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The purpose of this mixed methods study was to find out the ways in which web enhanced language learning (WELL) technologies are learned that make them more likely to be effectively integrated into the K-12 classroom. Specifically, the study investigated characteristics of WELL teacher training that translate to effective classroom implementation. The theoretical and conceptual frameworks used were Mishra and Koehler's (2006) Technological Pedagogical Content Knowledge (TPACK) and the Teachers of English as a Second Language (TESOL) Technology Standards (2008). Both quantitative and qualitative data were gathered from surveys, interviews, and observations of K-12 world language teachers in North Carolina. This study integrated quantitative and qualitative data in a convergent sequential design. Descriptive statistics and Pearson's Chi Square goodness of fit tests were used to analyze the quantifiable responses on the survey and thematic coding was used for the open responses. Thematic coding and categorization were used to analyze the interview and observation data.

The findings of the study revealed teachers mostly learned to use WELL technologies by themselves, with colleagues, through teacher education activities and through online sources. Additionally, they stated that effective WELL teacher education activities are interactive, allow for practice time and help teachers preemptively troubleshoot potential problems. Teachers applied their WELL teacher education by using TESOL (2008) defined effective practices in classroom. They used WELL

technologies to provide individualized practice, increase student motivation, to engage students into language learning, and provide access to authentic resources. Although teachers learned to use WELL technologies in a variety of ways, they used effective practices to integrate what they had learned into the curriculum. Nonetheless, they still desired increased access to more effective teacher education activities that could aid them in continuing to be knowledgeable practitioners of technology in world language classrooms. This study provided several implications for how teacher educators should conduct training activities, how teacher education programs can support pre-service teachers, and how school districts can support in-service teachers.

WORLD LANGUAGE TEACHER EDUCATION AND WEB-ENHANCED

LANGUAGE LEARNING (WELL): HOW K-12 WORLD LANGUAGE

TEACHERS LEARN TO EFFECTIVELY USE (WELL)

TECHNOLOGIES IN THE CLASSROOM

by

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APPROVAL PAGE

This dissertation written by Ayesha M. Coleman Swinton has been approved by
the following committee of the Faculty of the Graduate School at The University of
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CHAPTER I

INTRODUCTION

Computers will not replace teachers. However, teachers who use computers will replace teachers who don't. Ray Clifford, 1987

Due to growing globalization, there exists a need to expand the capacity and effectiveness of teaching world languages, especially in the United States (McGinn, 2014). The United States has entered a period of increased concern about foreign language education, like the one spurred during World War II in the 1940s (Modern Language Association, 2007). Some point to a "language deficit" in American education. Researchers note that economic pressures, national security, and growing numbers of heritage language speakers in the U.S. are all influencing this rapid globalization of language and increasing the need for second language learning (Allen & Negueruela–Azarola, 2010; McGinn, 2014; Modern Language Association, 2007). At the same time, the North Carolina Department of Public Instruction (NCDPI), in conjunction with the Friday Institute for Educational Innovation, published a digital learning plan in September 2015. The plan detailed the proportion of teachers who report adequate access to technology and sufficient training for technology use. It also reported the percentage of schools with 1:1 programs by district, and the self-assessment completed by districts on their digital content progress. Based on the research findings, the plan's goals included increasing digital access and resources for all students, training for all teachers, and

disseminating effective digital learning practices across all NC schools (Friday Institute, 2015).

The push to increase the scope of language learning in the United States and the initiatives to advance digital learning in North Carolina and across the country, taken together, form a catalyst for a renewed interest in the integration of language learning and technology. As second language learning continues to grow exponentially, world language teachers across the globe have been making strides to integrate instructional technology into their pedagogical practice to improve language acquisition. Students have expressed that the use of instructional technology makes their world language classes more motivating, fun, engaging, and allows them a degree of autonomy (Starks-Yoble & Moeller, 2015). Web enhanced language learning (WELL) technologies, or the technologies used in teaching and learning of languages, has been used as a form of instructional technology by teachers in their pedagogical practice to enhance teaching effectiveness and student achievement (Egbert, Nakamichi, & Paulus, 2002). The term WELL includes audio and visual technology as well as web-based technologies and software, which will be further defined at the end of this chapter. Teachers have learned to use WELL technologies through various teacher education programs, professional organizations, conferences and other resources (Arnold & Ducate, 2015).

