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Foreign language teachers' technology beliefs and implementation factors: a mixed methods study

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FOREIGN LANGUAGE TEACHERS' TECHNOLOGY BELIEFS AND IMPLEMENTATION FACTORS: A MIXED METHODS STUDY

by

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of the requirements for the Doctor of Philosophy
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CERTIFICATE OF APPROVAL

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PH.D. THESIS

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This is to certify that the Ph.D. thesis of

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has been approved by the Examining Committee for
the thesis requirement for the Doctor of Philosophy degree
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Pamela Wesely

To my supportive family, amazing children, and loving husband

You have to go wholeheartedly into anything
in order to achieve anything worth having

Frank Lloyd Wright

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ABSTRACT

Using a mixed methods design this study investigates in-service K-12 foreign language teachers' beliefs about technology and factors that influence its implementation in instruction. The study employs an Explanatory Design using a two-phase approach, where qualitative data is collected and analyzed to elaborate on the quantitative data results. A total of ninety-nine in-service K-12 foreign language teachers from across the state of Iowa responded to the Modified Technology Implementation Questionnaire about their reported technological beliefs and barriers to technology integration within classroom practices. The results of the instrument were tabulated using a hierarchical multiple regression to uncover factors impacting technology integration. To further enhance the quantitative findings, ten teachers were purposefully sampled from the same participant pool for follow-up interviews. Follow-up interviews with participants were conducted using thematic analysis. The findings from this study suggest that both internal and external variables impact teachers' reported uses of technology. Some of the contextual factors were time, resources, support, professional development, class sizes, and scheduling conflicts. In addition to contextual factors, teachers' reported that more internal factors about technology further impacted its incorporation. The study uncovered three main internal elements: beliefs, perceived benefits, and teaching style as factors making a difference in the utilization of technology. The internal factors were more influential than external factors in their ability to be successful with technology integration. The conclusion includes recommendations and implications for administrators, professional development coordinators, teachers, and teacher preparation institutions.

PUBLIC ABSTRACT

Using a mixed methods design this study investigates in-service K-12 foreign language teachers' beliefs about technology and factors that influence its implementation in instruction. The study employs an Explanatory Design using a two-phase approach, where qualitative data is collected and analyzed to elaborate on the quantitative data results. A total of ninety-nine in-service K-12 foreign language teachers from across the state of Iowa responded to the Modified Technology Implementation Questionnaire about their reported technological beliefs and barriers to technology integration within classroom practices. The results of the instrument were tabulated using a hierarchical multiple regression to uncover factors impacting technology integration. To further enhance the quantitative findings, ten teachers were purposefully sampled from the same participant pool for follow-up interviews. Follow-up interviews with participants were conducted using thematic analysis. The findings from this study suggest that both internal and external variables impact teachers' reported uses of technology. Some of the contextual factors were time, resources, support, professional development, class sizes, and scheduling conflicts. In addition to contextual factors, teachers' reported that more internal factors about technology further impacted its incorporation. The study uncovered three main internal elements: beliefs, perceived benefits, and teaching style as factors making a difference in the utilization of technology. The internal factors were more influential than external factors in their ability to be successful with technology integration. The conclusion includes recommendations and implications for administrators, professional development coordinators, teachers, and teacher preparation institutions.

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CHAPTER 1

INTRODUCTION

Background and Rationale

> Globalization and digitalization have reshaped the communication landscape affecting how and with whom we communicate, and deeply altering the terrain of language education. (Lotherington & Jenson, 2011, p. 226).

Technology continues to impact the ways in which people work, communicate, collaborate, and socialize. There has been an increasing demand for technology skills to succeed in life and in any profession (Johnson, Levine, Smith & Smythe, 2009). "Most citizens expect their medical and law enforcement professionals, and even their mechanics to be up to date regarding the latest technologies that enable them to perform their jobs more efficiently and effectively" (Ertmer & Ottenbreit-Leftwich, 2010, p. 255). Due to the increased demands for computers both at home and work for a variety of purposes, there has been pressure on schools to familiarize our youth with the uses of new technologies. If schools fail to educate our next generation it will lead to disadvantages in the job market within the fast growing technological age (Tyack & Cuban, 2000). Technology not only has a place in education, but it should be a driving force to better enable our students to perform and excel in their future career paths.

Technology has been a powerful tool for enhancing student achievement, learning, curriculum, and instruction in the educational realm (California Commission on Teacher Credentialing, 2000). The educational setting has increased the presence of technology in every classroom. According to a report from the Department of Education 97% of teachers had computers in their classrooms and 54% could bring computers in

through mobile labs (U.S. Department of Education, 2009). More school districts are beginning to adopt a one-on-one initiative, which places handheld devices into the hands of each individual student no matter the grade level. Currently 153 out of 421 public and private school districts in the state of Iowa have adopted the one-to-one initiative through use of a variety of devices: MacBooks, PC laptops, Netbooks, Chromebooks, iPads, Android Tablets, and Windows Tablets (AREA Education Agency, 2012; Iowa Area Education Agencies Partners in Education, 2014). The initiative enables the school districts to checkout devices for each student to use throughout the school year. The intention of this initiative is to increase student achievement through technology, which helps level the digital divide. The digital divide refers to the gap that exists between those with and without readily accessible technology, the knowledge that is provided through access, and the skills gained from these technological interactions. "This gap may be because of socio-economic, geographical, educational, attitudinal, or generational factors, or it may be through physical disabilities" (Cullen, 2001, p. 311). The one-to-one initiative helps level out the unequal technology access for families with low incomes, with lower literacy levels, in rural areas, etc. (Cullen, 2001). In addition to helping to minimize the digital divide, the increased technology resources also enable school districts to prepare their students for success within the 21st century (Partnership for 21st Century Skills, 2009).

There has been an increasing demand for technology skills to succeed in life and any profession (Johnson et al., 2009). The continued growth of informational technologies enables people to collaborate, create, and compete (Tapscott & Williams, 2006). Technology is a critical factor in what it means to be educated in today's society

(Warschauer, 2006). Therefore, the term literacy has changed with these new advances in technology. Literacy skills have changed from the traditional view of literacy to incorporate new forms of digital literacies related to social practices: blogging, gaming, emailing, tweeting, etc. (Gee, 2010). As people learn new practices, they also learn new values, norms, and ways of seeing the world (Gee, 1996). New digital modes of expression change our relationship to printed texts and new digital cultures provide support systems to aid adolescents in improving core competencies such as reading and writing (Davidson, Goldberg, & Jones, 2010). Given the range and volume of information available and the access to informational sources and resources, learning strategies have shifted from a focus on information to an emphasis on judging the reliability of information (Davidson et al., 2010). Digital learning via new technologies is changing how people of all ages learn, play, socialize, and engage in writing (Davidson et al., 2010). Digital technology has not only changed the way that we learn, but it has enabled more communication and collaboration.

The new capabilities of technology and digital literacy skills within the educational realm have led national organizations to create standards for technology and 21st century skills for both teachers and students. Additionally, technology has led to the development and integration of Computer Assisted Language Learning (CALL) for the foreign language classrooms and the creation of educational policy aimed at effective uses of technology in classrooms, schools, and districts. The International Society for Technology in Education (ISTE) published National Educational Technology Standards (NETS) for students in 1998. Teacher standards published in 2000, focused on five standards for digital citizenship, developing creativity, and the digital age (International

Society for Technology in Education, 2003). The intention of these standards is to help improve teaching and learning for a fast-paced society. The Teachers of English to Speakers of Other Languages (TESOL) added to the ISTE standards by focusing on English language teaching (ELT) in 2008 (Teachers of English to Speakers of Other Languages, 2008). The standards were designed for both teachers and students with a range of English proficiency levels and diverse settings around the world. The existence of technology standards places a greater emphasis on digital literacies and the importance it carries for students' future in a competitive workforce (TESOL, 2008). The work generated from current standards on technology has led to the creation of a new partnership aimed at necessary skills for the technological age of the 21st century. The Partnership for the 21st Century Skills depicted essential skills to be integrated into teaching for success in today's world: critical thinking, problem-solving, communication, and collaboration (Partnership for 21st Century Skills, 2009). Another element of the 21st century skills focuses on technology where students need to have experiences with digital literacies (Partnership for 21st Skills Learning, 2009).

An additional educational development stemming from the standards and 21st century skills focused on the enrichment of foreign language education through Computer Assisted Language Learning (CALL). CALL is defined as language development and improvement through computer technologies (Bax, 2003). Foreign language educators incorporate different forms of CALL to enhance their students' language learning experiences and interactions with the target culture (language being studied) (Li & Ni, 2011). The integration of technology provides supplementary benefits to language learning in foreign language classrooms due to its ability to bring more

cultural and linguistic materials into the curriculum. The internet is an excellent resource and means of communication for language learning. The internet is a vast resource of information that connects people with speakers of other languages (Gonglewski, 1999). It has the ability to take students beyond the four walls of the classroom to enable authentic interactions, communications, engagement, and membership with the target language and culture. Technology also creates more communicative opportunities for interacting with native speakers of the language and improving listening and speaking skills (Li & Ni, 2011).

To help support the integration of technology within classroom curriculums like foreign languages, state departments of education are partnering with local educational agencies to help meet the challenges of creating a modern educational system which prepares students to be successful in college and their future careers. New funding programs aimed at effective uses of technology have begun to surface to help support educational institutions (Duffey & Fox, 2012). Various forms of technological funding are generated from Title II-D, Enhancing Education Through Technology (EETT), and state funded educational programs. Title II-D is a federal educational program with funds explicitly aimed at supporting state and local educational institutions in their effective uses of technology. The main purposes of the program are to improve academic achievement through technology, support students within the digital divide, and integrate technology into teacher training and classroom curriculum. A second source of funding is through Enhancing Education Through Technology (EETT), which is used to increase quality learning programs aimed at student achievement, student motivation, and teacher productivity. The programs funded for 2012 school year focused on four common

themes: ensuring an infrastructure for learning, educator effectiveness, innovative learning models, and college and career preparation (Duffey & Fox, 2012). Each of these themes have enabled schools and districts to improve their learning and teaching skills through the utilization of technology.

Technology has been viewed as a powerful tool in enhancing curriculum and instruction as well as student academic achievement, participation, motivation, and lifelong learning. It changes the manner in which students think and retain information (California Commission on Teacher Credentialing, 2000; Garthwait & Weller, 2005; Bebell & Kay, 2010). The advances in technology have created new roles for both teachers and students in the classroom. Students are more actively engaged in directing their own learning as teachers assist in the process. Students use collaboration, cooperative learning, project based learning, etc. to promote critical thinking and problem solving skills. The new role of educators is to use technology to provide unique learning experiences catering to each individual student's needs for language learning.

Teacher Beliefs

Technology has changed the role of the teacher in the classroom, but teachers' beliefs dictate its integration into the curriculum. Therefore, since teachers are the facilitators of knowledge in the classroom it is important to understand teachers' beliefs because they guide the decisions teachers make and actions they take in the classroom (Palak & Walls, 2009). Beliefs are one's personal knowledge of the truth, but they have a "stronger affective, evaluative, and episodic nature" (Lundberg & Levin, 2003, p. 24). According to Pajares (1992), a belief "can be defined as being based on judgment and evaluations, in contrast to "knowledge," which is "based on objective fact" (p. 313). The

complex system of teachers' beliefs makes it difficult to understand, change, or enhance classroom teaching practices. Beliefs are a messy construct that does not lend itself to an observable investigation (Pajares, 1992). Green (1971) established that an individual may hold beliefs that are incompatible with one another. This can be troublesome because educators' beliefs might not match the reality of their classroom practices due to their unobservable and incompatible nature. In order to fully understand teachers' beliefs, it is essential to "infer from what they say, intend, and do" (Pajares, 1992, p. 314). Teachers' belief systems consist of interacting, interconnecting, and overlapping beliefs which are in continuous communication with each other (Pajares, 1992). According to Richardson (1996), the three main sources for teacher beliefs are personal experiences, instructional experiences, and pedagogical content knowledge. Teachers also hold beliefs about their work, students, roles and responsibilities. These beliefs influence classroom actions, judgements, decisions, planning, etc. In the classroom, when teachers are missing the necessary knowledge, they rely on their beliefs to guide them (Green, 1971).

Thus, teachers' beliefs can help predict subsequent classroom actions. When a new tool or pedagogical approach is present in the classroom, a teacher makes a decision as to the goals it might help accomplish (Zhao, Pugh, Sheldon, & Byers, 2002). Teaching practices are seen as equivalent to teachers' decision-making processes and teachers are the gatekeepers of what enters and happens in the classroom, stressing the important role teachers' play within the instructional process (Ertmer & Ottenbreit-Lettwich, 2010). Teachers' decision-making processes are deeply rooted in teachers' beliefs (Borg, 2003; Richardson, 2003). Strong beliefs about teaching, learning, and technology that teachers

bring into classroom can act as barriers to the effective integration of technology in education (Cuban, 2001; Bai & Ertmer, 2004; Palak & Walls, 2009). Hence, beliefs appear to shape teachers' decisions about pertinent knowledge, routines, and goals along with taking into consideration the context of the classroom (Speer, 2005). Teachers' beliefs about teaching, learning, and technology can be incorporated into the classroom as long as it helps achieve classroom goals. Therefore, gaining a better understanding of the relationship between teachers' beliefs, decisions, and classroom practices will help shed light on the possibilities of technology integration (Chen, 2008).

Foreign Language Teachers and Technology

Researchers have been calling for more investigations focused on teachers' beliefs and interactions with classroom curriculum (Pajares, 1992). The interconnected relationship between teachers' internal and external barriers can uncover the interplay these elements can have on technology integration within classroom practices. Oda (2011) conducted an important study that examines university-level foreign language teachers' awareness of the role technology can play in the classroom, as well as their ability to implement technology into their classroom practices. A finding from the study is that strongly held beliefs are the most influential when it comes to teachers' instructional practices. The teachers in this study align their usage of technology to their own classroom goals, intention, and practices. Two additional factors impacted teachers' integration of technology into the classroom: previous experiences as a learner and contextual factors (access, equipment, and lack of training). Oda's investigation (2011) is one of a few research studies on second language technology beliefs from the perspective of the teacher and their impact on classroom practices.

Another study related to the topic of foreign language educators and technology by Lam (2000) investigated second language teachers' perceptions about technology use in the classroom. The aim of the study was to discover the reasons behind second language teachers' technology use or lack of use in teaching, as well as outside factors that might influence these decisions. One of the findings suggests teachers' perception of technology is to enhance classroom tasks. According to the teachers, the primary reason for the implementation of technology in the classroom was to improve student learning by utilizing materials that can make the target language authentic for students. However, a second finding indicated a lack of technology usage in the classroom due to teachers' lack of knowledge on technological components. Other factors that were shown to affect teachers' use of technology included lack of professional development, lack of resources or money, lack of time, and lack of administrative or parental support (Lam, 2000).

Cummings (2005) conducted a study that focused specifically on secondary Spanish educators in the United States in relation to their administrative and pedagogical uses of technology in the classroom. The aim of this particular study was two-fold: to understand how teachers utilize computers in both administrative and pedagogical capacities and to determine the influence one's beliefs can have on integrating technology into the curriculum. A limitation of Cumming's study (2005) was the specific population of foreign language educators. In the study, the researcher selected only Spanish educators from across the United States to be participants in her study, reducing the impact of educators of other commonly and less commonly taught languages. An additional limitation of the study was the variety of computer usages in the classroom including: internet, power point presentations, word processing, etc. a very wide range of

implementations within the classroom. The broad scope of technologies incorporated into the study impacted the responses by instructors as to their pedagogical implementations.

Purpose of the Study

In spite of the initial inquiries into foreign language teachers' use of technology, there are still teachers who have not yet accepted the need for technology integration into their own language curriculum (Lotherington & Jenson, 2011). The full spectrum of teachers' beliefs impacting or prohibiting its use in the curriculum has not yet been discovered. Previous studies have not focused on K-12 teachers, larger populations of K-12 teachers from a variety of language backgrounds, or personal insights from the educators as to barriers that impact their use of technology in the foreign language classroom.

It is important to uncover foreign language teachers' beliefs about technological resources and their implementation into the curriculum. The intent of this particular study is to focus on K-12 foreign language classrooms and technologies used by educators in the state of Iowa. Technology has the ability to open up new doors for language learning, advance skill levels, bring in the native culture, and enable communication practice with native speakers. Gaining a better understanding of foreign language educators' technological beliefs can better equip administration and programs with solutions to internal and external barriers influencing technology integration.

Therefore, this study focuses on three main research questions:

1. What influences K-12 foreign language teachers' reported technological beliefs and integration into classroom practices?

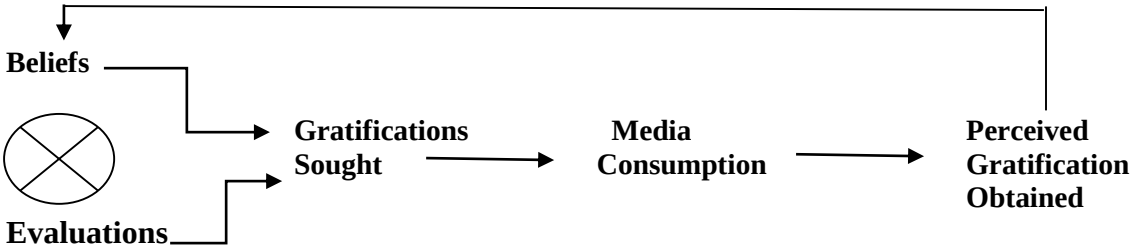
2. How do the perceived contextual factors (time, resources, training, etc.) impact the use of technology by foreign language educators?
3. How does the data from the self-administered questionnaire compare to the data collected during teacher interviews?

Theoretical Framework

The main theoretical framework for this study is the Expectancy-Value Theory (Fishbein, 1968); a model for understanding and predicting behaviors. The premise for this particular theory states that an individual holds various beliefs about a particular object that can be either positive or negative creating an overall attitude. Therefore, on future interactions with the specific object, the individual will draw upon his/her attitudes and beliefs during his/her interactions with the object (Fishbein, 1963). In other words, "innovations are more likely to be adopted if the perceived value of the innovation and the likelihood (expectancy) of success are high, as well as if these benefits outweigh the perceived costs of implementation" (Wozney, Venkatesh, & Abrami, 2006, p.177). There are three distinct elements to the Expectancy-Value theory: expectancy, values, and costs. The expectancy concept examines individual beliefs amongst the use of a strategy and a desired outcome. The value construct assesses the degree to which an individual perceives the outcomes of a particular strategy as worthwhile. The costs assess the physical and psychological demands associated with implementing a particular strategy (Wozney et al., 2006). In order for an individual to implement a specific strategy, one must have high anticipation for success and believe the end result is important enough to overlook the impending barriers. To finish the cycle, an individual will evaluate the process of strategy incorporation to decide whether it was worth the

trouble or not. The final evaluation will create change or validation for the individual's belief system. Figure 1 below depict the model of Expectancy-Value Theory and its cyclic process impacting successful technology implementation into the classroom.

Figure 1. Conceptual Model of the Expectancy-Value Theory

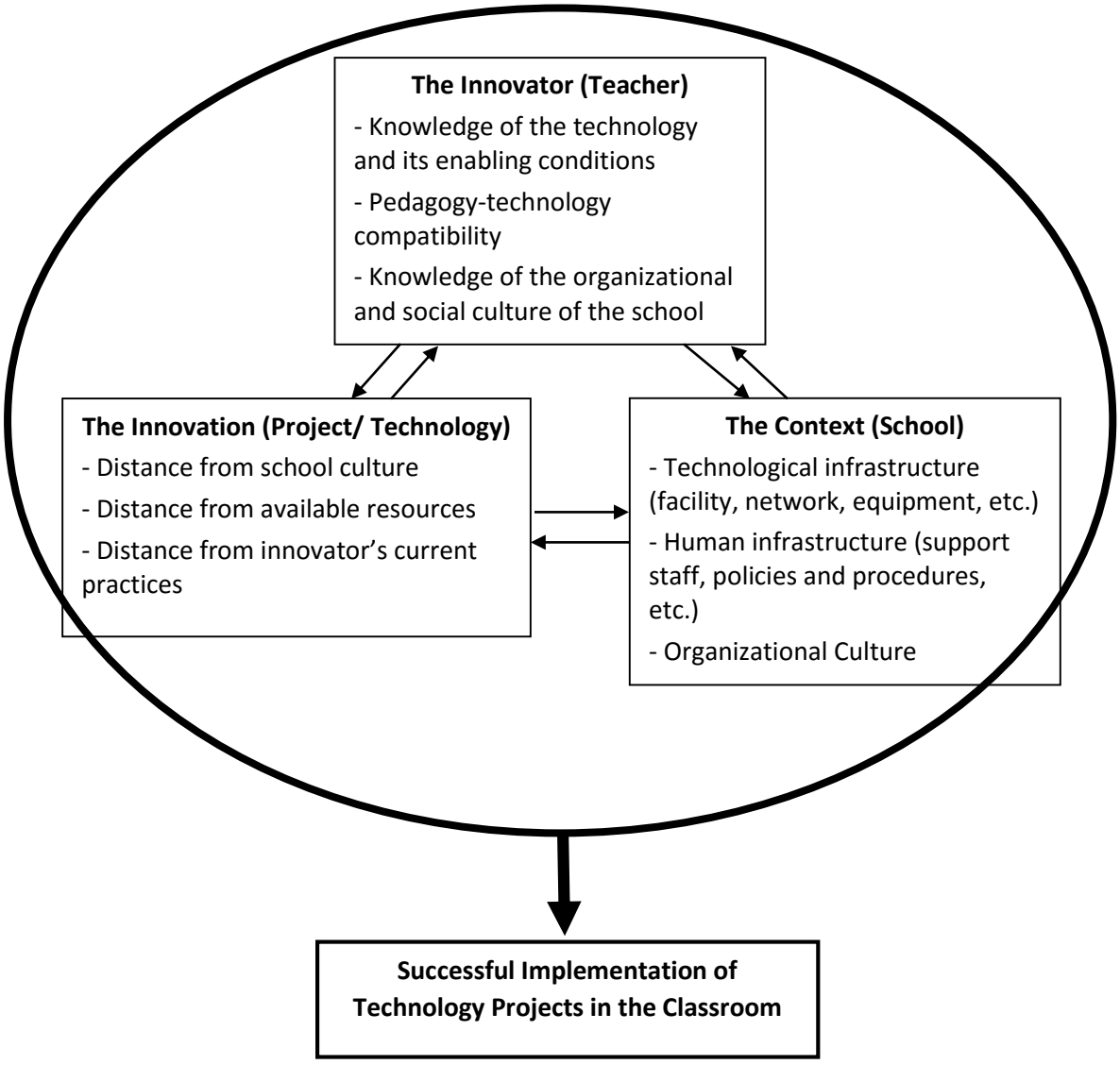


Source: Fishbein, M (1968). An investigation of relationships between beliefs about an object and the attitude towards that object. *Human Relationships, 16,* 233-240. doi:10.1177/001872676301600302

The Expectancy-Value Theory leads into the model surrounding conditions for classroom technology innovation. Zhao, Pugh, Sheldon, and Byers created a model in 2002 after conducting a study devised to uncover conditions for classroom technology integration. It consists of three main pieces: the innovator (teacher), the innovation (technology), and the context (school). Several factors impact the innovator/teacher's use of technology in the classroom: technology proficiency, pedagogical compatibility and social awareness. Each of these factors informs the innovator of their beliefs about incorporating technology in the classroom. Technology innovation in the classroom focuses on the distance from the school culture, the available resources, and the teacher's current classroom practices. The final piece, the context, consists of the technological reality of the school: the technological infrastructure, human infrastructure, and organizational culture (Zhao et al., 2002). The relationship between each of these

elements is intertwined with each one impacting the other and either leading to a successful or an unsuccessful implementation of technology within the classroom. The Conditions for Classroom Technology Innovation model depicts the continuous relationship between the major factors impacting successful integration of technology into classroom practices. Figure 2 below depicts the different elements in the classroom environment impacting technology inclusion.

Figure 2. Conditions for Classroom Technology Innovation Model



Source: Zhao, Y., Pugh, K., Sheldon, S., & Byers, J. (2002). Conditions for classroom technology innovations. *Teachers College Record*, 104(3), 482-515. EJ649784

The theoretical framework and model provide a strong basis for a mixed methods study due to the complex phenomena and beliefs within the study. Expectancy-Value theory lays the ground work in understanding teachers' beliefs while the model demonstrates the interconnected relationship between the teacher, technology, and

context impacting integration of technology. The incorporation of these two elements will help uncover factors prohibiting teachers from including technology in the classroom and provide suggestions as to how to enhance both teaching and learning experiences. The first theoretical framework lays the groundwork for revealing the importance educators place on classroom technology while the model takes a closer look at the various pieces influencing classroom technology innovation. The theory and model depict an embedded connection between beliefs and implementation, creating a need for a deeper understanding through a multiple methods inquiry.

Methods

This study focuses on Iowa K-12 foreign language teachers' technology beliefs and its influence on technology integration into classroom practices. An Explanatory Mixed Methods Design is used because it involves the gathering and examination of both quantitative and qualitative data. According to Creswell and Plano Clark (2007), an Explanatory Mixed Method Design consists of two phases, where the qualitative data builds on the primary collected quantitative data. Greater emphasis is placed on the initial quantitative data, followed by qualitative data collection. This two-phase design is suited to the study because it helps uncover unknown factors that K-12 foreign language teachers face while incorporating technology into their classroom practices. Follow-up interviews with diverse Iowa K-12 foreign language educators links feelings, emotions, and understanding to their quantitative questionnaires. Personal beliefs are very complex in nature, because of various interplaying elements that might not be exposed thoroughly within the questionnaire. Green (1971) establishes that an individual may hold beliefs that are incompatible with one another. This can be troublesome because educators'

beliefs might not match the reality of their classroom practices due to unobservable and incompatible nature. In order to fully understand teachers' beliefs, it is essential to "infer from what they say, intend, and do" (Pajares, 1992, p. 314). Despite the complex construct of "beliefs," researchers have been calling for more investigations focused on teachers' beliefs (Pajares, 1992). Therefore, a closer look at teachers' beliefs helps uncover the issues, complications, barriers, influences, attitudes, etc. towards the integration of technology in their classroom practices. Additional interviews aid in the explanation of unique, surprising, or interesting responses from the self-administered questionnaire responses. Essentially, interview questions are generated from the questionnaire findings to further understand personal perceptions and barriers that might impact the utilization of technology in the classroom.

This leads directly into the purpose of utilizing mixed methods research instead of choosing one research method. Mixed methods research enables an investigator to utilize both quantitative and qualitative data to create a more comprehensive study. The complexity associated with technology inclusion and teachers' beliefs are inefficiently researched through one approach. Instead of having a trade-off between quantitative and qualitative methods, one study encompassing both data sets can produce a more comprehensive picture of the phenomenon. In this study, the quantitative data establishes relationships between teacher characteristics impacting the use of technology and teachers' technological beliefs, but further exploration provides more in-depth context from diverse perspectives. The qualitative data provides richer information to further expand on the quantitative data. Due to the complex topic, mixed methods research is an ideal method for investigation.

Potential Scholarly Significance

There have been few studies conducted researching how and why foreign language teachers use technology in the classroom (Wiebe & Kabata, 2010), but few have focused on K-12 teachers' beliefs and their influence on instructional practices. Teachers are the main drivers within the language learning process and the mediator for the effectiveness of classroom technology (Zhao & Frank, 2003). Teachers' educational beliefs play an important role in the way they perceive and use technologies in the classrooms. "Thus we need to examine the psychological, social, cognitive, and organizational factors that affect teachers' willingness to integrate technology in their teaching" (Zhao, 2005a, p. 454). Uncovering foreign language teachers' beliefs about technology can enable administration, professional development, and pre-service teacher programs to make changes to better suit the needs of foreign language teachers.

According to research the administration helps predict the teachers' abilities to integrate technology in the classroom. There are several elements that have been identified as essential for technology integration: supportive school system, adequate resources, professional development, and sufficient support staff (Zhao, 2005a; Oda, 2011; Corey, 2012). The administration at each setting and levels plays a pivotal role in establishing the educational climate for or against technology innovation within the educational systems (Vannatta & Fordham, 2004). Therefore, the findings from this particular study can help identify the needs of K-12 foreign language educators attempting to incorporate technology into their classrooms. School administration can take these factors and try to create policy and actions to promote the use of technology

within their school districts, thus helping them stay up to date with educational standards, promoting student achievement, and supporting their school personnel.

In addition to the administration's role in enabling technology usage, professional development provides training for teachers on their abilities, skills, and software for technology integration into their own classrooms (Joyce & Showers, 1995; Ertmer, Ottenbreit-Leftwich & York, 2006; Ertmer & Ottenbreit-Leftwich, 2010). Professional development enables educators to practice with technology, interact with peers, and learn new techniques. In order for professional development to be successful, it needs to be continuous, ongoing, and involve follow-up and support for further learning (Carlson & Gadio, 2002). Another key element within professional development is the ability to make it subject-specific, context-specific, and accessible, as deviations from these specifications will make it less meaningful for educators (Ertmer et al., 2006). Thus, a better understanding of the current trends in professional development, conferences, workshops, etc. as well as current types of training can enable professionals in the field to fill the gaps in educational training to promote the use of technology in the classroom.

Another area that can gain improvement from this particular study is pre-service education. Pre-service teachers bring with them strongly held beliefs about teaching, learning, and schooling from their "apprenticeship of experience" as students (Richards, 2003). Students have spent thousands of hours observing teachers in action, but have only a small glimpse of classroom reality. Changing the beliefs of teacher candidates can be very difficult, but not impossible. In order to change teacher candidates' beliefs about educational practices, programs need to provide readings, dialogues, classroom experimentation, and modeling of effective uses of technology in the classrooms

(Richards, 2003). A better understanding of current K-12 foreign language teachers' technological beliefs can enable programs to create necessary changes, opportunities, and experimentations for pre-service teachers. These new possibilities will improve pre-service education as a whole to produce more equipped foreign language educators to succeed in the 21st century workforce.

This study sheds light on foreign language teachers' technological beliefs along with uncovering the necessary information for making changes to professional development, administrative support, and teacher education programs in an effort to promote higher levels of technology integration within the classroom. The study provides statistical analysis of relationships between teachers' contextual factors and beliefs as well as more in-depth narratives on the interconnected relationship between teachers, technology, and context. The mixed methods design of the study provides greater depth, encompassing teachers' beliefs and context with technology beyond what a solely quantitative or qualitative study would reveal. "If findings are corroborated across different approaches then greater confidence can be held in the conclusions of the study" (Johnson & Onwuegbuzie, 2004, p.21). Incorporating quantitative and qualitative data in various manners better suits the research questions by offsetting the weaknesses of each individual methodology.

This particular study considers the various research questions that were in-play and selects the appropriate methods. The two methods mixed in a sequential fashion have enabled the discovery of foreign language teachers' technological beliefs, analyzed the use of technology in the classroom, and revealed the reported internal and external barriers impacting its use. The hope is that the findings from this study will help

preparation programs, future foreign language teachers, and program administrators better understand the different barriers inhibiting the use of technology and its implementation. The study of Iowa K-12 teachers' beliefs will be influential in the field of foreign language education and a driving force for change in encourage the incorporation of technological benefits within the curriculum.

Definition of Terms

Computer Assisted Language Learning (CALL) is defined as "the type of language learning in which a learner uses a computer and, as a result, improves his or her language" (Beatty, 2003, p. 7).

Digital Divide is unequal access to information technology (Light, 2001).

Digital learning is the learning through technology for students who have some control over their learning in regards to pace, space, interactions, etc. (Davidson et al., 2010).

Digital Literacy "refers to the ability to use digital media to find needed information and evaluate its quality, as well as the ability to create new information through the use of various digital media" (Shin, 2015, p. 182).

Digital Literacies refer to "different social and culture practices which incorporate many different literacies (e.g. legal literacy, gamer literacy, country music literacy, academic literacy). People don't just read and write in general, they read and write specific sorts of 'texts' in specific ways and these ways are determined by the values and practices of different social and cultural groups" (Gee, 2010, p. 170).

Human and Technology Infrastructure refers to actual resources available within the schools and highly trained technical staff as well as a supportive administration (Zhao et al., 2002)

Information, Communication, and Technology (ICT) Literacy refers to the "use of technology as a tool to research, organize, evaluate, and communicate information, social networking, and encouraging sharing" (Partnership for 21st Century Skills, 2009, p. 9).

Information Literacy involves access and evaluation of an abundance of information along with being able to utilize and manage the information for creative purposes (Partnership for 21st Century Skills, 2009).

Media Literacy includes two main elements: analyze media and create media products. Analyzing media refers to the ability to understand and examine media messages while production is the creation of media for appropriate purposes (Partnership for 21st Century Skills, 2009).

Open sources "refers to software programs that are distributed with the source code-hence open source. The open source license allows users the freedom to run the program for any purpose, to study and modify the program, and to freely redistribute copies of the original or modified program" (Coppola & Neelley, 2004, p. 2).

Participatory Culture is defined as one with few barriers to expression, support for creating and sharing, and contributions that matter within social connections (Gee, 2010).

Pedagogical Compatibility the relationship between technology and teachers' pedagogical beliefs. The success of implementing an innovation depends on the teachers' value of the innovation and its connections to their curriculum (Zhao et al., 2002).

Pedagogical Technology is the changes to teaching and learning with technology for both the students and the teachers in the classroom (Mirsha & Koehler, 2007).

Target Language is the foreign language of the classroom, which is utilized in every aspect of the classroom, especially through lines of communication.

Teacher Beliefs are the emotions, feelings, and ideas, which are "instrumental in defining tasks and selecting the cognitive tools to interpret, plan, and make decisions" (Pajares, 1992, p. 325).

CHAPTER 2

LITERATURE REVIEW

Introduction

> "Technology will never go away and only continue to advance" (Papert, 1993, p. 24).

In order to better understand K-12 foreign language teachers' uses of technology, it is essential to uncover the interwoven connection between teachers' beliefs about teaching and learning, technology, and contextual factors. The literature review is broken down into three main pieces: technology in education, teachers' beliefs, and the theoretical framework. The first section on technology in education depicts some changes in education due to the growing advances of technology. It also reviews the history of computer technologies within the foreign language classroom, the increased implementation of one-to-one programs, the emergence of new digital skills necessary for participation in the technologically-rich society, and the development of new technology standards for both students and teachers. The second area discusses the teachers' beliefs, decisions, and views of teaching contributing to both intrinsic and extrinsic factors. These pieces all play a role in the integration of new tools or approaches into classroom practices. The final section of the literature review examines the theoretical framework and model utilized to uncover K-12 foreign language teachers' beliefs and other factors influencing the incorporation of technology. Throughout the literature review, research from foreign language education will be presented; however, in areas where research is lacking, literature will be pulled from general teacher educational studies and other areas.

Technology in Education

The world is now a tech-driven society where new technologies have impacted the way we run our everyday lives through electronic banking, travel, shopping, communicating, commerce, and many other areas (Wang & Reeves, 2003). "Before a kid leaves college he/she will play over 10,000 hours of video games, 200,000 emails and instant messages both sent and received, 10,000 hours talking on digital cell phones, 20,000 hours watching TV, and 500,000 commercials seen" (Prensky, 2001b, p. 1). The continued argument for technology in education is the need for our children to master the 21st century skills to compete in the current and future job markets (Friedman, 2005). Technology is a critical factor in what it means to be educated in today's society (Warschauer, 2006).

Education is continually influenced by new advances in technology that make learning more efficient, engaging, and entertaining through technologically-rich resources (Matthews, 2011). Technology has been a powerful tool for enhancing curriculum, instruction, and student achievement (California Commission on Teacher Credentialing, 2000). The advances in technology have created new roles for both teachers and students in the classroom. Students are more actively engaged in their own learning as teachers assist in the process. Teachers are continually searching for new resources to help enhance their classroom content. The following section reviews the changes technology has generated in the educational field including: one-to-one initiatives, foreign language education, new digital literacies skills for the 21st century, and technology standards for both teachers and students.

One-to-One

Among the major changes that have occurred through the introduction of computer technologies are the one-to-one initiatives which have been growing in popularity across the United States. The one-to-one initiative provides a device for every student within the school system and classroom to use, learn, and interact with throughout the school day. The first one-to-one initiative began in the mid-1980s through a longitudinal study by Apple Classrooms of Tomorrow Project. This particular study demonstrated the potential of learning with technology through collaboration, information access, and the expression of students' ideas (Ringstaff, Yocam, & Marsh, 1996). The most visible sponsored initiative of the mid-1990s was Microsoft Corporation and Toshiba's Anytime, Anywhere Learning Program (Rockman, Chessler, & Walker, 1998). In 1996, Microsoft Corporation and Toshiba's laptop immersion program began with 53 schools in the United States ranging from all areas of education elementary, middle, and high school in both the public and private sector. The four hundred teachers selected had little to no experience with technology prior to this initiative. Students were given the option to either buy or lease a laptop computer that both the students and teachers were expected to use throughout the school day. The findings from the study indicated that there was a lot of educational value in having laptop computers in the classroom (Rockman et al., 1998).

Few modern educational initiatives have been as wide spread as the integration of computer technologies into the classroom (Bebell & Kay, 2010). The one-to-one initiative continued to grow as the Anytime, Anywhere Learning Program expanded to as many as 800 schools and 125,000 teachers in 2000. In 2010, a survey revealed that

approximately 50 percent of schools districts in the United States were either implementing or in the process of implementing a one-to-one program (Branch, Orey, & Jones, 2010). The largest number of one-to-one programs currently exist in the following states: South Dakota, Pennsylvania, New Hampshire, Texas, Georgia, Louisiana, California, Virginia, Florida, Kansas, Maine, Massachusetts, and Michigan (Bebell & Kay, 2010). The state of Iowa has also seen a large increase in such programs, with 153 school districts in the elementary, middle, and high school levels from both private and public sectors engaged in one-to-one computer programs. There are a variety of devices being used, including: Mac laptops, PC laptops, Chromebooks, Windows tablets, Android tablets, iPads, and Netbooks. Some initiatives even use a variety of devices depending on the age of the students (Iowa Area Education Agencies Partners in Education, 2014). For example, laptop computers may be used for high school students and iPads for elementary school students.

The intention of this particular initiative is to improve educational experiences, as well as provide universal access and stronger connections with parents, teachers, and community members. Technology has helped improve both teaching and learning and developed important skills for students in their future job market. Computers have encouraged student participation, academic achievement, attendance, motivation, and lifelong learning as well as changed how students think and retain information (Garthwait & Weller, 2005; Bebell & Kay, 2010). The one-to-one initiatives have also helped level the educational playing field within the digital divide.

“The phrase, "digital divide," has been applied to the gap that exists between those with ready access to the tools of information and communication technologies and

the knowledge that they provide access to, and those without such access or skills. This gap occurs due to a variety of factors, including: socio-economic, geographical, educational, attitudinal, or generational factors, or it may be due to physical disabilities" (Cullen, 2001, p. 311). One-to-one initiatives helped level out unequal technology access for families with low incomes, with lower literacy levels or with less access because they live in rural areas (Cullen, 2001). These programs provide technological devices and access to the vast amount of information on the web to students both at school and home, which helps them develop skills for lifelong learning. Even though the intention of the initiatives is to increase student achievement, educators have not always had a fond outlook on one-to-one initiatives. Educators are nervous about the intrusion of another element into their classroom and its impact on their pedagogical beliefs and classroom practices (Donovan, Hartley & Strudler, 2014). Foreign language educators have been experiencing increased technological developments utilized to enhance language skills.

Technology in the Foreign Language Classroom

Foreign language education has endured a variety of changes over the past thirty years through the development of curriculum standards, the advances in technology permeating the classroom, and the diversity of language learners enrolled in foreign language classrooms. One of the most prominent forces in foreign language education is the organization known as the American Council of the Teaching of Foreign Languages (ACTFL), which has developed curriculum standards, assessment criteria, and conferences for sharing new improvements in the field with educators from around the world.

