to learn new skills to prepare students to meet the demands of a technological society. Teachers who viewed their role as instilling in their students a love of learning are now being required to place greater emphasis on technical competence" (Hallinan & Khmelkov, 2001, p. 177). If technology is going to be included as something future teachers need to know so they will "be prepared to enhance their students' learning in technologically-rich

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classrooms", the program should take advantage of the social constructivist framework that is already in place. Faculty and students can learn about technology together and from each other as they both expand their expertise in the area. The preservice teachers need a contextualized experience in the integration of computers if these future foreign language teachers are going to feel comfortable and secure in their knowledge and skills in integrating technologies, when and if they are available, in their lessons to achieve their language teaching and learning objectives.

"Trade-offs" of technology in foreign language classrooms

Are computers well suited in enhancing foreign language instruction? Are there limitations in using computers in the foreign language classroom? Technologies other than computers, such as CDs, videos, and DVDs for listening and speaking practice, and showing movies or culture related topics, are consistently used by high school and middle school foreign language teachers because they are easy to use, easily accessible, and can provide whole class instruction. Studies show the positive impact computer-based technology such as the Internet, CD-ROMs, online chats, and multimedia can have with student motivation, enjoyment, and increased cultural knowledge and communication at the college level (Blake, 1997; Blyth, 1999; Lee, 1998; Osuna & Meskill, 1998; Osuna, 2000; Singal, 1997; Spodark, 2001). Can these same types of activities be integrated into the public school language classroom where there are limited time and resources? Is that the trade-off of computer technology in foreign language classrooms? Are we sacrificing

the preparation of quality language teachers at the expense of making sure they know how to use computers?

Heeding the advice of Warschauer (2002) could be valuable in determining the place for computers in the foreign language classroom, "we have to do what is appropriate in our own circumstances. It might be the case in your circumstances that it's not appropriate to use computers or the Internet at all" (p. 5). He continues, "whatever the technology is, let the learners create with it…whatever the technology is, let's involve learners in active, constructive use, and mastery of the technology for producing content rather than just passively receiving it" (p. 5).

Limitations of the study

The limitations are related to the issue of generalizability in qualitative research and in how the reporting of the data may have been influenced by the personal relationships of the researcher with informants.

Generalizability in qualitative research

The findings of a study are generalizable to the extent that they can be applied to individuals or situations other than those in which the findings were obtained (Gall, Borg & Gall, 1996). The issue of generalizability versus transferability has plagued qualitative researchers for some time (Merriam, 2001). Because what is being studied in education is assumed to be in flux, multifaceted, and highly contextual, achieving reliability in the traditional sense is impossible (Merriam, 2001). Replication of a qualitative study will

not yield the same results, however, this does not discredit the results of the original study. In qualitative research, a single case or particular sample is chosen because the researcher wishes to understand the particular case in depth, not to find out about what is generally true of the many (Merriam, 2001).

Because qualitative research focuses on the experiences of one particular group, the researcher is not as concerned with generalizability to a larger group, rather, transferability across contexts may occur because of shared characteristics (Erlandson, et al, 1993) and the results may be transferable to a similar setting with a similar population. Reader or user generalizability involves leaving the extent to which a study's findings apply to other situations up to the people in those situations. Case-to-case transfer may be achieved by the reader where the applicability of one case to another is determined by the practitioner (Merriam, 2001).

This study conducted in a different university or with a different group of preservice teachers may achieve different results. This institution and program are unique because the laptop has been mandated at a public university as a program specific requirement. Other institutions have different sets of characteristics and may not implement the program in the same way, thus possibly resulting in different findings and patterns.

If this study was conducted with a different group of foreign language preservice teachers or with a group of other secondary preservice teachers in other subject areas, either at LPU or in another institution, the results may or may not be similar. At LPU, each group of preservice teachers has different characteristics, personalities, and

backgrounds that innately influence their experiences. Other factors affecting the results are the faculty working with the preservice teachers may or may not improve in the way they integrate computer technology into their courses, some student teachers may be placed with more technologically savvy mentor teachers in schools where they have a wide variety of resources and access, and each student may be exposed to other ideas from other courses they take. In other subject areas and settings, there may be more resources available to them, and they may work with faculty who have more ideas about teaching their subject area utilizing computers in addition to all of the factors mentioned above. There are number of conditions that can change from student to student and from year to year that could result in different findings if this study were replicated in the future.