Since 1965, organizations such as the International Association for Language Learning Technology (IALLT) and others, have been working to provide resources and leadership for world language teachers and the use of web enhanced language learning (IALLT, 2010). These organizations host world language-based conferences that

continually feature opportunities for teachers to become well-versed in how to present their content in technologically and pedagogically relevant ways. However, the way in which those opportunities are being presented may vary. Current studies affirm that technology must not be taught in isolation; rather teachers of world languages benefit most from practical applications of technology use that are carefully integrated into their varied curricula (ACTFL & CAEP, 2013; Sardegna & Dugartsyrenova, 2014; Williams, Abraham, & Bostelmann, 2014). Nonetheless, there remain gaps in this body of research, particularly relating to how world language teachers learn to use technology effectively (Hong, 2010).

To situate this study, I used Mishra and Koehler's (2006) Technological Pedagogical Content Knowledge (TPACK) as a theoretical framework viewed through the lens of the social constructivist paradigm. In conjunction with TPACK, I used the Teachers of English as a Second Language (TESOL) Technology Standards (2008) as a conceptual framework which defines effectiveness of technology use. With these frameworks, I sought to identify the ways in which K-12 world language instructors learned to use web-enhanced language learning (WELL) technologies in the classroom as well as the types of technologies they used. A goal of this study is to inform the instruction of world language teacher educators and researchers interested in effective methods of teaching K-12 educators to successfully integrate technology into their curricula (Hong, 2010).

Rationale for the Study

According to Egbert et al. (2002), the overall purpose of web-based language instruction is to enhance teaching effectiveness and student achievement. Researchers noted that when appropriately implemented, technologies can support experiential learning and practice in a variety of modes, provide effective feedback to learners, enable pair and group work, promote exploratory and global learning, enhance student achievement, provide access to authentic materials, facilitate greater interaction, individualize instruction, allow independence from a single source of information, and motivate learners (Lee, 2002; Warschauer & Healey, 1998).

Ketsman (2012) discussed multiple advantages of language learning technologies. They help tailor instruction to students with different abilities; enable fast sharing and building of knowledge in an engaging environment; increase student motivation, encourage curiosity and more interesting learning experiences; provide opportunities for "input, output, interactions, task-based and content-rich learning activities" (p. 159), provide access to native speakers; and create opportunities to enhance cultural knowledge, vocabulary building, grammar skills, writing skills, immediate feedback, student autonomy in learning, and realistic exercises. Unique to the field of second language acquisition, WELL provides learners access to communication with native speakers and authentic cultural interactions that might not otherwise be experienced.

Despite the benefits, there are teachers who are impeded from using technology effectively in their classrooms (Egbert et al., 2002). There may also be a reluctance to use technology because of teacher beliefs that technology must be taught using the first

language (L1) rather than the second language (L2) (Burnett, 1998). Other teachers do not find value in using WELL (Goodwin, 2011) and some need increased training or more design strategies (Richards, 2005; Wu & Wang, 2015).

The authors of these studies also found it important to note that some teachers use technology despite the listed barriers. Since technology and its capabilities evolve at such a rapid rate, there is a need to add to the current body of research by gathering data on types of technology that world language teachers use and how they learn to use them in a world language classroom. By determining how world language teachers learn to use effective instructional technology, teacher educators (such as professional development coordinators, instructors, professors, and academic coaches) will be able to align their lessons and presentations with those proven methods, thus potentially improving and informing their teaching effectiveness.