ACTFL is an influential and effective organization, which initiates change toward improvements in foreign language education, including technology. For example, one of ACTFL's program standards incorporates "diverse methods of technology to help students strengthen linguistic skills and learn about contemporary culture and everyday life in the target culture" (National Standards in Foreign Language Education Project, 1999, p.2). Technology has been considered an essential 21st century skill for students to acquire on their educational paths toward future careers. In addition to the 21st century skills, ACTFL generated national standards for foreign language education: Communication, Cultures, Connections, Comparisons, and Communities (American Council of the Teaching of Foreign Languages, 1996). "Since these goals are grounded in real world language use, they require second-language learners to interact with other speakers, and internet resources make this possible" (Gonglewski, 1999, p. 348). Technology is a great medium for foreign language learning in the classroom, due to its ability to support language learning in an engaging manner. Technology helps bring more cultural and linguistic materials to the curriculum, provides more opportunities to practice communication activities both listening and speaking, and increases student motivation for language learning (Li & Ni, 2011). The internet is an excellent resource and means of communication for language learning. "It functions both as a vast source of information and means to connect with other speakers of the target language" (Gonglewski, 1999, p. 360). It has the ability to bring students beyond the four walls of the classroom to enable authentic interactions, communications, engagement, and membership with the target language and culture.

Technology has been influencing and altering foreign language education since the creation of the first computer. In order to understand the full impact of technology in the field of foreign language instruction, it is important review its history in the classroom through Computer Assisted Language Learning (CALL) (Bax, 2003). Over the past thirty years, CALL has evolved considerably due to the technological advances in society from the beginning with mainframe computers, to the invention of personal computers, and now to the new multimedia age of the internet, e-mailing, computer-mediated communication, etc. (Lewandowska-Tomaszczyk, Osborne, & Schulte, 2001). The historical overview of CALL can be broken down into three main stages: behaviorist, communicative, and integrative. The three stages of CALL are distinguished by timeframes, level of technology, and pedagogical approaches to language teaching and learning (Warschauer & Healey, 1998).

CALL was first introduced into the language classroom around the early 1960s, and brought with it a theory described by Stern (1983) as "pedagogically audiolingualism, psychologically behaviorism, linguistically structuralism" (p. 169). The behaviorist learning model was centered on the stimulus and response mechanism where behaviors were either reinforced or deterred. The stimulus and response learning model led to the audio-lingual approach of language teaching. This approach highlights the use of the target language in the spoken sense where students were supposed to learn the language through a habit-forming mechanism (Stern, 1983). The "drill-and-kill" process of teaching required students to repeat a dialogue that included a new set of vocabulary words so as to teach them through imitation and practice. Schools setup language labs where students would utilize head-phones and microphones to listen and

repeat the target language. The intention was for students to learn through repetition and comments made by their teachers.

The language labs pushed software developers to create language practice through the drill-and-kill method of the audio-lingual approach (Levy, 1997). One of the most prominent tutorial systems developed through this era was Programmed Logic for Automatic Teaching Operations (PLATO), which provided a more mechanistic grammar and vocabulary drill for practice through computers. The benefits of software during this stage of CALL were its ability to be interactive and self-paced for larger groups of students. This type of software helped schools create learning for larger groups of students who interacted with the target language at their own pace with immediate feedback (Lewandowska- Tomaszczyk et al., 2001).

However, by the late 1970s the theoretical basis for drill and kill practice started unravel, leading to a new stage of CALL. The perspectives on language teaching and learning changed from a mass production of materials for students to a more individualistic perspective. The field started to identify the personal needs of individual students, the learning of more implicit concepts, and the importance of producing original statements in the target language (Warschauer & Healey, 1998). The language teaching approach during the communicative CALL era was Communicative Language Teaching focused on communicative competence and the four language skills: reading, writing, speaking, and listening (Levy, 1997). Communicative competence consists of the knowledge about underlying language structures and social interaction through communication (Canale & Swain, 1980). The intention of this era was to stress learning as an individual process for language development and discovery.

The ability to cater to students' individual needs for learning a foreign language was assisted through the development of the personal computer. The invention of the personal computer during this stage of CALL helped software developers come up with programs that enabled learners to discover language patterns through the rearranging of text along with negotiation and discussion amongst groups of students via simulation (Warschauer & Healey, 1998). The storyboard program was very popular during the communicative era of CALL because it was a "text-reconstruction program for the microcomputer where the aim was to reconstruct a text, word by word, using textual clues such as the title, introductory material, and textual clues within the text" (Levy, 1997, p. 24). Another facet of Storyboard software was the foreign language teachers' ability to input their own text into the program for students to manipulate. The program gave educators the opportunity to modify the stored text within the software for future use with other courses. The emphasis during the communicative era was for students to negotiate meaning with other students through the use of computers in the classroom for both language teaching and learning. The ability to generate individualistic learning through personal computers seemed to lack opportunities for authentic communication in the target language.

Consequently, by the later 1980s and early 1990s, CALL phased into another stage of more integrative language learning. The invention of the internet created a huge leap forward in CALL due to the wide accessibility of materials, people, software, authentic-environments, etc. (Levy, 1997). Local Area Networks (LAN) extended the lines of communication from computer to computer or building to building on the same network. The more extensive networks enabled computers from various locations to be

linked together creating new learning environments. The teaching approach dominating this stage of CALL was the socio-cognitive view that placed a lot of importance on authentic communication in the target language. "Task-based, project-based, and content-based approaches all sought to integrate learners into authentic environments and also to integrate the skills of language learning" (Warschauer & Healey, 1998, p. 58). The aim of integrative CALL was for students to incorporate a variety of multimedia tools for learning the target language (Warschauer & Healey, 1998). Technology developed during this stage of CALL focused on the internet and hypertext systems used to find and access online resources. One example was the network, International Email Tandem Network, which was developed in 1993 to link various universities to each other to encourage computer mediated communication. The concept enabled students from different countries to talk to each other fostering language learning through computers (Levy, 1997). The new range of information, software, and networks created through the internet has opened up new possibilities for language teaching and learning.

Due to the continual development of new multimedia technology tools, the role of the teacher in the classroom has shifted. Teachers have become facilitators of learning rather than the sole wisdom of the subject matter (Warschauer & Healey, 1998). As a facilitator, teachers look for, find, select, and integrate new forms of technology into the classroom to foster student learning. The new role of educators is to use technology to provide unique learning experiences, which cater to each individual student's needs for language learning. The future of CALL looks to the normalization stage where technology is invisible and not recognized as technology, but an integral part of the classroom. "CALL will reach this state when computers are used every day by language

students and teachers as an integral part of the lesson" (Bax, 2003, p. 24). Therefore, to move foreign language classrooms into the normalization stage of CALL it is important to understand its integration into teachers' classroom practices. The stage of normalization also calls for a new set of skills to enable school districts to prepare their students to be successful within the 21st century workforce (Partnership for 21st Century Skills, 2009).

Table 1. Three Stages of CALL

Stage	1970s-1980s: Structural CALL	1980s-1990s: Communicative CALL	21st Century: Integrative CALL
Technology	Mainframe	PCs	Multimedia and Internet
English-teaching paradigm	Grammar-translation and audio-lingual	Communicate (sic)language teaching	Content-Based, ESP/EAP
View of language	Structural (a formal structural system)	Cognitive (a mentally constructed system)	Socio-cognitive (developed in social interaction)
Principal use of computers	Drill and practice	Communicative exercises	Authentic discourse
Principal objective	Accuracy	And fluency	And agency

Source: Warschauer, M. (2000). Online learning in second language classrooms: An ethnographic study. In M.Warschauer & R. Kern (Eds.), *Network-based language teaching: Concepts and practice* (pp. 41-58). New York: Cambridge University Press.

Digital Literacy

The growing trend of technology has pushed people to acquire new digital skills to survive, work, and participate in today's society. Children's lives have been saturated

by computers, video games, digital music, video cameras, cell phones, smartphones, tablets, iPads, iPods, and a variety of other digital toys within the digital age (Prensky, 2001b). Therefore, we are imposing upon the younger generation to be "fluent in the digital language of computer, video games, and the internet" (Prensky, 2005, p. 8). The array of communication channels and expanding diversity in the world today calls for a much broader view of literacy than the traditional approaches and definition (New London Group, 1996). Due to the accelerated and immediate access to media, the growing versions of literacy in our 21st century require a new definition of literacy. This new definition is more broadly defined than the ability to read and write, but includes, "the ability to read and interpret media, to reproduce data and images through digital manipulation, and to evaluate and apply new knowledge gained from digital environments" (Jones-Kavaller & Flannigan, 2006, p. 9). The term literacy is now turned into a plural with literacies consisting of gamer literacy, country music literacy, academic literacy, information literacy, digital literacy, computer literacy, web literacy, media literacy, critical literacy, etc. (Masny & Cole, 2009; Gee, 2010; Jolls & Wilson, 2010).

Literacy skills for the 21st century require that students think and process information in a different manner from the previous educational and social environments (Prensky, 2001b). As people learn new practices, they also learn new values, norms, and ways of seeing the world (Gee, 1996). Given the range and volume of information available and access to informational sources and resources, learning strategies have shifted from a focus on information to an emphasis on evaluating the reliability of information (Davidson, Goldberg, & Jones, 2010). The digital learning of new technologies is changing how people of all ages learn, play, socialize, and engage in

writing (Davidson et al., 2010). Digital technology has not only changed the way that we learn, but it has made communication and collaboration more conducive.

Participatory Culture

Participatory culture not only enables people to connect with each other, but it also enables people to become authors and leaders of their own knowledge. It also changes the focus of new literacies from individual to more group involvement. New literacies nearly always involve the development of social skills through collaboration and networking (Gee, 2010). According to Gee (2010), participatory culture is defined as one with few barriers to expression, support for creating and sharing, and contributions that matter within social connections. Technology enables students to learn more, participate actively, and engage more with society than their traditional methods. Students who engage in playing with media environments will be more comfortable interacting with people from diverse cultures, be better equipped at multitasking, make quicker decisions about the quality of information, displayed enhanced navigation skills, and be better able to collaborate towards a common goal (Gee, 2010). Students actively take part in today's participatory culture by using new forms of media to collaborate, interact, and create presence through technology (Jenkins, 2007). The younger generation is described as eager to work collaboratively towards a common goal. Collaborative learning is more productive than individualized learning which has become an emphasis in the educational system (New London Group, 1996). Collaborative learning is a view that learning is a social construct occurring either peer to peer or within a larger group. The educational environment has pushed for collaborative learning because it develops higher order thinking skills, better understanding of diverse

perspectives, and increased preparation for real life situations (Cornell University Center for Teaching Excellence, 2012). Digital technology is seen as conducive for collaborative learning due to its ability to condense space and time through an extended network connecting people from all over the globe (New London Group, 1996). Due to the presence of digital technology and collaborative learning, the new forms of learning, writing, communicating, and publishing have changed the traditional skills of the educational environment. The ever-pressing demands of technology have urged the field of education to generate new skills to better prepare students for their own future careers.

21st Century Skills

In order for students to be effective in the 21st century, one must be able to exhibit a range of functional and critical thinking skills related to information, media, and technology. The Partnership of the 21st century skills is an organization that has formed alliances with other key national organizations representing core academic subjects. The partnership created a framework describing the skills, knowledge, and expertise students need to master to be successful in life and work (Partnership for 21st Century Skills, 2009). The interlocking framework includes: life and career skills, learning and innovative skills, and information, media, and technology skills. These three skills are seen as overarching and should be integrated into the core academic subjects. Essential skills for the 21st century focus on critical thinking, problem solving, communication, and collaboration, which can be enhanced through technology. The Partnership for the 21st Skills (2009) has identified necessary skills because we live in a technology and media-driven society depicted by access to an abundance of information, quickly changing technology tools, a capability to collaborate, and individual contributions. The

organization has taken the impact technology not only has in society, but also in the classroom to develop a set of skills encompassing the overarching theme of information, media, and technology skills. The Partnership generated three main categories within this particular theme for classroom integration: information literacy, media literacy, and information, communications, and technology (ICT) literacy. Within each category there are subcategories of skills to further depict the necessary elements of digital literacies.

Information literacy includes: the ability to critically evaluate and access information, as well as creatively use, manage, and apply fundamental understandings of the information. The second category, media literacy, is broken down into two subcategories: analyzing media and creating media products. The skills within this category refer to the ability to understand, interpret, and apply media messages to create a greater sense of one's beliefs and values within these messages. In addition to analyzing media messages it also reflects the ability to create media messages/products sensitive within multi-cultural environments. The final skill set, ICT literacy, has two subcategories of applying technology effectively and 21st century learning environments. These two subcategories reflect the ability to use technology as a tool for research, organization, evaluation, and communication of an abundance of information. In addition to these subskills, the ICT literacy also includes use of digital technologies for communication and social networking, which encourages the sharing of knowledge both face to face and virtually. The Partnership for the 21st Century Skills takes into consideration the new forms of literacy and participatory culture that technology provides for our students both in and out of the classroom. Besides impacting our educational curriculum, technology has also influenced the creation of other national standards.

National Technology Standards

The International Society for Technology in Education is a nonprofit organization dedicated to supporting technology use in both teaching and learning within the K-12 educational setting. The mission of the organization is "to empower learners to flourish in a connected world by cultivating a passionate professional learning community linking educators and partners for expertise, knowledge, and advocacy for strategic policies and continually improving teaching and learning" (International Society for Technology in Education, 2015, our vision and our mission). This particular organization has been very influential in the development of technology standards for both students and teachers in the K-12 setting. In 1998, the International Society for Technology in Education (ISTE) published National Educational Technology Standards (NETS) for students. The student technology standards describe the knowledge and skills needed to learn and live productively in an increasing global and digital society (ISTE, 2007). These standards included six areas of competencies for students: basic operations and concepts, social, ethical and human issues, technology productivity tools, technology communication tools, technology research tools, and technology problem-solving and decision-making tools (ISTE, 2003). These competencies depict the important skills a student needs to be successful in his/her own future career path.

Following the student technology standards, ISTE published technology standards for teachers in 2000. As of March 2003, 29 states had adopted or aligned their student technology standards with the ISTE standards and 30 states were using the ISTE technology standards for educators (ISTE, 2003). The ISTE standards for educators helps them design, implement, and assess technological learning experiences to enhance

student learning and engagement as well as improve professional practices. Teachers who employ these standards become an example and model for other educators, students, and the community on essential uses of technology (ISTE, 2008). The ISTE standards for educators are broken down into five standards and performance indicators within each category. The five standards are intended to facilitate and inspire student learning and creativity, design and develop digital age learning experiences and assessments, model digital work and learning, engage in professional growth and leadership, and promote and model digital citizenship and responsibility (ISTE, 2008). The performance indicators describe elements or pieces that fit within each standard. An example of one of the standards and classroom indicators for teachers is described below (ISTE, 2008, p.1).

1. Facilitate and inspire student learning and creativity. Teachers use their knowledge of subject matter, teaching and learning, and technology to facilitate experiences that advance student learning, creativity, and innovation in both face-to-face and virtual environments.
    a. Promote, support, and model creative and innovative thinking and inventiveness.
    b. Engage students in exploring real-world issues and solving authentic problems using digital tools and resources.
    c. Promote student reflection using collaborative tools to reveal and clarify students' conceptual understanding and thinking, planning, and creative processes.

d. Model collaborative knowledge construction by engaging in learning with students, colleagues, and others in face-to-face and virtual environment.

The performance indicators demonstrate how these standards can transpire in the classroom or the types of classroom activities that will promote a particular standard. The publication of teacher and student technology standards reflects the importance of technology in K-12 education. The ISTE teacher technology standards have led other organizations to create their own teaching standards for specific content areas.

TESOL Standards

The Teachers of English to Speakers of Other Languages (TESOL) expanded on the work done by ISTE with the National Educational Technology Standards Project to create their own technology standards for students and educators. The difference between these two sets of technology standards is the specific pedagogy of English language teaching (ELT) within the TESOL technology standards (Teachers of English of Speakers of Other Languages, 2008). TESOL education wanted to help level the playing field and guide teachers toward more effective technology practices. Through this guidance, teachers might come to realize the possible benefits with technology and the difference between easy and valuable uses of technology. There are some unique aspects to teaching English as a second language (ESL) or English as a foreign language (EFL) that come into play when designing technology standards. One of these unique pieces is students' English language proficiency level ranging from beginning to more advance depending on their experiences both in and out of the classroom with the language. Another piece that needs to be taken into consideration is the variety of

environments where the English language is taught. The educational environments around the world can be vastly different in their access and resources to technology.

Therefore, the students' and teachers' technology standards are designed for different ranges of English proficiency levels and language teaching settings from around the world to provide ample guidance to technology integration. The structure of both the student and educator technology standards are similar to the National Educational Technology Standards including goals, standards, and performance indicators. In addition to the overarching goals, standards, and performance indicators, the project team has also provided vignettes of various situations. The vignettes provide classroom scenarios for different proficiency levels and technological access. These classroom scenarios help ESL and EFL teachers better understand how these standards will work for their particular students and situations. The overarching three goals for students include: demonstrate foundational knowledge and skills in technology for a multilingual world, use technology in socially and culturally appropriate, legal, and ethical ways, and effectively use and critically evaluate technology-based tools as aids in the development of language learning competency as part of formal instruction and for further learning (TESOL, 2008).

The TESOL project team wanted both the student and teacher technology standards to appear in one document because of the interwoven relationships with each other. The team identified technology standards for ESL/EFL education and then generated ones for students and educators. The standards help clarify the difference between simple (e.g., serving as a visual aid) and quality (e.g. developing critical thinking) uses of technology (TESOL, 2008). The technology teaching standards has

four overarching goals: acquire and maintain foundational knowledge and skills in technology for professional purposes, integrate pedagogical knowledge and skills with technology to enhance language teaching and learning, apply technology in record-keeping, feedback, and assessment, and use technology to improve communication, collaboration, and efficiency. These overarching goals are broken down into sub-standards, performance indicators, and vignettes to help teachers in diverse settings around the world (TESOL, 2008). The development of technology standards for both students and teachers emphasizes its importance within the educational system and benefits to both teachers and students. Since teachers are the facilitators of knowledge in the classroom it is critical to fully understand how teachers' use technology in the classroom.

Teachers' Beliefs

Bax (2000) called for research on how the innovation of technology is accepted or effective in the classroom. Since teachers are the facilitators of knowledge in the classroom it was critical to fully understand the issues impacting K-12 foreign language teachers' use of technology in the classroom. It is important to understand teachers' beliefs because they guide the decisions teachers make and actions they take in the classroom (Palak & Walls, 2009). The complex system of teachers' beliefs makes it difficult to understand, change, or enhance classroom teaching practices. Beliefs are a messy construct because they do not lend themselves to an observable investigation (Pajares, 1992). The unobservable nature of beliefs requires educators to self-report their beliefs surrounding technology practices in the classroom. Additionally, Green (1971) established that an individual may hold beliefs that are incompatible with one another.

This can be troublesome because educators' beliefs might not match the reality of their classroom practices due to their unobservable and incompatible nature. In order to fully understand teachers' beliefs it was essential to "infer from what they say, intend, and do" (Pajares, 1992, p. 314). Despite the complex construct of "beliefs," researchers have been calling for more investigations focused on teachers' beliefs (Pajares, 1992). Therefore, a closer look at teachers' beliefs will help uncover the issues, complications, barriers, influences, attitudes, etc. towards the integration of technology into their classroom practices.

According to Pajares (1992), other terms that have been used as beliefs in disguise: attitudes, values, perceptions, theories, and images. Beliefs are one's personal knowledge of the truth, but they have a "stronger affective, evaluative, and episodic nature" (Lundberg & Levin, 2003, p. 24). According to Pajares (1992), a belief "can be defined as being based on judgment and evaluations, in contrast to "knowledge," which is "based on objective fact" (p. 313). Therefore, a statement such as "communicating in the target language is a piece of the foreign language curriculum" is described as "knowledge;" it is a statement of fact that does not incorporate a judgment or an evaluation. Conversely, a statement such as "communicating in the target language is the most important element of the foreign language classroom," is categorized as a belief because it indicates a judgment or evaluation (Cummings, 2005). A person believes something to be true and two people can hold the same belief, but not with equal degrees of strength or with matching resources and evidence (Green, 1971). In regards to varying degrees of beliefs, no one holds a particular belief independent from others meaning that

beliefs occur in groups or within a belief system, but never in isolation. A belief system, according to Green (1971), demonstrates varying degrees of strength:

> Imagine a belief system with the structure of a set of concentric circles, within the core circle will be found these beliefs held with the greatest psychological strength, those we are most prone to accept without question, those we hold most dearly, and which we are at least able to debate openly and least able to change. As we move from circle to circle toward the perimeter, there will be found those beliefs we hold with progressively less strength and more prepared to examine, discuss, and alter (p. 46).

Therefore, beliefs can be seen as primary or derivative depending on their strengths and position within the concentric circles of the belief system. The positioning of a belief is not only a representation of the belief, but its connections to other beliefs. The more a belief is connected and in communication with other beliefs, the more implications it has for other beliefs. Primary or core beliefs are the most difficult to change due to their connections to other beliefs (Rokeach, 1972). Besides being primary or derivative, beliefs can be conscious or unconscious; meaning one can claim a belief and demonstrate actions inconsistent with this particular belief. For example, a teacher believes it is important to give students some control in the classroom, but ends up controlling every activity within the lesson plan. These classroom inconsistencies can happen within the classroom due to the interaction with other beliefs and contextual factors.

Teachers' belief systems consist of interacting, interconnecting, and overlapping beliefs that are in continuous communication with each other (Pajares, 1992). According

to Richardson (1996), the three main sources for teacher beliefs are personal experiences, instructional experiences, and pedagogical content knowledge. Teachers also hold beliefs about their work, students, roles and responsibilities. These beliefs influence classroom actions, judgements, decisions, planning, etc. In the classroom, when teachers are missing the necessary knowledge, they rely on their beliefs to guide them (Green, 1971). An important element about beliefs is their inability to change due to a person's strong conviction over their values in the classroom (Block & Hazelip, 1995). Teachers' beliefs can help predict subsequent classroom actions. When a new tool or pedagogical approach is present in the classroom, a teacher makes a decision as to the goals it might help accomplish (Zhao, Pugh, Sheldon, & Byers, 2002).

Thus, beliefs appear to shape teachers' decisions about pertinent knowledge, routines, and goals along with taking into consideration the context of the classroom (Speer, 2005). "Teachers 'interpret' a teaching situation in the light of their beliefs about learning and teaching a second language; the results of this interpretation is what the teacher plans for and attempts to create in the classroom" (Woods, 1996, p. 69). Teachers' beliefs about teaching, learning, and technology can be incorporated into the classroom as long as it helps achieve classroom goals. Thus, the relationship between teachers' beliefs, decisions, and classroom practices will help shed light on the possibilities of technology integration (Chen, 2008).

Teachers' Decisions

Teachers play a vital role in deciding what happens and is implemented into classroom practices on a minute-by-minute basis. The construction of a course, syllabus, and curriculum is completed through a progression of decisions made by the teacher in

connection to other elements of the environment. Teachers interpret the activities and behaviors occurring within the classroom to guide their planning for each subsequent activity, day, week, etc. (Woods, 1996). According to Borko, Cone, Russo, & Shavelson (1979) a teacher's decision-making process can be described as the following:

> Teaching is viewed as a decision making process, the teacher is seen as an active agent who selects a teaching skill or strategy in order to help students reach some goal. The choice maybe based on one or more factors. Teachers would need to integrate the larger amount of information about students from a variety of sources and somehow combine this information with their own beliefs and purposes, the nature of the instructional task, the constraints of the situation and so on in order to select an appropriate instructional strategy (p. 139).

These classroom decisions are based on context, prior decisions and experiences, and the overall goals of the curriculum. The interconnected relationship between decisions, rationale, and interactions creates the planning process for teachers within their curriculum development. Due to the continuous relationships between beliefs, decisions, and classroom proceedings, it is important to examine teachers' beliefs about teaching, learning, and technology (Levy, 2009). However, there are additional elements both within the classroom and institutional environments that contribute to the implementation of new pedagogical tools, technology.

Internal Factors

People have a tendency to hold strong to their beliefs even when faced with sound evidence to the contrary (Cummings, 2005). The internal factors focus on the creation and changing aspects of teacher beliefs which activate the decision making process for

classroom practices. Teachers make decisions based on their beliefs created through chance, failures, successes, knowledge, background knowledge, etc. (Pajares, 1992). The complex tasks of curriculum development include both available resources and constraints. Teachers need to find a way to balance these two elements in order to achieve their classroom goals. According to Woods (1996), constraints refer to factors that limit the possibilities for teachers that can either be external or internal for each individual teacher. The internal factors (i.e. intrinsic, second-order changes) are elements within the decision-making process: relationship amongst decisions, learning beliefs, teaching beliefs, belief systems, experiences, etc. The external factors (i.e. extrinsic, first-order changes) refer to the situational elements: class size, subject, resources, administration, colleagues, etc. (Ertmer, 2005).

Past research has emphasized the impact of second-order changes on first-order changes in the educational system (Hativa & Lesgold, 1996). For example, if an educator does not believe technology enhances foreign language learning then it will not matter whether he/she has access to computers, time to incorporate technology into their curriculum, added technical support, etc. because the educator will still not implement technology into his/her daily classroom practices. Internal factors are seen to be more influential than external factors in their ability to be successful, especially with technology usage (Ertmer, Ottenbreit-Leftwich & York, 2006). Thus, it is important to uncover teachers' internal factors and their interplay with external factors as they impact pedagogical practices.

In order to make modifications to second-order changes, one has to challenge the belief system of educators and classroom routines. In addition to challenging beliefs, the

new state (belief) has to be desirable and available in the educational environment, as well as not impending on the current goals of the individual. Some additional factors playing a role in changing beliefs are: earlier experiences, contradictory information, and pedagogical approaches (Ertmer, 2005). In order for a second-order change to occur, education innovation (technology) is essential to uncover teachers' current classroom beliefs and practices (Ertmer, Addison, Lane, Ross, & Woods, 1999). There are several intrinsic factors that contribute to technology integration in the classroom: motivation, self-interest, fears, underlying beliefs, roles of educators, pedagogical approaches, etc. (Cuban, 1986, Means, 1994; Ertmer, 1999). The interconnected relationship between teachers' first-order and second-order changes need to be looked at in more detail with the aim of uncovering the interplay on teachers' beliefs and their impact on technology integration into classroom practices. This study focuses on K-12 foreign language teachers' integration of technology into classroom practices that can be discovered by understanding teachers' belief systems.

Paradigm Shift in Teaching with Technology

Teachers' beliefs predict subsequent classroom actions in regards to decisions, planning, classroom activities, assessments, etc. There are two conflicting paradigms creating an impact on technology integration into classroom practices (Lucas & Wright, 2009): behaviorist and constructivist. The behaviorist or more traditional views of teaching utilizes a lecture-based style where students sit, listen, and learn from the instructor. Students are responsible for memorizing and learning the content through the lectures and individualized learning is supplemental. It does not promote creative thinking, collaboration, or cooperative learning. The majority of the time the decisions in

the classroom come from the teacher without the added input from students (Learning Theories Knowledgebase, 2008). The second paradigm, constructivist, views learning as an active process. Learners construct knowledge based on their personal experiences and link new knowledge to prior knowledge. Students are actively involved in their learning through collaboration, cooperative learning, project-based learning, etc. to promote critical thinking and problem solving skills. The majority of the time students are interacting with the materials and others towards a common goal (Learning Theories Knowledgebase, 2008)

These two paradigms have also played a role in technology implementation. Teachers who have teacher-centered, pedagogical beliefs use technology more as a reward for a lot of independent practice or learning experiences controlled by the teacher; while a student-centered pedagogical beliefs use technology to support collaboration, project-based learning, critical thinking, cooperative learning, etc. (Palak & Walls, 2009). Teachers with more traditional beliefs will implement technology for low-level (i.e., visual aids) uses while more constructivist teachers will implement higher level (i.e., project-based learning) uses of technology (Judson, 2006). Research has demonstrated a connection between technology and the constructivist view of learning. Teachers whose pedagogical beliefs aligned with the constructivist teaching are more likely to incorporate or be open to incorporating technology into their classroom practices, while teachers with pedagogical beliefs aligning with traditional teaching are less likely to integrate technology into classroom practices (Lucas & Wright, 2009). The field of education has recognized that traditional pedagogies need to be changed to better integrate the new digital tools (Sheridan & Roswell, 2010). Therefore, teachers' pedagogical beliefs can

also impact their decisions, planning, and integration of technology into classroom practices. Teachers' pedagogical beliefs constitutes another layer of beliefs within the intrinsic factors influencing their uses of technology, but there are added constraints of the environment contributing to teachers' pedagogical practices.

Contextual Factors

Besides educator's beliefs, there are other barriers that have an impact on foreign language teachers' integration of technology into classroom practices. The barriers to change are both intrinsic and extrinsic elements influencing teacher's abilities to implement practices into their teaching. There are two types of barriers that influence educators' beliefs about teaching and learning: first-order (e.g. intrinsic and internal) and second-order changes (e.g. extrinsic, external, and contextual). First-order changes focus on continuous efficiency and improvement of classroom practices, but the underlying beliefs are not changed. Second-order changes focus on challenging current classroom beliefs to lead to new goals, activities, and innovation (Ertmer et al., 1999). Contextual factors in schools and classrooms can greatly impact the process of change for teachers' beliefs and knowledge (Richardson, 1996). These contextual factors will contribute to inconsistencies between teachers' expressed technological pedagogical beliefs and its actual implementation into classroom practices. Teachers' explanation for these inconsistencies often reference contextual limitations such as curriculum requirements, social pressure exerted by parents, peers or administrators, and resources (Ertmer, Gopalakrishnan, & Ross, 2001).

External factors are situational factors which teachers take into account when making decisions, creating plans, and executing classroom activities (Woods, 1996).

These factors can be broken down into two main categories: factors within the institution and factors directly linked with the teachers. Researchers have identified that many of the first-order changes to technology implementation within the institution revolve around the culture, administration, infrastructure, and support. The factors associated with the culture of the institution: organization, inability to provide students with training or troubleshooting, poor quality of programs, peer use at the same institution, norms, etc. (Becker, 2000b; Reiser, 2001; Bitner & Bitner, 2002; Butler & Selbom, 2002; Hannessey, Ruthven, & Brindley, 2005). Each institution, administration, and team of teachers has their own set of norms that guide their instructional practices, from their values to instructional methods to acceptable tools within classroom practices (Ertmer & Ottenbreit-Leftwich, 2010). Technology innovation within the classroom is less likely to occur if it deviates too much from the current values, beliefs, and practices of the schools' administrations and colleagues within the institution (Zhao & Frank, 2003).

In addition to the values, practices and beliefs of the administration, research has documented that poor leadership, staff development activities, scheduling, smaller class sizes, funding, and expenses of installation all influence technology use (Cuban, 1986; Becker, 2001a; Reiser, 2001; Bitner & Bitner, 2002). The infrastructure depends on the amount of funding and maintenance allocated from the schools' budget. The lack of equipment and resources, hardware and software access, and lack of technology support can lead to gaps in a supportive infrastructure and can impact teachers' abilities to integrate technology into classroom practices (Cuban, 1986; Bitner & Bitner, 2002; Butler & Seldom, 2002; Wonzey, Venkatesh & Abrami, 2006). A second set of factors directly linked to teachers seem to have the greatest impact on the uses of technology in

the classroom. The most influential factor is time; few teachers have the planning time required to make best use of technology (Wang & Reeves, 2003). Another influential piece is the lack of teacher training for integrating technology into the classroom, which impacts their skills and knowledge about technology (Hong, 2010). Other aspects related to teachers' technology integration include: computer literacy skills, gender, age, years of teaching, years of technology use, workload, and prior experiences with technology (Reiser, 2001; Bitner & Bitner, 2002; Butler & Selbom, 2002; Hernandez-Ramos, 2005; Wozney et al., 2006). Both contextual factors and intrinsic factors can impede teachers as they try to adjust to any change in the classroom. It can be very difficult to address a particular challenge prior to others, as new challenges constantly emerge (Ertmer, 1999). The interconnected relationship between teachers' first-order and second-order changes needs to be looked at in more detail with the aim of uncovering the interplay on teachers' beliefs and their impact on technology integration into classroom practices.

Therefore, the intention of the study is to not only to uncover first-order changes, but also to probe deeper into second-order changes impacting the implementation of technology by K-12 foreign language educators. Researchers have expressed the importance of designing a study on beliefs that takes on a mixed-methods approach because of the complicated nature of beliefs (Palak & Walls, 2009). This investigation intends to help eliminate educators' bias of their own beliefs by taking it one step further than past studies. K-12 foreign language teachers will complete a self-reported questionnaire, but the second step of follow-up interviews will probe deeper into second-order changes, teachers' beliefs, and their intersecting relationships.

Foreign Language Teachers' Use of Technology

Over the past several years, researchers have been investigating the various uses of technology in the foreign language classroom. The first study, *Technology and Teaching Culture: Results of a Statewide Survey of Foreign Language Teachers* (Moore, Morales & Carel, 1998), was a non-experimental quantitative study that contained a six-page survey using a Likert-type scale on frequency with a small section for open-ended questions about technology. The aim of the study was to discover language teachers' use of available technology for teaching culture, and how language teachers incorporated technology into various classroom activities. "The survey response rate was 20 percent, which was 388 completed surveys from second language teachers in Texas" (Moore et al., 1998, pp. 113). The surveyed teachers taught in middle school, high school, and college levels of education along with having diverse years of teaching and educational backgrounds.

The data analysis consisted of five variables from the state survey: level of teacher education, years of teaching experience, languages taught, school setting, and level of schooling. Each of these variables affected the use of technology in the classroom for second language teachers in Texas. The level of education influenced the frequency of technology use in the classroom; teachers with doctorate degrees utilized technology more than teachers with bachelor's degrees. The years of experience influenced the use of technology in the same manner as levels of education. Teachers with more years of experience incorporated technology more often than less experienced teachers. The language taught variable was surprising for the researchers. The study showed that Japanese second language teachers used technology more than commonly

taught language teachers, despite available materials for the more commonly taught languages (French, Spanish, German). The fourth variable, school setting, was more important for the rural teachers than the urban teachers. The school systems in rural settings had fewer resources, which led to less technological advancement. The final variable that affected technological implementation was the level of schooling. Elementary school teachers used technology less than middle or high school educators (Moore et al., 1998).

A subsequent study, *Classroom Management-Classroom Survival: One Teacher's Story of Constructing Practice in a Computer-Equipped, Foreign Language Classroom* (Burnett, 1999), was a qualitative case study that provided in-depth information on the incorporation of computers into a text-based curriculum from the perspective of a French teaching assistant. The study uncovered how the teacher negotiated and experienced the inclusion of technology into the teaching of a second language. The data were collected through three, one-hour audio-taped interviews with the participant along with the researcher's observations of the classes and training sessions. The researcher kept a reflective journal to help record both encounters with informants (other individuals in the environment) and a daily log of research activity. The data collected on the participant were completed over the course of an academic year.

The participant in this study was Leslie Fiero, a teaching assistant for French 103 course, which met four times a week with one class session conducted electronically. She is in her mid-thirties with ten years of teaching experience at the high school and university settings. The data analyzed consisted of interpretations of the transcribed interviews to find patterns or themes. "The main influences on Leslie's incorporation of

technology were due to her own personal conflicts with it and her lack of confidence in her abilities to use or teach through technology" (Burnett, 1999, pp. 281). Leslie employed a variety of coping strategies that helped her survive the electronic classroom. Two elements would have helped Leslie utilizes technology better were improved preparation programs and administrative support throughout the course. This study alludes to the importance of preparation and support in assisting educators in utilizing technology in their classroom practices.

An additional study that focused on foreign language teachers use of technology was conducted by Lam (2000) entitled, *Technophilia vs. Technophobia: A Preliminary Look at Why Second Language Teachers Do or Don't Use Technology in their Classroom*. The qualitative approach to research was incorporated into the study, but more specifically it used a mixture of phenomenological and symbolic interactionism. "Phenomenology studies the manner in which people make meaning out of their lived experiences, and symbolic interactionism studies the interpretative processes being used by people in dealing with materials and social situations" (Brantlinger, Jimenez, Klingner, Pugach, & Richardson, 2005). The aim of the study was to discover why second language teachers used or did not use technology in teaching, and outside factors that might influence these decisions. The data were collected through a questionnaire on each participant's professional, educational, and personal background. The researcher conducted semi-structured interviews with each of the participants, which were recorded and transcribed to help analyze the collected data. "The participants included four male and six female graduate students between the ages of 35 to 50 with varying years of teaching experience from two to ten" (Lam, 2000, p. 396). The collected data were

analyzed by comparing the participants' responses to the questionnaire and the interviews in order to find common patterns.

The common patterns were then generalized into four main descriptive categories: teachers' perceptions of technology, stated reasons for using technology, stated reason for not using technology, and factors that influence decisions on technology. Overall the teachers' perception of technology was that it would enhance classroom tasks. According to the teachers, the primary reason for the implementing technology into the classroom was to improve student learning through the use of materials that bring authenticity to the target language for students. A reason for not using technology in the classroom was the teacher's lack of knowledge on various technological components. Other factors that were shown to impact a teacher's use of technology were: lack of professional development, lack of resources or money, lack of time, and lack of administrative or parental support (Lam, 2000). The investigation was able to reveal some of the external barriers that teachers' face when integrating technology into the classroom.

An additional study conducted by Cummings (2005), *Administrative and Pedagogical Uses of Computers in Foreign Language Classrooms: A Survey of Spanish Teachers' Beliefs and Practices,* focused specifically on secondary Spanish educators in the United States in relation to their administrative and pedagogical uses of technology in the classroom. The aim of this particular study was two-fold: understand how teachers utilize computers in both administrative and pedagogical ways and the influence one's beliefs can have on integrating technology into the curriculum. Participants for the study were selected from the members of ACTFL, Advance Placement Spanish teachers or

members of the American Association of Teachers of Spanish and Portuguese (AATSP) in Georgia. 500 teachers were selected from this population to take part in the study. A questionnaire was generated through current literature on teacher cognition, foreign language education, technology, and survey design. Through this particular questionnaire, Cummings (2005) was able to discover that many teachers utilized computers for administrative reasons due to the establishment of computer software by school districts, which was required to report attendance and grades. The pedagogical uses of computers in the classroom were a little more complicated because of the influence of teacher beliefs. The majority of the teachers felt that computers could enhance the main skill sets of language learning: grammar, reading, writing, and listening. However, some teachers were concerned that the use of on-line translators deterred them from including computers for specific tasks in the classroom. The study was able to uncover both administrative and pedagogical uses of computers in the classroom along with discovering the impact beliefs can have on classroom practices.

However, there are some limitations for this particular study due to the smaller pool of participants in the field of foreign language education and the specific technology included in the study. There have been some changes in the field of education through the expansion of language offerings and the various technological tools created. The intent of this particular study is to focus on the foreign language classroom and technology use by its educators through the expansion of the participant pool to include all languages and the expansion of the idea of collaborative technology. Technology has the ability to open up new doors for language learning, advancing skill levels, bringing in the native culture, and enabling communication practice with native speakers. Gaining a

better understanding of foreign language educators' perspectives on technology can better equip administration and programs with solutions to internal and external barriers prohibiting technology inclusion into their classrooms.

A more recent study investigated by Kazue Oda (2011), *Post-Secondary Foreign Language Teachers' Belief Systems about Language Teaching/Learning and Technology/Teaching with Technology*, focused on Spanish post-secondary foreign language educators' beliefs and uses of technology in the classroom. The aim of the study is to uncover the interrelated relationship between teachers' beliefs about teaching and learning and teaching with technology. Oda (2011) utilized a multiple case study with three post-secondary Spanish professors drawing on various forms of data: observations, questionnaires, and interviews. Oda discovered teachers' beliefs are greatly impacted by past experiences both as teachers and learners in the classroom. These central beliefs must also align with technology and its purposes in the classroom. All three teachers were situated in a similar environment, but their uses of technology were different based on their intended purposes in the classroom. Teachers' beliefs impacted their views on technology and the manners in which technology was integrated into the classroom. Some contextual factors have also influenced technology uses in the classroom: lack of access and training as well as some pedagogical implications. The study was able to uncover the role beliefs can play within the classroom for both teaching and learning. It also revealed the individualized nature of technology use in the post-secondary foreign language classroom.