Personal relationships

An additional limitation of this study was in the way I analyzed the data from the faculty and administration. Denzin and Lincoln (1998) discuss the problem in framing qualitative data,

> Besides the problem of framing real-life events in a two-dimensional space, we face the added problems of how the framing is being done and who is doing the framing. In sociological terms this means that the type of interviewing selected, the techniques used, the ways of recording information, all come to bear on the results of the study. Additionally, data must be interpreted and the researcher has

a great deal of influence on what part of the data will be reported and how it will

be reported. (p. 66)

Qualitative research by nature will have some bias as the main data collection instrument

is human and therefore bias cannot be eradicated completely.

As the researcher, my role as TA and facilitator allowed me the opportunity to

collect data from a particular group of students and afforded me with the access I needed

into their classrooms. My role also put me in a delicate position as I was working with

Dr. Nueva and Dr. Methods as their TA. Yin (2003) discussed one of the problems

related to being a participant-observer is the potential bias that it can create. Glesne

(1999) presented three different ways in which friendships can bias the data, bias can

result from a somewhat unconscious subjective selection process, sometimes researchers

are denied access to data sources because of their friendships, and participants can

overidentify with the researcher. Rather than forming friendships as a result of data

collection, I knew several of the informants personally and worked with them in various

capacities before beginning this study. My relationships with Dr. Nueva and Dr.

Methods were unique as we had been students together in the same program, and during

the data collection, I worked as their TA. I do not believe that these relationships

affected the kind of data I collected from them, but initially I was less critical in the way I

analyzed the data.

Because I worked directly under Dr. Nueva and Dr. Methods, they served as

reference for me in my job search, I worked with them closely as their TA, and I did not

want depict them in a negative way. They were qualified to teach the methods course

and supervise the student teachers, but were limited in the way they integrated technology with the content of foreign languages. If they had more direction from the administration about the kinds of technology components to include, they may have been more successful in the application of teaching foreign languages with technology.

As a TA and a student within the college and department run by the administrative informants, I was concerned with reporting the data too critically. At the time, I was trying to avoid being too critical or evaluative of the program or the people with whom I worked. While finishing this study, I was applying for jobs and as a potential candidate to replace Dr. Methods, I was concerned with the possible ramifications of being too critical of the administration and the initiative.

Future Research

Policy implementation takes time and is complex in the way it involves many levels of stakeholders and participants. As this study was conducted during the beginning of the third year of the requirement, similar studies should be done in subsequent years of implementation to be able to gauge improvements and identify deficiencies in the program. Longitudinal studies should also be conducted with students as they enter the teaching profession. As Dr. Curry suggested, "the proof of the pudding" is really in how they will be using the computer and possibly their laptops in their own classrooms. Studies should be undertaken with graduates of the program during their first years of teaching and throughout their teaching careers in order to observe what place computers or laptops have in their classrooms.

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In the area of foreign language teacher preparation, there should be research done in the area of specific technologies for the teaching and learning of specific language skills and should consider teachers' pedagogical objective for technology-based instruction. How do they choose what to incorporate and why? What can a foreign language teacher do with a computer that they can't do without a computer? Is the full worth and potential of the laptop or the computer being realized? Are we buying into technology for the sake of technology? What is the place of technology in the foreign language classroom?

This study shows the importance of the entire system in policy implementation and how each member of the system affects the way in which implementation is ultimately successful. Everyone needs to take responsibility for their own role in the process, the administration, faculty, and students each have a certain role and need to take accountability for themselves. For the laptop program to have its desired affect, careful consideration needs to be made during each step of implementation to achieve meaningful results, "Meaningful change is not going to be possible until people at all points come to understand the whole system and begin to trust members at other points. Those at each spot along the continuum need to focus on doing their own jobs well" (Hall & Hord, 2001, p. 12). In addition to taking individual responsibility, in order for the system to function, all members involved need to work together for implementation to successfully continue.