However, there are some limitations for this particular study due to the small number of participants in the field of post- secondary foreign language education and the

focus on one particular language, Spanish. The study was able to reveal the individualistic nature of technology, but only took into account a few of the extrinsic and intrinsic factors impacting technology integration. There are other elements of the classroom that impact a teachers' use of technology besides beliefs: policies, administration, support, culture, etc. These elements are seen more as the contextual factors while beliefs are more intrinsic. So, the intent of this particular study is to focus on the K-12 foreign language classroom and technology use by its educators through the expansion of the participant pool to include all languages and the various educational environments. Gaining a better understanding of K-12 foreign language educators' beliefs and contextual factors within a variety of educational environments and their impact on technology integration in the classroom will create more engaging, active, and enhanced academic experiences for the students. Therefore, this study focuses on three major research questions: what factors influence foreign language teachers' incorporation of technology in the classroom, how do different characteristics (background, technology knowledge, resources, etc.) impact the use of technology by foreign language educators, and how does the data from the self-administered questionnaire compare to the data collected during teacher interviews.

Theoretical Framework

The complicated and messy construct of beliefs does not lend itself to a clear cut theoretical foundation. The unobservable nature of beliefs creates an additional level of complexity for researchers to deal with when selecting a framework (Pajares, 1992). In order to fully understand teachers' beliefs, it is essential to "infer from what they say, intend, and do" (Pajares, 1992, p. 314). Therefore, researchers must choose from a

variety of related theories on belief systems that take into account teachers' practices along with technology integration. Moreover, the context of the foreign language classroom and curriculum brings, on its own, unique facets to technology integration. For example, a K-12 foreign language teacher must not only teach the intricate pieces of the language to his/her students, but also incorporate the multitude of cultures associated with the target language. The foreign language teacher is challenged to provide both breadth and depth to the cultural elements of the language.

In reviewing the literature on technology integration, teachers' beliefs, and the foreign language classroom, I found a theoretical framework and a model that complement each other well and uncover different pieces of teachers' beliefs, both intrinsic and extrinsic, that impact the integration of technology into classroom practices. Thus, I explore the research questions by pairing the theoretical frameworks of Expectancy-Value theory and the Conditions for Classroom Technology Innovations model to provide a more encompassing picture of teachers' beliefs and barriers to uses of technology in the classroom. Expectancy-Value theory gives a picture of the more intrinsic factors that can influence a teacher's use of technology in the classroom (Wozney et al., 2006) while the Conditions for Classroom Technology Innovations model provides a structure to the various extrinsic factors impacting the integration of technology into classroom practice (2002). The interplay of the framework and model create a more complete investigation into the construct of beliefs.

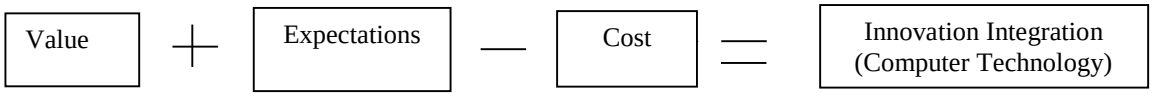
Expectancy-Value Theory

Expectancy-Value theory is a model for understanding and predicting behaviors (Fishbein, 1968). The premise for this particular theory states that an individual holds

various beliefs about a particular object that can be either positive or negative, thus creating an overall attitude. Therefore, on future interactions with the specific object, the individual will draw upon his/her attitudes and beliefs during his/her interactions with the object (Fishbein, 1963). In other words, " innovations are more likely to be adopted if the perceived value of the innovation and the likelihood (expectancy) of success are high, as well as if these benefits outweigh the perceived costs of implementation" (Wozney et al., 2006, p.177). For example, a student will incorporate a new reading strategy if he/she feels the benefits of the strategy outweighs the costs of learning a new strategy and its implementation into reading.

Thus, there are three distinct elements to the Expectancy-Value theory: expectancy, values, and costs. The expectancy concept examines individual's beliefs amongst the use of a strategy and a desired outcome. The value construct assesses the degree to which an individual perceives the outcomes of a particular strategy as worthwhile. The costs assess the physical and psychological demands associated with implementing a particular strategy (Wozney et al., 2006). In order for an individual to implement a specific strategy, one must have high anticipation for success and believe the end result as important enough to overlook the impending barriers. To finish the cycle, an individual will evaluate the process of strategy incorporation to decide whether it was worth the trouble or not. The final evaluation will create change or validation for the individual's belief system. Figure 3 below demonstrates the circular pattern of one's beliefs and their impact on various strategies for technology integration.

Figure 3. Expectancy Value Theory for Technology Integration



Source: Wozney, L., Venkatesh, V., & Abrami, P.C. (2006). Implementing computer technologies: Teachers' perceptions and practices. *Journal of Technology and Teacher Education*, 14(1), 173-207.

Research Grounded in Expectancy-Value Theory

The Expectancy-Value theory was originally utilized more in the industrial and occupational settings, which discusses the leadership decisions, attitudes, motivation, and social power as they pertain to an organizational structure (Mitchell, 1977). Within the occupational setting, researchers have conducted a variety of studies surrounding the work environment to predict individual differences with job-satisfaction, motivation to work, interactions between co-workers, productivity, effects of unemployment, etc. (Kopelman, 1979). The intention of these studies was to uncover strategies for predicting employee beliefs and the elements impacting their beliefs. However, the Expectancy-Value theory has changed venues in the world of research from the industrial and occupational setting to the educational environment.

More recent investigations have looked into the motivational factors impacting students' achievement abilities with various subject matters. Wigfield (1994) conducted a study to understand children's competency beliefs and value toward mathematics. The study reviewed a strong connection between students' beliefs and achievement in mathematics. If students had a positive belief about their mathematical abilities. then their achievement level increased, but the reverse is also true; a negative perspective led to lower achievement levels. A new study utilized Expectancy-Value theory to

investigate K-3 elementary teachers' use of Comprehension Strategy Instruction (CSI) and factors impacting its integration into the curriculum (Foley, 2011). CSI is explicitly teaching cognitive strategies through explaining, modeling, and scaffolding for a gradual release to students. Through CSI readers use the strategies to construct meaning while interacting with text. The researcher sent out surveys to K-3 teachers to uncover the three areas of the theory: expectancy, values, and costs. A correlation was found between teachers' expectancy value of CSI and their willingness to implement it into their curriculum. Other factors were seen as beneficial for CSI integration: literacy coaches, training, teacher collaboration, and peer teams (Foley, 2011).

Besides student achievement levels and teachers' implementation of CSI, the Expectancy-Value theory has also been utilized to discover teachers' implementation of computer technologies. Wozney et al., (2006) investigated personal and setting characteristics, teacher attitudes, and current technology practices of both elementary and secondary teachers. The researchers wanted to uncover teachers' perceived expectancy of success, value of technology use, and cost of technology use into classroom practices. "The investigation found out that technology implementation is a dynamic process mediated by subjective teacher characteristics and by conditions within the school" (Wozney et al., 2006, p. 192). The following elements: teaching style, personal computer usage, technology-related training, and computer access were found to have an impact on teachers' attitudes toward technology integration.

This study focuses on teachers' technology integration, but selects a very specific type of educator: K-12 foreign language teachers. According to the theory base, "innovations are more likely to be adopted if the perceived value of the innovation and

the likelihood of success are high as well as if these benefits outweigh the perceive costs of implementation" (Wozney et al., 2006, p.177). In other words, teachers will implement new forms of technology into their teaching if they believe them to be valuable and successful within classroom instruction. Teachers have to be able to get past the costs of integrating technology into the classroom, which includes both intrinsic and extrinsic barriers.

Conditions for Classroom Technology Innovation Model

The Conditions for Classroom Technology Innovation model was generated to understand the intricate and messy process of classroom technology integration. A study conducted by Zhao et al., (2002) identified factors that help facilitate or hinder technology integration into K-12 classrooms. The participants for the yearlong study were selected from the recipients of a state technology innovation grant intended to support educators' technology integration to improve student achievement. A survey was designed to uncover technology proficiency, computer anxiety, attitudes and beliefs toward technology, previous and planned professional uses of technology, pedagogical styles, and experiences preparing for grant proposal, which was sent out 118 educators. Follow up interviews with 32 educators focusing on previous experiences with technology, motivation for applying for the grant, and concerns or plans for implementing technological innovations. In addition to the surveys and interviews, ten teachers were selected to be observed and interviewed following each observation. The researchers also interviewed students and colleagues to gain an insight into technology in the classroom. Additionally, data that was analyzed included a second interview on teachers' experiences mid-year, message postings on grant listserv, teachers' weekly

journals, and ten team journals. A thematic analysis was used to analyze all of the data collected within the study to identify each case as either a success, mixed success or failure. Attention was also given to factors that were present or absent within in each case.

The study identified three major pieces for successful technology integration into classroom practices: the innovator, the innovation, and the context. The innovator is the teacher and the first person to identify factors that influence technology uses. Three factors of the innovator contributing to technology success: technology proficiency, pedagogical compatibility, and social awareness. Technology proficiency is the knowledge of what is necessary to use technology in teaching and the ability to use software applications. Pedagogical compatibility looks at the relationship between technology and teachers' pedagogical beliefs. "Successful implementation of technology innovation into the classroom is more likely when teachers are highly reflective about their own teaching practice and goals, in the sense that they consciously use technology in a manner consistent with their pedagogical beliefs" (Zhao et al., 2002, p. 492). The success of technology also depends on the teachers' value or view of technology and its connections to their curriculum. The final element, social awareness, relates the ability of the teacher to understand the social dynamics of the school system. A school's social dynamics refers technical support, peer support, resources beyond teachers' control, school resources, etc.

The second major element within the model, innovation, is the technology integration itself. The innovation is seen to be successful based on two factors: distance and dependence. Distance of school culture refers to the degree that an innovation differs

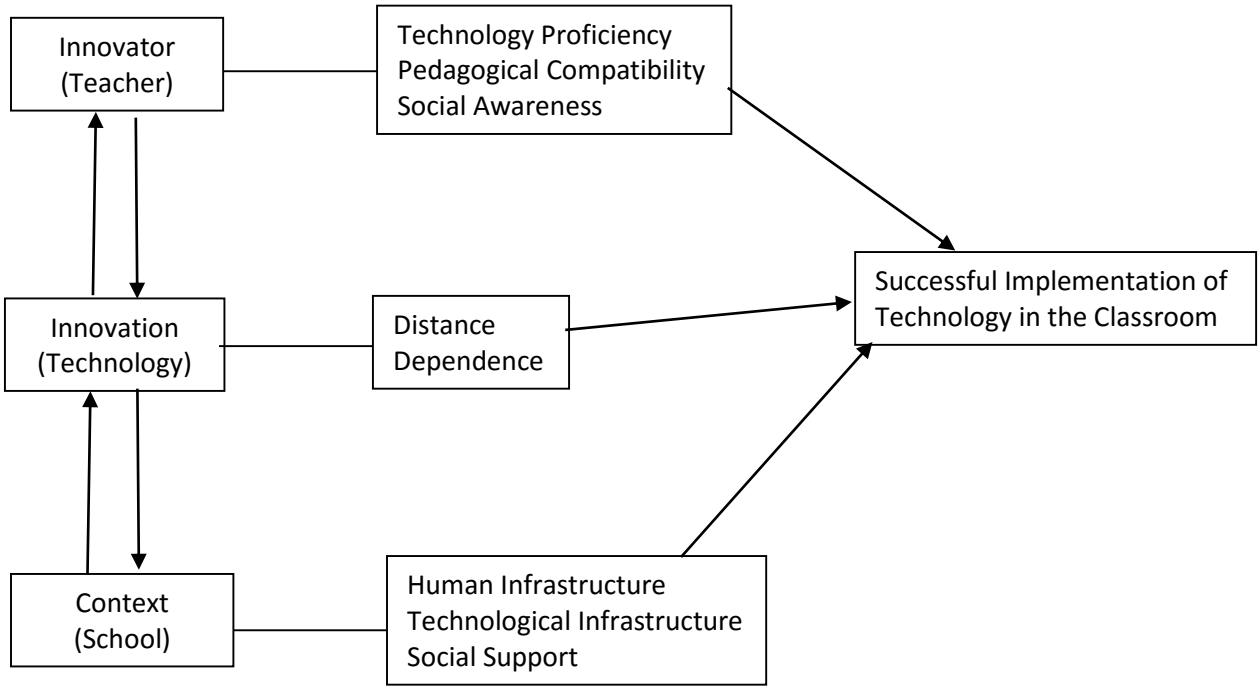
from the more dominate values, pedagogical beliefs, and practices of teachers and administrators in the school (Zhao et al., 2002). Distance from existing technological resources is the amount of resources (hardware, software, connectivity, etc.) needed for success of the new technology. Besides distance, dependence is broken down into two pieces: others and technological resources. Dependence on others is the degree that the innovation requires collaboration, support or participation, while dependence on technological resources refers to the innovations reliance on resources outside of the control of the innovator. The less dependent and distant the innovation is from the school culture and resources, the more successful the innovation will be within classroom practices.

The continuous interactions between the innovator and the innovation can help hinder or influence technology integration, but there is a final element in the intricate relationship. The piece is the context referring to human infrastructure, technological infrastructure, and social support. A human infrastructure includes a highly trained and helpful technical staff, a group of people who can help teachers understand and use technology, and a supportive administration. The technological infrastructure is the actual resources available to teachers: computers, network, connectivity, software, etc. Social support is the degree that colleagues support or discourage the innovation. The three domains of the model have interconnected relationships, but some of them seem to play a bigger role in technology innovative success. The strongest pull for technology innovation comes from the innovator, but the innovation and context play a role in its success or failure within classroom practices. "Teachers are not 'free agents' and their

use of technology for teaching and learning depends on the interlocking cultural, social, and organizational contexts in which they live and work" (Somekh, 2008, p. 450).

Therefore, the Conditions for Classroom Technology Innovation model depicts the continuous relationship between the major factors impacting the successful integration of technology into classroom practices. This model provides a glimpse into the interrelated factors impacting successful technology implementation. Even though there has not been any further research utilizing the model by Zhao et al. (2002), additional research on factors impacting teachers' technology use has uncovered similar elements: time, resources, support, collaboration, beliefs, classroom culture, professional development, etc. This is the only model that describes the interconnected relationship of the various pieces and their impact on technology integration into the classroom. Zhao & Frank (2003) has expanded on this particular model to look more at an ecological perspective encompassing more of a hierarchical structure of the school ecosystem. This system includes the President and Governor Legislation to the school board and administrations. Each of these factors enforces policies and procedures that impact each educator's classroom. The ecological model focuses on the hierarchical factors and their impact on schools. Although these elements might play a role in education, the major area in technology innovation is the educator. This specific study focuses on K-12 foreign language teachers' technological beliefs and the factors that influence its integration into the classroom. Figure 4 below depicts the different factors and people within the classroom that impact successful technology implementation into the classroom.

Figure 4. Classroom Technology Integration



Source: Zhao, Y., Pugh, K., Sheldon, S., & Byers, J. (2002). Conditions for classroom technology innovations. *Teachers College Record,* 104(3), 482-515.

Interplay of both Theories

The messy construct of beliefs brings diverse perspectives into a single study, which is seen as being better equipped to reflect social realities (Tashakkori & Teddlie, 2003). The two interrelated theory and model on teachers' beliefs provide a strong basis for a mixed methods study due to the complex phenomena, beliefs, within the study. Expectancy-Value theory lays the ground work in understanding various teacher beliefs, which might influence a teacher's decision about integrating technology into his/her classroom curriculum. The Conditions for Classroom Technology Innovation model helps uncover various external factors in K-12 foreign language teachers' adoption of technology into everyday practices. The incorporation of these two pieces will help

uncover the items prohibiting teachers from including technology into the classroom and provide suggestions to enhance both teaching and learning experiences. The interrelated theory and framework depict an embedded connection between beliefs and implementation, creating a need for a mixed methods investigation.

Conclusion

The vast developments of new multimedia technology tools are changing the roles of the teachers and learners in the classroom. Teachers have taken on a more facilitative role in the classroom where they find information to be re-created by the students in the classroom (Warschauer & Healey, 1998). Students are taking on an active role in language learning through the interactions with various technologies. There has been a call for research on how the innovation of technology can influence the various pieces of the classroom. Since teachers are the key to incorporating materials, multimedia, activities, etc. into the curriculum, it is important to gain their perspectives on technology integration. Educators' beliefs and perspectives guide the decisions they make and the actions they take in their own classrooms (Palak & Walls, 2009).

In spite of the benefits of technology integration, there are still teachers who have not yet accepted the need for technology inclusion into their own language curriculum (Lotherington & Jenson, 2011). Teachers are the key decision-makers who direct instruction and shape the environmental context in which technologies are used in the classroom (Web-based Education Commission, 2000). Teachers' decision-making processes are deeply rooted in teachers' beliefs (Borg, 2003; Richardson, 2003). Strong beliefs about teaching, learning, and technology that teachers bring into classroom can act

as barriers to the effective integration of technology in education (Cuban, 2001; Bai & Ertmer, 2004; Palak & Walls, 2009).

Therefore, it is important to uncover K-12 foreign language teachers' technological beliefs and their implementation into the curriculum. The intent of this particular study is to focus on K-12 foreign language classroom practices and technologies used by educators. Gaining a better understanding of K-12 foreign language educators' technological beliefs can better equip administration, professional development programs, and pre-service educational programs with suggestions on how to help with both internal and external barriers influencing technology inclusion in the classroom. The intricate relationships between teachers, technology, and beliefs need to be thoroughly considered in order to understand various uses of technology in the foreign language classroom.

CHAPTER 3

METHODOLOGY

Introduction

The intent of this study is to focus on K-12 foreign language teachers' technology usage for their classrooms within the state of Iowa. Technology has the ability to open up new doors for language learning, advance skills development, bring in the native culture, and enable communication practice with native speakers. However, the complex system of teachers' beliefs makes it difficult to understand, change, or enhance classroom teaching practices. Beliefs are a messy construct because they do not lend themselves to an observable investigation (Pajares, 1992). Further, it is troublesome because educators' beliefs might not match the reality of their classroom practices. In order to fully understand teachers' beliefs, it is essential to "infer from what they say, intend, and do" (Pajares, 1992, p. 314). According to Richardson (1996), the three main sources for teacher beliefs are personal experiences, instructional experiences, and pedagogical content knowledge. Teachers also hold beliefs about their work, students, roles, and responsibilities. These beliefs influence classroom actions, judgments, decisions, planning, etc. In the classroom, when teachers are missing the necessary knowledge, they rely on their beliefs to guide them (Green, 1971). It is important to understand teachers' beliefs because they guide the decisions teachers make and actions they take in the classroom (Palak & Walls, 2009).

Therefore, the chosen methodology for this study is mixed methods where both quantitative and qualitative data are collected, analyzed, and mixed into one study to

obtain a better understanding of reality (Johnson & Onwuegbuzie, 2004). The focus of the study is on three major research questions:

1. What influences K-12 foreign language teachers' reported technological beliefs and integration into classroom practices?
2. How do the perceived contextual factors (time, resources, training, etc.) impact the use of technology by foreign language educators?
3. How does data from the self-administered questionnaire compare to the data collected during teacher interviews?

Mixed Methods Research

Researchers face a multitude of decisions to make in regards to research: methodology, methods, world views, research questions, data collection, data analysis, etc. One of the important decisions is the choice of methodology, because it helps direct other research selections and contributes to a "domino effect." The options of methodology range from quantitative to qualitative with a mixture in between. An evolution of research methodologies develops a third methodology, mixed methods. The development of a third methodology emerges from the concept of triangulation where two data sources are used together to study the same social phenomena (Tashakkori & Teddlie, 1998). Incorporating quantitative and qualitative data in various manners can better suit the research questions by off-setting the weaknesses of each individual methodology. Mixed methods research is increasingly utilized in research practice as well as emerging as a third major research approach (Johnson, Onwuegbuzie & Turner, 2007). Mixed methods enables a researcher to utilize both quantitative and qualitative

methodologies in a vast array of options. The flexibility of mixed methods research can open up more potential for future educational research.

Research Paradigm

Flexibility in mixed methods research provides broad appeal, but can also be seen as a downfall due the lack of consistent beliefs (worldviews). Traditionally, two worldviews have been established based on quantitative and qualitative research methodologies. Worldviews (paradigms) are a system of beliefs that depict the nature of reality, how we gain knowledge of what we know, the role values play in research, the process of research, and the language of research. A post-positivist paradigm underpins the quantitative methodology depicting one reality with a complete separation between the researcher and the research along with being a more formal deductive style of investigation (Creswell & Plano Clark, 2007). Generally, post-positivist researchers try to refine or test a prior theory in their studies together with eliminating their own biases that might impinge the data collection and analysis. The intention of quantitative research is to test a theory broadly through multiple participants, which enables the investigator to support or refute an existing theory (Creswell & Plano Clark, 2007).

On the other spectrum of worldviews, the constructivist view underlies qualitative research supporting diverse realties, closer relationships with participants, inclusion of researcher bias, and a more informal writing style. The constructivist paradigm enables participants to help shape worldviews through interactions with others and their personal experiences. Therefore, multiple realities help shape and develop theories in society from completed research. Constructivist investigators acknowledge and explicitly reference their own biases within research (Creswell & Plano Clark, 2011). The clear distinction

between post-positivist and constructivist worldviews leads researchers to pick a paradigm, which will influence diverse steps of their research studies. Both post-positivist and constructivist researchers feel their methodology in research is ideal leading to a lack of mixing methodologies. These beliefs of choosing either constructivism or post-positivism have led to the incompatibility thesis, which essentially requires researchers to pick a paradigm to guide their research.

There has been, however, some effort to find middle ground amongst the differences between post-positivist and constructivist paradigms, from which a new paradigm emerges, pragmatism (Tashakkori & Teddlie, 1998). Pragmatic researchers identify both one and multiple realities, biased and unbiased perspectives, combination of data sources, and importance of practicality. The emphasis is placed on selecting different methodologies based on "what works" the best in addressing the research questions (Tashakkori & Teddlie, 2003). Triangulation emerges as a driving force in combing data sources on the same phenomena (Tashakkori & Teddlie, 1998). The combination of both qualitative and quantitative data provides a more comprehensive picture enabling one to look in-depth at participant perceptions along with generalizations. Pragmatic approach has led to the development of subsequent paradigms that also look at the mixing of fundamental values from post-positivist and constructivist worldviews: transformative-emancipatory and advocacy-participatory.

In addition to the emergence of multiple paradigms, a new philosophy allows researchers to not only mix quantitative and qualitative methods, but also multiple worldviews in conducting research. The dialectical philosophy examines the tension that could surface due to the use of multiple methods from opposing viewpoints (Tashakkori

& Teddlie, 2003). The dialectical philosophy focuses on interrelating the data through reexamination. Disagreements between diverse paradigms reflect different ways of understanding and valuing the social world. The integration of diverse perspectives into a single study is seen as being better equipped to reflect social realities (Tashakkori & Teddlie, 2003). Therefore, my philosophy of mixed methods research is the dialectical philosophy due to its ability to reflect the social world. The main difference between the pragmatist philosophy and the dialectical philosophy is its added emphasis on understanding and knowing the reasons for utilizing both quantitative and qualitative data within the investigation.

Methods

This study focuses on a K-12 foreign language teachers' reported technological beliefs and their influence on technology integration in the curriculum. An Explanatory Mixed Methods Design is used that involves the gathering and examination of both quantitative and qualitative data. According to Creswell and Plano Clark (2007), an Explanatory Mixed Methods Design consists of two phases, where the qualitative data builds on the primary collected quantitative data. Greater emphasis is placed on the initial quantitative data, which is followed by qualitative data collection. This specific design is suited to the study due to the unknown barriers that K-12 foreign language teachers face while incorporating technology into their classroom curriculum. Personal beliefs are very complex in nature, because of various interplaying elements that might not be exposed thoroughly within the questionnaire. Beliefs are a messy construct because they do not lend themselves to an observable investigation (Pajares, 1992). The unobservable nature of beliefs requires educators to self-report their beliefs surrounding

technology practices in the classroom. Additionally, Green (1971) establishes that an individual may hold beliefs that are incompatible with one another. This can be troublesome because educators' beliefs might not match the reality of their classroom practices due to an unobservable and incompatible nature. Thus follow-up interviews with diverse K-12 foreign language educators' link feelings, emotions, and understanding to their quantitative questionnaire responses. Additionally, interviews aid in the explanation of unique, surprising, or interesting responses from the self-administered questionnaire. Essentially, a set of interview questions is generated prior to interviews, but other questions are negotiated during the interview to further understand personal beliefs and barriers that might impede the utilization of technology in the classroom. A full list of interview questions can be found in APPENDIX H.

This study applies complementarity as; it seeks to elaborate the results of one method with the results from the other method (Greene, Caracelli & Graham, 1989). The intention is for the qualitative data to expand on the findings from the quantitative data. The final research question details the aim of complementary results. The intention is to find interesting results from the Modified Technology Implementation Questionnaire that are also conveyed throughout the foreign language teacher interviews. However, there is the potential to find conflicting, surprising, or unusual data results. The individualistic nature of curriculum inclusion leads to diverse results, which can depend on teachers' beliefs and technology.

Due to the uncertainty of the two data sets, my philosophy of mixed methods research ties into the dialectical approach. The dialectical philosophy examines the tension that could surface due to the use of multiple methods from opposing viewpoints.

The dialectical approach focuses on interrelating the data through reexamination. Teacher interviews provide a reassessment of the data collected through the self-administered questionnaire. The integration of diverse perspectives into a single study is seen as being better equipped to reflect social realities (Tashakkori & Teddlie, 2003). The varying teachers' beliefs impact the amount, type, and importance that technology plays in their own classrooms.

The complexity associated with technology inclusion and teachers' beliefs are insufficiently researched through one approach and that is why there is a need to utilize mixed methods research instead of choosing one research method. Because teachers' beliefs are generated based on three main factors: innovator, innovation, and context, as noted in the Conditions for Classroom Technology Innovation model (Zhao, Pugh, Sheldon, & Byers, 2002). It is important to discover the impact of each of these elements within the classroom context. The innovator is the teacher and the first person to identify factors that influence technology uses. There are three factors of the innovator contributing to technology success: technology proficiency, pedagogical compatibility, and social awareness. Technology proficiency is the knowledge of what is necessary to use technology in teaching and the ability to use software applications. Pedagogical compatibility looks at the relationship between technology and teachers' pedagogical beliefs. The final element, social awareness, relates the ability of the teacher to understand the social dynamics of the school system. The second major area within the model, innovation, is the technology integration itself. The innovation is seen to be successful based on two factors: distance and dependence. Distance from school culture refers to the degree that an innovation differs from the more dominate values,

pedagogical beliefs, and practices of teachers and administrators in the school (Zhao et al., 2002). Distance from existing technological resources is the amount of resources (hardware, software, connectivity, etc.) needed for success of the new technology. The context area refers to human infrastructure, technological infrastructure, and social support. A human infrastructure includes a highly trained and helpful technical staff, a group of people who can help teachers understand and use technology, and a supportive administration. The technological infrastructure is the actual resources available to teachers: computers, network, connectivity, software, etc. Social support is the degree that colleagues support or discourage with the innovation (Zhao et al., 2002).

Table 2. Conditions for Classroom Technology Innovation Model

Factors Impacting Technology Integration		
The Innovator (Teacher)	The Innovation (Technology)	The Context
Technology Proficiency	Distance	Human Infrastructure
Pedagogical Compatibility	Dependence	Technological Infrastructure
Social Awareness		Social Support
These Factors Lead to Successful Implementation of Technology in the Classroom		

Source: Zhao, Y., Pugh, K., Sheldon, S., & Byers, J. (2002). Conditions for classroom technology innovations. *Teachers College Record*, 104(3), 482-515.

In addition to these interrelated elements of the classroom, there is also the teachers' personal beliefs which is researched through the Expectancy-Value theory. The

premise for this particular theory states that an individual holds various beliefs about a particular object that can be either positive or negative, thus creating an overall attitude. Therefore, on future interactions with the specific object, the individual will draw upon his/her attitudes and beliefs during his/her interactions with the object (Fishbein, 1963). There are three distinct elements to the Expectancy-Value theory: expectancy, values, and costs. The expectancy concept examines individual's beliefs amongst the use of a strategy and a desired outcome. The value construct assesses the degree to which an individual perceives the outcomes of a particular strategy as worthwhile. The costs assess the physical and psychological demands associated with implementing a particular strategy (Wozney et al., 2006). In order for an individual to implement a specific strategy, one must have high anticipation for success and believe the end result as important enough to overlook the impending barriers. To finish the cycle, an individual will evaluate the process of strategy incorporation to decide whether it was worth the trouble or not. The final evaluation will create change or validation for the individual's belief system.

Therefore, having the trade-off between quantitative and qualitative methods, within one study encompasses both data sets to produce a more comprehensive picture of the phenomenon. In this study, the quantitative data establishes correlations between contextual factors impacting the use of technology and teachers' technological beliefs, but further exploration provides more in-depth context from diverse perspectives. The qualitative data provides richer information to further solidify and expand on the quantitative data. Due to the complex topic, mixed methods research is an ideal method for this investigation.

Pilot Studies

The instrument was developed based on the literature in foreign language education, teacher beliefs and perceptions, technology, classroom practices, and survey design. Additionally, other questionnaires in the field of foreign language education and technology were consulted during the creation stage of the instrument (Gebel, 2000; Wozney, Venkatesh, & Abrami, 2001; Chen, Bunam, Howie, Aten, & Nambirar, 2003; Cummings, 2005; Partnership for 21st Century Skills, 2009; Bebell & Kay, 2010). Through the incorporation of various surveys and literature, a new instrument was created to better understand K-12 foreign language teachers' beliefs about technology and its implementation into classroom practices. The basis for the instrument was adopted from the original Technology Implementation Questionnaire (Wozney et al., 2001), but with additional resources focused on the field of foreign language education.

The first pilot study was conducted through the first paper-based Modified Technology Implementation Questionnaire. An email was sent out to six newly graduate K-12 foreign language educators, who represented both native and non-native speakers of the language they taught and a variety of languages: Spanish, French, Japanese, and Chinese. The six foreign language teachers were asked to comment on the structure, design, and content for each element included in the Modified Technology Implementation Questionnaire. The feedback from these participants led to the addition of a new question about whether teachers were native speakers or non-native speakers of the language they taught, since this had an impact on their technology inclusion in the classroom. Additional changes were made to the structure of the Likert-scale questions within the first section of the questionnaire.

After the new modifications were made to the Modified Technology Implementation Questionnaire, a second pilot study was conducted with fourteen current K-12 foreign language teachers in the state of Iowa. The paper-based version of the instrument was converted to an electronic version using the program Qualtrics, which enabled the researcher to send a link of the questionnaire through email. The fourteen K-12 foreign language teachers also represented both native and non-native speakers as well as the languages of French, Spanish, German, Chinese, and Japanese. Twelve of the teachers gave their responses to the different questions within the Modified Technology Implementation Questionnaire along with providing comments on different design features of the online version. Based on the feedback, changes were made to the demographics section of the instrument to enable educators to select more than one option for questions based on level of education, language levels, and buildings.

After these changes were incorporated into the Modified Technology Implementation Questionnaire, a one-on-one meeting was conducted with an expert in the field of foreign language education, Dr. Leslie Schrier, and the researcher. The expert was asked to review the constructed questionnaire for logic, flow, and content. Based on the dialogue between the researcher and the expert, changes were made to the structure of the Modified Technology Implementation Questionnaire. The original four-section questionnaire was reduced to three sections by eliminating section three. The expert and researcher felt the questions within section three actually represented ideas from other sections of the questionnaire. Therefore, questions were moved from section three into both section one and two of the questionnaire. This created a three-section instrument: views on computer technologies, experiences with technology, and demographics.

Additionally, a link was created for a question about the ACTFL standards where teachers indicate their technology usage for each standard. The link to the ACTFL standard page was added to give descriptions for each foreign language standard.

A final plot study was conducted to help solidify the modifications made to the Modified Technology Implementation Questionnaire to better represent the population being studied. According to Wozney, Venkatesh, and Abrami (2006), some of their skewed responses from educators could have been remedied by modifying the instrument to better reflect the type of educator under study. Therefore, a think aloud was conducted with two current K-12 foreign language educators in the field: one native speaker of French at a large urban school and one non-native speaker of Spanish at a smaller, rural, one-to-one school. The pilot study provided more information as to the barriers impacting current K-12 foreign language teachers' integration of technology in the classroom, as well as expressed changes that needed to be made to some of the questions on the Modified Technology Implementation Questionnaire to provide some clarification. These changes were suited to the population of this particular study better than the original Technology Implementation Questionnaire. The additional variables from the pilot study were incorporated into the first phase of data collection.

Participants

After pilot testing the additional questions surrounding both internal and external obstacle added to the TIQ questionnaire. Two different tactics were utilized to gain participants for the first phase of the research study, the online questionnaire. The first tactic used to gain access to foreign language educators throughout the state of Iowa was through the school districts' administration. A consent letter was sent to both public and

private school districts in the state of Iowa totaling 394 districts. Forty-seven school district administrators granted permission to contact their foreign language educators through their school email addresses. A consent letter and link to the Modified Technology Implementation Questionnaire was sent to each of the 128 foreign language educators from these districts. Fifty-three of the 128 teachers completed the questionnaire through the consent letter link. The response rate of these foreign language educators was 41%.

The next tactic used to gain participants for the online portion of the research study was through a professional organization within the state of Iowa for foreign language educators. Iowa World Language Association (IWLA) was contacted with consent letters, a brief description of the study, and a link to the Modified Technology Implementation Questionnaire. Permission was granted from the organization, which provided their members with a brief description of the study and a link to the online survey. Forty-six teachers responded to the online questionnaire through their membership emails, but the response rate was unknown.

There were 99 participants for the first phase of the study from the across the state of Iowa. The participants from this study represented educators from both private and public school districts. A diverse spectrum of educators was included in the participant pool in regards to years of experience (1 year to over 16 years), age (under 25 to over 55), gender, school locations (rural, urban, and suburban), levels of education (elementary middle, and high school), language levels, native and non-native speakers, and languages (Spanish, French, German, and others).

Participants for the second phase of the mixed method study were selected from the previous questionnaire participant pool. The ten participants were selected due to their ability to maintain the same or similar descriptive statistics as the overall participant pool in regards to mean scores of all nine predictor variables. The descriptive statistics takes the mean score for each individual predictor variable. The descriptive statistics were broken down into reported frequency of technology usage, age, perceived benefits, years of teaching, gender, one-to-one school, teaching style, perceived attitudes, reported context, and average class size. Each of these variables have been coded from the original data set by giving numbers to each element. There were some variables that were calculated using several questions from the Modified Technology Implementation Questionnaire while other variables represent only one question.

The variables constituting several questions from the questionnaire are reported frequency of technology, perceived benefits, teaching style, AOC (perceived attitudes), and reported context. These variables were call calculated very similarly by transforming the responses in the Likert-scale questionnaire to numbers. Therefore, the reported frequency of technology is calculated by looking at the codes for each question in the second section of the questionnaire: 55-68. Each question was coded using numbers one to six where each number stood for an option in the questions beginning with one. For example: Information Literacy-Access and Evaluate Information was coded one for never, two for practically never, three for once in a while, four for fairly often, five for very often and six for almost always. Each of these codes were then calculated to create one variable score for each participant. The mean score for the participant pool is 3.88 which means the participants are generally more comfortable with using technology in

their classrooms. The same calculations were conducted with the ten interview participants and their overall mean score was 4.62. The interview participants were slightly more comfortable with using technology in their classrooms than the participant pool from phase one. The next variable calculated in a similar manner is perceived benefits of technology which takes into consideration questions several questions throughout the questionnaire. A mean score was calculated for the participant pool representing 3.73 meaning that participants perceived technology to be beneficial for classroom learning. The ten participants from phase two of the study had a similar outlook on the benefits of using technology in the classroom.

The third variable of teaching style looked at several questions surrounding the teacher's role in the classroom. The continuum of responses ranging from completely teacher-centered to completely student-centered. The overall mean score for the population, 4.47, depicts classrooms as being more student-centered than teacher-directed. The interview participants had the exact same mean score. The fourth variable, perceived attitudes was calculated in a similar manner rendering a mean score of 3.31. The participants from phase one had a slightly positive attitude towards technology based on the mean score, but the mean score of the ten participants was a little less than the overall participant pool. The final variable with a similar calculation was reported context where the mean score 3.52. The participants believed that context contributed in part to their abilities to integrate technology into the classroom and the ten participant pool had a very similar outlook on context.

The second set of variables were calculated using only one question from within the Modified Technology Implementation Questionnaire. The variable age was

calculated using the same coding system for question 71. The options for age choices range from under age 25 to over age 55. The mean score for the participant pool is 3.00 meaning that the average age of the teachers was between the ages of 36-45 and the ten interview participants had the same average age. The next variable of years of teaching was calculated in the exact same manner, but the options of choices range from 1-3 years up to 16 or more years. The mean score for the participants is 4.47 meaning that the average years of teaching is somewhere between four to eleven years. The second phase participants' years of teaching is a little lower, but still very similar. The third variable of average class size ranged from under 10 students to over 30. The mean score of 3.61 means that the average class size for the population ranges from 16 to 25 students and the ten participants have a very similar average class size.

The final variable of gender is calculated a little differently than the other variable since this is a dichotomous variable meaning there are only two options. Participants were either male or female. Dichotomous variables are coded using a zero for one option and one for the second option. In this questionnaire, the male option was coded as a zero while the female option was coded as a one. The mean score of .82 means that approximately 82 percent of the participants in the study were female while only 18 percent of the participants were male. The follow-up interview participants had a very similar gender split with eight females and two males. The table below provides the comparison of the descriptive statistics for each of the nine variables by giving the mean scores for both the participant pools from phase one and phase two.

Table 3. Descriptive Statistics for both Dependent and Independent Variables

Variables	Mean	N	Phase 2 Participants Means	N
Frequency	3.88	74	4.62	10
Age	3.00	74	2.9	10
Benefits	3.73	74	3.88	10
Years of Teaching	2.82	74	2.5	10
Gender	.82	74	.8	10
One to one School	.45	74	.5	10
Teaching Style	4.47	74	4.47	10
AOC (attitude)	3.31	74	3.07	10
Context	3.52	74	3.47	10
Average Class Size	3.61	74	3.5	10

The second criteria for the selection of the ten participants from phase of the study was the reporting of surprising or conflicting results within the findings of phase one of the study. Some of the conflicting or surprising results included: a lack of support or resources within a one-to-one school system, older educators with a high level of technology inclusion, younger teachers with a lower level of technology inclusion, teachers with a few years of teaching incorporating technology more frequently than others, and student-centered teaching style with minimal technology inclusion. The participants were selected due to these surprising results provoking more inquiry into the findings from the first phase of the study.

A brief description of the participants provided more insight into the environment, demographics, and perceived barriers impacting their integration of technology. The ten participants for phase two of the study represented educators who have a range of years

of teaching from one to over 16 years in the field of foreign language education. Along with the years of teaching, the full spectrum of age under 25 to over 55 years was depicted within the same population. In education there has always been an overrepresentation of women to men, which was also demonstrated in my study with two men out of the ten interview participants. In addition to demographic variables the location of the school district and the resources (one-to-one schools) was also taken into account when selecting for phase two of the study. There were school districts from rural, suburban, and urban settings with about 50% of these educators working within a one-to-one setting. The participant selection for phase two encompassed similar descriptive statistics to the overall population, as well as enabled room for surprising or conflicting results and more in-depth background information from the participants and their environments.

Procedures for Initial Contact and Consent

In this section, I described the procedures that were used to make contact with the K-12 foreign language educators in the state of Iowa. A consent letter was sent out via email to every school district administrator in the state of Iowa including both public and private institutions. A researcher cannot contact educators through institutional email addresses without permission from the administration. Once I received permission from the administrators, a consent letter was sent out to every K-12 foreign language educator in the state of Iowa describing the study as well as providing a link to the online Modified Technology Implementation Questionnaire. By filling out the survey, foreign language educators consented to being a participant in the study. At the end of the survey there were two final questions for participants to answer regarding their willingness to

participate in a follow-up interview and an email address where they can be contacted. The participants were selected from the range of educators that responded to the interview question with their email addresses. A consent letter was sent out to each of the ten interview participants as a time, date, and location for their follow-up interviews.

An additional contact of K-12 foreign language educators was completed through an educational organization, Iowa World Language Teachers (IWLA). I gained permission to not only utilize their listserv of members, but to have my consent and survey link included in their quarterly email blasts. The secretary, Carrie Morris, of IWLA sends out an email blast quarterly to its members. A consent letter containing the survey link was sent out in the March/April email blast to every member on the listserv with the permission from Carrie Morris. Iowa, K-12 foreign language educators were asked to read about the study and complete the online survey provided through the web link. By completing the survey, these educators consented to becoming participants in this study. At the end of the survey there were two final questions for participants to answer regarding their willingness to participate in a follow-up interview and an email address where they can be contacted. The participants were selected from the range of educators that responded to the interview question with their email addresses. A consent letter was sent out to each of the ten interview participants as a time, date, and location for their follow-up interviews.

Instrument

The instrument for the study was created through the incorporation of a few current questionnaires on foreign language education, technology, teachers' beliefs, and classroom practices. The completed questionnaire for this study can be found in

APPENDIX G. Instrument items were adopted from various surveys, but the majority of the items were from the Technology Implementation Questionnaire developed in Quebec to focus on the importance of integrating technology across curriculums. This instrument was "designed to identify attitudinal and demographic factors that influenced teachers' implementation of computer technologies in their teaching activities" (Wozney et al., 2001, p. 3). At Concordia University a team of researchers in the Centre for the Study of Learning and Performance developed the Technology Implementation Questionnaire. They generated an initial pool of items that were identified from other studies, which explored factors impacting teachers' integration of technology in the classroom. Wozney et al. (2001), pulled various items from past studies to incorporate into a new instrument that represented both positive and negative factors impacting technology implementation. The second step was to create a preliminary study to send out to teachers, aids, and administrators to verify the factors influencing teachers' technology integration. Additionally, a focus group of teachers was brought together to discuss the elements that emerged from previous literature. The complied list of items was reduced based on frequency, past literature, and teachers' response. This led to a pilot-study with the first version of the Technology Implementation Questionnaire. The pilot study enabled the researcher to reduce the number of items on the questionnaire as well as taking out the undecided part of the Likert-point scale (Wozney et al., 2006).

The original version of the Technology Implementation Questionnaire contained five main sections: professional view on technology, background and teaching style, experiences with computers, process of integration, and additional comments. The questionnaire items were setup in a Likert scale continuum providing six different options

ranging from never to almost always. Participants did not have the option to select undecided or neutral feelings towards the various items on the questionnaire. Maintaining the same item structure within the questionnaire created internal consistency along with providing exterior criterion validity (Pantelidou & Craig, 2006).

Each section of the questionnaire focused on a particular theme, categories of questions, and other specifications. A professional view on computers, the first section of the questionnaire with 33 statements concentrated on technology integration into teaching practices. Teachers indicated their agreement or disagreement with each statement by selecting a point on the six-point Likert scale. The statements correlated to factors that were collected during the development of the instrument as important factors impacting technology implementation in the classroom. The second section, Background, Teaching style, and Resources, consisted of seven questions concerning the demographics of each individual teacher, personal teaching style, and the teaching environment. The next section, Experience with Computer Technologies, portrayed the proficiency teachers had with technology and the extent it was used in their classrooms. The Process of Integration was the fourth section on the Technology Implementation Questionnaire which asked nine questions about the frequency or lack of use for different computer technologies in the classroom for a variety of activities. The final section of the questionnaire, Additional Comments, asked participants to describe resources to facilitate ideal situations for technology implementation into their classrooms (Wozney et al., 2001). The Technology Implementation Questionnaire was able to acquire information about teachers' uses of technology in the classroom, but it did not account for the unique characteristics of the foreign language classroom.

Structure

Therefore, the instrument for this study was adopted from the original Technology Implementation Questionnaire, but other items from various studies were also incorporated into the survey design. The integration of other surveys helped bring in the elements that influence the foreign language classroom: standards, language, classroom practices, etc. The Modified Technology Implementation Questionnaire was structured: Section I: Views on Computers Technologies, Section II: Experiences with Computer Technologies, and Section III: Demographics. Each section and questions within the sections helped address two of the research questions for this particular study:

1. What influences K-12 foreign language teachers' reported technological beliefs and integration into classroom practices?
2. How do the perceived contextual factors (time, resources, training, etc.) impact the use of technology by foreign language educators?

Within in each main section of the questionnaire, there were smaller sub-sections focused on a particular element of technology inclusion in the classroom either as elements consistent with teachers´ beliefs about technology or the context in their environments impacting their technology. According to the Expectancy-Value theory, teachers had to believe that technology enabled them to reach their curricular goals, align with their classroom practices, and have positive experiences with technology in order for one to be more proficient and comfortable with using technology in the classroom. Coinciding with the Expectancy-Value theory, the Conditions for Classroom Technology had two main elements within the innovation model: referenced back to the innovator (teacher) and the innovation (technology) that depicted one´s ability to integrate

technology into their classroom practices. The innovator, the teacher, was the first person to identify factors that influenced technology uses. Three factors of the innovator contributed to technology success: technology proficiency, pedagogical compatibility, and social awareness. Technology proficiency referred to the knowledge of what is necessary to use technology in teaching and the ability to use software applications. Pedagogical compatibility looked at the relationship between technology and teachers' pedagogical beliefs. The success of technology also depended on the teachers' value or view of technology and its connections to their curriculum. The final element, social awareness, related to the ability of the teacher to understand the social dynamics of the school system. School's social dynamics referred to technical support, peer support, resources beyond teachers' control, school resources, etc. (Zhao et al., 2002).

A final element in the intricate relationship was the context referring to human infrastructure, technological infrastructure, and social support. A human infrastructure included highly trained and helpful technical staff, a group of people who helped teachers understand and use technology, and a supportive administration. The technological infrastructure comprises the actual resources available to teachers: computers, network, connectivity, software, etc. The strongest pull for technology innovation came from the innovator, but the innovation and context played a role in its success or failure within classroom practices. The Conditions for Classroom Technology Innovation model depicted the continuous relationship between the major factors impacting the successful integration of technology into classroom practices.

Further, each section and sub-section of the questionnaire addressed the dependent variable (reported frequency of technology usage), two main factors within the

model, and two of the research questions for this study. Each question of the questionnaire was described in detail as it pertains to a particular element within the model, the research questions, or the dependent variable (reported frequency of technology usage). Section I included fifty-four questions specific to foreign language teachers' views on computer technologies and related skills gained from technology integration. The items incorporated into this section of the questionnaire were adopted from various surveys on foreign language literature, technology, teachers' beliefs, classroom practices, students' influences, etc. Questions one through fifty-four were either adopted from various surveys in the field of foreign language education or generated from current literature to focus on teachers' beliefs (the innovator) or perceived first-order barriers (the context) impacting foreign language teachers' use of computer technologies in the classroom. The benefits of computer technologies on various standards or skills in the foreign language classroom and 21st century literacies were also presented in this section of the questionnaire demonstrating teachers´ perceived benefits of technology integration (the innovator).

Section I

The first main section on technology integration included different elements of teachers´ beliefs about technology within classroom practices: perceived benefits teaching style, and perceived attitudes, opinions, costs. This section helped answer the research question as to the impact teachers´ beliefs can have on technology integration into classroom practices. Each of these elements played into the different factors within the innovator element of the Conditions for Classroom Technology Innovation model that focused on technology proficiency, pedagogical compatibility, and social awareness.

Technology proficiency referred to the knowledge level of a teacher to use technology and software effectively within teaching. Pedagogical compatibility looked at the relationship between technology and teachers' pedagogical beliefs. The final element, social awareness, related to the ability of the teacher to understand the social dynamics i.e. technical support, peer support, resources beyond teachers' control, school resources, etc. (Zhao et al., 2002).

Perceived Benefits Sub-Section

The first sub-section within section I focused on the perceived benefits that came from incorporating computer technologies into classroom practices. The questions 1, 5, 7, 13, 14, 17, 20, 25, 28, and 30 were adopted from the original Technology Implementation Questionnaire where teachers marked their agreement or disagreement towards each statement about technology use in the classroom. These questions focused on the perceived benefits of using computer technology in the classroom including enhanced student motivation, creativity, engagement, collaboration, differentiation, and achievement (Silvernail & Lane, 2004; Garthwait & Weller, 2005; Bebell & Kay, 2010). Besides enhanced student learning and academics, technology was also very beneficial in enhancing language learning skills and teachers´ self-competency in the classroom. In addition to the questions adopted from the original Technology Implementation Questionnaire, other questions 37, 41, 48, and 49 were drawn from a survey created by Cummings (2005) and used with the author´s permission. Incorporating various computer technologies for different skills and standards in the foreign language classroom as well as digital literacies for the 21st century enhanced students´ language learning skills.

Traditionally, foreign languages were broken down into major skill sets, which draw from different resources for support in the classroom. The major skills sets included: grammar, vocabulary, speaking, writing, listening, reading, and culture. Teachers were to mark how beneficial they felt computer technologies were towards each skill set in the foreign language classroom. Teachers were to indicate the benefits of computer technologies for accomplishing each of the foreign language national standards. These standards included: communication, cultures, connections, comparisons, and communities. The national foreign language standards were intended to help solidify and exemplify the necessary curricular components. Participants marked their beliefs about how beneficial computers were for each skill or standard from not at all to extremely beneficial. Questions 50 to 54 addressed the 21st century digital literacies skills and focused on information literacy, media literacy, and ICT (Information, Communications, Technology) literacy. "The growing accessibility of information technologies put the tools required to collaborate, create value, and compete at everybody's fingertips" (Tapscott & Williams, 2006, p. 10). The Partnership for the 21st Century Skills and key national organizations representing core academic subjects worked together to depict essential skills to be integrated into the teaching for success in today's world (Partnership for 21st Century Skills, 2009). The structure of these questions asked the participants to indicate their frequency of integrating technology aimed at each type of 21st century literacy skills ranging from never to almost always. The following questions, belonging to the first sub-section focused on the perceived benefits of technology integration within the foreign language classroom:

1. Increases academic achievement (e.g. grades)

5. Is a valuable instructional tool.

7. Makes teachers feel more competent as educators.

13. Enhances my professional development.

14. Eases the pressure on me as a teacher.

17. Motivates students to get more involved in learning activities.

20. Promotes the development of students' interpersonal skills (e.g. ability to work with others).

25. Improves students learning of critical concepts and ideas.

28. Improves student motivation to learn the language.

30. Develop deeper student understanding of the content.

37. I feel computers can help students learn a foreign language.

41. There are appropriate cultural materials on the internet for meaningful learning.

48. Please indicate by checking the appropriate box for your response as to how beneficial you believe computer technologies are for learning the following language skills.

49. Please indicate by checking the appropriate box for your response as to how beneficial you believe computer technologies are for meeting each of the ACTFL standards.

Please indicate how frequently computer technologies are integrated into your teaching activities for each of the uses listed below. Select the appropriate response. Each section provides you with a link to the 21st Century Skills.

50. Information Literacy- Access and Evaluate Information.

51. Information Literacy- Use and Manage Information.

52. Media Literacy- Analyze Media.

53. Media Literacy- Create Media Products.

54. ICT (Information, Communications, and Technology)- ITC Literacy

Teaching Style Sub-Section

The second sub-section within this section focused on the teaching style that came from incorporating computer technologies into classroom practices. The questions 2, 3, 9, 12, 16, 27 and 29 were adopted from the original Technology Implementation Questionnaire where teachers marked their agreement or disagreement towards each statement about technology use in the classroom. In addition to the questions adopted from the original Technology Implementation Questionnaire, another question 39 was taken from a survey created by Cummings (2005) and used with permission. These questions focused on teaching styles and their compatibility with using computer technology in the classroom. Teachers' beliefs predicted subsequent classroom actions in regards to decisions, planning, classroom activities, assessments, etc. There were two conflicting paradigms demonstrating an impact on technology integration into classroom practices (Lucas & Wright, 2009). The behaviorist or more traditional views of teaching utilized a lecture-based style where students sit, listen, and learn from the instructor. Students were responsible for memorizing and learning the content through the lectures and more individualized learning (Learning Theories Knowledgebase, 2008). The second paradigm, constructivist, views learning as an active process. Learners constructed knowledge based on their personal experiences and linked new knowledge to prior knowledge. Students were actively involved in their learning through collaboration,

cooperative learning, project based learning, etc. promoting more critical thinking and problem solving skills (Learning Theories Knowledgebase, 2008)

These two paradigms contributed to technology implementation. Teachers who had more teacher-centered pedagogical beliefs used technology more as a reward for a lot of independent practice or learning experiences controlled by the teacher while student-centered pedagogical beliefs used technology to support collaboration, project-based learning, critical thinking, cooperative learning, etc. (Palak & Walls, 2009). Research demonstrated a connection between technology and the constructivist view of learning. Teachers who used pedagogical beliefs aligned with the constructivist teaching were more likely to incorporate or be open to incorporating technology into their classroom practices while teachers with pedagogical beliefs aligning with traditional teaching were less likely to integrate technology into classroom practices (Lucas & Wright, 2009). Therefore, teachers' pedagogical beliefs also impacted their decisions, planning, and integration of technology into classroom practices. Teachers' pedagogical beliefs represented another layer of beliefs within the intrinsic factors influencing their uses of technology, but there were added constraints in the environment that contributed to teachers' pedagogical practices. The following questions constituted the second sub-section within section I and focused on teaching style and its impact on technology integration within the foreign language classroom:

2. Is effective because I believe I can implement it successfully.

3. Promotes student collaboration.

9. Gives teachers the opportunity to be learning facilitators instead of information providers.

12. Is an effective tool for students to of all abilities.

16. Helps accommodate students' personal learning styles.

27. Helps meet individual student's learning needs.

29. Increases students' interactions with each other.

39. Students need to learn computers for the 21st century.

Perceived Attitudes, Opinions, and Costs Sub-Section

The third sub-section within section I focused on perceived attitudes, opinions, and costs associated with incorporating computer technologies into classroom practices. The 4, 18 and 44 were adopted from the original Technology Implementation Questionnaire where teachers marked their agreement or disagreement towards each statement about technology use in the classroom. In addition to the questions adopted from the original Technology Implementation Questionnaire, other questions 33, 34, 35, 36, 40, and 42 were selected from a survey created by Cummings (2005) and used with permission. These questions focused on attitudes, opinions, and costs of integrating technology and their compatibility with teachers´ beliefs. Teachers made decisions based on their beliefs created through chance, failures, successes, knowledge, background knowledge, etc. (Pajares, 1992). Some additional factors played a role in changing beliefs: earlier experiences, contradictory information, and pedagogical approaches (Ertmer, 2005). Therefore, on future interactions with the specific object, the individual draws upon his/her attitudes and beliefs during his/her interactions with the object (Fishbein, 1963). In other words, innovations were more likely to be adopted if the perceived value of the innovation and the likelihood (expectancy) of success are high, as well as if these benefits outweighed the perceived costs of implementation" (Wozney et

al., 2006, p.177). Determining teachers' perceived attitudes, opinions, and costs associated with technology integration contributed to their overall beliefs. The following questions constituted the third sub-section and focused on the perceived attitudes, opinions, and costs associated with incorporating computer technologies into classroom practices:

4. Makes classroom management more difficult.

18. Limits my choices of instructional materials.

33. Computers are not sophisticated enough to teach language skills.

34. I worry that my students will use internet resources such as online translators to do their language tasks for them.

35. It is easy to integrate computers into my regular lesson plans.

36. While using computers with my class, it concerns me that I have to use so much English to explain what to do.

40. The value of computers in learning foreign languages is overrated.

42. Managing a classroom of students on computers is more difficult than managing a classroom of students without computers.

44. Teaching students how to use technology is not my job.

Reported Contextual Factors Sub-Section

The final sub-section within section I focused on reported contextual factors associated with the ability to impact technology into classroom practices. The 6, 8, 10, 11, 15, 19, 21, 22, 23, 24 and 26 were adopted from the original Technology Implementation Questionnaire where teachers marked their agreement or disagreement towards each statement about technology used in the classroom. In addition to the

questions adopted from the original Technology Implementation Questionnaire, questions 31, 32 and 43 were selected from a survey created by Cummings (2005) and used with permission. An additional question, 38, also addressed teachers' beliefs, but was adopted from a survey by Chen et al. (2003) and used with permission. These questions focused on perceived attitudes, opinions, and costs of integrating technology and their compatibility with teachers´ beliefs. Besides educator's beliefs, there were other perceived barriers that had an impact on foreign language teachers' integration of technology into classroom practices. These elements related to the second research question of this particular study: how do the perceived contextual factors (time, resources, training, etc.) impact the use of technology by foreign language educators? In addition to addressing the second research questions, this particular section addressed the third element of the model, the context. The context piece referred to human infrastructure, technological infrastructure, and social support. The human infrastructure included a highly-trained and helpful technical staff, a group of people who helped teachers understand and use technology, and a supportive administration. The technological infrastructure referred to the actual resources available to teachers: computers, network, connectivity, software, etc., while social support was the degree to which colleagues support or discourage the innovation or use of technology.

Therefore, contextual factors in schools and classrooms greatly impacted the process of change for teachers' beliefs and knowledge (Richardson, 1996). External factors were situational factors which teachers took into account when making decisions, creating plans, and executing classroom activities (Woods, 1996). These factors were broken down into two main categories: factors within the institution and factors directly

linked with teachers. Researchers identified many of the contextual factors associated with technology implementation within the institution. These factors revolved around the culture, administration, infrastructure, and support. The factors associated with the culture of the institution included organization, inability to provide students with training or troubleshooting, poor quality of programs, peer use at the same institution and norms (Becker, 2000a; Reiser, 2001; Bitner & Bitner, 2002; Butler & Selbom, 2002; Hannessey, Ruthven, & Brindley, 2005). Each institution, administration, and team of teachers had their own set of norms that guided their instructional practices, from their values to instructional methods to acceptable tools within classroom practices (Ertmer & Ottenbreit-Leftwich, 2010). Technology innovation within the classroom was less likely to occur if it deviated too much from the current values, beliefs, and practices of the schools' administrations and colleagues (Zhao & Frank, 2003).

In addition to the values, practices and beliefs of the administration, research has documented that poor leadership, staff development activities, scheduling, smaller class sizes, funding, and expenses of installation influence teaches' uses of technology within classroom practices (Cuban, 1986; Becker, 2001a; Reiser, 2001; Bitner & Bitner, 2002). The infrastructure depended on the amount of funding and maintenance allocated from the schools' budget. The lack of equipment and resources, hardware and software access, and the lack of technology support led to gaps in a supportive infrastructure, which impacted teachers' abilities to integrate technology into classroom practices (Cuban, 1986; Bitner & Bitner, 2002; Butler & Seldom, 2002; Wonzey et al., 2006). The second set of factors directly linked to teachers seemed to have the greatest impact on the uses of technology in the classroom. The most influential factor was time, few teachers had the

planning time required to make the best use of technology (Wang & Reeves, 2008). Another influential piece was the lack of training for integrating technology into the classroom, which impacted their skills and knowledge about technology (Hong, 2010). Other aspects related to teachers' technology integration included: computer literacy skills, gender, age, years of teaching, years of technology use, workload, and prior experiences with technology (Reiser, 2001; Bitner & Bitner, 2002; Butler & Selbom, 2002; Hernandez-Ramos, 2005; Wozney et al., 2006).

An added contextual factor within the classroom that impacted teachers' technological beliefs and integration, were the students in the classroom. Computer technology has enhanced student motivation, creativity, engagement, collaboration, differentiation, and achievement (Silvernail & Lane, 2004; Garthwait & Weller, 2005; Bebell & Kay, 2010). The presence of increased computer technology in the classroom has not always been an easy transition for educators. Computers created more classroom management problems, a fear of failure, and a fear of embarrassment amongst educators (Bebell & Kay, 2010; Mathews, 2011; Storz & Hoffman, 2013). Therefore, questions 45, 46, and 47 were generated based on current research focusing on students' impact on teachers' technological beliefs and integration into classroom practices. The following questions constituted the final sub-section within section I and focused on reported contextual factors associated with the ability to impact technology within classroom practices:

6. Is too costly in terms of resources, time, and effort.

8. Is successful only if computers are regularly maintained by technical staff.

10. Is successful only if there is adequate teacher training in the uses of technology for learning.

11. Demands that too much time be spent on technical problems.

15. Is effective if teachers participate in the selection of computer technologies to be integrated.

19. Requires software-skills training that is too time consuming.

21. Will increase the amount of stress and anxiety students experience.

22. Is effective only when extensive computer resources are available.

23. Is difficult because some students know more about computers than many teachers do.

24. Requires extra time to plan learning activities.

26. Adds challenges to controlling off-task students.

31. It is difficult to maintain students' attention while working on computers.

32. The internet is a better foreign language resource than my school's library.

38. I am hesitant to use computers because I do not know what to do if something goes wrong.

43. Planning a lesson that uses computers involves more work than planning a lesson without computers.

45. Students perceive issues with technology as a failure by me, the teacher.

46. I learn about new technologies from my students.

47. I implement students' suggestions for technologies into my teaching practices.

Section II

Section II included thirteen questions specific to foreign language teachers' experiences with computer technologies and its inclusion in their curriculum. Items 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67 and 68 in this section of the questionnaire were adopted from the original Technology Implementation Questionnaire. The purpose of section II was to gain a picture of foreign language teachers' current reported uses of computer technologies as related to classroom practices. Section II provided data for the dependent variable of reported frequency of technology usage. In addition to the frequency of use, the first question within this section reflected upon the innovator (teacher) element of the model for their technology proficiency skills where the teachers felt more or less proficient in their skills to use technology within the classroom. Technology proficiency referred to the knowledge of what is necessary to use technology in teaching and the ability to use software applications. The success of technology also depended on the teachers' value or view of technology and its connections to their curriculum.

The second-order changes were elements that were intrinsic to each individual educator including "beliefs about teaching, beliefs about computers, established classroom practices and unwillingness to change" (Ertmer, Addison, Lane, Ross, & Woods, 1999, p. 55). In order to alter second-order changes, one must challenge the belief system of educators and the routine classroom practices. "If second-order change was necessary for educational innovation to become practice, it was important to examine how teachers' current classroom practices and beliefs support or inhibit classroom technology use" (Ertmer et al., 1999, p. 55). Thus, the sequence of questions had the

participant give their own proficiency level with computer technologies ranging from “unfamiliar” to “expert”. The questions then progressed to the amount of time ranging from “never” to “almost always” regarding incorporation of computer technologies into various teaching activities. The second question focused on how often technology was integrated in to teaching activities. An additional question asked the average hours per week spent on computers for personal use. The final question of this specific section asked participants to rate their process of technology integration in their own teaching practices. This was broken down into six stages: awareness, learning, understanding, familiarity, adaptation, and creative application. Each of the following questions helped gain a better understanding of the level of reported technology used within classroom practices for each individual educator:

55. Please read the following descriptions of the proficiency levels a user has in relation to computer technologies. Determine the level that best describes you and check the appropriate box for your response.

56. Please indicate how often you integrate computer technologies in your teaching activities.

57. On average, how many hours per week do you spend using a computer for personal use outside of the teaching activities?

Please indicate how frequently computer technologies are integrated into your teaching activities for each of the uses listed below.

58. Instructional (e.g. drill, practice, tutorials, remediation)

59. Communicative (e.g. e-mail, computer conferencing)

60. Organizational (e.g. (e.g. data base, lesson plans, record keeping)

61. Analytical/Programming (e.g. statistics, graphing, charting)

62. Recreational (e.g. games)

63. Expansive (e.g. experiments, brainstorming, simulations)

64. Creative (e.g. digital camera, scanners, graphics)

65. Expressive (e.g. on-line journal, blogging)

66. Evaluative (e.g. portfolio, testing)

67. Informative (e.g. Internet, searches)

68. Please read the description of each of the six stages related to the process of integrating computer technologies in teaching activities. Choose the stage that best describes where you are in the process and check the appropriate box for your response.

Section III

Section III was the last section of the Modified Technology Implementation Questionnaire that focused on participants' demographics. There were thirteen questions about their background, teaching experiences, computer access, schools' location, etc. Sensitive questions such as marital status, age, educational background, etc. were more threatening for participants. These more loaded questions were placed at the end of the questionnaire to encourage participants to complete the questionnaire as a whole (Dörnyei, 2003). Section III on demographics was broken down into two sub-categories: the innovator and the context, which referred to two main features within the Conditions for Classroom Technology Innovation model depicting the continuous relationship for successful integration of technology. Along with the model, this section helped provide answers to both research questions as to the impact of teachers´ technological beliefs and

context on the implementation of technology into classroom practices. The first main section on the innovator discovered different aspects of the teacher such as age, gender, years teaching, etc. while the contextual section revealed elements about their environment: class size, school location, etc. An additional element within context, resources, was taken one step further for those educators working in a one-to-one school district. The one-to-one school environment created a unique setting for language learning that impacted both the students and the educators. Each of these sub-categories provided answers to the different areas within the model along with providing more answers to the research questions.

Demographics

The first sub-category for this section focused on the innovator and their demographic variables contributing to technology integration. Questions 69, 70, 71, 72, 75, 76, 85 and 86 were adopted from the original Technology Implementation Questionnaire where teachers marked their answers to a variety of demographic variables: gender, years of teaching, age, native/non-native speaker, foreign language taught, and language levels taught. In addition to the questions adopted from the original Technology Implementation Questionnaire, question 77 was drawn from a survey created by Cummings (2005) with permission. This question provided the grade level that a particular educator was working with through a typical school year. In addition to demographic variables, the last two questions related to the innovator enable the discovery of the amount of training and preferred teaching style for each individual educator. Research documented that an influential piece of technology integration was

the lack of training, which impacted educators´ skills and knowledge about technology (Hong, 2010).

The teaching styles ranged from largely teacher-centered to largely student-centered. As mentioned earlier, teachers who had more teacher-centered pedagogical beliefs used technology more as a reward for independent practice or learning experiences controlled by the teacher. Student-centered pedagogical beliefs used technology to support collaboration, project-based learning, critical thinking, cooperative learning, etc. (Palak & Walls, 2009). Teachers with more traditional beliefs implemented technology for low-level (i.e., visual aids) uses while more constructivist teachers implemented higher-level (i.e., project-based learning) uses of technology (Judson, 2006). Research has demonstrated a connection between technology and the constructivist view of learning. Teachers whose pedagogical beliefs aligned with constructivist teaching were more likely to incorporate or be open to incorporating technology into their classroom practices, while teachers' with pedagogical beliefs aligning with traditional teaching were less likely to integrate technology into classroom practices (Lucas & Wright, 2009). Each of these elements associated with the innovator played a part in the intricate relationship between technology and classroom curriculum. The following questions presented in section III, focused on demographic variables associated with the innovator:

69. Gender

70. Years of Teaching

71. Age

72. Native Speaker of the language(s) you teach

75. Language you are currently teaching (select all that apply)

76. Level of foreign language you are teaching (select all that apply)

77. Grade-level(s) you are currently teaching (select all that apply)

85. Total amount of in-service training you have received to date on computer technologies in the classroom

86. Select your preferred teaching style

Contextual Variables

The second sub-category for this section focused on more contextual variables playing a part in technology integration. Questions 73 and 78 were adopted from the original Technology Implementation Questionnaire where teachers marked their answer about the environmental factor of classes on technology inclusion. Question, 74 was drawn from a survey by Gebel (2000) with permission and addressed environmental factors around the number of foreign language educators in the building. The final two questions for this particular sub-category, 79 and 80, were selected from a survey by Cummings (2005) with permission. These two questions addressed the available resources within the classroom and school system that influenced the inclusion of technology into the classroom.

Each of these elements reviewed additional contextual factors contributing or hindering the implementation of technology into classroom practices. Research has documented that poor leadership, staff development activities, scheduling, smaller class sizes, funding, and expenses of installation prohibits teachers from integrating technology into the curriculum (Cuban, 1986; Becker, 2001b; Reiser, 2001; Bitner & Bitner, 2002). The infrastructure depended on the amount of funding and maintenance allocated from

the schools' budget. A lack of equipment and resources, lack of hardware and software access, and a deficiency in technology support led to gaps in a supportive infrastructure which impacted teachers' abilities to integrate technology into classroom practices (Cuban, 1986; Bitner & Bitner, 2002; Butler & Seldom, 2002; Wonzey et al., 2006). These questions provided some insight into the infrastructure within each individual educator's work environment while trying to integrate technology into their classroom curriculum.

73. Average class size that you teach.

74. Number of foreign language teachers in your building.

78. Describe the location of your school.

79. Number of computers in your classroom.

80. Number of computer labs in your school.

One-to-One Initiatives

The third sub-category for this section focused on more contextual variables in relation to one-to-one school districts. Items 80, 81, 82, 83 and 84 were created to indicate not only those educators working within a one-to-one school district, but also the various variables added to the integration of these devices within the classroom curriculum. Among the major changes that occurred through the introduction of computer technologies were the one-to-one initiatives, which have been growing in popularity across the United States. Schools implementing a one-to-one initiative provided a device for every student within the school system to use, learn, and interact with throughout the school day. The intention of this particular initiative was to improve educational experiences, through universal access to technology, as well as provided

stronger connections with parents, teachers, and community member. Technology has helped improve both teaching and learning and develop important skills for students in their future job market. Computers have encouraged student participation, academic achievement, attendance, motivation, and lifelong learning have changed how students think and retain information (Garthwait & Weller, 2005; Bebell & Kay, 2010). The one-to-one initiatives helped students progress in their academic skills, but there are some mixed emotions as to their benefits within the classroom setting. The following questions within section III reflects the specific questions associated with one-to-one initiatives:

81. Teach in a one to one school.

82. Select the device(s) used within your one to one school.

83. Students are able to take their device home each night.

84. The one to one initiative . . .

Increase student attendance.

Requires more policing of devices.

Helps achieve my curricular goals.

Motivates my students to complete their homework.

Differentiates materials to meet the needs of my students.

Costs exceed its benefits in my classroom.

Contact Information

The final two questions 84 and 85 invited participants to supply their contact information: email, school, or home address. Participants supplied their personal information if they wanted to participate in a follow-up interview or receive more information as to the findings of this particular study. The results were sent to the

address each participant provided on the questionnaire form at the closing of the study. These two questions were adopted from the survey by Cummings (2005) with permission. Due to the researcher's lack of presences during the administration of the questionnaire, it is always a good idea to include a note about sending respondents a summary of the findings (Dörnyei, 2003).

84. Would you be willing to participate in a follow-up interview to gain better insight into your classroom?

85. Would you like to receive the results of this questionnaire?

If so, please provide your email, school, or home address.

There are three main sections within the Modified Technology Implementation Questionnaire that addressed the main areas (innovation, innovator, and context) within the Conditions for Classroom Technology model, as well as two of the research questions for this particular study focusing on the impact of teachers´ beliefs and contextual factors contributing or hindering their abilities to utilize technology in the classroom. Within in each main section of the questionnaire, there were smaller sub-sections focused on a particular element of technology inclusion in the classroom either as elements consistent with teachers´ beliefs about technology or the context in their environments influencing the implementation of technology into classroom practices.

Data Sources

To conduct this study, an Explanatory Mixed Methods Design was used which involved the gathering and examination of both quantitative and qualitative data. This specific design was suited to the study due to the unknown barriers that K-12 foreign language teachers faced while incorporating technology into their classroom curriculum.

Personal beliefs are very complex in nature, because of various interplaying elements that might not be exposed thoroughly within the questionnaire. This could be troublesome because educators' beliefs might not match the reality of their classroom practices due to unobservable and incompatible nature.

Therefore, three research questions were developed regarding teachers' integration of technology into the classroom and factors impacting its integration. Research has depicted two main categories of factors influencing teachers' uses of technology in the classroom: internal and external. Internal barriers focused on teachers' beliefs dictating the decisions made about instructional strategies, materials, and resources including technology. External barriers were factors outside of the educators' control either from the institution or linked to the teachers: class size, training, professional development, etc. The following research questions discovered the impact of both types of barriers on technology integration.

4. What influences K-12 foreign language teachers' reported technological beliefs and integration into classroom practices?
5. How do the perceived contextual factors (time, resources, training, etc.) impact the use of technology by foreign language educators?
6. How does the data from the self-administered questionnaire compare to the data collected during teacher interviews?

Each phase of the study data collection and analysis enabled the discovering of answers to each of the three research questions for this particular study. The first phase of the research study focused on the distribution of the Modified Technology Implementation Questionnaire which generated some answers to the first two research

questions: the impact of beliefs and contextual factors on the inclusion of technology in the classroom for foreign language educators. The second phase of the study highlighted the one-to-one interviews with different foreign language educators to create more depth to the questionnaire responses, but also enabled the discovery of surprising or conflicting results. The second phase of the study also provided more thorough answers to the first two research questions about the influence of beliefs and context on their uses of technology within their curriculum. The final phase of data analysis enabled the researcher to compare the data from the first phase to the second phase of the study to solidify commonalities and the emergence of surprising or conflicting results. The comparison of the two data sets provided insight into the third research question.

Data Collection

The first phase of the study opened with the researcher contacting every administrator of both public and private K-12 institutions in Iowa asking permission to contact their foreign language educators. Once permission was granted, the Modified Technology Implementation Questionnaire, along with a thorough description of the study's details, aim, potential significance and consent, was sent out to every K-12 foreign language educators in the state of Iowa for which the research received permission. In addition to contacting educators through their administrators, the members of the Iowa World Language Association (IWLA) organization working with K-12 foreign language educators within the state of Iowa, were contacted with permission of the organization. The consent letters, a brief description of the study, and a link to the Modified Technology Implementation Questionnaire were sent through the IWLA listserv.

The second phase of the study expanded on the findings from the first phase through semi-structured interviews of ten current K-12 foreign language teachers in the state of Iowa. The participants from this phase of the study were purposefully selected due to their responses on the questionnaire. The participants were selected due to consistencies in responses as well as some surprising results. A specific set of questions were generated to focus on some of the pertinent elements influencing foreign language teachers' beliefs and contextual factors contributing or hindering the implementation of technology in the classroom. Each interview was initiated by having K-12 foreign language teachers reflect on their experiences with technology and incorporating it into their curriculum. After establishing some of the emotions, frustrations, and real experiences these individuals have dealt with while trying to use technology as an added resource in language learning. The subsequent questions were negotiated on an individual basis depending on the direction of the interview with each foreign language educator. Some of the additional topics related to technology integration and beliefs involved internal barriers, external barriers, benefits, drawbacks, support systems, one to one, etc. Finally, the last element discussed within each interview was to ask for follow-up contacts with each participant to provide any clarification, if needed, during the data analysis phase of the study.

Within a mixed methods design, a final data set was collected by analyzing the results from both the quantitative and qualitative phases of the study. I generated a list of the significant findings from the hierarchical multiple regression analysis amongst the various elements within the Modified Technology Implementation Questionnaire, which looked at the reported contextual factors and belief factors that impacted technology

implementation within classroom practices. I then looked over the themes that emerged from the ten K-12 foreign language teacher interviews that documented both positive and negative teacher's attitudes, beliefs, emotions, and contextual barriers with the implementation of technology into their classroom practices. The two distinct tables of categories and items from both the questionnaire and the interviews enabled a comparison and contrast of the data to provide a more complete and meaningful picture of the study's aim. The purpose of this step in the research process was to demonstrate the strength of the findings incorporated in a mixed methods design along with some surprising or contradictory results that appeared between the first and second phase of the study.

Data Analysis

The first phase of the study began with a factor analysis to help decide which questions from the questionnaire were correlated with the various predictor variables: - perceived beliefs, perceived AOC (attitudes, opinions, and costs), reported contextual factors (support, time, access, training, students), and teaching style. The predictor variables were derived from the structure of the Modified Technology Implementation Questionnaire and from research within the field of technology integration. The factor analysis solidified the items from the questionnaire and was placed into the appropriate predictor variables based on strong correlations. Once the factor analysis was complete, a second analysis was run to help provide each subscale for the predictor variables.

Cronbach's alpha is a test for internal consistency and reliability of the various subscales created within the Likert scale questionnaire. The internal consistency establishes the degree to which all items within a subscale measure the same construct

(Cronbach, 1951). The alpha is expressed in numerical values rating from zero to one. There is a parallel relationship between the alpha score and the correlations within the subscales: increase in correlation creates an increase in alpha score as does a decrease in correlation creates a decrease in alpha score. Cronbach's alpha test was run on each of the predictor variables and dependent variable to establish internal consistency and reliability for each of the subscales. An acceptable value of Cronbach's alpha ranges from .7 to .95 (DeVellis, 2003). The table below provides the internal consistency values for Cronbach's alpha.

Table 4. Cronbach's Alpha of Reliability for Variables

Variables	Number of Items	Reliability Alpha
Frequency of Use (DV)	13	.821
Beneficial Beliefs	28	.931
AOC (attitude, opinion, costs)	8	.742
Context (support, time, access, training, students)	22	.739
Teaching Style	10	.825

In a hierarchical multiple regression there were a few additional steps prior to running the linear regression analysis. The first step followed by Cronbach's alpha was through univariate analysis to review data for missing elements, improper coding, and distribution. The univariate analysis provides a summary of each individual variable within the data set. Therefore, the descriptive statistics for both the dependent variable and the seven predictor variables were generated in regards to mean scores and number of participants without missing data. Once the univariate analysis was complete the next

step was to review multicollinearity looking at each individual variable to make sure they are not heavily correlated. If two variables are highly correlated it means that they are measuring the same concept and there is no need for two separate variables. The process of multicollinearity begins with Pearson's correlational values for the variables. Pearson's correlation established relationships between variables: a higher value, the more closely related the two variables are while a lower value depicts a more distant relationship. The Pearson's correlations for the nine predictor variables and dependent variable were all below .70, except one relationship. There was a strong relationship between benefits of technology usage and teaching style resulting in a .837 correlational value. The high correlational value would normally be a concern, except in this particular study the two values are put into the same category for the hierarchical regression analysis.

The next two steps for checking multicollinearity were the tolerance levels and the variance inflation factor (VIF). Multicollinearity looks at the relationship between the predictor variables within the multiple regression analysis. If two more variables are highly correlated, then it can affect the standard error for the model. A small change in highly correlated variables can significantly change the coefficient for the overall regression model. Tolerance levels not below .1 are acceptable while variance inflation factors must be below 10 to be acceptable. These last two steps verify the different variables are measuring separate elements within the data set. The seven predictor variables met the acceptable level for both tolerance and VIF. Each of the seven predictor variables have a tolerance level above .1 and a variance inflation factor below

ten. These values are show in the Table 4 creating no reason for concern with predictive variables and their abilities to influence each other.

Table 5. Multicollinearity of Predictor Variables

Variables	Tolerance	VIF
Gender	.909	1.100
Age	.396	2.527
Years of Teaching	.393	2.547
Average Class that You Teach	.801	1.248
Teach in a One to One School	.911	1.098
Context (support, time, access, training, students)	.493	2.027
Teaching Style	.251	3.989
Beneficial Beliefs	.251	3.992
AOC (attitude, opinion, costs)	.330	3.032

The internal consistency of both the predictor variables and the dependent variable from within the Modified Technology Implementation Questionnaire created subscales utilized in the hierarchical regression analysis. The purpose of a multiple regression analysis was to predict a dependent variable from various independent predictor variables. The multiple regression analysis selected was hierarchical due to its ability to simultaneously analyze a series of predictor variables using the same dependent variable. The hierarchical regression allowed sets of variables to be held constant while the predictive ability of other sets could be examined (Hayes, 1994). The variables were entered into the model based on past research. A very common practice is to begin with demographic variables as it is out of the control of the participants. The final sets of

variables are entered based on their predictive ability for the dependent variable. Therefore, nine predictor variables were entered into three blocks of variables: control, external barriers, and internal barriers. The three predictor variables out of the control of the participants were age, gender, and years of teaching. The second set of predictor variables focused on the elements external to the population which were also directly out of the control of the participants: teaching in a one-to-one school, average class size, and context (support, time, access, training, students, etc.). The final set of predictor variables entered into the model focused on elements internal to the population which they have the most direct control over: teaching style, perceived AOC (attitude, opinion, costs), and perceived benefits. The three sets of variables were entered into the hierarchical regression analysis to determine their impact on the dependent variable, reported frequency of technology use. The power for this study is .95 based on the nine predictor variables and a sample size bigger than 74 participants (G*Power Version 3.1.9.2, 2014).