Appendix A

Information about you

1. Name:

2. Age:

3. Native language:

4. Number of years living in Austin:

5. Do you use a computer at home?

If yes:
What kind of computer do you use at home?

Do you have Internet access at home?

What kind? (dial-up, cable modem, etc)

6. Did you buy a laptop computer under the College of Education requirement?

If yes:
When did you buy your laptop?

Would you have bought the laptop if it were optional?

Appendix B

Semi-Structured Interview Guide for Student
Background Interview

Tell me about yourself, how did you decide to study at UT?

Why and how did you decide to study languages?

Have you done any study abroad?

How did you decide to do the Teach Liberal Arts program?

When did you enter the TLA sequence?

Tell me about your field experiences so far.

How did you find out about the laptop requirement?

When did you buy your laptop?

How has it been incorporated into your courses?

What do you think about using the computer in the foreign language classroom?

Appendix C

Semi-Structured Interview Guide for Focus Group Interview
Student Group

First I have some questions and then I want to get some of your reactions to some statements.

I was looking over the syllabi from your 100, 200, 300, and methods classes as they relate to computer technology. In 100 it was email, attach documents and do web activities.

In 200, it was adding word processing and web searches, was there the addition of these things?

In 300, there was the addition of looking at subject specific software and creating web pages? Were these incorporated into that course?

Then in methods, there was using TeachNet and the tutorial, PowerPoint, and creating lessons with the Internet. Were any of these new to you?

How do you see using some of the applications in the classroom?

Is the laptop your main computer?

What are the top three uses or top three things that you do with your computer right now?

What changes would you like to see in the laptop requirement?

What kind of training have you received?

How have your professors in your language classes used computers?

Statements:
Knowing how to use a computer equals or does not equal knowing how to teach using a computer?

My preservice experience has or has not provided adequate training for me to take advantage of using computer in a classroom situation.

Right now I need more training on using technology with challenging learning experiences for students in my subject area rather than how to use computers.

I am knowledgeable about the technology resources appropriate for my grade level.

Appendix D

Questionnaire 1, Fall 2004
August 23, 2004

Please take some time to think about and answer the following questions. Please return the completed questionnaire by next week, either via email or as a hard copy. Feel free to adjust the answer areas if you need more room. Thanks!!

IN YOUR STUDENT TEACHING CLASSROOM/SCHOOL
What kinds of computer resources are available to you at your student teaching placement? (i.e. in your individual classroom, in the entire school, computer labs, etc)

Does your mentor teacher have a computer in her/his classroom?
If so, is it connected to the Internet?

What kinds of things does she/he/you do with the computer on a daily basis at school?

Are there computers for students to use in your classroom?

If so, how many?

If so, are they connected to the Internet?

If applicable, have you taken your laptop to your placement?

Do you plan on taking your laptop to your placement this semester?

If you think you will take your laptop to your placement, what kinds of things do you think you will use it for?

AWAY FROM THE CLASSROOM
Outside of your placement, what kind of computer do you use the most?
Is it connected to the Internet? What kind of connection?
What are the top 5 things that you use your computer for?
If you own a laptop:
What are some of the advantages to owning the laptop?

What are some of the disadvantages?

If you did not purchase the laptop:
Do you feel like you are as technologically prepared as those students who did purchase the laptop?

Appendix E

Questionnaire 2
Please respond to the following statements using the following scale: 0 = not true of me now, 3 = somewhat true of me now, 5 = very true of me now. Please elaborate and expand in short answer format on any of the statements.

Skills, training and preparation   **Scale 0 = not true of me now**
3 = somewhat true of me now
5 = very true of me now

1. I am proficient in the use of computer   0 1 2 3 4 5
technology for instruction.

2. I am competent in using computer technology   0 1 2 3 4 5
learning tools in my instruction.

3.I am prepared to enhance my students' learning   0 1 2 3 4 5
in a technologically rich classroom.

4. My pre-service experience has provided   0 1 2 3 4 5
adequate training for me to take advantage of
using computers in a classroom situation.