The next step in data analysis was to look at the interrelated elements within the Modified Technology Implementation Questionnaire to discoveries areas for further development within the second phase of the study. Ten participants were purposefully selected from the current participant pool for follow-up interviews. The thirty-to-sixty minute interviews with each participant, either in person or through Skype, were conducted. Each interview was recorded using a voice recorder and then transcribed verbatim to create a written text from the verbal conversations. Once the transcriptions were completed, I read through each transcription in its entirety to gain a general understanding of the material (Creswell, 2003). While reading through the transcriptions,

I jotted down some general notes as themes started to emerge. The second time reading through the data, I generated a graphic organizer to help create categories, similar stories, topic threads, themes, etc. These categories were separated into main themes and subthemes. Once the themes were identified, I read through the interviews again to highlight each theme and subtheme with its own individual color. I utilized the highlighting tool within Microsoft Word to create unique colors for each theme and varying degrees of the color for each subtheme. The highlighting was not a linear process as it led to some content being connected to more than one theme or subtheme resulting in the need for double coding or layered codes. The double or layered coding presents the interconnected relationship amongst the themes and subthemes of the study.

Figure 5. A Visual Example of Multiple Theme Color Codes

Example 1

That's what we get as a Tech Committee, stuff to address. That they're playing games while I'm lecturing. It's like such a loaded statement, like oh, okay. Maybe you should look at a different way. I'm pretty vocal when this stuff comes up in our staff meetings. There's no reason for you to do that. There's no reason for you to let them have their iPads. Have them close the lid on it. There's no reason for them to have it out. Then we get the comments of, but then I give stories and I give other things that aren't included in the PowerPoint. I want them to take notes on the device that they're most comfortable with and whatever. I think that's been an issue for some, but I think it's because they're not willing to change their teaching style to adapt to that.

In **Multiple Theme Data Color Coding Example** 1, the yellow code represents technology support available for educators as they work with technology. The red code represents issues or concerns arising with classroom management about technology use within the classroom, but the white text represents a blue coding within the background

to tag personal' beliefs about technology. Layered together, the coding indicates a relationship between these factors. The final code color, peach, refers to differentiation and teacher beliefs about technology.

Once the highlighting was complete, the color scheme was utilized to create a more robust graphic organizer depicting themes, subthemes, and specific data related to each piece. Once the graphic organizer was finalized, I sent out emails to a few participants asking for more clarification or detail surrounding a main theme or subtheme, which was then added to the graphic organizer.

The mixed methods design provided an additional analysis pertaining to research question three: findings from the two phases are compared and contrasted. A third set of data was constructed by looking at the results from both the qualitative and quantitative phases of the study. The results from the quantitative phase were structured into three main categories of predictor variables: control, internal, and external. These categories focus on demographic variables, personal attitudes and beliefs of the participants, and the reported contextual elements within the environment. The significant predictor categories were then put on a sheet of paper. The second phase data from the one-to-one interviews were review to create a list of common themes from the color-coded thematic analysis. A table was created to display every theme derived from the collective ten interviews. The two distinct data sets were compared and contrasted for consistencies, inconsistencies, and surprising results which developed a more complete and meaningful picture of the study's aim. The purpose of this step in the research process was to demonstrate the strength of the findings incorporated in a mixed methods design.

Conclusion

This study focused on K-12 foreign language teachers' technological beliefs and their influence on curriculum integration. An Explanatory Mixed Methods Design was used involving the gathering and examination of quantitative and qualitative data. According to Creswell and Plano Clark (2007), an Explanatory Mixed Method Design consists of two phases, where the qualitative data build on the primary collected quantitative data. Thus greater emphasis was placed on the initial quantitative data, which was followed by qualitative data collection. Due to the uncertainty of the two data sets, my philosophy of mixed methods research tied into the dialectical approach. The dialectical philosophy examined the tension that could surface due to the use of multiple methods from opposing viewpoints. The dialectical approach focused on the interrelating data through reexamination.

The complexity associated with technology inclusion and teachers' beliefs are inefficiently researched through one approach. It is important to understand teachers' beliefs because they guide the decisions teachers make and actions they take in the classroom (Palak & Walls, 2009). The complex system of teachers' beliefs makes it difficult to understand, change, or enhance classroom teaching practices. Beliefs are a messy construct because they do not lend themselves to an observable investigation (Pajares, 1992). The unobservable nature of beliefs requires educators to self-report their beliefs surrounding technology practices in the classroom. Additionally, Green (1971) establishes that an individual may hold beliefs that are incompatible with one another. This can be troublesome because educators' beliefs might not match the reality of their classroom practices due to their unobservable and incompatible nature. In order to fully

understand teachers' beliefs, it is essential to "infer from what they say, intend, and do" (Pajares, 1992, p. 314). Instead of having a trade-off between quantitative and qualitative methods, one study encompassing both data sets produced a more comprehensive picture of the phenomenon.

Therefore, the first quantitative phase used a Likert scale questionnaire, Modified Technology Implementation Questionnaire (MTIQ), collected from K-12 foreign language educators in the state of Iowa for which the researcher was able to gain permission. The questionnaire helped explain various variables impacting teachers' reported technological beliefs and perceived contextual factors in regards to technology integration. The second qualitative phase probed deeper into teachers' perceptions and beliefs about technology along with providing a glimpse into their educational environments. The second phase commenced with ten semi-structured interviews selected from the initial participant sample. Additionally, interviews aided in the explanation and exploration of unique, surprising, or interesting responses from the self-administered questionnaire. Essentially, interview questions generated from the questionnaire findings furthered the understanding of reported personal beliefs and barriers that influenced the utilization of technology in the classroom. Subsequent questions were negotiated during each individual interview based on the conversations between participant and researcher.

CHAPTER 4

FINDINGS

Introduction

The essential pieces of this chapter focus on the multiple phases of data analysis, results, and participants answering the research questions. Due to the mixed methods Explanatory follow-up design the chapter is broken down into three main sections: quantitative data analysis (phase one), qualitative data analysis (phase two), and comparison data analysis (phase three). The first phase of the study was analyzed using a hierarchical multiple regression analysis where predictor factors for integrating technology were generated from the Modified Technology Implementation Questionnaire. The second phase of the study utilized follow-up semi-structured interviews to focus on the results from the questionnaire, as well as explore surprising or contradictory results. The final phase of data analysis compares the data from phase one and two to help uncover inconsistencies or unexpected results.

This study focused on K-12 foreign language classrooms and technology use by educators within the state of Iowa. Technology has the ability to open up new doors for language learning, advancing skill levels, bringing in the native culture, and enabling communication practice with native speakers. There were both perceived internal and external barriers influencing foreign language educators' integration of technology into the classroom. The internal barriers focused on teachers' beliefs and decision-making process within the classroom. External barriers were broken down into two main categories: factors within the institution and factors directly linked with the teachers. It was important to understand teachers' beliefs because they guide the decisions teachers

make and actions they take in the classroom. The classroom institutional environments also played into the teachers' decision-making process. For example, if a teacher did not have access to a computer lab on a regular basis, it was more difficult for this particular teacher to incorporate technology into his/her classroom.

Due to the complexity associated with technology inclusion and teachers' beliefs, a single approach to research was inefficient. Incorporating quantitative and qualitative data in various manners can better suit the research questions by off-setting the weaknesses of each individual methodology. Instead of having a trade-off between quantitative and qualitative methods, one study encompassing both data sets can produce a more comprehensive picture of the phenomenon. In this study, the quantitative data established relationships between both the perceived internal and external barriers, but further exploration provided more in-depth context from diverse perspectives. Follow-up interviews with diverse K-12 foreign language educators linked feelings, emotions, and understanding to the data from the quantitative questionnaire. Interview questions were generated from the questionnaire findings to further understand personal beliefs and barriers that impacting the utilization of technology in the classroom.

Research Questions

To conduct this study, three research questions were developed regarding teachers' integration of technology into the classroom and factors impacting its integration. In the research literature, the factors influencing teachers' uses of technology are separated into two main categories of factors influencing teachers' reported uses of technology in the classroom: internal and external. Internal barriers focused on teachers' beliefs dictating the decisions made about instructional strategies, materials, and

resources including technology. External barriers were factors outside of the educator's control either from the institution or linked to the teachers: class size, training, professional development, etc. The following research questions discovered the impact of both types of barriers on technology integration.

7. What influences K-12 foreign language teachers' reported technological beliefs and integration into classroom practices?
8. How do the perceived contextual factors (time, resources, training, etc.) impact the use of technology by foreign language educators?
9. How does the data from the self-administered questionnaire compare to the data collected during teacher interviews?

Phase One

Participants

An email detailing the study's intent along with a link to the online Modified Technology Implementation Questionnaire (MTIQ) was sent out to every K-12 administrator in the state of Iowa for both private and public institutions. Once the administrators gave their permission, the Modified Technology Implementation Questionnaire was sent out to 394 districts. Forty-seven school district administrators granted permission to contact their foreign language educators through their school email addresses. A consent letter and link to the Modified Technology Implementation Questionnaire was sent to each of the 128 foreign language educators from these districts. Fifty-three of the 128 teachers completed the questionnaire through the consent letter link. The response rate of these foreign language educators was 41%.

The next tactic used to gain participants for the online portion of the research study was through a professional organization within the state of Iowa for foreign language educators. Iowa World Language Association (IWLA) was contacted with consent letters, a brief description of the study, and a link to the Modified Technology Implementation Questionnaire. Permission was granted from the organization, which provided their members with a brief description of the study and a link to the online survey. Forty-six teachers responded to the online questionnaire through their membership emails, but the response rate was unknown. The final number of participants was 99 K-12 foreign language educators within the state of Iowa.

Data Analysis

Phase one of data analysis utilized a hierarchical multiple regression to measure the impact that multiple variables had on a given outcome (Creswell, 2012). A higher significance value of the variable implied a closer relationship in predicting the outcome. SPSS, Statistical Program for Social Science, was utilized to conduct the hierarchical multiple regression analysis for diverse factors impacting technology integration into classroom practices. SPSS is a computer program that runs the statistical analysis and provided a computer printout depicting the significant correlations. SPSS performs hierarchical multiple regression analysis amongst the reported frequency of use as the dependent variable or the variable that the analysis was trying to predict based on other variables within the questionnaire. There were nine predictor variables found within the Modified Technology Implementation Questionnaire after running a factor analysis and Cronbach's alpha to determine the internal consistencies of the various questions selected for each predictor variable. The predictor variables contributed in part, to the reported

frequency of technology use in the classroom. There were nine predictor variables: age, years of teaching, gender, one-to-one school, average class size, reported context, teaching style, perceived attitudes, opinions, and costs, and perceived benefits.

The multiple regression analysis selected was hierarchical due to its ability to simultaneously analyze a series of predictor variables using the same dependent variable. The hierarchical regression allowed sets of variables to be held constant while the predictive ability of other sets can be examined (Hayes, 1994). The variables were entered into the model based on past research. A very common practice is to begin with demographic variables as it is out of the control of the participants. The final sets of variables are entered based on their predictive ability for the dependent variable. Therefore, the nine predictor variables were entered into three blocks of variables: control, external barriers, and internal barriers. The three predictor variables out of the control of the participants age, gender, and years of teaching were entered first. The second set of predictor variables focused on the elements external to the population which were also directly out of the control of the participants: teaching in a one-to-one school, average class size, and reported context (support, time, access, training, students, etc.). The final set of predictor variables entered into the model focused on elements internal to the population which they had the most direct control over: teaching style, perceived AOC (attitude, opinion, costs), and perceived benefits. The three sets of variables were entered into the hierarchical regression analysis to determine their impact on the dependent variable, and reported frequency of technology use.

The dependent variable, reported frequency of technology use, was calculated by transforming the responses within the Likert-scale questionnaire to numbers. The

reported frequency of technology was calculated by looking at the codes for each question in the second section of the questionnaire: 55-68. Each question was coded using numbers one to six where each number stood for an option in the questions beginning with one. For example: Information Literacy-Access and Evaluate Information was coded one for never, two for practically never, three for once in a while, four for fairly often, five for very often and six for almost always. For each participant a number was calculated by taking these questions with their numerical values and generating the mean score. The other variables were also calculated in a similar manner with either a series of questions or one question from the Modified Technology Implementation Questionnaire.

Results

The hierarchical regression allowed sets of variables to be held constant while the predictive ability of other sets could be examined (Hayes, 1994). The variables were entered into the model based on past research. A very common practice is to begin with demographic variables as it is out of the control of the participants. The final sets of variables are entered based on their predictive ability for the dependent variable. Therefore, nine predictor variables were entered into three blocks of variables: control, external barriers, and internal barriers. The three predictor variables out of the control of the participants were age, gender, and years of teaching. The second set of predictor variables focused on the elements external to the population which were also directly out of the control of the participants: teaching in a one-to-one school, average class size, and context (support, time, access, training, students, etc.). The final set of predictor variables entered into the model focused on elements internal to the population which

they have the most direct control over: teaching style, perceived AOC (attitude, opinion, costs), and perceived benefits. The three sets of variables were entered into the hierarchical regression analysis to determine their impact on the dependent variable, reported frequency of technology use.

Therefore, the hierarchical regression analysis led to three different linear regression models where each category of predictor variables was entered into the analysis. Below in Table 5 there are three lines of regression analysis displaying each of the categories. The analysis is broken down into a few elements to demonstrate the predictability of each category of variables on the dependent variable, reported frequency of technology use and the significance of this predication. The R square value depicts the percentage of predictability for each category of variables while the significance value demonstrates the error that can occur with the analysis. The standard significance values are between .05 and .01, but the smaller the p-value the more significance the results are meaning there is less error.

The first category of control variables was entered first into the analysis stage of the research. The control category accounted for 30.2% of the variance or predictability for the dependent variable of reported frequency of technology use. This particular regression model contributed significantly to the regression model, $F(3, 70) = 10.106$, $p < .001$). This means that the control variables are significant at the $p<.001$ level or there is a really small chance of error. The second category of perceived external variables were entered into the second model and accounted for 5.1% of the variance or predictability for the dependent variable of reported frequency of technology use. This particular regression model did not contribute significantly to the overall predictability in reported

frequency of technology use. The p-value for this particular model is .167 which does not fall below the acceptable significance level of .05 or lower. The final category of reported internal barriers was entered into the third model of the regression analysis. The reported internal barriers accounted for 24.7% of the variance or predictability in of the dependent variable. The reported internal barriers contributed significantly to the regression model, $F(3, 64) = 13.230$, $p < .001$). This means that the control variables are significant at the $p<.001$ level or there is a really small chance of error. Collectively, the nine predictor variables in each category (gender, age, years of teaching, one to one school, average class size, reported context, perceived AOC, perceived benefits, and teaching style) accounted for 60% of the overall variance within the dependent variable: reported frequency of technology use. This means the variables entered into the various categories was able to predict the reported frequency of technology use 60% of the time. In other words, the K-12 foreign language educators reported frequency of technology use can be attributed to the nine variables for 60% of the time.

Table 6. Three Hierarchical Regression Models for Each Block of Predictor Variables

Model	R Square	df1	df2	F	Sig.
1	.302	3	70	10.106	.000
2	.353	3	67	1.740	.167
3	.600	3	64	13.230	.000

The nine predictor variables all sought to discover the relationship between each individual variable and the dependent variable. Another analysis was conducted to test the unique contributions from each of the nine predictor variables within the study. A

coefficient value was connected to the predictor variables called beta weights: the higher the beta weight, the stronger the impact on the dependent variable. The table below demonstrates each of the unique beta weights for the nine predictor variables. The beta weights are represented by the standard coefficient beta within the table. The strongest impact on the reported frequency of technology was age -.548. The next two strongest impact on the dependent variable were perceived benefits of technology .491 and years of teaching .244. Followed by gender .151, teaching in a one-to-one school .114, and teaching style .10 while the other variables: perceived attitudes (AOC) .076, reported context -.027, and average class size -.006 provided the weakest impact on reported frequency of technology use in the classroom. This step enables the researcher to dissect each of the categories into individual variables. The individual beta weights enable a closer look at each variable and their contributions to the dependent variable. The beta weights and the models demonstrate the predictability within the nine predictor variables for reported frequency of technology use in the foreign language classroom.

Table 7. Coefficient Beta Weights for Each Predictor Variable

Predictor Variable	Unstandardized Coefficients B	Standardized Coefficients Beta	*t*	Sig.
Age	-.333	-.548	-4.364	.000
Benefits	.642	.491	3.108	.003
Years of Teaching	.160	.244	1.937	.057
Gender	-.299	1.151	-1.822	.073
One to one School	.172	.114	1.372	.175
Teaching Style	.121	.102	.646	.521
AOC (attitude)	.072	.076	.554	.582
Context	-.046	-.027	-.244	.808
Average Class Size	-.004	-.006	-.072	.943

Findings

The predictor variables have provided some insight as to elements impacting foreign language teachers' reported use of technology in the classroom. The nine predictor variables were able to account for a large portion of the variance in reported technology use in the classroom with the highest impact coming from factors outside of the control of the participants. The demographic variables gender, age, and years of teaching yielded the highest impact with age, heavily affecting frequency. The younger participants incorporated technology more frequently into their classroom than older participants. The findings also revealed that more experienced teachers included technology in the classroom more than teachers with fewer years of experience, while

more male than female foreign language teachers tended to utilize technology within their classrooms.

The next two sets of predictor variables impacting the reported teachers' uses of technology in the classroom focused on the items which the teachers had the most control over: teaching style, perceived benefits, and perceived attitudes about technology. Teaching style was broken down into a continuum reflecting more student-centered classrooms at one end to more teacher-centered classrooms at the other end. Teacher-centered classrooms focused on the transmission of knowledge from the educator to the students in the classroom. The teacher had the expertise that they were conveying to the students, but few changes or modifications were made for learner needs (Brown, 2003). Student-centered classrooms focused on the students and their needs first when working with the course materials. Teachers were seen more as facilitators of knowledge, with students taking a more active role in learning through collaboration, inquiry-based learning, etc. (Brown, 2003). Participants who had a largely student-centered philosophy incorporated technology more into their teaching than participants with a largely teacher-centered approach. In addition to teaching style; teachers' perceived beliefs, attitudes, and opinions seemed to contribute to technology integration within the classroom. Teachers who placed a higher value on technology seemed to incorporate it more into their curriculum than teachers who did not believe it provided sufficient benefits for classroom usage. The internal elements provided the most significant variance in reported technology integration other than demographic variables.

The sub section of predictor variables, context, had the smallest impact on variance for reported technology integration. Teachers working in a one-to-one school

where each student has his/her own device to utilize throughout the school day had more reported technology integration than teachers who were not in a one-to-one school. Teachers with more limited resources in regards to technological devices had a harder time incorporating it into their own classrooms. In addition to resources, class size played a role in reported technology integration. The larger the foreign language class size, the less likely a teacher was to use technology in the classroom. Conversely, smaller class sizes led to more frequent technology usage. Other perceived contextual factors such as time, access, resources, support, etc. led to a negative relationship with technology. The more contextual factors a teacher had to combat, the less likely the teacher was to utilize it in the classroom. The more external barriers within the school system; the more dissuaded teachers were to incorporate technology into their classroom curriculum.

The interplay between internal barriers and external barriers created a complex process for technology integration within the classroom curriculum. It is important to understand teachers' beliefs because they guide the decisions teachers make and actions they take in the classroom (Palak & Walls, 2009). In order to gain a better understanding of teachers' more interrelated external and internal barriers to technology, follow-up interviews were conducted with participants from the first phase of the study.

Phase Two

Participants

Once the data was collected and analyzed from the quantitative phase, a second set of participants was selected using the same sample based on trends, potential paradoxical or conflicting data. Participants for the qualitative phase were selected from

K-12 foreign language teachers who completed the questionnaire and agreed to a follow-up interview. The second phase of the study expanded on the findings from the first phase through semi-structured interviews of ten K-12 foreign language teachers in the field. The participants were selected utilizing a participant selection sampling technique based on: educators' placements in different school districts, one-to-one initiative, educational backgrounds, multiple barriers impacting the use of technology, native or non-native speakers of the foreign language taught, and surprising or contradictory results.

Diverse institutions created varying programs, resources, and philosophies that can impact one's technological beliefs as these elements related to the various contextual and innovation factors: human infrastructure, technology infrastructure, social support, distance, and dependence. Additionally, background factors such as age, years of teaching and gender can influence a teacher's exposure, comfort level, instruction and classroom practices with technology. Further exploration of various internal and external barriers influencing technology integration in the classroom can help school districts, policy makers, professional development and pre-service teachers better understand the needs of K-12 foreign language educators. Therefore, a purposeful sample of participants in the study can help capture the varying degrees of technology integration and teachers' beliefs.

Data Analysis

The thirty to sixty minute semi-structured interviews in phase two were collected and analyzed by looking for emerging patterns across the ten interviews. The thematic analysis looked for clusters of common meanings or thoughts that surfaced throughout a

variety of interviews. The intention was to identify frequent themes associated with teachers' reported technological beliefs and perceived contextual barriers influencing the inclusion of technology in the curriculum.

Each interview was recorded through a voice recorder followed by verbatim transcriptions to present written text to the verbal conversations. Once the transcriptions were completed, I read through each transcription in its entirety to gain a general understanding of the material (Creswell, 2003). While reading through the transcriptions, I jotted down some general notes as themes started to emerge. The second time reading through the data, I generated a graphic organizer to help create categories, similar stories, topic threads, themes, etc. These categories were separated into main themes and subthemes. Once the themes were identified, I read through the interviews again to highlight each theme and subtheme with its own individual color. I utilized the highlighting tool within Microsoft Word to create unique colors for each theme and varying degrees of the color for each subtheme. Once the highlighting was complete, the color scheme was utilized to create a more robust graphic organizer depicting themes, subthemes, and specific data related to each piece. Once the graphic organizer was finalized, I sent out emails to a few participants asking for more clarification or detail surrounding a main theme or subtheme, which were then added to the graphic organizer.

Findings

The thematic analysis from the qualitative phase of the study revealed four main themes with eighteen subthemes focusing on various factors impacting the reported frequency of technology use in the classroom by foreign language educators. The first two research questions of the study were addressed through the emergence of three main

themes with one additional main theme emerging unexpectedly from the findings. This next section presents findings specific to the research questions, beginning with the perceived influence of attitudes towards technology, benefits of technology, impact of reported context of technology integration, and finally ending with the surprise finding. The data coding and analysis resulted in 4 major themes and 18 subthemes as presented in Figure 6.

Figure 6. Data Coding and Analysis with Themes and Subthemes

Research Question Findings Main Themes 1-3	Additional Findings Main Theme 4

• MT 1: Attitudes
  • Attitudes Towards Technology
  • Student Impact
  • Classroom Management
• MT 2: Benefits
  • Language Learning Skills
  • 21st Century Skills
  • Student Engagement
  • Differentiation
• MT 3: Context
  • Time
  • Resources at School
  • Resources at Home for Students
  • Technology Support
  • Administrative, Parental and Community Support
  • Class sizes and Scheduling Conflicts
  • Collaboration
  • Training and Professional Development
	• MT 4: One to One Initiatives
	  • Issues with One to One Initiatives
	  • Application Downloading

What influences K-12 foreign language teachers' reported technological beliefs and integration into classroom practices?

Major Theme 1: Attitudes

Since teachers are the facilitators of knowledge in the classroom, it is critical to fully understand the issues impacting K-12 foreign language teachers' use of technology in the classroom. It is important to understand teachers' beliefs and attitudes because they guide the decisions teachers make and actions they take in the classroom (Palak & Walls, 2009). The complex system of teachers' beliefs makes it difficult to understand, change, or enhance classroom teaching practices. According to the Expectancy-Value theory which examines individual's beliefs amongst the use of a strategy and a desired outcome. In order for an individual to implement a specific strategy, one must have high anticipation for success and believe the end result as important enough to overlook the impending barriers. One of the costs or barriers to implementing technology into the classroom is teachers' personal attitudes. The findings from the qualitative phase uncovered three main subthemes to reported attitudes: attitudes toward technology, classroom management, and student impact. The thematic discussion concludes with a summary response to the research question.

Attitudes toward technology emerged as a common theme among participants, but the perspectives varied from positive, uncertain, and negative. Some teachers displayed a more positive spin towards technology due to their enduring outlook towards technology and its potential impact on language learning. Teachers felt like technology fits better into their teaching style because it helps them connect to their students. One participant discussed how technology better enabled his teaching style:

> It has made my preferred style of teaching a lot more feasible. It's a lot better organized; it's more streamlined. I don't have to waste a lot of downtime with papers back and forth. I can maximize the time I've got, which has allowed me to use that downtime for other things like more informal speaking activities. It's everywhere. It's the fastest growing thing in our society right now. It's not going to go away and it's not going to change (one-on-one interview, 09/08/2014).

The educators believed the perceived benefits of technology in language learning far out weighted the pitfalls, so they were able to overlook some of the complications or additional work required to implement technology into their classroom practices. One participant expressed her path to integrating technology and its importance in language learning:

> I am really passionate about finding more effective ways to do things. I also think in teaching we can use things they already use, like Instagram. I can take out the learning curve of teaching technology and just focus on the content. And I just think, especially with the internet and everything being electronic, it's really easy to integrate into the classroom with the internet (one-on-one interview, 08/10/2014).

A few educators expressed uncertainty as to the impact technology would have in their classrooms. These teachers experienced more trial and error options as to how technology might be integrated into their curriculum. One participant describes her process of trial-and-error.

> It's more of like let's see what's out there and let's see what's working, what's not working, and how can we change it to make it better. Because I think if we can't change it, it's not going to improve (one-on-one interview, 07/21/2014).

These educators had a positive outlook in the fact that they would like to integrate technology more into the curriculum, but they were just not as familiar with applicable technology or the constantly changing technologies. These teachers felt the need to play around with the technology to find the elements that work best for their classrooms. This process was not without its frustrations leading some teachers to give up, while others persevered. One educator expressed her frustration with the continuous changes, updates, and obsolete nature of current technology. "Then of course when you find something wonderful like Voice Thread, it disappears or you have to pay a fee" (one-on-one interview, 07/24/2014).

The last perspective for educators was of a more negative attitude towards technology stemming from the fear of using technology or the unwillingness to change their current teaching practices. One participant describes some frustrations with one-to-one initiative, "I think that's been an issue for some, but I think it's because they're not willing to change their teaching style to adapt to it" (one-on-one interview, 07/25/2014). These teachers believed that technology did not accommodate their teaching style, philosophy, or aims for their language learning classrooms. Some of these reported beliefs stemmed from their lack of exposure to technology in practice within the foreign language classroom. One educator expressed the lack of perceived benefits for technology integration, "I don't know if it is beneficial or not. Foreign language is so communicative; I don't know that I wish I had more technology, because I think it's

important for them to be talking to each other" (one-on-one interview, 07/17/2014). Educators with a more negative perspective were not sure that the complications, frustration, or inconsistencies associated with technology were worthwhile. Several educators expressed their own personal views on technology and their fear of technology. One participant described her old school beliefs, "I am open to technology, but I guess I'm still a little bit old school. I still depend on a lot of paper and actually writing things down. I think the physical part of it helps get into their brains, like note taking" (one-on-one interview, 08/14/2014). Participants had a wide spectrum of beliefs about technology and its uses in their classrooms. Some educators felt it had a more positive spin while others felt it created a more negative impact on their teaching. Still other educators where clear about their positive beliefs about technology, but not quite sure how to follow through with its integration.

Student impact within the classroom and with technology also emerged. In addition to their own personal attitudes towards technology, educators also had their own perceptions of students' uses of technology both in and out of the classroom. Some educators expressed excitement about the enhanced learning opportunities technology can bring students; especially in relation to target language materials, enhanced language skills, and ample opportunities for differentiation. The students expressed their own interests, excitement, and ideas, which they shared openly with their teachers. One teacher describes students' assistance with a program, "When I started teaching in 2001, I didn't know how to make a PowerPoint. I assigned a PowerPoint to my class, and I started to walk around and I learned with them as they explained it to me" (one-on-one

interview, 07/24/2014). The technology conversations between teachers and students enabled sharing of new ideas, technologies, which impacted student learning.

In addition to acknowledging positive enhancements technology brings to language learning, educators were also open to accepting student help with technology difficulties. Some teachers felt that students had more knowledge about new advances in technology than they did. Students were born in the technology information age and had been using it their entire lives, while some educators had only been working with these advances for several years. Students have a better understanding of technology and their own capabilities. One participant described the knowledge of the students, "Frankly, the kids probably know a lot more than I do. And I let them go with it" (one-on-one interview, 08/14/2014). Some educators openly asked students for assistance when a problem with technology arose in the classroom. Students were able to help fix the problem as it arose enabling classes to run more smoothly.

Not all of the teachers had a positive experience with students' uses of technology, both in and out of the classroom. Some educators believed that technology has made students lazier when it comes to everyday tasks, homework, and learning. A participant described her thoughts on students and technology, "I think now everything in their life is fast and easy. You know, they're texting, instagraming, and they expect school to be fast and easy" (one-on-one interview, 07/17/2014). Technology has given students faster access to information, materials, and resources; but students' digital literacy skills are lacking. Students do not take the time to validate the information or translations they are able to acquire through technology before utilizing the materials within classroom assignments. Another participant expressed the frustration of digital

illiteracy skills. “It’s very quick, they just look at the first thing that pops up and that’s what they’ll use and not check it with other sources” (one-on-one interview, 07/21/2014). In addition to the fast access, students lacked other literacy skills in relation to computer skills. Students were knowledgeable about their own devices, but did not understand some of the basic programs and login information required for classroom projects.

The lack of computer and digital literacy skills were not the only concerns teachers had with students’ uses of technology. Some teachers believed that old-school techniques or skills were more worthwhile than the newer waves of technology skills. There is some value in having students write hand-written notes instead of taking pictures of the power point or talking with each other through communicative activities instead of through Skype with one speaker to an entire class of students. Educators believed these more old-school techniques would also improve students’ language learning and negate some of the more negative aspects of technology. One participant expressed issues with homework, “I’ve seen in my class itself. It’s a lot easier for students to neglect their homework, because they don’t have a physical thing in their hands” (one-on-one interview, 09/08/2014). Students impacted teachers’ abilities to use technology within their courses both in positive and negative ways. Some educators believed that the students were more knowledgeable and aided with technological difficulties in the classroom, while other teachers believed technology made students lazier in relation to digital literacy skills. Students also played a major role in some of the complications with technology and classroom management.

Classroom management concerns emerged as a third sub-theme impacting teachers’ perceived attitudes towards technology. The classroom environment has

changed with the integration of technology into the classroom. Computers, iPads, Chromebooks, etc. have become part of the normal classroom environment. This change in environment has presented some new concerns for educators in regards to classroom management. Technology has made it more difficult for teachers to monitor students' behaviors both on and off devices. One participant described her concerns, "being one-to-one would worry me. How do you know they're always paying attention? If they have that computer screen in front of them, I don't know how you monitor that they're doing what they're supposed to" (one-on-one interview, 07/17/2014). Another challenge to the change in environment stemmed from an inability to get students to pay attention in class and stay on-task. One participant expressed frustration with this scenario, "students are often playing games while I'm lecturing" (one-on-one interview, 07/25/2014).

Other educators believed that the new version of educational classrooms did not add any challenges to classroom management. It is simply a new viewpoint on classroom management and the new elements that technology brings to the classroom environment. A foreign language educator described the issues as the same with or without technology. "They don't like to stay on the page you want them to be on. It's the same with the textbook. They mess around. So if I walk around they're on the right page" (one-on-one interview, 07/21/2014). There were other items teachers focused on with technology in the classroom, like constant monitoring of computer screens, firewall protection of inappropriate sites, and firm guidelines for students while interacting with computer technologies. Classroom management has always been an issue in the classroom, with technology it just depends on how the teacher handles the students, their behaviors, and

the new additions to the environment. An educator with a positive view described classroom management with technology as "the moment students' understand that the management of the class gets a different level, it is easier" (one-on-one interview, 07/24/2014). The role of classroom management with technology has altered the classroom environment creating some new complications or perspectives for foreign language educators. It is the perception of technology and its impact on the classroom, which has created two diverse perspectives: the addition of technology either adds challenges to teaching and classroom management or does not have a negative effect on the classroom environment. Besides the attitudes that teachers had towards technology impacting its integration into the curriculum, its perceived benefits also contributed to technological implementation.

Major Theme 2: Benefits

Teachers play a vital role in deciding what happens and is implemented into classroom practices on a minute-by-minute basis. The construction of a course, syllabus, and curriculum is completed through a progression of decisions made by the teacher in connection to other elements of the environment. Teachers interpret the activities and behaviors occurring within the classroom to guide their planning for each subsequent activity, day, week, etc. (Woods, 1996). These classroom decisions are based on context, prior decisions and experiences, and the overall goals of the curriculum. Teachers incorporate technology into their curricular decisions based on their own experiences and perceived benefits. The findings from the qualitative phase uncovered five subthemes within benefits: improved language skills, authentic resources, 21st century skills, differentiation, and student engagement.

Language learning skills enhancement emerged as the first sub-theme within the various benefits associated with technology integration. Language learning has been broken down into five main skill sets: listening, speaking, reading, writing, and culture. Teachers work to incorporate a variety of lesson plans to help improve each of these skill sets within the language classroom. In addition to the skill sets, the American Council on the Teaching of Foreign Languages further added to the importance of improving these language learning elements through their national standards for foreign language education: Communication, Cultures, Connections, Comparisons, and Communities (ACTFL, 1996). The educators from the second phase of the study agreed that increasing these skills sets is the only way to improve students' language abilities. They felt that technology had the ability to provide new insights and enhancement for their students. They believed that technology can improve listening and communication skills; provide cultural products, practices, and perspectives; and enhance grammar and vocabulary skills. One educator described the various pieces of technology and its applications to language learning, "Lots of videos; I love YouTube and I always find some stuff that would be culturally appropriate. I am into Pinterest; you find tons of collections and interesting materials for class" (one-on-one interview, 07/24/2014). The ACFTL standards created the need for implementing authentic resources into the foreign language classroom.

Authentic resources were another area that emerged as a sub-theme to benefits. Technology provides instant access to authentic elements from the target culture: books, photographs, food, blogs, native speakers, culture perspectives, etc. Technology also helps bring more cultural and linguistic materials to the curriculum, provides more

opportunities to practice communication activities (both listening and speaking) and increases student motivation for language learning (Li & Ni, 2011). The internet is an excellent resource and means of communication for language learning. "It functions both as a vast source of information and means to connect with other speakers of the target language" (Gonglewski, 1999, p. 360). It has the ability to take students beyond the four walls of the classroom to enable authentic interactions, communications, engagement, and membership with the target language and culture. Some of the foreign language educators described the real-life applicability that technology can bring to their students, and its connection to the target society outside of the classroom. A foreign language educator described her excitement for authentic resources. "My students Tweet. They have to answer a specific question every day for a week or follow some people, make comments, etc. so it is real world" (one-on-one interview, 07/24/2014). Additionally, teachers discussed the more open access they have to finding artifacts, texts, music, and sources within the target culture. Prior to technology, teachers had to visit countries that spoke the target culture in order to gain some of these materials for use in their own classrooms. Another educator expressed his successes with authentic texts. "The reality into the classroom. The introduction of authentic material, which is huge, because when I was a Spanish student in high school, the only reality was what my teacher brought back from the target country in her suitcase. And now, if we want to see the top 40 songs for right now in Mexico, we can" (one-on-one interview, 07/25/2014). The advances in technology have better equipped teachers for accessing authentic materials in the language that were made for native speakers or at least from the perspective of the culture, instead of material about the target culture made for foreigners learning the

language. Another area besides ACTFL standards and authentic resources that has been a driving force in technology implementation is the partnership for the 21st Century Skills.

21st century skills were a third area that emerged as a sub-theme to perceived benefits, as technology proficiency has been considered an essential skill set for students to acquire during their educational paths for future careers. The Partnership for the 21st Skills (2009) has identified necessary skills for the classroom. We live in a technology and media-driven society characterized by access to an abundance of information, quickly changing technology tools, a capability to collaborate, and individual contributions. The Partnership for the 21st Century Skills takes into consideration the new forms of literacy and participatory culture that technology provides for our students both in and out of the classroom. The teachers are aware of the 21st Century Skills and the presence technology plays in future career paths. A few teachers expressed the importance of effective digital literacy skills defined as "the ability to read and interpret media, to reproduce data and images through digital manipulation, and to evaluate and apply new knowledge gained from digital environments" (Jones-Kavaller & Flannigan, 2006, p. 9). In addition to digital literacy skills, teachers expressed the need to teach students employability skills associated with technology. However, several teachers felt they did not spend enough time on teaching students' digital literacy skills or the importance of these skills for their future careers. One teacher explained her opportunities to bring up digital literacy skills to her class.

> I don't think we're talking about them at the level we should be in high school. I talked about Instagram in the classroom and students realized that it is out there for everyone to see. We talked about digital citizenship and the importance of

having a clean profile when applying for jobs and colleges (one-on-one interview, 08/10/2014).

Digital literacy skills are important for students to be successful in their current classes and future careers. The incorporation of technology in the classroom has led to enhanced student achievement.

Student engagement was the fourth area that emerged as a sub-theme to perceived benefits, as technology provides students with the ability to interact with elements outside of the normal classroom. Technology is a great medium for foreign language learning in the classroom, due to its ability to support language learning in an engaging manner. Educators from the second phase of the study expressed the increase in students' interests when technology was integrated into the curriculum. Students were more excited about learning when it was integrated into diverse activities, especially with new forms of technology. Technology helped grasp and maintain students' attention because it was something out of the ordinary. An educator explained her view on student engagement. "Anything that is a little bit out of the ordinary. Because they get so tired of sitting with a pen and pencil that if I can give them something different to do, that skill makes it educational for them" (one-on-one interview, 08/21/2014). Not only does technology help engage students, but it provides students with the opportunity to collaborate more with each other both in and out of the classroom. Students are able to use software programs like Google Documents, which enables multiple people to view and edit documents together in real time. Students who are not able to meet together outside of the class can still collaborate through these forms of software programs. Teachers believed that technology helped foster more student collaboration outside of the

classroom. "They would use it to collaborate outside of the classroom, so groups that didn't have enough time to finish in class, they could go to the library and check out an iPad to finish their work" (one-on-one interview, 08/10/2014). Teachers believed that technology also provided their students with more choices in how to complete classroom materials. Teachers enabled students to self-select their manner of completing different classroom assignments, assisting teachers with the integration of differentiation into their classroom curriculum.

Differentiation was the final area that emerged as a sub-theme to perceived benefits. As mentioned before, technology provides students with more choices when completing course materials. Differentiation is making changes to your classroom materials, instructions, and activities to meet the needs of the students in the classroom. Teachers must provide a vast array of instructional strategies and activities to meet the interests and learning levels of the students in their classrooms. One educator described the options he gave his students with various activities. "I'll give them different choices as to how they're going to show me their mastery of something, like they can do a video" (one-on-one interview, 07/25/2014). Differentiation enables teachers to reach more students in the classroom and challenge them to become better at language learning. Participants believed that technology made it easier for them to differentiate within their classroom curriculum. Teachers were able to provide programs to assist special needs students as well as challenge all students' intellectual abilities. Technology helped instructors cater to the students' needs in the classroom, whatever those needs happen to be. Another educator explained the adaptations she was able to make through technology. "I have a student who is hearing impaired, and she learned Spanish. She had

a text speak program, and then she used Duolingo. She loved it because she could talk into it and it would type it out" (one-on-one interview, 07/24/2014). Besides meeting the vast array of student needs, technology enabled students to be more in control of their own learning by self-selecting options given by the educator in the classroom.

Summary of Perceived Attitudes and Benefits of Technology

What impacts foreign language teachers' reported technological beliefs and integration into classroom practices? Collectively, the data answers the question revealing two major themes: perceived attitudes and benefits. All participants in this study expressed some personal attitudes towards technology and its impact on their education classroom. For some participants, their attitudes towards technology were more positive in nature, while others had a more negative perspective. A few participants were somewhere in the middle because they were able to see the value of technology but were not completely comfortable with integrating it into their curriculum. The participants conveyed the multiple benefits of integrating technology into the classroom: improve language skills, authentic resources, 21st century skills, differentiation, and student engagement. Technology was able to enhance language learning, meet the needs of students in the classroom, and help prepare students for future careers.

How do the perceived contextual factors (time, resources, training, etc.) impact the use of technology by foreign language educators?

Main Theme 3: Context

Besides educators' beliefs, there are other perceived barriers that have an impact on foreign language teachers' integration of technology into classroom practices. External factors are situational factors which teachers take into account when making

decisions, creating plans, and executing classroom activities (Woods, 1996). These contextual factors contributed to inconsistencies between teachers' expressed technological pedagogical beliefs and actual implementation into classroom practices. Teachers' explanation for these inconsistencies often included reference to contextual limitations such as curriculum requirements, social pressure exerted by parents, peers or administrators, and resources (Ertmer, Gopalakrishnan, & Ross, 2001). Contextual factors in schools and classrooms greatly impacted the process of change for teachers' beliefs and knowledge (Richardson, 1996). The findings from the qualitative phase revealed a main theme and eight subthemes for reported context: time, resources at school, resources at home, class sizes and schedules, technology support, administration, parental, and community support, collaboration, and professional development and training. These thematic discussions concluded with a summary response to the research question.

Time and its impact on integrating technology into the classroom emerged as a common theme amongst participants. The educators expressed their frustration in the amount of time it takes to research new programs, applications, and strategies for integration into the classroom. Teachers have full days packed with professional and student meetings, grading, curriculum development, and actual teaching. "Just having the time to actually sit down and look at the technology. There is so much out there that I could do, but I just don't have the time to sit down and look through the information," one educator expressed (one-on-one interview, 08/21/2014). With additional responsibilities teachers are expected to fulfill, they do not have enough time to explore new forms of technology to integrate into their curriculum. One solution to the time

constraints was to explore various forms of technology during summer break, but by summer teachers are ready for a break from school. In addition to insufficient time to explore technology, foreign language educators also stated their concern with the abundance of choice materials that could be incorporated into their classroom activities. The selection process was very difficult when the educator did not have the knowledge, experience, or exposure with the various options. An elementary teacher described the difficult process in finding appropriate technology. "For the elementary kids, I wanted something that would do colors or numbers. But what I would find, it wasn't what I wanted, you know. It just didn't suit what I wanted to do with it and I went through a lot of them" (one-on-one interview, 07/21/2014). Time was an issue for foreign language educators in relation to technology integration as there did not seem to be enough time to explore and discover new forms of technology for their classes.

Resources at school emerged as a common theme among participants as it impacted teachers' abilities to integrate technology into classroom practices. Teachers who were not in one-to-one school districts had a harder time accessing technology to utilize in their classrooms. Some school districts only had one or two computers labs for the entire school to access throughout the school day. One educator explained her frustration with computer labs in her school district:

> I do think that when I call four weeks ahead of time or six weeks, and say 'Hey I want to do this thing on Spanish on the running of the bulls.' I want the kids to be able to do this or whatever. And they'll say, 'We have a policy that you only can sign up for technology about three weeks in advance, because we don't want

somebody who plans ahead to have it all booked up, then that person who plans a week ahead.' I don't understand that (one-on-one interview, 07/17/2014).

Other districts were provided with mini-computer labs of about nine laptops stationed in their classrooms, but only in core content areas. A few other districts provided mobile computer labs that could be shared among one or two departments. Further complications were added to the lack of resources when policies were passed banning smartphones or other devices from being used during the school day. Smartphones and other devices have some, if not all, of the same capabilities as computers. Teachers make use of these device when there is a shortage of technology within the school system. These policies frustrate some teachers. "At our school we have a no-technology policy for students, so they cannot use their cell phones in the classroom, even if it is for education use. We basically have to plan ahead to reserve a cart or travel to the library" (one-on-one interview, 08/10/2014). A final complication connected to few resources available to educators, was scheduling. Teachers often had to plan well in advance in order to use the few computer labs within the school system. There was a sign-up sheet for each lab, and the teachers had to make sure to put their names down within the scheduling sheet to reserve a specific timeslot. The limited resources in the school districted restricted foreign language teachers' implementation of technology. Students' resources outside of the classroom also contributed to the reported uses of technology within the curriculum.

Resources at home for students developed as a common theme among participants causing some reported barriers to technology use both in and out of the classroom due to the digital divide. A gap exists between those with and without readily

accessible technology which can be due to socio-economic status, geographic location, educational level, or generational factors (Cullen, 2001). Teachers described the impact a student's lack of computer resources outside of school can have on their curriculum. Teachers were not able to assign any homework or activities that require computer technologies or the internet as some of their students do not have the resources or access at home. One teacher explained the impact unequal access technology has on student learning. "I can give assignments at home for those with 24-hour access, but others I need to be careful to give them enough time to do it in the classroom. That means they need to have a computer available to use" (one-on-one interview, 07/24/2014). Teachers had to make accommodations for these students either throughout the school day, before or after school hours, or by appointments. There were some community resources such as the public library where students could go to access computer technologies and the internet for students to utilize, but it has to be during hours of operation. The unequal access to computer technology and internet for students in the foreign language classroom restricted teachers' ability to further integrate technologies into their curriculum and prohibited students' language skills enhancement. Students' limited technological resources impacted not only the students' learning, but the teachers' ability to incorporate it into the classroom.

Technology support surfaced as a fourth common theme among participants in relation to technology integration into curricular practices. Foreign language educators discussed their frustration with the lack of technical support for their own issues with technology as they arose throughout the school day. The majority of the participants believed that their technical support staff was overworked, underfunded, and inadequate

for the school system. Teachers had a hard time finding their support staff when an issue presented during class. The majority of the school districts did not have a full time technical staff member or only had one staff member for the entire school district. In addition to the lack of staff members, these few staff members did not seem to have enough time to help support faculty due to their other responsibilities with network issues, firewall protection, access, etc. Due to the amount of work associated with the technical support staff, assisting teachers was not as feasible. One teacher described a possible solution to a lack of technical staff. "We have one technology coordinator, and he's three-quarters time. He's there quite a bit more, I think. That's really it for trained people. Also, he's got some students who have, probably three or four, that really are interested in technology who have helped him some" (one-on-one interview, 07/25/2014). Another issue teachers had with technical support was the prolonged process it took to get websites, programs, and other resources unblocked from the existing school firewalls. Technology support staff was overwhelmed, limited, or not adequate for the needs of the teachers when working with technology in their classrooms.

Administrative, parental, and community support emerged as a common theme among participants, regardless of the resources available within the school district. Educators within a one-to-one school districted described the support they had received from their administration as rather positive. The majority of the one-to-one initiatives were pushed along and through from a more top-down approach. The administration believed in the importance technology can play for both educational and career skills learning. However, some participants believed their administration was too overworked to help or support their uses of technology within their curriculum. The parents and

community support seemed a little more skeptical in regards to technology integration into the educational system. Parents and the community members were not sure how technology was being utilized within the classroom and the impact it had on student learning. The community and parents needed more information about how technology was being utilized and its benefits for students. One participant described his community, "We've got an interesting mixture of people in the community, some of which are very well educated and some which are not. There doesn't seem to be a whole lot of middle ground. There is the concern that technology is viewed as a universal Band-Aid. Like we're going to give you a computer and that is going to solve all our problems" (one-on-one interview, 09/08/2014). Most of the participants felt supported by their administration, parents, and community members in regards to advances in technology and its implementation into the curriculum.

Class sizes and scheduling conflicts also developed as a common theme among participants causing some reported barriers to technology incorporation. Some restrictions in class scheduling have pushed teachers to think through each activity and its purpose in the classroom. Some of the scheduling conflicts came from scheduled class time where each class period was about fifty minutes or running on a skinny block schedule. At some school districts, block scheduling was the norm, but non-core classes ran on skinny blocks, which were about half the time of a regular block. Another concern with scheduling focused on the number of sections teachers had for each language level. Some taught six different sections of the same classroom or had four to five different levels of language classes to prep curricular materials. In addition to scheduling conflicts, class sizes created complications with the implementation of technology within

the classroom. Some educators have class sizes as large as thirty-two students in each class, making integration of technology too hectic. Large class size also makes, finding sufficient resources, and classroom management more difficult. The large number of students in a class created more complications for educators and the addition of technology caused more disruptions. One educator described her overload due to class sizes: "We are inundated with papers to grade and our classes are bigger than they've ever been before. So when you consider that we aren't blocks, we have six sections, almost 30 in a section, so I think we have roughly 170 to 180 papers to correct when you give a test" (one-on-one interview, 07/17/2014).

Collaboration surfaced as a common theme among participants as to the perceived benefits and downfalls technology can play in the ability to work with other colleagues. Some participants had more of a positive perspective on collaboration with other colleagues within and beyond the school district. Teachers were able to utilize technology to collaborate and network with colleagues from around the world. Technology programs and social media like Skype, Twitter, Pinterest, etc. enabled teachers to talk to each other, gain new ideas, and learn more about different software specific to their target language and culture. Advances in technology made it easier for foreign language teachers to stay in contact with each other and collaborate. "I actually feel like I get more like through my online colleagues, through Twitter. My former high school Spanish teacher is still at her school and she's like actually really good with technology" (one-on-one interview, 07/25/2014).

However, there are some educators who had a more negative response to the ability to collaborate and gain new perspectives from other colleagues within the foreign

language field. Some teachers did not have as many opportunities to explore and collaborate with other colleagues specifically for technology integration. Teachers were able to collaborate with each other through Professional Learning Communities (PLC) where teachers get together about once a week to discuss issues, share new ideas, professional development, etc. The PLCs did a great job of getting teachers to talk to each other, but the focus on these sessions did not center on technology. PLCs also placed teachers from a variety of subjects within the school district together to work, which was great for collaboration, but not as productive for ideas specific to foreign language education. Teachers wanted more collaboration from teachers who also taught the same subject matter and focused on technology integration. One participant described her desire to collaborate. "I need to collaborate with other people. That would be really helpful. Just to talk to others in the same content" (one-on-one interview, 07/21/2014). Foreign language educators had mixed feelings on the benefits of collaborating with colleagues. Some felt that social media enabled them to collaborate with other foreign language educators from across the country while some felt their current PLC groups were not specific nor focused on education.

Training and professional development emerged as the final common theme among participants causing some reported barriers to technology use both in and out of the classroom. Similar to collaboration, there were both negative and positive experiences with professional development and training specific to technology implementation. Some educators said that they have had a minimal amount of training from professional development offered within the school district. A participant explained her in house school training: "I don't know, we've had very minimal training

that I would say we were given as a whole staff. It's more the people who go out and look for it or try to get trained to train other people" (one-on-one interview, 07/17/2014). The professional development was either not specifically aimed at technology and its use in the classroom or not targeted towards foreign language learning in the classroom. One participant expressed her need for discipline-specific training: "So many of the trainings are not specific to foreign languages. That's really tough" (one-on-one interview, 08/14/2014). Some educators have received some training with technology during their undergraduate degrees, but technology is constantly changing. Some of the items they learned a few years ago are not as relevant with today's technology. Foreign language educators often have to seek out their own opportunities for professional development through continuing education courses, professional conferences, and workshops. These opportunities have tremendous benefits for educators, but they can be rather costly.

Even though conferences, workshops, and continuing education courses might be costly, foreign language educators believe they are extremely beneficial in gaining new ideas. These opportunities enabled educators to network and collaborate with other foreign language educators. Discipline targeted training better equipped teachers to integrate technology specific to their target language and culture. Some educators were also given the chance to observe other school districts working with technology integration. One participant described his exposure to one-to-one classes. "We went to school that was using it to observe them. We had the iPads for a year to play with them" (one-on-one interview, 07/21/2014). These opportunities provided ample exposure to how technology can be integrated into daily classroom practices. In addition to classroom observations, some school districts received training from companies, college

personnel, and technology directors for specific software or devices. This additional training was described by a participant: "There were a few times where the technology director would do training with teachers. And then also some of the teachers who are finding cool apps and stuff would just share what they are doing with it and how it could apply to other teachers" (one-on-one interview, 07/25/2014). The training was to help educators be more aware of the capabilities, purposes, and strategies for inclusion in the classroom. These additional training opportunities for educators have better prepared them for technology inclusion.

Summary of Reported Context and Technology

How do the perceived contextual factors (time, resources, training, etc.) impact the use of technology by foreign language educators? Eight context-related subthemes emerged from the data to answer this question. All participants in this study expressed some frustrations with the contextual constraints their educational environments had on their ability to integrate technology into the curriculum. Some participants had more positive experiences with different aspects of the environment: administrative support, technical support, etc. A few participants had a more negative perspective on their educational environment due to the multitude of restrictions: time, resources, training, etc. The participants conveyed their concerns, frustrations, limitations, and support their educational system created when working and integrating technology into their curriculum. Both perceived contextual factors and intrinsic factors impeded teachers as they tried to adjust to any change in the classroom. It was very difficult to address and prioritize any one particular challenge over others, as new challenges constantly emerged (Ertmer, 1999). These reported contextual factors contributed to inconsistencies between

teachers' expressed technological pedagogical beliefs and its actual implementation into classroom practices.

How does the data from the self-administered questionnaire compare to the data collected during teacher interviews?

A third set of data was constructed by comparing the hierarchical regression findings from the quantitative phase of the study to the thematic analysis findings from the quantitative phase. This comparison of the two data sets revealed three main areas representing consistencies, inconsistencies, and some surprising results amongst the two sets of data. The consistent results from the third set of data uncovered three main elements: teaching style, perceived benefits, and reported contextual factors. The inconsistencies within data set three disclosed four main areas: gender, age, years of teaching, and reported contextual factors. The final areas discovered through the comparison of the two data sets were a few surprising results associated with one-to-one school districts and the issues or complications associated with it.

Consistencies

The comparison of the two data sets revealed some consistencies between the results of the regression analysis and the thematic analysis. These consistencies represent the costs associated with the Expectancy-Value theory. Teachers take the costs associated with implementing technology into classroom practices. Two of the consistencies, perceived benefits and teaching style, focus on the innovator's influence technology uses within the Conditions for Classroom Technology Innovation model. The first consistency is perceived benefits of technology which had the highest beta weight within the regression analysis. This means that the perceived benefits of technology had

the strongest relationship with the dependent variable, frequency of technology. The teachers' beliefs about the perceived benefits of technology greatly impacted foreign language educators' uses of technology within their curriculum. The interviews with various teachers also uncovered similar results. Teachers' perceived benefits of technology played a major part in their ability to integrate technology into the classroom. Educators believed that the challenges to integrating technology were worth it due to the various advantages it can provide for their language learning students. Teachers' beliefs about the perceived benefits of technology were the greatest predictor of actual technology use in the classroom by foreign language educators.

In addition to perceived benefits of technology, the second consistency focused on different teaching styles on a continuum from teacher-centered to student-centered classrooms. Teachers who had more teacher-centered pedagogical beliefs used technology more as a reward for a lot of independent practice or learning experiences controlled by the teacher while those with student-centered pedagogical beliefs used technology to support collaboration, project-based learning, critical thinking, cooperative learning, etc. (Palak & Walls, 2009). Teachers with more traditional beliefs implemented technology for low-level (i.e., visual aids) uses while more constructivist teachers implemented higher level (i.e., project-based learning) uses of technology (Judson, 2006). Teachers who held pedagogical beliefs aligned with constructivist teaching were more likely to incorporate or be open to incorporating technology into their classroom practices, while teachers with pedagogical beliefs aligning with traditional teaching were less likely to integrate technology into classroom practices (Lucas & Wright, 2009). The findings from the first and second phase of the study were consistent with this continuum

of teaching styles and technology integration. Teachers with a more student-centered outlook tended to integrate or overlook some barriers to technology integration more than other educators with a more teacher-centered classroom.

The final consistency has to do with the reported contextual factors also seemed to influence the integration of technology within the classroom. These reported contextual factors fit into the Conditions for Classroom Technology Innovation model referring to human infrastructure, technological infrastructure, and social support. One the reported contextual factor, one-to-one schools, was a consistent element found within both the findings from the first and second phase of the study. The first phase of the study provided an association between the resources available at a one-to-one school district and its influence on technology integration. Educators who were working within a one-to-one school district, which is where each individual student has access to his/her own device throughout the school day, integrated technology more frequently than educators whose students did not have equal access to computer technologies. The results were also consistent within the second phase of the study. Foreign language educators who worked within a school district with one-to-one access utilized more technology within their classroom practices than those without access. There were a few foreign language educators with one-to-one access who were a little unsure of their abilities with technology resulting in inconsistent uses of technology within their courses.

Summary of Consistencies

How does the data from the self-administered questionnaire compare to the data collected during teacher interviews? The data revealed three main consistent factors from both phases one and two of the research study. The first consistency between phase one

and two focused on teachers' beliefs about the perceived benefits of technology in the foreign language classroom and language learning. If an educator does not believe technology enhances foreign language learning, then it will not matter whether he/she has access to computers, time to incorporate technology into their curriculum, added technical support, or other external factors, because the educator will still not implement technology into his/her daily classroom practices. Internal factors were seen to be more influential than external factors in their ability to be successful, especially with technology usage (Ertmer, Ottenbreit-Leftwich, & York, 2006). An additional reported internal factor impacting technology integration was teaching style. Teachers who had a more student-centered approach to teaching, integrate technology more frequently aimed at more cooperative learning amongst the students, while a more teacher-centered approach might incorporate technology more as a reward. The final consistent element, one-to-one schools, enabled teachers to readily integrate technology into their classroom practices. One-to-one educators have technological devices present in their classrooms each and every day. These teachers came up with creative and innovative ideas for technology integrated for enhanced language learning.

Inconsistencies

The comparison of the two data sets revealed some inconsistencies between the results of the regression analysis and the thematic analysis. The inconsistencies of demographic variables and reported contextual factors represent the costs associated with the Expectancy-Value theory. Teachers take the costs associated with implementing technology into classroom practices. The first demographic variable gender, had a larger impact on the regression analysis with a beta weight of -.299. It seemed male educators

integrated technology more consistently throughout their curriculum than female foreign language educators. The demographic variables had a higher impact on reported frequency of technology use within the hierarchical regression analysis than the other factors combined. However, it did not seem to hold true within the interview phase of the study. The male participants did utilize technology within their classrooms, but it was not at a greater rate than the female participants. Gender did not have an impact on the reported frequency of technology use within the foreign language classroom. Other factors seemed to be the underlying causes for technology integration into the curriculum.

A second demographic variable, age, had a larger impact within the regression analysis with a beta weight -.333. The findings from the first phase of the study depicted age as a main factor influencing reported frequency of technology. Younger educators integrated technology into the classroom more than older educators. The younger generation of educators took courses in teaching and technology within their undergraduate degrees, grew-up in the information age, and utilized technology on a daily basis, whereas the older generation had to play some catch up with new forms of technology. The discrepancy in ages was not consistent within the second phase of the study. The participants from phase two of the study varied in ages, but the integration of technology did not seem to make a difference. Both older and younger educators were integrating and not integrating technology into their curriculum regardless of age. Age did not seem to have as large an impact as it did within the first phase of the study.

Another variable, years of teaching, had a large impact on the reported frequency of technology inclusion with a beta weight of .160. Teachers with more years of teaching experience integrated technology more frequently than teachers with fewer years of

teaching. Educators who have more years of teaching had the time to work with their students, curriculum, environment, etc. to better equip them to face the challenges that arose from incorporating technology into classroom practices. Teachers with fewer years of teaching are still focusing on their curriculum, students, support system, etc. and did not have the time to find innovative ways to utilize technology for improved language skills. Teachers need time to work with their surroundings to gain knowledge about the contextual factors, innovative technology, and their own curriculum. However, the second phase of the study was not consistent with the first phase of the study where years of teaching did not seem to have much of an impact. Educators with diverse years of teaching both did and did not integrate technology. The reported frequency of technology used in the classroom did not seem to be impacted by the years of teaching.

Besides demographic variables, reported contextual factors did not seem to be consistent between the two data sets. These reported contextual factors fit into the Conditions for Classroom Technology Innovation model referring to human infrastructure, technological infrastructure, and social support. The hierarchical regression analysis revealed a very weak beta score of -.016 for reported contextual factors. External factors are situational factors which teachers take into account when making decisions, creating plans, and executing classroom activities (Woods, 1996). Foreign language educators were able to implement technology regardless of the contextual factors or limitations of the environment. The first phase of the study uncovered teachers' abilities to increase their uses of technology regardless of time, resources, support, access, etc. Contextual factors in schools and classrooms greatly impacted the process of change for teachers' beliefs and knowledge (Richardson, 1996).

The second phase of the study uncovered more issues with the perceived contextual factors and its impact on reported technology use within the foreign language classroom. Teachers discussed the time limitations, lack of resources, lack of support, scheduling conflicts, class size, training, professional development, etc. these pieces had on technology incorporation. These reported contextual factors contributed to inconsistencies between teachers' expressed technological pedagogical beliefs and its actual implementation into classroom practices. Teachers' explanations for these inconsistencies often included references to contextual limitations such as curriculum requirements, social pressure exerted by parents, peers or administrators, and resources (Ertmer et al, 2001). The participants from the semi-structure interviews depicted the inconsistency between their beliefs and the dependent variable (reported frequency of technology) was due to the various contextual factors. The perceived contextual factors were a major influencer on technology integration more than it seemed to be described within phase one data.

Summary of Inconsistencies

How does the data from the self-administered questionnaire compare to the data collected during teacher interviews? The data answers this question by revealing four main inconsistent factors from both phase one and two of the research study. The first inconsistency between phase one and two focused on gender. Males included technology more frequently than females in the first phase whereas the second phase of the study did not reveal any differences between gender and their reported uses of technology for language learning. Other demographic factors were uncovered as inconsistencies between the first and second phase of the study. The second demographic variable, age,

demonstrated that younger teachers more readily integrated technology into the curriculum than older educators. Younger teachers tended to have more exposure to technology and its purposes, thus increasing the integration of technology. However, the second phase of the study did not uncover the same results. Educators were able to integrate technology into the classroom regardless of age. The third demographic variable, years of teaching, revealed that teachers with more years of experience were better equipped at integrating technology than teachers with fewer years of teaching. These teachers had more time to focus on new and innovative ideas because they had the time to work through other factors within their curriculum, environment, and support system. The results from phase two of the study did not reveal consistent results in regards to years of teaching. Again, teachers were able to utilize technology in their classroom practices no matter how many years of teaching. Besides demographic variables, reported contextual factors also represented discrepancies in the data results from phase one to phase two. The perceived contextual factors did not play a major part in the reported frequency of technology usage any more than other factors within the regression analysis, but they became a big theme within the thematic analysis. Teachers had issues with time, resources, access, training, professional development, class sizes, scheduling conflicts, etc. all of which impacted their ability to integrate technology into the classroom. Teachers' explanation for these inconsistencies often included reference to reported contextual limitations such as curriculum requirements, social pressure exerted by parents, peers or administrators, and resources (Ertmer et al, 2001). The perceived contextual factors created more constraints on teachers' abilities to integrate

technology causing some teachers to carefully select the technology to integrate and others to avoid technology all together.

Surprising Findings

The comparison of the two data sets revealed some surprising elements between the results of the regression analysis and the thematic analysis. There were two main, surprising factors associated with one-to-one school districts, which were not exposed during the first phase of the study. The hierarchical regression analysis revealed a relationship between a one-to-one school district and the reported frequency of technology use. These surprising results from one-to-one environments reflect two of the factors within the Conditions for Classroom Technology Innovation model, the innovator and the context. The innovator is the teacher influencing technology uses. One-to-one teachers within this study felt bombarded with technological devices in their classrooms causing them to think about how to better utilize these devices for language learning. The questionnaire did not enable teachers to express their frustrations or concerns with one-to-one initiative within their own school districts. The second surprising result with application downloading reflected the second element of context. The context refers to human infrastructure, technological infrastructure, and social support. Educators expressed some of the issues associated with one-to-one initiatives and frustration with downloading applications which constricted their uses of technology within the classroom.

Issues with one-to-one initiatives were discovered, such as issues with the release of the one-to-one initiatives, lack of professional development, firewall protection, and loss of materials. Some participants within the study described their

frustration with the lack of planning with the release of the devices for both teachers and students.

> Our district decided to go one to one without really laying any of the foundation that is necessary. We put the shiny noise and light boxes in everyone's hand and they basically said, 'Use technology' and for folks who are not that tech savvy, it didn't go quite as well. You have to get the logistical things, like your bandwidth isn't enough. We don't have enough access points in the hallways. Just silly things that could have been precluded by better planning (one-on-one interview, 09/08/2014).

The professional development provided for educators working with these new devices was inadequate, and they lacked the knowledge, understanding, and readiness to integrate technology into their own classroom practices. Educators wanted to see more professional development specific to their content area, as well as constant support from their technical staff to make the transition to one-to-one a little easier.

Besides the development and roll out of one-to-one devices teachers also expressed their frustration with the loss of materials. Teachers were not able to get items transferred from one device to another either for use within course materials or to enable students to present from their own devices. Teachers had to take a few extra steps or seek out assistance to better equip them for completing technological tasks. In addition to losing materials, teachers' described their frustration with the firewall protection program and its impact on technology integration. Teachers wanted to be able to utilize a particular site or program, but access was blocked at school. The intention of firewalls was to protect the students and teachers from accessing inappropriate sites. However, a

lot of the firewall protection programs readily blocked access to the majority of sites causing a lot of frustration for educators. One participant described his way around the firewall, "I can get to whatever I want to get to because I'm fiendish little bugger. Sometimes, I put on my black hat and just do what I want because it's educationally relevant and it needs to get done" planning (one-on-one interview, 09/08/2014). There was a long process of getting sites and programs unblocked at the school and by the time the item was unblocked, the particular point in the curriculum had come to a close.

Application downloading also became a major concern with one-to-one educators, as it influences technology integration within the classroom curriculum. Teachers were not able to add applications to their own or students' devices without the assistance of the technology staff. The educator had to plan well in advance of their curriculum to talk with the technical staff and give them time to have it uploaded to everyone's device by the time it was necessary. Some school districts also had a schedule setup for when applications were downloaded to their own and student computers. These schedules restricted the integration of technology if a new or innovative software was found a day after the scheduled installation date. Teachers then had to wait several days, weeks, or months before getting the application downloaded to their devices. One participant described her frustrations with updating classroom iPads. "We have to plan really far in advance to have our technology guy add new applications to the iPads, because we don't have access" (one-on-one interview, 08/10/2014). In addition to downloading issues, students were restricted access for downloading applications onto their own devices. The administration was concerned with enabling students the ability to download any applications or programs onto their own devices due

to the inability to filter their choices. One school district discussed the system they utilized to keep track of students' applications and the infractions students received for downloading items rated as 18 and older. This particular school district discovered that only 15% of their students were committing the infractions for downloading inappropriate materials. One participant described some concerns with freedom to download. "The students have the freedom to download (programs) that don't have a bad rating. And then if they were to get in trouble, there would be some restrictions" (one-on-one interview, 07/25/2014). These supplementary complications to technology implementation created some concerns for educators as they were trying to plan their technologically-enhanced curriculum.

Summary of Surprising Findings

How does the data from the self-administered questionnaire compare to the data collected during teacher interviews? The data answers the question revealing a few surprising findings that emerged between the hierarchical regression analysis and the thematic analysis. The first surprising results focused on the issues arising from one-to-one initiatives within various school districts impacting technology inclusion in the classroom. One-to-one initiatives did not necessarily reveal a well-planned implementation process for all parties involved: parents, teachers, and students. Teachers were not given sufficient professional development specific to their content in order to facilitate technology implementation. In addition to professional development, other concerns surfaced in relation to network concerns, printing issues, fire-wall protection, etc. The frustration associated with the one-to-one initiatives have impeded some innovative technology usages in the classroom. A second surprise from the findings of

both phases of the study related to application, program, and software downloading onto both educators' and students' devices. In some school districts with one-to-one devices, technical staff controlled not only the applications that were downloaded, but when these downloads actually take place. The extra steps in getting programs, applications, and software has deterred educators from taking the time to get new forms of technology in the hands of their students. Other school districts had different issues with downloading new advances in technology where students had control, but it is more time consuming to monitor their devices and infractions for downloading inappropriate materials. The one-to-one initiatives provided educational systems with new advances in technology within their classrooms, but there is a lack of planning and follow through that can impede these uses of technology for improved language learning.

Conclusion

This chapter presented the findings from the hierarchical regression analysis in phase one and the thematic analysis in phase two of the mixed methods research study. The demographic factors of the participants, strategies for participant recruitment, and reasons for participant selections provided the structure for collecting and analyzing participant information. In addition to the participant information, the findings answered the three research questions for the mixed methods study:

1. What influences K-12 foreign language teachers' reported technological beliefs and integration into classroom practices?
2. How do the perceived contextual factors (time, resources, training, etc.) impact the use of technology by foreign language educators?

3. How does the data from the self-administered questionnaire compare to the data collected during teacher interviews?

The quantitative data were gathered from foreign language educators within the state of Iowa on the Modified Technology Implementation Questionnaire. The data were used to answer the first two research questions through a hierarchical regression analysis to help predict the factors impacting the frequency of technology usage within classroom practices. The hierarchical regression analysis enabled various factors to be entered into the regression analysis by stages beginning with demographic variables followed by internal factors and finishing with more external factors for utilizing technology. The results from the hierarchical regression analysis showed demographic factors had the greatest influence on reported technology use in the classroom followed by the reported internal factors of teachers' beliefs. The final set of variables, perceived contextual factors, did not play a major role in technology integration for the first phase of the study.

In the qualitative phase of the study, the findings were gathered through one-to-one semi-structured interviews through the use of purposeful sampling. The participants from the second phase of the study represented similar descriptive statistics from the first phase of the study along with the discovery of some surprising responses. The themes that emerged from the thematic analysis of the one-to-one interviews led to three main themes and fifteen subthemes broken down to answer the first two research questions of the mixed-methods study. The first two themes of perceived attitudes and benefits along with their various subthemes revealed some findings relevant to the first research question surrounding teachers' reported beliefs and their impact on technology inclusion in the classroom. Some of the items associated with reported teachers' beliefs were

perceived attitudes towards technology, classroom management, student impact, improved language skills, authentic resources, 21st century skills, differentiation, and student engagement. Technology was able to enhance language learning, meet the needs of students in the classroom, and help prepare students for future careers.

However, teachers have to believe that technology is important to them and their curricular goals to overcome some of the obstacles. The third theme of perceived context helped answer the second research question as to the factors within the environment that impact foreign language teachers' inclusion of technology. The reported contextual factors included time, resources at school, resources at home, class sizes and schedules, technology support, administrative, parental, and community support, collaboration, and professional development. The perceived contextual factors appeared to play a major role in the integration of technology for classroom practices. The participants conveyed their concerns, frustrations, limitations, and amount of support their educational systems provided when working with and integrating technology into their curriculum. Both perceived contextual factors and intrinsic factors impeded teachers as they tried to adjust to any change in the classroom. It was very difficult to address and prioritize any one particular challenge over others, as new challenges constantly emerge (Ertmer, 1999). These reported contextual factors contributed to inconsistencies between teachers' expressed technological pedagogical beliefs and its actual implementation into classroom practices.

The final set of data was generated by comparing the findings from the hierarchical regression analysis in phase one to the thematic analysis of phase two for the mixed-methods research study. The third set of data was established to answer the final

research question looking at the comparison. There were several inconsistencies, consistencies, and some surprising results generated from the comparison set of data. The inconsistencies focused on the more demographic variables creating a discrepancy influencing technology incorporation. The first phase of the study depicted them as extremely influential while the second phase of the study did not reveal a difference amongst the demographic variables. A second area where inconsistencies surfaced was in relation to the reported contextual factors. The first phase of the study did not depict these variables as influential while the second phase of the study described several issues with the classroom environment preventing the inclusion of technology. The consistencies between the two data sets centered on teachers' reported beneficial beliefs and teaching style with the two data sets reporting the same findings. Teachers' reported beliefs about technology impacted its use in the classroom through their curriculum, decisions, syllabi, etc.

The third data set also uncovered some surprising results representing two main elements: issues with one-to-one and downloading new applications, software, and programs. Teachers described their frustration with the beginning of one-to-one initiatives focusing on the lack of planning, training, network, firewall protections, etc. In addition to these frustrations, educators also expressed concerns as to who has control of downloading new elements onto students' and teachers' devices as well as when downloads can happen. Teachers are often relying on technical support staff to download new applications, software, and programs, which took longer than educators would like, especially when it was needed for a particular curricular element. The one-to-one initiatives provided educational systems with new advances in technology, but the issues

associated with the new devices impeded educators' utilization of technology into course curriculum.

CHAPTER 5

DISCUSSION, RECOMMENDATIONS, AND CONCLUSIONS

Introduction

Technology continues to impact the ways in which people work, communicate, collaborate, and socialize. There has been an increasing demand for technology skills to succeed in life and any profession (Johnson, Levine, Smith, & Smythe, 2009). Technology is a critical factor in what it means to be educated in today's society (Warschauer, 2006). Education is continually influenced by new advances to make learning more efficient, engaging, and entertaining with technologically rich resources (Matthews, 2011). Technology has been a powerful tool for enhancing curriculum, instruction, and student achievement (California Commission on Teacher Credentialing, 2000). The advances in technology have created new roles for both teachers and students in the classroom. Students are more actively engaged in their own learning as teachers assist in the process. Teachers are actively searching for new resources to help enhance their classroom content. Since teachers are the facilitators of knowledge in the classroom it is important to understand teachers' beliefs because they guide the decisions teachers make and actions they take in the classroom (Palak & Walls, 2009).

The literature review chapter explored the impact technology has had on society, education, and the foreign language classroom for the enhancement of student achievement and performance both in and out of the classroom. In addition to the ever-present technology, teachers' beliefs and their influences on classroom curriculum, practices, and decisions were investigated. These classroom decisions are based on context, prior decisions and experiences, and the overall goals of the curriculum. The

interconnected relationship between decisions, rationale, and interactions creates the planning process for teachers within their curriculum development. Due to the continuous relationships between beliefs, decisions, and classroom proceedings, it is important to examine teachers' beliefs about teaching, learning, and technology (Levy, 2009). There are two types of barriers that play into teachers' integration of technology into the foreign language classroom: internal and external. The internal factors focus on the creation and changing aspects of teacher beliefs which activate the decision-making process for classroom practices. Teachers make decisions based on their beliefs created through chance, failures, successes, knowledge, background knowledge, etc. (Pajares, 1992). External factors are situational factors which teachers take into account when making decisions, creating plans, and executing classroom activities (Woods, 1996). These factors can be broken down into two main categories: factors within the institution and factors directly linked with the teachers and factors associated with the culture of the institution, namely organization, inability to provide students with training or troubleshooting, poor quality of programs, peer use at the same institution, norms, etc. (Becker, 2000a; Reiser, 2001; Bitner & Bitner, 2002; Butler & Selbom, 2002; Hannessey et al, 2005). These contextual factors will contribute to inconsistencies between teachers' expressed pedagogical beliefs about technology and its actual implementation into classroom practices.

The final chapter first presents a summary of the research study, design, and methods. Followed by the findings for each of the research questions for the dissertation. Subsequently discussed, are the implications these findings have for the field of foreign language research and education. The limitations to the research study and designed are

examined, as well as considerations for future research for educational technology and the foreign language classrooms.

Summary of Study

The purpose of this particular study was to uncover factors impacting Iowa K-12 foreign language teachers' technological integration into classroom practices. The complex system of teachers' beliefs makes it difficult to understand, change, or enhance classroom teaching practices. Beliefs are a messy construct because they do not lend themselves to an observable investigation (Pajares, 1992). The unobservable nature of beliefs requires educators to self-report their beliefs surrounding technology practices in the classroom. Additionally, Green (1971) establishes that an individual may hold beliefs that are incompatible with one another. This can be troublesome because educators' beliefs might not match the reality of their classroom practices due to an unobservable and incompatible nature. In order to fully understand teachers' beliefs, it is essential to "infer from what they say, intend, and do" (Pajares, 1992, p. 314). Therefore, the methodology for this particular study was mixed methods where both quantitative and qualitative data were collected, analyzed, and mixed into one study to obtain a better understanding of reality (Johnson & Onwuegbuzie, 2004). An explanatory follow-up model design was used that involved the collection of initial quantitative data followed by the collection of qualitative data.

A questionnaire for teachers was developed based on the literature in foreign language education, teacher beliefs and perceptions, technology, classroom practices, and survey design. Additionally, other questionnaires in the field of foreign language education and technology were consulted during the creation stage of the instrument.

Through the incorporation of various surveys and literature a new instrument was created to better understand K-12 foreign language teachers' beliefs about technology and its implementation into classroom practices called the Modified Technology Implementation Questionnaire. The electronic instrument was sent out to every K-12 foreign language educators within the state of Iowa for which the research was given permission from the administration or through a listserv for Iowa World Language Association. A total of 99 K-12 foreign language educators responded to the electronic survey representing both public and private institution.

Following the collection of the electronic survey, ten K-12 foreign language educators were selected for the semi-structured follow-up interviews. The participants were selected from those in the pool of the first phase of the study who agreed to a follow-up interview. The follow-up interviews explored the topics of technology, teachers' technological beliefs, classroom practices, and factors impacting technology integration into classroom practices. The participants were selected using purposeful sampling for follow-up based on consistent, inconsistent, and surprising results that emerged from the first phase of the study. The follow-up interviews were intended to expand on the previously collected data from the online questionnaire. Besides the quantitative and qualitative data, a third set of data was analyzed where the data from the first phase was compared to the second phase of the study looking for consistency, inconsistencies, and the emergence of surprising or conflicting results.

Thus, three research questions were developed regarding teachers' integration of technology into the classroom and factors impacting its integration. Research has depicted two main categories of factors influencing teachers' reported uses of technology

in the classroom: internal and external. The perceived internal barriers focus on teachers' beliefs dictating the decisions made about instructional strategies, materials, and resources including technology. The perceived external barriers are factors outside of the educators' control either from the institution or linked to the teachers: class size, training, professional development, etc. A theoretical framework and model were selected to demonstrate the complex relationship between both internal and external factor. Expectancy-Value theory is a model for understanding and predicting behaviors (Fishbein, 1968). The premise for this particular theory states that an individual holds various beliefs about a particular object that can be either positive or negative creating an overall attitude. Therefore, in future interactions with the specific object, the individual will draw upon his/her attitudes and beliefs during his/her interactions with the object (Fishbein, 1963). In other words, for an individual to implement a specific strategy (technology), one must have high anticipation for success and believe that the end results are important enough to overlook the impending barriers. To finish the cycle, an individual will evaluate the process of strategy incorporation to decide whether it was worth the trouble or not. The final evaluation will create change or validation for the individual's belief system.

In addition to the theoretical framework, the model Conditions for Classroom Technology Innovation depicts the continuous relationship between the major factors impacting successful integration of technology into classroom practices. The study identified three major pieces for successful technology integration into classroom practices: the innovator, the innovation, and the context. The innovator is the teacher and the first person to identify factors that influence technology uses. Three factors of the

innovator contributing to technology success: technology proficiency, pedagogical compatibility, and social awareness. Technology proficiency is the knowledge of what is necessary to use technology in teaching and the ability to use software applications. Pedagogical compatibility looks at the relationship between technology and teachers' pedagogical beliefs. When teachers are more reflective about their own classroom goals and practices reflecting their pedagogical beliefs, then technological innovation is more likely (Zhao, Pugh, Sheldon, & Byers, 2002). The success of technology also depends on the teachers' value or view of technology and its connections to their curriculum. The final element, social awareness, relates the ability of the teacher to understand the social dynamics of the school system. School's social dynamics refers technical support, peer support, resources beyond teachers' control, school resources, etc.