5. I know how to design student-centered,   0 1 2 3 4 5
instructional materials
that take advantage of computers
to engage students in their own learning.

6. I am competent in the use of the computer.   0 1 2 3 4 5

7. I am competent in the use of the computer   0 1 2 3 4 5
to teach my subject area.

8. I need more training in how to utilize   0 1 2 3 4 5
the computer to teach my subject area.

What specifically do you need more training in? (if any)

What extra resources would you find useful to you?

Appendix F

Questionnaire 3
October 4, 2004

How have you used the computer for your student teaching thus far? Be specific

How have you had your students use the computer thus far? Be specific

Have you taken your laptop to your student teaching placement? How many times? What have you done with it?

In the school where you are doing your student teaching…
Are there computer labs?
If so, how many?
Where they are?
Have you seen them?

Have you had conversations with your cooperating teacher about using computers? If so, what have the conversations been about?

What kinds of computers are most prevalent for use? (PC or Mac?)

Appendix G

Questionnaire 4
In the last few weeks, have you had your students use the computer for anything? If so, what have they done? Was it during class time or outside of class?

APPLICATIONS
What have you used the following applications for this semester either personally or for student teaching? Please be specific.

Word

Excel

PowerPoint

IPhoto

ITunes

IMovie

Garage Band

IDvd

Internet

RESOURCES
What College of Education technology resources have you used? For what purpose? Did you find these resources to be helpful?

Help Desk
LTC to check out equipment
New Applications help desk
Other

As a first-year teacher, will you try to incorporate computers into your teaching? How?

What are your overall opinions about having to purchase a laptop?

Appendix H

Questionnaire 5
November 9, 2004

1. In the last few weeks, have you used the computer for your teaching? If so, what kinds of things have you done?

   What was the student response?

2. Knowing how to use the computer is the same as knowing how to use the computer to teach. Do you agree with this statement? Why or why not?

3. Thinking specifically about your technology preparation, what have been the strengths of in your preparation?

   What could be improved?

4. Thinking generally about your preparation to be a language teacher, what have been the strengths in your preparation sequence?

   What could be improved?

5. Is it important to you to know how to use the computer in your teaching?

6. What do you think the need was for adopting this laptop program?

7. What do you think is the goal of the laptop initiative?

8. Most of you answered that you feel like you need more training on how to teach your subject area using technology. How could this have been done more effectively?

9. If you had regular access to a projector for your laptop would you have used your laptop more often in your student teaching?

What kinds of things do you think you would have done?

What are your plans for next semester?
Will you have a different email address? If so, what is it?

Appendix I

Semi-Structured Interview Guide for Interview
Administration

How did the laptop requirement get started?

When was the requirement put into place?

What is your role within the laptop requirement?

What other models of laptop programs were looked at?

What do you see as the goal of the laptop program?

What do you hope students will leave the program with?

Who makes the curriculum decisions for faculty?

How do you see the laptop requirement developing over the next few years?

What kind of evaluation has been done on the program?

What kind of planning was/is being done with the local school districts?

Who else should I speak with?

Appendix J

Semi-Structured Interview Guide for Focus Group Interview
Administration

What are your personal opinions about the laptop requirement?

What role did the Dean have in the development and decision making process?

I understand that a lengthy pilot program was undertaken prior to the decision to adopt at a program wide level, could you elaborate on the input of the faculty and the students who were involved in the pilot?

How will the success of the program be measured? How will you know that it has been successful?

At the secondary level, have there been efforts to coordinate with the content specific departments?

It seems that the requirement was a top-down decision, is that an accurate statement?

Appendix K

Semi-Structured Interview Guide
Faculty

Describe your position and your role within the teacher preparation sequence.

Did you know about the laptop requirement when you started here?

How was the laptop program presented to you?

What kind of guidance was given to you about what kind of technology you should include in your courses?

What kind of curriculum coordination do you do with the other secondary coordinators regarding technology components?

What do you think about computers for foreign language teaching?

What kinds of technology things have you integrated into your classes?

What do you think about the laptop requirement?

What kinds of computer resources do you see in the public schools where we place students?

What kinds of examples do you think the students are seeing in the field?

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