The second major element within the model, innovation, is technology itself. The innovation is seen to be successful based on two factors: distance and dependence. Distance of school culture refers to the degree that an innovation differs from the more dominate values, pedagogical beliefs, and practices of teachers and administrators in the school (Zhao et al., 2002). Distance from existing technological resources is the amount of resources (hardware, software, connectivity, etc.) needed for success of the new technology. Besides distance, dependence is broken down into two pieces: others and technological resources. Dependence on others is the degree that the innovation requires collaboration, support or participation while dependence on technological resources refers to the innovations reliance on resources outside of the control of the innovator. The less dependent and distance the innovation is from the school culture and resources, the more successful the innovation will be within classroom practices.

The continuous interactions between the innovator and the innovation can help hinder or influence technology integration, but there is a final element in the intricate relationship: the context referring to human infrastructure, technological infrastructure, and social support. A human infrastructure includes a highly trained and helpful technical staff, a group of people who can help teachers understand and use technology, and a supportive administration. The technological infrastructure is the actual resources available to teachers: computers, network, connectivity, software, etc. While social support is the degree that colleagues support or discourage the innovation. The three domains of the model have interconnected relationships, but some of them seem to play a bigger picture in technology innovative success. The strongest pull for technology innovation comes from the innovator, but the innovation and context play a role in its success or failure within classroom practices. Thus, based on the theoretical framework, model, and aim of the study, the following research questions discovered the impact of both types of barriers on technology integration.

1. What influences K-12 foreign language teachers' reported technological beliefs and integration into classroom practices?
2. How do the perceived contextual factors (time, resources, training, etc.) impact the use of technology by foreign language educators?
3. How does the data from the self-administered questionnaire compare to the data collected during teacher interviews?

This study helped shed some light on various factors impacting foreign language teachers' uses and integration of technology into their classroom practices. The findings and insights discovered from this study were addressed through each individual research

questions. In addition, a discussion of the implications this research has had on the field of foreign language education and technology was also included. This chapter will conclude with a discussion of the limitations of the study and suggestions for future research.

Findings

Research Question 1

What influences K-12 foreign language teachers' reported technological beliefs and integration into classroom practices?

Since teachers are the facilitators of knowledge in the classroom it is critical to fully understand the issues impacting K-12 foreign language teachers' use of technology in the classroom. It is important to understand teachers' beliefs and attitudes because they guide the decisions teachers make and actions they take in the classroom (Palak & Walls, 2009). The unobservable nature of beliefs requires educators to self-report their beliefs surrounding technology practices in the classroom. Additionally, Green (1971) establishes that an individual may hold beliefs that are incompatible with one another. This can be troublesome because educators' beliefs might not match the reality of their classroom practices due to their unobservable and incompatible nature. In order to fully understand teachers' beliefs, it is essential to "infer from what they say, intend, and do" (Pajares, 1992, p. 314). According to Richardson (1996), the three main sources for teacher beliefs are personal experiences, instructional experiences, and pedagogical content knowledge. Teachers also hold beliefs about their work, students, roles and responsibilities. These beliefs influence classroom actions, judgements, decisions, planning, etc.

Thus within the Conditions for Classroom Technology Innovation model, the three elements influencing technology success for the innovator are: technology proficiency, pedagogical compatibility, and social awareness. Technology proficiency is the knowledge of what is necessary to use technology in teaching and the ability to use software applications. Pedagogical compatibility looks at the relationship between technology and teachers' pedagogical beliefs. The success of technology also depends on the teachers' value or view of technology and its connections to their curriculum. The final element, social awareness, relates the ability of the teacher to understand the social dynamics of the school system. A school's social dynamic refer to technical support, peer support, resources beyond teachers' control, school resources, etc. The strongest pull for technology innovation comes from the innovator, but the innovation and context play a role in its success or failure within classroom practices. Therefore, this study uncovered the following elements associated with teachers' reported technological beliefs: their perceived attitudes towards technology, benefits of technology, and their teaching style. In the quantitative phase of the study, these three factors contributed to 24.7% of the overall variance in reported frequency of technology use in the classroom. This means that their perceived attitudes towards technology, benefits of technology, and their teaching style played a part in predicting their uses of technology within their classroom practices. These three elements played a role in teachers' abilities to integrate technology into the classroom.

Teachers' perceived attitudes towards technology were broken down into three different categories: positive, trial and error, and negative. Foreign language educators with a more positive attitude toward technology believed in the potential benefits

technology could bring to their students and language learning. These educators were able to overlook some of the complications or additional work required to implement technology into their own practices because it coincided with their beliefs and teaching style in the classroom. Educators who strongly believed that technology was necessary for their own teaching and student learning had a higher rate of technology incorporation into their curriculum. Another set of foreign language educators had more of a trial-and-error attitude towards technology, where it depended on the circumstances for technology incorporation. These teachers had a more positive outlook on using technology, but they were just not as familiar with applicable technology or the constantly changing technologies. Teachers felt the need to play around with the technology to find the elements that worked best for their classrooms. This process was not without its frustrations; leading some teachers to give up, while others persevered. The trial-and-error attitude contributed to some technology integration because these educators believed in the benefits of technology for their students, but were not quite sure how to actually accomplish it in the classroom. The various positive and negative experiences these educators faced greatly impacted teachers' abilities and attitudes towards technology integration into the foreign language classroom. The final perspective on technology integration was a negative attitude. These teachers believed that technology did not accommodate their teaching style, philosophy, or aims for their language learning classrooms. Some of these beliefs stemmed from their lack of exposure to technology in practice within the foreign language classroom, while others were not sure that the complications, frustration, or inconsistencies associated with technology were worthwhile. Educators with a more negative attitude towards technology incorporated it

the least amongst the three different perspectives. This directly reflects the theoretical framework for this particular study, the Expectancy-Value theory, which states that an individual holds various beliefs about a particular object (technology) that can be either positive or negative creating an overall attitude. Therefore in future interactions with the specific object (technology), the individual will draw upon his/her attitudes and beliefs during his/her interactions with the object (Fishbein, 1963). In other words, "innovations are more likely to be adopted if the perceived value of the innovation and the likelihood (expectancy) of success are high, as well as if these benefits outweigh the perceived costs of implementation" (Wozney, Venkatesh, & Abrami, 2006, p.177). In order for an individual to implement a specific strategy, one must have high anticipation for success and believe the end result is important enough to overlook the impending barriers. To finish the cycle, an individual will evaluate the process of strategy incorporation to decide whether it was worth the trouble or not. Hence, educators within this particular study who had more positive attitudes readily incorporated technology into their own classroom practices, while educators with more negative attitudes steered away from technology. Educators who were more in the middle in terms of attitude, relied on their personal experiences with technology to help guide its incorporation into their curriculum.

Besides general perceived attitudes towards technology, teachers' also expressed some concerns with technology, classroom management, and its impact on students in the classroom. The two dichotomous attitudes of either positive or negative perspectives contributed to the overall concept of teachers' technological beliefs. Foreign language educators with positive attitudes toward students and classroom management perceived students as having greater ability to remedy their own deficiencies, as well as to enhance

their learning opportunities through their own self-discovery with technology. These educators also believed that classroom management with technology was not any more complicated than without technology. It was simply a different way of looking at classroom management that requires a different set of strategies for keeping students on-task. The negative perspectives on technology led teachers to feel their students were lazier and lacked the necessary digital literacy skills. Additionally, these teachers felt classroom management with technology can be a nightmare since it is easier for students to get off-task and harder for the teacher to police. These two dichotomous perspectives contributed to teachers' overall reported technological beliefs, since their own beliefs about these component pieces figures into their classroom decisions.

In addition to attitudes, teachers perceived benefits of technology also contributed to their technological beliefs. Teachers play a vital role in deciding what happens and is implemented into classroom practices on a minute-by-minute basis. The construction of a course, syllabus, and curriculum is completed through a progression of decisions made by the teacher in connection to other elements of the environment. Teachers interpret the activities and behaviors occurring within the classroom to guide their planning for each subsequent activity, day, week, etc. (Woods, 1996). These classroom decisions are based on context, prior decisions and experiences, and the overall goals of the curriculum. According to the Conditions for Classroom Technology Innovation model, the factor pedagogical compatibility looks at the relationship between technology and teachers' pedagogical beliefs. "Successful implementation of technology innovation into the classroom is more likely when teachers are highly reflective about their own teaching practice and goals, in the sense that they consciously use technology in a manner

consistent with their pedagogical beliefs" (Zhao et al., 2002, p. 492). The success of technology also depends on the teachers' value or view of technology and its connections to their curriculum.

Hence, teachers incorporate technology into their curricular decisions based on their own experiences and perceived benefits. Teachers' perceived benefits of technology were broken down into four main areas: language learning skills, 21st century skills, student engagement, authentic resources, and differentiation. Foreign language educators who believe that technology can enhance their materials, student learning, and the ability to engage every student in their classroom are more likely to include it in their courses while educators who believe it is irrelevant to each of these factors are less likely to integrate technology into their syllabi.

The final component to teachers' reported technological beliefs focuses on teaching style in the classroom. Teaching style was broken down into a continuum reflecting more student-centered classrooms at one end to more teacher-centered classrooms at the other end. Teacher-centered classrooms focus on the transmission of knowledge from the educator to the students in the classroom. The teacher has the expertise that they are conveying to the students, but little changes or modifications are made for learner needs (Brown, 2003). Student-centered classrooms focus on the students and their needs first when working with the course materials. Teachers are seen as more facilitators of knowledge while students take a more active role in learning through collaboration, inquiry-based learning, etc. (Brown, 2003). Educators who had a more student-centered philosophy incorporated technology more into their teaching than participants with a more teacher-centered approach.

Teachers' belief systems consist of interacting, interconnecting, and overlapping beliefs, which are in continuous communication with each other (Pajares, 1992). According to Richardson (1996), the three main sources for teacher reported beliefs are personal experiences, instructional experiences, and pedagogical content knowledge. Teachers also hold beliefs about their work, students, roles and responsibilities. These beliefs influence classroom actions, judgements, decisions, planning, etc. These classroom actions are reflected in the teachers' ability to reflect on the situation by weighing the benefits with the costs of integrating technology into the classroom, which is reflected in the Expectancy-Value theory and the Conditions for Classroom Technology Innovation model. According to the theory, in order for an individual to implement a specific strategy, one must have high anticipation for success and believe the end result is important enough to overlook the impending barriers. To finish the cycle, an individual will evaluate the process of strategy incorporation to decide whether it was worth the trouble or not. Additionally, the model discusses pedagogical compatibility for the innovator that looks at the relationship between technology and teachers' pedagogical beliefs. "Successful implementation of technology innovation into the classroom is more likely when teachers are highly reflective about their own teaching practice and goals, in the sense that they consciously use technology in a manner consistent with their pedagogical beliefs" (Zhao et al., 2002, p. 492). The success of technology also depends on the teachers' value or view of technology and its connection to their curriculum.

Therefore, this study discovered that teachers' beliefs about technology are centered on three elements: attitudes towards technology, perceived benefits of technology, and teaching style. Within each of these categories teachers have taken into

consideration their classrooms, students, content knowledge, personal experiences, and professional responsibilities as they integrate technology into the classroom. A more positive perception of technology leads to greater integration while a more negative perception results in teachers' avoidance of technology within their course curriculum, which directly reflects both the theoretical framework and model for this particular study. The more internal factors have been more influential than contextual factors in teachers' abilities to be successful while integrating technology into their classroom practices (Ertmer, Ottenbreit-Leftwich, & York, 2006). Therefore, it is essential to understand teachers' interconnected technological beliefs because they are strong predicators of technology inclusion into classroom practices.

Research Question 2

How do the perceived contextual factors (time, resources, training, etc.) impact the use of technology by foreign language educators?

Besides educator's beliefs, there were other perceived barriers that impacted foreign language teachers' integration of technology into classroom practices. External factors are situational factors which teachers take into account when making decisions, creating plans, and executing classroom activities (Woods, 1996). Contextual factors in schools and classrooms can greatly impact the process of change for teachers' beliefs and knowledge (Richardson, 1996). These factors can be broken down into two main categories: factors within the institution and factors directly linked with the teachers. The factors associated with the culture of the institution are: organization, inability to provide students with training or troubleshooting, poor quality of programs, peer use at the same institution, norms, etc. (Becker, 2000b; Reiser, 2001; Bitner & Bitner, 2002; Butler &

Selbom, 2002; Hannessey et al, 2005). Each institution, administration, and team of teachers has their own set of norms that guide their instructional practices, from their values to instructional methods to acceptable tools within classroom practices (Ertmer & Ottenbreit-Leftwich, 2010). In addition to the values, practices, and beliefs of the administration, research has documented that poor leadership, staff development activities, scheduling, smaller class sizes, funding, and expenses of installation impact technology integration within the classroom (Cuban, 1986; Becker, 2001; Reiser, 2001; Bitner & Bitner, 2002). The infrastructure depends on the amount of funding and maintenance allocated from the schools' budget. The lack of equipment and resources, hardware and software access, lack of technology support can lead to gaps in a supportive infrastructure which impacts teachers' abilities to integrate technology into classroom practices (Cuban, 1986; Bitner & Bitner, 2002; Butler & Seldom, 2002; Wonzey et al, 2006). These contextual factors coincide with the Conditions for Classroom Technology Innovation model where one of the three main factors for using technology successfully is context referring to human infrastructure, technological infrastructure, and social support. A human infrastructure includes a highly trained and helpful technical staff, a group of people who can help teachers understand and use technology, and a supportive administration. The technological infrastructure is the actual resources available to teachers: computers, network, connectivity, software, etc.

These contextual factors contributed to inconsistencies between teachers' expressed technological pedagogical beliefs and its actual implementation into classroom practices. Teachers' explanation for these inconsistencies referenced contextual limitations (Ertmer, Gopalakrishnan, & Ross, 2001). This reflected the Expectancy-

Value theory selected for this particular study, as educators have to take into consideration the costs associated with technology implementation. The costs assess the physical and psychological demands associated with implementing a particular strategy (technology) (Wozney et al., 2006). In order for an individual to implement a specific strategy, one must have high anticipation for success and believe the end result as important enough to overlook the impending barriers. In the quantitative phase of the study these reported contextual factors of time, resources, support, etc. contributed 5.1% of the variance for frequency of technology use. This means that reported contextual factors were able to predict teachers' integration of technology into the classroom, but with a smaller impact than teachers' reported technological beliefs. The idea of context was further explored within the qualitative phase of the study. Several factors contributing to technology integration were revealed: time, resources at schools, resources at home for students, technology support staff, administrative, parental, and community support, class sizes, scheduling conflict, collaboration, and professional development and training.

Foreign language educators faced a variety of challenges in their own classrooms, schools, cultures, and environments. The frustrations associated with the contextual constraints in their educational environments impacted their ability to integrate technology into the curriculum. A more dichotomous relationship between the contextual factors either enabled or constricted teachers' abilities to incorporate technology into their classroom practices. Some of the influential experiences focused on resources, collaboration, and professional development and/or training. School systems with ample access to technologies for both students and teachers had an increased likelihood for

technology integration more so than school districts with limited available resources. Collaboration amongst other educators within the foreign language classroom also enhanced technology integration due to the networking of sharing ideas for classroom integration. Another piece was professional development where there was either a lack of training available for educators or it was not focused on foreign languages. Teaching different subject matters makes a large difference on the various elements of technology (software, hardware, etc.) to be incorporated into the classroom curriculum.

Overall, educators with more positive experiences with different aspects of the environment: administrative support, technical support, etc. were better equipped with the necessary infrastructure to support technology inclusion while others had more negative perspectives on their educational environment due to the multitude of restrictions: time, resources, training, etc. Personal experiences, concerns, frustrations, limitations, and a lack of support from the educational system greatly impacted the teachers' abilities to utilize technology into their classrooms. Educators who had more positive beliefs about technology were better equipped to overlook some of the environmental constrictions while educators with more negative beliefs further solidified their negative perspective on technology and continued to avoid it in their classroom curriculum. The reported contextual factors had the greatest impact on educators who were somewhere in between the negative and positive technological beliefs. Educators with a more trial-and-error belief, tended to associate their inconsistencies in integrating technology to their contextual environments. The concept of positive and negative perspectives on technology integration directly reflected the continuous relationship between the three elements of the Expectancy-Value theory: expectancy, values, and costs. The expectancy

concept examined individual beliefs' amongst the use of a strategy and a desired outcome. The value construct assessed the degree to which an individual perceived the outcomes of a particular strategy as worthwhile. The costs assessed the physical and psychological demands associated with implementing a particular strategy (Wozney et al., 2006). Therefore, educators with more positive experiences using technology in the classroom were better equipped with its inclusion in the classroom than those with more negative experiences or a more prohibitive environment.

Consequently, reported contextual factors contributed to inconsistencies between teachers' expressed technological pedagogical beliefs and its actual implementation into classroom practices. Although teachers' beliefs had a greater impact on technology integration into classroom practices, perceived contextual factors also contributed to the relationship. Educators needed sufficient resources such as time, support, collaboration, content specific professional training, resources, etc., which are all contextual factors depicted in the Conditions for Classroom Technology Innovation model, to enable them to utilize technology in the classroom. This is especially important for educators who were more in the middle ground on their beliefs about technology as their personal and professional experiences with technology contributed to the overall schema of technological beliefs. Both reported contextual factors and intrinsic factors impacted teachers as they tried to adjust to any change in the classroom. The perceived contextual factors impacted the personal and professional experiences along with their curriculum decision-making process which directly reflects the continuous interactive relationship between three main elements in the Conditions for Classroom Technology Innovation model: innovator, innovation, and context (Zhao et al., 2002).

Research Question 3

How does the data from the self-administered questionnaire compare to the data collected during teacher interviews?

The final stage of data analysis takes the data set from phase one (quantitative) and phase two (qualitative) to look for comparisons, differences, and surprising results amongst the two data sets. The third set of data revealed three main areas representing consistencies, inconsistencies, and some surprising results amongst the two sets of data. The consistent results from the third set of data uncovered three main elements: teaching style, perceived benefits, and reported contextual factors. The inconsistencies within the data set three disclosed four main areas: gender, age, years of teaching, and reported contextual factors. The final area discovered through the comparison of the two data sets were a few surprising results associated with one to one school districts and the issues or complications associated with this particular initiative.

The consistencies amongst the data sets focused more on internal variables (teacher beliefs and teaching style) for foreign language educators. The foreign language teachers' beliefs about the benefits of technology greatly influenced their use of it within their curriculum. Additionally, teachers whose pedagogical beliefs aligned with more student-centered teaching were more likely to incorporate or be open to incorporating technology into their classroom practices, while teachers' whose pedagogical beliefs aligned with more teacher-centered teaching were less likely to integrate technology into classroom practices (Lucas & Wright, 2009). The final consistency centered on one-to-one school districts where educators integrated technology more frequently than educators without equal access to computer technologies. This consistency revealed the

importance of understanding teachers' beliefs, teaching style, and available resources to increase technology integration into the curriculum. This interconnected and continuous relationship reflects the elements both within the Expectancy-Value theory and the Conditions for Classroom Technology Innovation model.

The inconsistencies within the two data sets depended more on demographic variables: gender, age, and years of teaching. The first inconsistency between phase one and two focused on gender. According to the findings, males included technology more frequently than females within the quantitative phase of the study. The qualitative phase did not reveal any differences between gender and their uses of technology for language learning. The second demographic variable, age, demonstrated that in the first phase of the study, younger teachers more readily integrated technology into the curriculum than older educators. Younger teachers tended to have more exposure to technology and its purposes, thus increasing the integration of technology. However, the second phase of the study did not uncover the same results. According to the study, educators were able to integrate technology into the classroom regardless of age. The third demographic variable, years of teaching, revealed that teachers with more experience in the classroom were better equipped at integrating technology than teachers with fewer years of teaching. Teachers had more time to focus on new and innovative ideas when they had the time to work through other factors within their curriculum, environment, and support system. The results from the second phase of the study did not reveal consistent results in regards to years of teaching. Again, teachers were able to utilize technology in their classroom practices regardless of the years of teaching. Besides demographic variables, perceived contextual factors also represented a discrepancy. Reported contextual factors

did not play a major part in the frequency of technology use within the first phase of the study when compared to other factors, but contextual factors became a big theme within second phase of the study. Contextual factors in schools and classrooms can greatly impact the process of change for teachers' beliefs and knowledge (Richardson, 1996). These contextual factors will contribute to inconsistencies between teachers' expressed technological pedagogical beliefs and its actual implementation into classroom practices. Teachers' explanation for these inconsistencies often included references to contextual limitations such as curriculum requirements, social pressure exerted by parents, peers or administrators, and resources (Ertmer et al., 2001).

In addition to consistencies and inconsistencies of the two data sets, a third element emerged as a surprising result with one-to-one initiatives. The one-to-one initiative provides a device for every student within the school system and classroom to use, learn, and interact with throughout the school day. Educators expressed some issues and frustrations associated with one-to-one initiatives which constricted their uses of technology within the classroom, including: a lack of professional development, firewall protection, and loss of materials. The professional development provided for educators working with these new devices was inadequate in regards to knowledge, understanding, and readiness to integrate technology into their own classroom practices. Educators wanted to see more professional development specific to their content area as well as constant support from their technical staff to make the transition to one-to-one easier. There was also frustration with transferring items from one device to another, either for use within course materials or to enable students to present from their own devices. Teachers had to take extra steps or seek out assistance to better equip them for

completing technological tasks within their curriculum. In addition to losing materials, teachers' described their frustration with the firewall protection program and its impact on technology integration. The intention of firewalls was to protect the students and teachers from accessing inappropriate sites. However, the firewall protection also prohibited teachers from utilizing a particular site or program for their classes which would enrich student learning. The lack of accessibility of curricular materials due to the firewall protection detoured educators from being more creative in their selection of technology resources for their classrooms.

The final surprising elements with one-to-one initiatives involved the downloading of applications/software for both students' and teachers' devices. Teachers were not able to add applications to their own or students' devices without the assistance of the technology staff. The educator had to plan well in advance of their curriculum to talk with the technical staff and give the technology staff sufficient time to upload it to everyone's device by the time it was needed for the particular piece of classroom curriculum. Some school districts also had a schedule setup for when applications were downloaded to their own and student computers. These schedules restricted the integration of technology, if a new or innovative software was found after the scheduled installation date. Besides a constricting schedule, students were not able to download applications, software, or programs onto their own devices. The administration was concerned with enabling students the ability to download any applications or programs onto their own devices due to the inability to filter their choices. Overall, one-to-one initiatives provided classrooms with sufficient access to technology to better enable integration into the curriculum. However, it also created some complications that

administrators need to be aware of when integrating the initiative into their school systems. Educators need content specific training, access to pertinent websites, and training on information transfer from one device to another. The teachers and the students also needed the ability to download applications/software onto their devices for enhanced technology integration.

There were several elements that are consistent, inconsistent, and surprising from the two data sets. The consistencies reiterated the importance of internal barriers and their impact on technology integration within the classroom curriculum. Teachers who had stronger positive beliefs and a more student-centered classroom were better able to integrate technology into the classroom more so than other educators. The inconsistencies amongst the data sets revealed that demographic variables did not play a major factor within the incorporation of technology in the curriculum. Foreign language educators were able to integrate technology into their classrooms regardless of age, gender, and years of teaching. But, reported contextual factors emerged as a primary reason with inconsistencies in implementing technology into classroom practices. Within the initial data, context played a minor part in contributing to technological classroom practices. But the in-depth one-to-one interviews, revealed that context plays a major role it educators' abilities and beliefs about technology within classroom practices. The final elements that emerged from the third data sets where some surprising factors associated with one-to-one initiatives. The implementation of one-to-one devices within the school system better equipped educators to integrate technology, but it was not without its complications. Teachers needed content specific training, transfer device training, and support to enhance their technological skills within the classroom

curriculum. Additionally, the inability to download applications/software created more frustration and impeded teachers' abilities to better incorporate technology into the classroom curriculum.

Implications for Educational Practice

The findings from this dissertation suggest some valuable insights into a variety of elements impacting teachers, students, administrators, and pre-service teachers as to the enhancement of the frequency and integration of technology into classroom curriculum. While some of the findings of this particular study reinforced those of previous studies in the field of technology and foreign language education, several new findings also emerged from the study. Five implications surfaced from this particular study: changing attitudes and beliefs about technology, accessibility and support, conducting quality professional development, pre-service teacher training, and issues associated with one to one initiatives. Each of these will be described in more detail along with their implications in the field of foreign language education and technology.

Changing attitudes and beliefs amongst teachers for the improvement of technology integration. Teachers have the main authority within the language learning process and the mediators for the effectiveness of classroom technology (Zhao & Frank, 2003). Teachers' educational beliefs play an important role in the way teachers perceive and use technologies in the classrooms. Thus, beliefs appear to shape teachers' decisions about pertinent knowledge, routines, and goals along with taking into consideration the context of the classroom (Speer, 2005). "Teacher "interpret" a teaching situation in the light of their beliefs about learning and teaching a second language, the results of this interpretation is what the teacher plans for and attempts to create in the classroom"

(Woods, 1996, p. 69). Teachers' beliefs about teaching, learning, and technology can be incorporated into the classroom, as long as it helps achieve their classroom goals.

According to the research, there are a few ways to change teachers' beliefs to challenge them or to create a desirable environment supporting their current curriculum goals. Some additional factors playing a role in changing beliefs are: earlier experiences, contradictory information, and pedagogical approaches (Ertmer, 2005). The findings from this particular study support these findings. Teachers who had a more positive perception of technology, a more student-centered classroom, and the belief that technology can enhance their curricular goals were better equipped at integrating technology due to their personal perspective as to its importance in the classroom. Educators with a more negative perception of technology, a more teacher-centered classroom, and the belief that technology does not help them meet their educational goals were not able to integrate technology as easily since it did not support their pedagogical approach. However, there are an additional group of educators who strongly believe in the importance of technology, but have a hard time implementing it in the classroom due to their past experiences and environmental constrictions. These attitudes directly reflected the continuous relationship between various elements within Expectancy-Value theory and technology inclusion. Educators have to value the importance of technology within their curriculum in order to overcome the costs (lack of times, support, resources, etc.) associated with technology. In order to promote changes within teachers' beliefs, the teaching and learning environment needs to support teachers' curricular goals. Training and professional development need to show teachers the importance of technology, its abilities to enhance their students learning which can coincide with their

curricular goals. The administration needs to promote a conducive environment for educators to practice with technology and its capabilities in the classroom. A conducive environment has sufficient resources, connectivity, support, collaboration, and training for their educators in the classroom leading to more technological inclusion.

Accessibility and support have been demonstrated as essential elements within the process of technology implementation. Past literature and the findings from this particular study demonstrate the importance of providing sufficient access and support as foreign language educators utilize technology within their classroom practices. The data provided evidence that contextual factors such as access to resources, support from the environment, and support from technical staff play a part in their abilities to integrate technology, as well as providing evidence of inconsistencies between educators' expressed beliefs about technology and its integration into actual classroom curriculum. Therefore, accessibility depended on the infrastructure of the school districts, which hinged on the amount of funding and maintenance allocated from the schools' budget. The lack of equipment and resources, hardware and software access, and lack of technology support can lead to gaps in a supportive infrastructure which impacted teachers' abilities to integrate technology into classroom practices (Cuban, 1986; Bitner & Bitner, 2002; Butler & Seldom, 2002; Wonzey et al, 2006). Some of the findings from this particular study coincided with the various contextual factors associated with accessibility and support. Educators readily needed to have access to technology in order to increase the frequency of integration into the curriculum. Teachers struggled with the limited resources school districts have in regards to technology, which was further

complicated by the additional steps of signing up for computer labs far in advance of usage within the curriculum.

Besides the lack of access, teachers struggled with support from other members of their educational environments: administration, technology support staff, community, and parents. Teachers needed to have the confidence and comfort to play around with technology in their own classroom to increase their students' learning. The administration and technology staff had direct impact on teachers' abilities to integrate technology, which hinged on their ability to provide them with the necessary support when complications might arose requiring some assistance. In addition to support from their immediate environment, the outside environment of the community and parents helped create a united front when teachers are working with technology in their classrooms to help meet their curricular goals. To increase teachers' utilization of technology within their classroom curriculum, they need readily accessible and available technologies within their classrooms, along with a very supportive learning and teaching environment. Administrators need to make sure there is sufficient technology within their school districts, to provide teachers with adequate technological support staff, and to create a more supportive work environment. An additional element of support that educators need to effectively integrate technology into their curriculum is collaboration. Teachers needed time to talk with other educators within their specific content area to gain new insights into elements that might help enhance their curriculum and curricular goals. These elements play an integral role in teachers' abilities to incorporate technology into their classroom practices.

Conducting quality professional development can greatly impact a teachers' ability to integrate technology successfully in the classroom. Professional development can influence teachers' attitudes towards technology inclusion in classroom practices. These opportunities provide training for teachers about their abilities, skills, and software for technology integration into their own classrooms (Joyce & Showers, 1995; Ertmer et al., 2006; Ertmer & Ottenbreit-Leftwich, 2010). Professional development enables educators to practice with technology, interact with peers, and learn new techniques. In order for professional development to be successful, it needs to be continuous, ongoing, and involve follow-up and supportive for further learning (Carlson & Gadio, 2002). Another key element within professional development is the ability to make it subject-specific, context-specific, and accessible as it will make it meaningful for educators (Ertmer et al., 2006). A quality professional development program focuses on teachers' knowledge and skills related to technology. In addition, it also provides teachers with ample opportunities to participate in more hands-on learning within their content specific subject matter. Another element of professional development is the collaboration with other educators from the same subject matter. These opportunities for teachers to work together with technology establish the exchanging of ideas in relation to technology integration.

The findings from this study further solidified the necessity for in-service professional development with technology integration. Foreign language teachers need more content specific professional development aimed at technology along with the opportunities to participate in more hands-on learning experiences. Educators also crave interaction, collaboration, and exchanging of ideas with other members the foreign

language profession. Teachers need to talk to each other about the various methods of technology integration. The sharing of content specific ideas and hands-on learning experience enhances technology implementation within the foreign language classroom. Two main concepts from professional development are directly linked to the Conditions for Classroom Technology Innovation model with the innovator: technology proficiency and social awareness. Technology proficiency is the knowledge of what is necessary to use technology in teaching and the ability to use software applications. Social awareness relates the ability of the teacher to understand the social dynamics of the school system. The school's social dynamics refers to technical support, peer support, resources beyond teachers' control, school resources, etc. The continuous interactions between the innovator and the innovation can help hinder or influence technology integration. But, the strongest pull for technology innovation comes from the innovator. Hence, the administrators need to provide and support educators with ample opportunities to attend conferences, workshops, etc. as well as establish a continuous structure of professional development contained within their institutional environments. Besides professional development experiences, administrators can help facilitate conversations amongst their current foreign language educators and others within the same field from diverse institutions which enables networking and the exchanging of ideas focused on technology integration.

Pre-service teacher training is another component that influences teachers' technological beliefs and practices. Pre-service teachers bring with them strongly held beliefs about teaching, learning, and schooling from their "apprenticeship of experience" as students (Richards, 2003). Students have spent thousands of hours observing teachers

in actions, but have only a small glimpse of classroom reality. Changing the beliefs of teacher candidates can be very difficult, but not impossible. In order to change teacher candidates' beliefs about educational practices, programs need to provide readings, dialogues, classroom experimentation, and modeling of effective uses of technology in the classrooms (Richards, 2003). The Conditions for Classroom Technology Innovation model revealed that the most important factor in successful technology implementation is the innovator. The teacher has the strongest impact on their environment, students, curriculum, decisions, etc. impacting the curricular resources used for classroom practices. Therefore, skill enhancement is important not only for current foreign language educators, but also pre-service teachers who will be in the field. Current pre-service programs need to provide courses on technology, pedagogy, and integration specific to the content area as well as creating a collaborative community where pre-service educators can openly discuss ideas associated with technology integration. These new possibilities will improve pre-service education as a whole to produce more equipped foreign language educators to succeed in the 21st century workforce.

Issues associated with one-to-one initiatives emerged as an area for improvement within school systems. The one-to-one initiative provides a device for every student within the school system and classroom to use, learn, and interact with throughout the school day. Few modern educational initiatives have been as wide spread as the integration of computer technologies into the classroom (Bebell & Kay, 2010). Computers have encouraged student participation, academic achievement, attendance, motivation, and lifelong learning as well as changed how students think and retain information (Garthwait & Weller, 2005; Bebell & Kay, 2010). The decision for the

implementation of the one-to-one initiatives comes from the top down method where the administration begins the decision-making process in regards to these new devices. Teachers are not generally brought into the decisions or planning process for the implementation of such initiatives. Therefore, additional complications associated with its installation from the perspectives of the students, teachers, parents, and community members might arise. Teachers from this particular study discussed the problems associated with the process. Teachers were not given sufficient time to experiment with the new devices, professional training was not sufficient, and teachers lacked skills for technology integration. Administrators needed to bring their educators into the conversation in the decision-making, planning, and implementation process to eliminate complications, create a smoother transition, and enhance learning skills with technology for both students and teachers.

Other considerations that administrators should address with one-to-one are firewall protection and application/software downloading. Firewall protections were established by the school district to help keep students, faculty, and staff away from websites that are inappropriate for the educational environment. However, it created a lot of headaches and loss of instructional time for educators when they were denied access to appropriate materials for their curriculum and had to request to be unblocked by the technology staff. Another concern arising from the concept behind providing appropriate content for their students and staff was the ability to download applications/software on to their devices. School districts have restricted the applications/software that can be downloaded, the ability to download the applications, and the schedule for downloading. Each of these additional steps can create frustration and deter educators from using

technology in the classroom. Therefore, the administration should consult the faculty and provide guidelines for restrictions with firewall protection and application downloading to create a more technologically conducive environment.

To enhance the facilitation of technology integration by foreign language educators, the administration needs to take into consideration the available resources, support, and professional development for their current faculty. In addition to the suggestions for administrators, foreign language educators need to take the chance to explore technology, participate in hands-on professional development, and collaborate with other current foreign language educators about technology integration. These more positive experiences and opportunities increase changes in teachers' beliefs and classroom practices to facilitate technology inclusion.

Limitations

Even though this study has provided some new insights into technology implementation, it is not without its own limitations. The limitations of the study focused on the type of data collected, the sample size, instrument reliability, and the time of the study. Each of these limitations created an impact on the data, the participants, and the results of the study. Each of these limitations will be discussed in greater detail below.

Self-reported data is the primary source of data collected from the teachers through the administration of the online questionnaire. Self-reported data collects information from participants, but only from their own personal perspectives. This particular type of data does not offer as much accuracy as other types of data. However, to provide more depth, follow-up interviews were conducted with a few of the participants to further clarify and explain previously collected responses from the first

phase of the study. Due to the voluntary nature of participation, it is possible that some attitudes toward technology integration were omitted. Self-reported data can provide insight into personal perspectives, but additional data would help strengthen and clarify these elements.

Sample size for this study was ninety-nine participants, but due to missing data from some of the participants, the final number used for analysis was seventy-four. Even though seventy-four participants were enough for statistically significant findings, the power of the conclusions would increase with more participants. In addition to sample size, the selection of participants also limits the generalizability to teachers across Iowa, within other states, and with various languages. Participants voluntarily self-selected to complete the online questionnaire which was emailed to individual K-12 foreign language educators from across Iowa. The administration for both private and public institutions gave permission for the initial contact with their foreign language educators. Participants were also solicited through memberships with the Iowa World Language Association, but not every K-12 foreign language educator in Iowa is a current member of the organization. The final piece of generalizability within the study was the selection within the state of Iowa. Language educators within other states across the United States, as well as some language teachers not being represented, might bring in different perspectives about technology integration. Therefore, the participant selection process created some complications with getting the full spectrum of perspectives from K-12 foreign language educators on technology.

Instrument reliability was another limitation of this study as the current Modified Technology Implementation Questionnaire was adapted to better suit the

subject-specific content of foreign languages. Current literature and experts from the field were taken into considerations with the adaptations, modifications, and additional questions aimed at foreign language education. One complication arose as the study was collecting data from various participants in the field. Some participants chose not to participate in the research study after reading through some of the questionnaire items because they felt they did not utilize technology enough in their classroom to be considered an excellent participant for the study. Other participants contacted the researcher for clarification or direction as to whether or not they would be good candidates for the study. A method to combat this issue for participants was to clarify the description of the intention of the study considering the full spectrum of foreign language perspectives on technology integration, regardless of the amount currently used in the classroom.

Timing of study, a mixed methods research design can take a considerable amount of time for data collection and analysis for each phase of the study. A mixed methods design requires the results of one study to feed each consecutive phase of the study. It took several months to contact participants and collect data from the online questionnaire. Once the data was complete, it took a few more months to analyze the data and select the ten participants for follow-up interviews from the pool who self-selected to participate. The data collection for phase two and analysis took several more months. The overall process took over a year to collect and analyze each subsequent stage. In addition to the length of time to complete the process, the actual timeframe for data collection for both phase one and two of the mixed methods design was an issue. The first phase of the study was collected in February, which can be a very busy time for

educators as they have just come back from winter break, parent teacher conferences, and other events within the school systems. Additionally, the second phase of the study was conducted throughout the months of June, July, and August, which are when schools are on summer break. Educators take vacations and a mental reprieve from their jobs over the summer break. The two timeframes chosen were not the most conducive time for gaining the participation of educators. The most ideal time for contacting teachers is during the month of October when there seems to be more down time in the busy school schedule.

Teacher-researcher role, describes the relationship the researcher has to his/her research. I was a K-12 foreign language educator in the state of Iowa at a rural district for four years prior to continuing on with my educational career. As an educator, I was struggling to find ways to bring the target language into the classroom for the students to experience without traveling to a foreign country. I found advances in technology to be an effective and efficient way to introduce students to the target culture, language, native speakers, etc. In addition to my role as a foreign language educator in Iowa, my current role is teaching pre-service teachers about the different elements of the classroom. Due to the ever-changing presences of technology in the classroom, I feel it is imperative that we train our pre-service teachers to interact and teach with technology. My own biases towards the implementation of technology into the foreign language classroom might have influenced the results. While I took every effort to maintain neutrality throughout the research process, my own beliefs about technology and pedagogical practices may have influenced my work at various stages of the research study.

Considerations for Future Research

In spite of the initial inquiries into foreign language teachers' use of technology, there are still teachers who have not yet accepted the need for technology integration into their own language curriculum (Lotherington & Jenson, 2011). The results and implications of this study build a strong foundation for future research on K-12 foreign language teachers' beliefs about technology, environmental barriers, and their influences on technology integration. Several possible directions for future research can be identified including, a larger selection of participants, inclusion of more languages taught, and the ability to recruit language teachers from other states. In addition to changes within the population for the study, observing foreign language teachers as they teach utilizing technology within their own classrooms will provide more insights into the activities, reasons, and intention of technology implementation into classroom practices

There have been few studies conducted researching how and why foreign language teachers use technology in the classroom (Wiebe & Kabata, 2010), and even fewer have focused on K-12 teachers' beliefs and their influence on instructional practices. Teachers are the main factors within the language learning process and the mediator for the effectiveness of classroom technology (Zhao & Frank, 2003). Teachers' educational beliefs play an important role in the way teachers perceive and use technologies in the classrooms. Therefore, additional research needs to be conducted with current K-12 foreign language educators in a variety of settings to gain a better understanding of teachers' beliefs and their impact on technology integration.

There are several elements that have been identified as essential for technology integration: supportive school system, adequate resources, professional development, and

sufficient support staff (Zhao, 2005; Oda, 2011; Corey, 2012). Professional development provides training for teachers on their abilities, skills, and software for technology integration into their own classrooms (Joyce & Showers, 1999; Ertmer et al., 2006; Ertmer & Ottenbreit-Leftwich, 2010). In order for professional development to be successful, it needs to be continuous, ongoing, involve follow-up, to be supportive to help further technology integration. Another key element within professional development is the ability to make it subject-specific, context-specific, and accessible as it will make it more meaningful for educators (Ertmer et al., 2006). Measuring the impact that quality professional development programs have had on technology integration within the K-12 setting will shed light on the most effective methods and programs.

An additional area of exploration in regards to technology integration into classroom curriculum is the institutional administration. "Administration in all settings and at all levels plays key roles in establishing either "change" or "maintenance" cultures within their education systems" (Vannatta & Fordham, 2004). Exploring the input, beliefs, and support of the administration will establish other elements of the equation in regards to teacher beliefs and technology incorporation. Another area where administration can provide more insight is with one-to-one initiatives. This study established some complications with technology integration within the one-to-one initiative especially in relation to its implementation and planning process. Gaining insights from administrations will provide a better understanding as to the purpose and intention of the initiative as well as explain their planning process for its implementation.

A final area for continued research is with pre-service K-12 educators and their own beliefs about technology. Pre-service teachers bring with them strongly held beliefs

about teaching, learning, and schooling from their "apprenticeship of experience" as students (Richards, 2003). Students have spent thousands of hours observing teachers in action, but have only a small glimpse of classroom reality. In order to change teacher candidates' beliefs about educational practices, programs need to provide readings, dialogues, classroom experimentation, and model effective uses of technology in the classrooms (Richards, 2003). Researching current technology practices within pre-service teacher programs, as well as observing or discussing pre-service candidates' current beliefs will enhance practices and programs for higher quality technology integration into classroom practices.

Summary

My goal for this study was to explore the factors impacting teachers' implementation of technology within their classroom practices. In this investigation it became apparent that both reported internal and external variables impacted teachers' reported uses of technology. Some of the perceived contextual factors were time, resources, support, professional development, class sizes, and conflicting schedule. Contextual factors in schools and classrooms can greatly impact the process of change for teachers' beliefs and knowledge (Richardson, 1996). These contextual factors contributed to inconsistencies between teachers' expressed technological pedagogical beliefs and its actual implementation into classroom practices. In addition to perceived contextual factors, teachers' more internal factors about technology further impacted its incorporation. The self-reported data demonstrate the teachers' beliefs about their own classroom curriculum, practices, and beliefs. The teachers explained their own thoughts about technology and its impact on their classroom while simultaneously uncovering

their own personal beliefs about technology. Teachers' beliefs about teaching, learning, and technology can be incorporated into the classroom as long as it helps achieve classroom goals. The study uncovered three main internal elements making a difference in the utilization of technology: beliefs, perceived benefits, and teaching style. The internal factors were more influential than external factors in their ability to be successful, especially with technology use (Ertmer et al., 2006). The findings from this result demonstrated the impact internal and external factors have on the success of technology implementation by K-12 foreign language educators. They directly linked with the theoretical framework and model for this particular study.

The Expectancy-Value theory is a model for understanding and predicting behaviors (Fishbein, 1968). The premise for this particular theory states that an individual holds various beliefs about a particular object that can be either positive or negative, thus creating an overall attitude. Therefore on future interactions with the specific object, the individual will draw upon his/her attitudes and beliefs during his/her interactions with the object (Fishbein, 1963). The teacher has the greatest impact on the success of technology incorporation, but there are other elements within the environment that also play a role as well. The Conditions for Classroom Technology Innovation model depicts the continuous relationship between the major factors impacting the successful integration of technology into classroom practices. The study identified three major pieces for successful technology integration into classroom practices: the innovator, the innovation, and the context. The innovator was the teacher and the first person to identify factors that influence technology uses. The three factors of the innovator that contributed to technology success were: technology proficiency,

pedagogical compatibility, and social awareness. The second major area within the model, innovation, was the technology integration itself. Innovation was seen to be successful based on the two factors of distance and dependence. The final piece, context, refers to human infrastructure, technological infrastructure, and social support. The three domains of the model have interconnected relationships, but some of them seem to play a bigger part with technology innovative success than others. The strongest pull for technology innovation comes from the innovator, but the innovation and context play a role in its success or failure within classroom practices (Zhao et al., 2002).

In addition to the continuous and connected relationship between internal and external elements impacting technology integration, a few surprising results were also discovered within the third data set. The third data set enabled the research to compare and contrast between the data from the first and second phase of the study. I looked for consistencies, inconsistencies and the emergence of surprising results. The surprising results from the third data set focused on issues with one-to-one initiatives. Teachers expressed frustration when working with new devices, due to a lack of training, issues with firewall protection, and downloading new applications/software. Recommendations for administration introducing technology to faculty included: thinking through the decision-making process, better planning, and improved implementation.

Besides the findings from the research study, implications for practices were presented that demonstrated the impact this research can have on the field of foreign language education. Some of the findings of this particular reinforced those of previous studies in the field of technology and foreign language education. Several new findings also emerged from the study: changing attitudes and beliefs about technology, improving

accessibility and support, conducting quality professional development, utilizing pre-service teacher training, and exploring issues associated with one-to-one initiatives. Each of these elements will enhance technology integration for both pre-service and current K-12 foreign language educators as well as provide some recommendations for higher educational institutions and administration. The recommendations are followed by various considerations for future researcher to provide new insights, perspectives, and elements influencing the frequency of technology integration into classroom practices.

APPENDIX A

IRB APPROVAL THE UNIVERSITY OF IOWA 1

IRB ID #: 201312769

To: Brittany Garling

From: IRB-02 DHHS Registration # IRB00000100,

Univ of Iowa, DHHS Federalwide Assurance # FWA00003007

Re: Foreign Language Teachers' Perceptions and Integration of Technology A Mixed Methods Approach

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Approval Date: 04/04/14

Next IRB Approval

Due Before: N/A

Type of Application:	**Type of Application Review:**	**Approved for Populations:**	
☐ New Project		☐ Full Board:	☐ Children
☐ Continuing Review	Meeting Date:	☐ Prisoners	
☒ Modification		☐ Expedited	☐ Pregnant Women, Fetuses, Neonates
		☒ Exempt	

Source of Support:

This approval has been electronically signed by IRB Chair:

John Wadsworth, PHD

04/04/14 1017

IRB Approval: IRB approval indicates that this project meets the regulatory requirements for the protection of human subjects. IRB approval does not absolve the principal investigator from complying with other institutional, collegiate, or departmental policies or procedures.

Agency Notification: If this is a New Project or Continuing Review application and the project is funded by an external government or non-profit agency, the original HHS 310 form, "Protection of Human Subjects Assurance Identification/IRB Certification/Declaration of Exemption," has been forwarded to the UI Division of Sponsored Programs, 100 Gilmore Hall, for appropriate action. You will receive a signed copy from Sponsored Programs.

Recruitment/Consent: Your IRB application has been approved for recruitment of subjects not to exceed the number indicated on your application form. If you are using written informed consent, the IRB-approved and stamped Informed Consent Document(s) are attached. Please make copies from the attached "masters" for subjects to sign when agreeing to participate. The original signed Informed Consent Document should be placed in your research files. A copy of the Informed Consent Document should be given to the subject. (A copy of the *signed* Informed Consent Document should be given to the subject if your Consent contains a HIPAA authorization section.) If hospital/clinic patients are being enrolled, a copy of the IRB approved Record of Consent form should be placed in the subject's electronic medical record.

Continuing Review: Federal regulations require that the IRB re-approve research projects at intervals appropriate to the degree of risk, but no less than once per year. This process is called "continuing review." Continuing review for non-exempt research is required to occur as long as the research remains active for long-term follow-up of research subjects, even when the research is permanently closed to enrollment of new subjects and all subjects have completed all research-related interventions and to occur when the remaining research activities are limited to collection of private identifiable information. Your project "expires" at 12:01 AM on the date indicated on the preceding page ("Next IRB Approval Due on or Before"). You must obtain your next IRB approval of this project on or before that expiration date. You are responsible for submitting a Continuing Review application in sufficient time for approval before the expiration date, however the HSO will send a reminder notice approximately 60 and 30 days prior to the expiration date.

Modifications: Any change in this research project or materials must be submitted on a Modification application to the IRB for prior review and approval, except when a change is necessary to eliminate apparent immediate hazards to subjects. The investigator is required to promptly notify the IRB of any changes made without IRB approval to eliminate apparent immediate hazards to subjects using the Modification/Update Form. Modifications requiring the prior review and approval of the IRB include but are not limited to: changing the protocol or study procedures, changing investigators or funding sources, changing the Informed Consent Document, increasing the anticipated total

number of subjects from what was originally approved, or adding any new materials (e.g., letters to subjects, ads, questionnaires).

Unanticipated Problems Involving Risks: You must promptly report to the IRB any serious and/or unexpected adverse experience, as defined in the UI Investigator's Guide, and any other unanticipated problems involving risks to subjects or others. The Reportable Events Form (REF) should be used for reporting to the IRB.

Audits/Record-Keeping: Your research records may be audited at any time during or after the implementation of your project. Federal and University policies require that all research records be maintained for a period of three (3) years following the close of the research project. For research that involves drugs or devices seeking FDA approval, the research records must be kept for a period of three years after the FDA has taken final action on the marketing application.

Additional Information: Complete information regarding research involving human subjects at The University of Iowa is available in the "Investigator's Guide to Human Subjects Research." Research investigators are expected to comply with these policies and procedures, and to be familiar with the University's Federalwide Assurance, the Belmont Report, 45CFR46, and other applicable regulations prior to conducting the research. These documents and IRB application and related forms are available on the Human Subjects Office website or are available by calling 335-6564.

APPENDIX B

IRB APPROVAL THE UNIVERSITY OF IOWA 2

IRB ID #: 201312769

To: Brittany Garling

From: IRB-02 DHHS Registration # IRB00000100,

Univ of Iowa, DHHS Federalwide Assurance # FWA00003007

Re: Foreign Language Teachers' Perceptions and Integration of Technology A Mixed Methods Approach

---

Approval Date: 01/28/14

Next IRB Approval

Due Before: N/A

Type of Application:	**Type of Application Review:**	**Approved for Populations:**
☒ New Project	☐ Full Board:	☐ Children
☐ Continuing Review	Meeting Date:	☐ Prisoners
☐ Modification	☐ Expedited	☐ Pregnant Women, Fetuses, Neonates
	☒ Exempt	

Source of Support:

This approval has been electronically signed by IRB Chair:

John Wadsworth, PHD

01/28/14 2008

IRB Approval: IRB approval indicates that this project meets the regulatory requirements for the protection of human subjects. IRB approval does not absolve the principal investigator from complying with other institutional, collegiate, or departmental policies or procedures.

Agency Notification: If this is a New Project or Continuing Review application and the project is funded by an external government or non-profit agency, the original HHS 310 form, "Protection of Human Subjects Assurance Identification/IRB Certification/Declaration of Exemption," has been forwarded to the UI Division of Sponsored Programs, 100 Gilmore Hall, for appropriate action. You will receive a signed copy from Sponsored Programs.

Recruitment/Consent: Your IRB application has been approved for recruitment of subjects not to exceed the number indicated on your application form. If you are using written informed consent, the IRB-approved and stamped Informed Consent Document(s) are attached. Please make copies from the attached "masters" for subjects to sign when agreeing to participate. The original signed Informed Consent Document should be placed in your research files. A copy of the Informed Consent Document should be given to the subject. (A copy of the *signed* Informed Consent Document should be given to the subject if your Consent contains a HIPAA authorization section.) If hospital/clinic patients are being enrolled, a copy of the IRB approved Record of Consent form should be placed in the subject's electronic medical record.

Continuing Review: Federal regulations require that the IRB re-approve research projects at intervals appropriate to the degree of risk, but no less than once per year. This process is called "continuing review." Continuing review for non-exempt research is required to occur as long as the research remains active for long-term follow-up of research subjects, even when the research is permanently closed to enrollment of new subjects and all subjects have completed all research-related interventions and to occur when the remaining research activities are limited to collection of private identifiable information. Your project "expires" at 12:01 AM on the date indicated on the preceding page ("Next IRB Approval Due on or Before"). You must obtain your next IRB approval of this project on or before that expiration date. You are responsible for submitting a Continuing Review application in sufficient time for approval before the expiration date, however the HSO will send a reminder notice approximately 60 and 30 days prior to the expiration date.

Modifications: Any change in this research project or materials must be submitted on a Modification application to the IRB for prior review and approval, except when a change is necessary to eliminate apparent immediate hazards to subjects. The investigator is required to promptly notify the IRB of any changes made without IRB approval to eliminate apparent immediate hazards to subjects using the Modification/Update Form. Modifications requiring the prior review and approval of the IRB include but are not limited to: changing the protocol or study procedures, changing investigators or funding sources, changing the Informed Consent Document, increasing the anticipated total

number of subjects from what was originally approved, or adding any new materials (e.g., letters to subjects, ads, questionnaires).

Unanticipated Problems Involving Risks: You must promptly report to the IRB any serious and/or unexpected adverse experience, as defined in the UI Investigator's Guide, and any other unanticipated problems involving risks to subjects or others. The Reportable Events Form (REF) should be used for reporting to the IRB.

Audits/Record-Keeping: Your research records may be audited at any time during or after the implementation of your project. Federal and University policies require that all research records be maintained for a period of three (3) years following the close of the research project. For research that involves drugs or devices seeking FDA approval, the research records must be kept for a period of three years after the FDA has taken final action on the marketing application.

Additional Information: Complete information regarding research involving human subjects at The University of Iowa is available in the "Investigator's Guide to Human Subjects Research." Research investigators are expected to comply with these policies and procedures, and to be familiar with the University's Federalwide Assurance, the Belmont Report, 45CFR46, and other applicable regulations prior to conducting the research. These documents and IRB application and related forms are available on the Human Subjects Office website or are available by calling 335-6564.

APPENDIX C

CONSENT LETTER FOR ADMINISTRATORS

COLLEGE OF EDUCATION

Leaders. Scholars. Innovators.

Teaching and Learning

January 6, 2014

Dear Administrator,

My name is Brittany Garling and I am a doctoral student in the program of Foreign Language & ESL Education at the University of Iowa, working with Dr. Leslie Schrier, my chairperson. The topic of my dissertation looks at best practices in foreign language education including the use of technology to enhance the instruction of languages in the schools. The purpose of this study is to examine perceptions and practices of technology by foreign language teachers within the state of Iowa by looking at both demographic and other factors that influence technology incorporation into classroom practices. I will do this through a questionnaire I designed to look at these factors impacting technology usage in the classroom. Additionally, I will conduct interviews with ten educators to gain a more in-depth understanding of their beliefs about technology.

I have chosen your school for my research because of the unique backgrounds of each of your foreign language educators. I have attached a summary of the research study which outlines the benefits, risks, and purpose of this particular study in more detail. This study will contribute to the improvement and better understanding of technology integration into the language classroom. I am contacting you for approval to email your foreign language educators at all levels within the district utilizing their school email accounts. Attached is an approval/denial form that needs to be signed by you and either mailed or emailed to me electronically. An additional attachment includes the consent letter for foreign language educators and an electronic link to the questionnaire.

As a past foreign language educator, I understand the tight schedule and time constraints as well as the need to be as minimally disruptive to the educational process as possible. My study solely involves foreign language educators. No students will be involved in the study. Please contact me by phone 1-319-290-7777, email at brittany-garling@uiowa.edu, or mail N230 Lindquist Center Iowa City, IA 52240 if you have further questions or concerns about the research study.

If you have questions about the rights of research subjects, please contact the Human Subjects Office, 300 College of Medicine Administration Building, The University of Iowa, Iowa City, IA 52242, (319) 335-6564, or e-mail irb@uiowa.edu.

Thank you very much for your consideration.

Sincerely,

Brittany Garling, Doctoral Candidate
Foreign Language and ESL Education

Leslie L. Schrier, Ph.D.
Supervising Faculty

APPENDIX D

CONSENT LETTER FOR EDUCATORS

COLLEGE OF EDUCATION

Leaders. Scholars. Innovators.

Teaching and Learning

February 1, 2014

Dear Colleague:

Best practices in foreign language education include the use of technology to enhance the instruction of languages in the schools. I have selected you to help me understand how the professional language educator, such as yourself, uses technology in the language classroom. I have designed a questionnaire that is part of the research study, which will help me complete, my dissertation at the University of Iowa. If you are willing to help me gather data for my study I have provided a link at the end of this letter, which will allow you to answer my questionnaire.

The questionnaire is short, and it should take you no longer than 15 minutes to complete and there are no "right" or "wrong" answers. I really value your voice in this research and if you would like a report of the findings for this study will be sent to you later this spring through this email address or one you provide at the end of the survey. You may also request an electronic copy of the results by emailing Brittany Garling at brittany-garling@uiowa.edu. I will keep the information you provide confidential, however federal regulatory agencies and the University of Iowa Institutional Review Board (a committee that reviews and approves research studies) may inspect and copy records pertaining to this research. If I write a report about this study I will do so in such a way that you cannot be identified.

There are no known risks from participating in the study, and you will not benefit personally. However, I hope that others may benefit in the future from what I learn as a result of this study. Taking part in this research study is completely voluntary. If you decide not to be in this study, or if you stop participating at any time, you won't be penalized or lose any benefits for which you otherwise qualify. If you have any questions about the research study itself, please contact Brittany Garling at N230 Lindquist Center, Iowa City, IA/ 319-290-7777 or email brittany-garling@uiowa.edu

If you have questions about the rights of research subjects, please contact the Human

Subjects Office, 300 College of Medicine Administration Building, The University of Iowa, Iowa City, IA 52242, (319) 335-6564, or e-mail irb@uiowa.edu. Thank you very much for your consideration. Your consent to participate in this study will be indicated when you complete the questionnaire and submit your responses. To take this survey now, please click on the following link, and thank you for your participation! If you are not interested in helping me finish my dissertation, I totally understand and just delete this email.

https://uiowa.qualtrics.com/SE/?SID=SV_2lXkAMGByV5MTYh

Sincerely,

Brittany Garling, Doctoral Candidate
Foreign Language and ESL Education

APPENDIX E

CONSENT LETTER FOR IWLA

COLLEGE OF EDUCATION

Leaders. Scholars. Innovators.

Teaching and Learning

My name is Brittany Garling and I am a doctoral student in the program of Foreign Language & ESL Education at the University of Iowa, working with Dr. Leslie Schrier, my chairperson. The topic of my dissertation looks at best practices in foreign language education including the use of technology to enhance the instruction of languages in the schools. The purpose of this study is to examine perceptions and practices of technology by foreign language teachers within the state of Iowa by looking at both demographic and other factors that influence technology incorporation into classroom practices.

I am inviting you to help me understand how the professional language educator, such as yourself, uses technology in the language classroom. I have designed a questionnaire that is part of the research study, which will help me complete, my dissertation at the University of Iowa. If you are willing to help me gather data for my study I have provided a link, which will allow you to answer my questionnaire.

The questionnaire is short, and it should take you no longer than 15 minutes to complete and there are no "right" or "wrong" answers. I really value your voice in this research and if you would like a report of the findings for this study will be sent to you later this spring through the email address you provide at the end of the questionnaire. You may also request an electronic copy of the results by emailing Brittany Garling at brittany-garling@uiowa.edu. I will keep the information you provide confidential, however federal regulatory agencies and the University of Iowa Institutional Review Board (a committee that reviews and approves research studies) may inspect and copy records pertaining to this research. If I write a report about this study I will do so in such a way that you cannot be identified.

There are no known risks from participating in the study, and you will not benefit personally. However, I hope that others may benefit in the future from what I learn as a result of this study. Taking part in this research study is completely voluntary. If you decide not to be in this study, or if you stop participating at any time, you won't be penalized or lose any benefits for which you otherwise qualify. If you have any questions about the research study itself, please contact Brittany Garling at N230 Lindquist Center, Iowa City, IA/ 319-290-7777 or email brittany-garling@uiowa.edu

If you have questions about the rights of research subjects, please contact the Human Subjects Office, 300 College of Medicine Administration Building, The University of Iowa, Iowa City, IA 52242, (319) 335-6564, or e-mail irb@uiowa.edu.

https://uiowa.qualtrics.com/SE/?SID=SV_2lXkAMGByV5MTYh

Thanks you,

Brittany Garling, Doctoral Candidate
Foreign Language and ESL Education
N230 Lindquist Center
Iowa City, IA 52242
319-290-7777
brittany-garling@uiowa.edu

APPENDIX F

CONSENT LETTER FOR INTERVIEW

COLLEGE OF EDUCATION

Leaders. Scholars. Innovators

Teaching and Learning

May 19, 2014

Dear Colleague:

My name is Brittany Garling and I am a doctoral student in the program of Foreign Language & ESL Education at the University of Iowa, working with Dr. Leslie Schrier, my chairperson. The topic of my dissertation looks at best practices in foreign language education including the use of technology to enhance the instruction of languages in the schools. The purpose of this study is to examine perceptions and practices of technology by foreign language teachers within the state of Iowa by looking at both demographic and other factors that influence technology incorporation into classroom practices.

You have recently completed the questionnaire and marked that you would be willing to participate in a follow up interview in order to gain a deeper understanding of the relationship between your classroom and technology. If you could provide me with an email address or phone number where I can reach you over the next few months, I would really appreciate it. I will be in contact soon to setup an interview time and date. If you have any questions about the research study itself, please contact Brittany Garling at N230 Lindquist Center, Iowa City, IA/ 319-290-7777 or email brittany-garling@uiowa.edu

Thank you very much for your time,

Sincerely,

Brittany Garling, Doctoral Candidate
Foreign Language and ESL Education

APPENDIX G

ONLINE QUESTIONNAIRE

Instructions: The questionnaire consists of four sections and four pages. To complete the questionnaire, please check the box for the most appropriate response when answering. After you have completed your responses, submit the questionnaire electronically.

Section I – Your Professional Views on Computer Technologies Using the scale provided, please rate the extent to which you agree or disagree with the following statements regarding the use of computer technology in the classroom.

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree
1. Increases academic achievement (e.g. grades).	❍	❍	❍	❍	❍	❍
2. Is effective because I believe I can implement it successfully.	❍	❍	❍	❍	❍	❍
3. Promotes student collaboration.	❍	❍	❍	❍	❍	❍
4. Makes classroom management more difficult.	❍	❍	❍	❍	❍	❍
5. Is a valuable instructional tool.	❍	❍	❍	❍	❍	❍
6. Is too costly in terms of resources, time, and effort.	❍	❍	❍	❍	❍	❍
7. Makes teachers feel more competent as educators.	❍	❍	❍	❍	❍	❍
8. Is successful only if computers are regularly maintained by technical staff.	❍	❍	❍	❍	❍	❍

9. Gives teachers the opportunity to be learning facilitators instead of information providers.	❍	❍	❍	❍	❍	❍
10. Is successful only if there is adequate teacher training in the uses of technology for learning.	❍	❍	❍	❍	❍	❍
11. Demands that too much time be spent on technical problems.	❍	❍	❍	❍	❍	❍
12. Is an effective tool for students of all abilities.	❍	❍	❍	❍	❍	❍
13. Enhances my professional development.	❍	❍	❍	❍	❍	❍
14. Eases the pressure on me as a teacher.	❍	❍	❍	❍	❍	❍
15. Is effective if teachers participate in the selection of computer technologies to be integrated.	❍	❍	❍	❍	❍	❍

Using the scale provided, please rate the extent to which you agree or disagree with the following statements regarding the use of computer technology in the classroom: The use of computer technology in the classroom. . .

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree
16. Helps accommodate students' personal learning styles.	❍	❍	❍	❍	❍	❍
17. Motivates students to get more involved in learning activities.	❍	❍	❍	❍	❍	❍
18. Limits my choices of instructional materials.	❍	❍	❍	❍	❍	❍
19. Requires software-skills training that is too time consuming.	❍	❍	❍	❍	❍	❍
20. Promotes the development of students' interpersonal skills (e.g. ability to work with others).	❍	❍	❍	❍	❍	❍
21. Will increase the amount of stress and anxiety students experience.	❍	❍	❍	❍	❍	❍

22. Is effective only when extensive computer resources are available.	❍	❍	❍	❍	❍	❍
23. Is difficult because some students know more about computers than many teachers do.	❍	❍	❍	❍	❍	❍
24. Requires extra time to plan learning activities.	❍	❍	❍	❍	❍	❍
25. Improves student learning of critical concepts and ideas.	❍	❍	❍	❍	❍	❍
26. Adds challenges to controlling off-task students.	❍	❍	❍	❍	❍	❍
27. Helps meet individual students' learning needs.	❍	❍	❍	❍	❍	❍
28. Improves student motivation to learn the language.	❍	❍	❍	❍	❍	❍

29. Increases students' interactions with each other.	❍	❍	❍	❍	❍	❍
30. Develop deeper student understanding of the content.	❍	❍	❍	❍	❍	❍

Use the scale provided, please rate the extent to which you agree or disagree with the following statements regarding the use of computer technology in the classroom:

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree
31. It is difficult to maintain students' attention while working on computers.	❍	❍	❍	❍	❍	❍
32. The Internet is a better foreign language resource than my schools' library.	❍	❍	❍	❍	❍	❍
33. Computers are not sophisticated enough to teach language skills.	❍	❍	❍	❍	❍	❍
34. I worry that my students will use Internet resources such as on-line translators to do their language tasks for them.	❍	❍	❍	❍	❍	❍
35. It is easy to integrate computers into my regular lesson plans.	❍	❍	❍	❍	❍	❍

36. While using computers with my class, it concerns me that I have to use so much English to explain what to do.	❍	❍	❍	❍	❍	❍
37. I feel computers can help students learn a foreign language.	❍	❍	❍	❍	❍	❍
38. I am hesitant to use computers because I do not know what to do if something goes wrong.	❍	❍	❍	❍	❍	❍
39. Students need to learn computers for the 21st century.	❍	❍	❍	❍	❍	❍
40. The value of computers in learning foreign languages is overrated.	❍	❍	❍	❍	❍	❍

41. There are appropriate cultural materials on the Internet for meaningful learning.	❍	❍	❍	❍	❍	❍
42. Managing a classroom of students on computers is more difficult than managing a classroom of students without computers.	❍	❍	❍	❍	❍	❍
43. Planning a lesson that uses computers involves more work than planning a lesson without computers.	❍	❍	❍	❍	❍	❍
44. Teaching students how to use technology is not my job.	❍	❍	❍	❍	❍	❍
45. Students perceive issues with technology as a failure by me, the teacher.	❍	❍	❍	❍	❍	❍

46. I learn about new technologies from my students.	❍	❍	❍	❍	❍	❍
47. I implement students' suggestions for technologies into my teaching practices.	❍	❍	❍	❍	❍	❍

48. Please indicate by checking the appropriate box for your response as to how beneficial you believe computers technologies are for learning the following language skills:

	Not at all	Slightly Beneficial	Moderately Beneficial	Extremely Beneficial
Grammar (1)	❍	❍	❍	❍
Vocabulary (2)	❍	❍	❍	❍
Speaking (3)	❍	❍	❍	❍
Writing (4)	❍	❍	❍	❍
Listening (5)	❍	❍	❍	❍
Reading (6)	❍	❍	❍	❍
Culture (7)	❍	❍	❍	❍

49. Please indicate by checking the appropriate box for your response as to how beneficial you believe computer technologies are for meeting each of the ACTFL

Standards: http://www.actfl.org/publications/all/national-standards-foreign-language-education

	Not at all	Slightly Beneficial	Moderately Beneficial	Extremely Beneficial
Communication	❍	❍	❍	❍
Cultures	❍	❍	❍	❍
Connections	❍	❍	❍	❍
Comparisons	❍	❍	❍	❍
Communities	❍	❍	❍	❍

Please indicate how frequently computer technologies are integrated into your teaching activities for each of the uses listed below. Select the appropriate response. Each Section provides you with a link to the 21st Century Skills

	Never	Practically Never	Once in a while	Fairly Often	Very Often	Almost Always
50. Information Literacy- Access and Evaluate Information	❍	❍	❍	❍	❍	❍
51. Information Literacy- Use and Manage Information	❍	❍	❍	❍	❍	❍
52. Media Literacy- Analyze Media	❍	❍	❍	❍	❍	❍
53. Media Literacy- Create Media Products	❍	❍	❍	❍	❍	❍
54. ICT (Information, Communications and Technology)- ITC Literacy	❍	❍	❍	❍	❍	❍

Section II: Your Experience with Computer Technologies

55. Please read the following descriptions of the proficiency levels a user has in relation to computer technologies. Determine the level that best describes you and select the appropriate response

- ❍ Unfamiliar- I have no experience with computer technologies.
- ❍ Newcomer- I have attempted to use computer technologies, but I still require help on a regular basis.
- ❍ Beginner- I am able to perform basic functions in a limited number of computer applications.
- ❍ Average- I demonstrate a general competency in a number of computer applications.
- ❍ Advanced- I have acquired the ability to competently use a broad spectrum of computer technologies.
- ❍ Expert- I am extremely proficient in using a wide variety of computer technologies.

56. Please indicate how often you integrate computer technologies in your teaching activities.

- ❍ Not at all
- ❍ Rarely
- ❍ Occasionally
- ❍ Frequently
- ❍ Almost Always
- ❍ All the Time

57. On average, how many hours per week do you spend using a computer for personal use outside of teaching activities?

- ❍ None
- ❍ Less than 1 hour
- ❍ 1 hour to 3 hours
- ❍ 3 to 5 hours
- ❍ 5 to 10 hours
- ❍ 10 or more hours

Please indicate how frequently computer technologies are integrated into your teaching activities for each of the uses listed below. Select the appropriate response.

	Never	Practically Never	Once in a while	Fairly Often	Very Often	Almost Always
58. Instructional (e.g. drill, practice, tutorials, remediation)	❍	❍	❍	❍	❍	❍
59. Communicative (e.g. e-mail, computer conferencing)	❍	❍	❍	❍	❍	❍
60. Organizational (e.g. data base, lesson plans, record keeping)	❍	❍	❍	❍	❍	❍
61. Analytical/Programming (e.g. statistics, graphing, charting)	❍	❍	❍	❍	❍	❍
62. Recreational (e.g. games)	❍	❍	❍	❍	❍	❍
63. Expansive (e.g. experiments, brainstorming, simulations)	❍	❍	❍	❍	❍	❍
64. Creative (e.g. digital camera, scanners, graphics)	❍	❍	❍	❍	❍	❍
65. Expressive (e.g. on-line journal, blogging)	❍	❍	❍	❍	❍	❍
66. Evaluative (e.g. portfolio, testing)	❍	❍	❍	❍	❍	❍
67. Informative (e.g. Internet, searches)	❍	❍	❍	❍	❍	❍

68. Please read the description of each of the six stages related to the process of integrating computer technologies in teaching activities. Choose the stage that best describes where you are in the process and select the appropriate response.

- Awareness- I am aware that technology exists, but have not used it- perhaps I am even avoiding it. I am anxious about the prospect of using computers.
- Learning- I am currently trying to learn the basics. I am sometimes frustrated using computers and I lack confidence when using them.
- Understanding- I am beginning to understand the process of using technology and can think of specific tasks in which it might be useful.
- Familiarity- I am gaining a sense of self-confidence in using the computer for specific tasks. I am starting to feel comfortable using the computer.
- Adaptation- I think about the computer as an instructional tool to help me and I am no longer concerned about it as technology. I can use many different computer applications.
- Creative Application- I can apply what I know about technology in the classroom. I am able to use it as an instructional aid and have integrated computers into the curriculum.

Section III- Your Background, Your Teaching Style and Resources Available to You

69. Gender:

- ❍ Male
- ❍ Female

70. Years of Teaching:

- ❍ 1-3 years
- ❍ 4-10 years
- ❍ 11-15 years
- ❍ 16 or more years

71. Age:

- ❍ under 25
- ❍ 26-35
- ❍ 36-45
- ❍ 46-55
- ❍ over 55

72. Native Speaker of the language(s) you teach:

- ❍ Yes
- ❍ No

73. Average class size that you teach:

- ❑ under 10
- ❑ 11-15
- ❑ 16-20
- ❑ 21-25
- ❑ 26-30
- ❑ over 30

74. Number of foreign language teachers in your building:

- ❍ One
- ❍ Two
- ❍ Three to five
- ❍ Six to eight
- ❍ Nine or more

75. Language you are currently teaching (select all that apply):

- ❑ Spanish
- ❑ French
- ❑ German
- ❑ Japanese
- ❑ Chinese
- ❑ Other

76. Level of foreign language you are teaching (select all that apply):

- ❑ 1st year
- ❑ 2nd year
- ❑ 3rd year
- ❑ 4th year
- ❑ 5th year or above

77. Grade-level(s) you are currently teaching (select all that apply):

- ❑ Elementary
- ❑ Middle School
- ❑ High School

78. Describe the location of your school:

- ❍ Urban
- ❍ Suburban
- ❍ Rural

79. Number of computers in your classroom:

- ❍ Zero
- ❍ One to two
- ❍ Three to five
- ❍ Six to ten
- ❍ Eleven or more

80. Number of computer labs in your school:

- ❍ Zero
- ❍ One to two
- ❍ Three to five

81. Teach in a one to one school:

- ❍ Yes
- ❍ No

Answer If 81. Teach in a one to one school: Yes Is Selected

Select the device(s) used within your one to one school:

- ❍ Mac Laptops
- ❍ PC Laptops
- ❍ iPads
- ❍ Android Tablets
- ❍ Window Tables
- ❍ Chromebooks
- ❍ Netbooks

Answer If 81. Teach in a one to one school: Yes Is Selected

Students are able to take their devices home each night:

- ❍ Yes
- ❍ No

Answer If 81. Teach in a one to one school: Yes Is Selected

The one to one initiative. . .

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree
1. Increases student attendance	❍	❍	❍	❍	❍	❍
2. Requires more policing of devices	❍	❍	❍	❍	❍	❍
3. Helps achieve my curricular goals.	❍	❍	❍	❍	❍	❍
4. Motivates my students to complete their homework.	❍	❍	❍	❍	❍	❍
5. Differentiates materials to meet the needs of my students.	❍	❍	❍	❍	❍	❍
6. Costs exceed its benefits in my classroom.	❍	❍	❍	❍	❍	❍

82. Total amount of in-service training you have received to date on using computer technologies in the classroom:

- ❍ None
- ❍ A full day or less
- ❍ More than a full day but less than one-semester course
- ❍ A one-semester course
- ❍ More than a one-semester course

83. Select your preferred teaching style

- ❍ Largely teacher centered
- ❍ More teacher directed than student-centered
- ❍ Even balance between teacher-direct and student-centered
- ❍ More student-centered than teacher-directed
- ❍ Largely student-centered

84. Would you be willing to participate in a follow-up interview to gain better insights in your classroom?

- ❍ Yes
- ❍ No

85. Would you like to receive the results of this questionnaire?

- ❍ Yes
- ❍ No

If so, Please provide your email, school, or home address:

APPENDIX H

Semi-Structured Interview Questions

1. What type of access do you have to computer technologies both in and out of the classroom? How does it compare to your students?

2. What have been some of your experiences with incorporating technology into your lessons?

3. What types of computer technologies do you think are the most beneficial for your classroom?

4. What do you think aids you in your integration of technology in the classroom?

5. What do you think prevents you from incorporating more computer technologies into your classroom?

6. What do you feel will help you in the future to integrate more technology into your classroom?

7. What do you think your students are doing outside of the class with technology? Do you see it making an impact in the classroom?

8. Do you think you are teaching the 21st century skills within your classroom? Has technology aided in teaching the 21st century skills? (critical thinking, collaboration, communication, creativity, access information, evaluate information, use and manage information, analyze media, create media products, ITC literacy)

9. How much technology training have you received through your education background, professional development, and continuing education courses? Have you had any follow-up support from the instructors, colleagues, or administration?

10. What influences your technology integration into the classroom?

11. How much time both in and out of the classroom are you able to devote to technology and its integration into the classroom? Are you able to collaborate with others?

12. Are you able to find more quality materials through technology? Why or why not?

13. Does technology help you meet curricular goals? If so, how? If not, why?

14. Do you think technology integration engages students more in the classroom? Why or why not?

15. Do you think technology helps meet the needs of every learner in the classroom? Why or why not?

<u>One to One Initiative Questions</u>

1. What impact has the one-to-one initiative had on you, your teaching, and your students?

2. Due to the one-to-one initiative, do you see more use of electronic materials within your classroom such as: online textbooks, electronic ancillary materials, etc.?

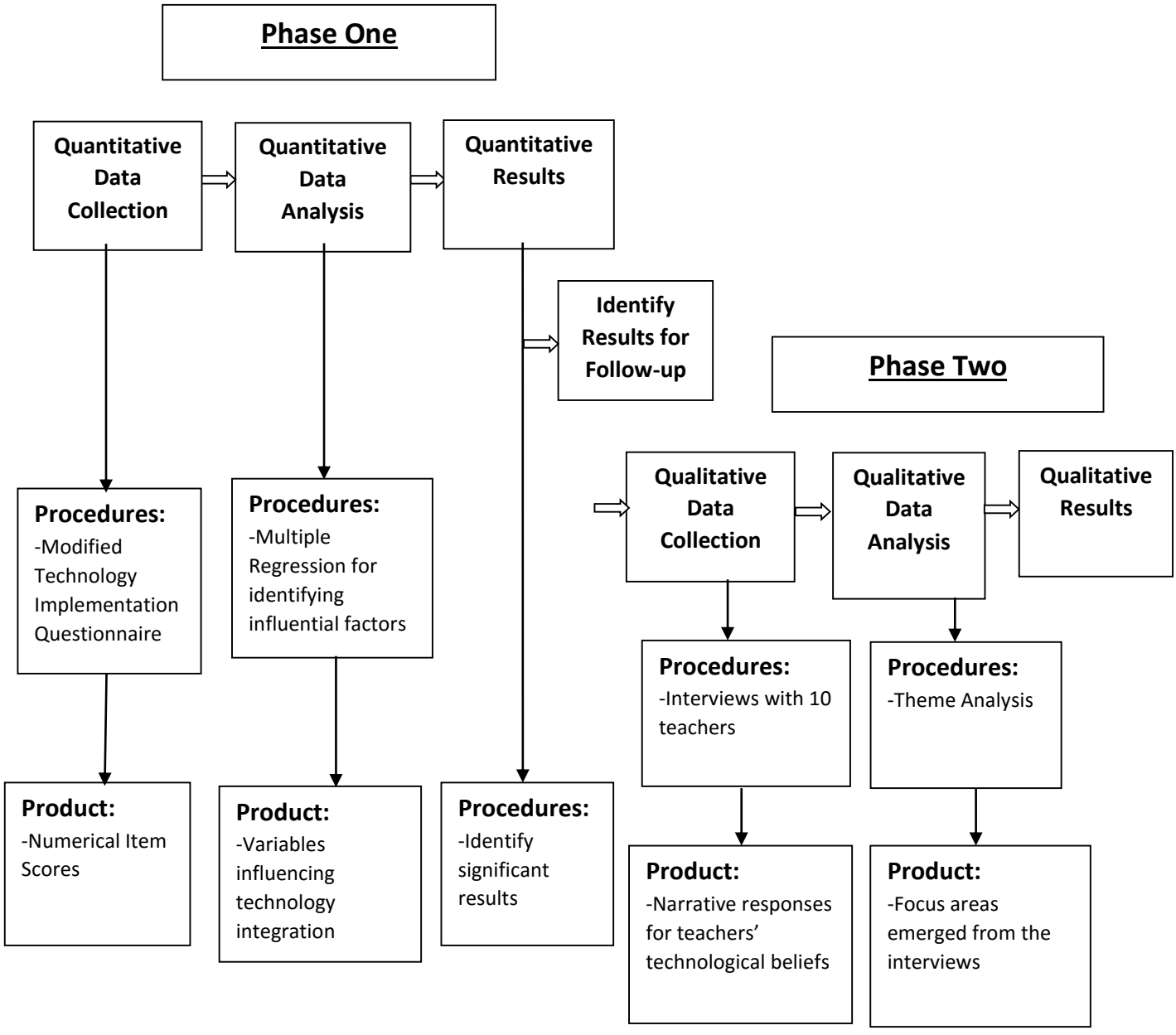
3. Do you think your students us their devices for more personal or academic purposes?

4. Do you think the one-to-one initiative benefits or hinders your teaching in the classroom? How so?

5. How supportive are parents, students, colleagues, and the community with the one-to-one initiative?

APPENDIX I

FLOW OF DESIGN



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