Connecting to Vygotsky's theory of the zone of proximal development, to become fluent in a language one must seek out situations in which one can be immersed and practice communicating in that language frequently with someone who is more fluent (Vygotsky & Cole, 1978). Practicing with native or near-native speakers of the language is ideal. Furthermore, in line with social constructivist perspectives, the hypothesis is that those seeking to learn something new will do so more effectively through social interaction (O'Donnell, 2012). The corollary is that in their attempt to become fluent in technology and to immerse their students in the target language, today's world language teachers seek to learn from experts in the field by immersing themselves in effective technology integration through various types of teacher education opportunities.

There has been some discussion related to how world language teachers can learn to utilize technology in the classroom. Sardegna and Dugartsyrenova (2014) noted that carefully integrated technology-based activities are generally well received by pre-service world language teachers and can enhance in-class learning. Nonetheless, this type of learning does not replace practical and hands-on experiences for teachers. Huhn (2012) has found that although there has been attention on technology-based student outcomes, there is little research on what world language teachers should know and be able to do as educators with technology. Overall, Huhn (2012) concluded there is a lack of research on the connection between effective foreign language teacher education and teacher classroom performance. Yoon, Duncan, Lee, Scarloss, and Shapley (2007) further noted that: "…to substantiate the empirical link between professional development and student achievement, studies should …establish … that there are links among professional development, teacher learning and practice, and student learning" (p. 3).

My interest in this topic stemmed from the importance of WELL and teachers' reliance on professional development and teacher education programs for new skills. I sought to understand how technology-based instruction for in-service teachers in the field of world languages best makes the transition from the acquisition to application. In other words, I investigated how the transition of technology learned in teacher education settings to the actual classroom could be more seamless. I have observed that integrating new technologies and methodologies learned in teacher education activities into current classroom practice can have a positive effect on student learning by engaging them in higher level thinking skills (Starks-Yoble & Moeller, 2015; Wu & Wang, 2015).

Conversely, the integration can be ineffectual as technology can be distracting to students and lead them away from communicative language (Wu & Wang, 2015).

In the busyness of day-to-day lessons, assignments, and assessments; new ideas may be looked upon with a wary eye because teachers are hesitant to dedicate precious time to experiment with ideas that may or may not be beneficial to students and/or compatible with individual teaching styles. Therefore, the purpose of this study was to find out the ways in which WELL is learned that make WELL technologies more likely to be effectively integrated into the classroom. Specifically, I investigated the characteristics of WELL teacher training that translate to effective classroom implementation. Some previously researched strategies included: (1) multiple opportunities to learn the same concept, (2) a support network within the teacher's work environment, (3) professional development which is geared toward the teacher's subject matter or age group, and (4) collaborative professional development (Lieberman & Pointer Mace, 2008).

Purpose

The purpose of this study was to identify ways in which K-12 world language instructors learn to effectively use web-enhanced language learning (WELL) in the classroom as well as ways in which WELL teacher education activities are applied in the classroom. In doing so, I hoped to inform school districts concerning WELL teacher education and the instruction of world language teacher educators.

Research Questions

This study aimed to address the following research questions:

1. In what ways do K-12 world language teachers learn to use WELL technologies in the classroom?

    a. What access do teachers have to WELL teacher education?

    b. What are the characteristics of effective WELL teacher education?

2. In what ways do teachers apply WELL in the classroom?

    a. Why do teachers use WELL in the classroom?

    b. What types of WELL technologies are being used by world language teachers?

    c. How often are WELL technologies being used in the classroom?

Assumptions

As a world languages teacher who frequently uses technology in the classroom and based on my experiences with my pilot study, I have assumptions about the participants and the use of WELL in the classroom. First, as this study was geared towards technology use, I assumed that administering the survey electronically would be accepted by the potential participants who may have already felt comfortable with using technology. Secondly, I assumed that the participating teachers would have learned to use technology in a variety of non-traditional or non-lecture-based formats. Furthermore, I assumed that the ways and reasons teachers use technology in the classroom would vary significantly from one teacher to the next according to their paradigms, lived experiences, grade levels, and other delineating factors. Additionally, I assumed that many teachers who participated in the study would have access to personal teaching and learning

devices, or one to one technology devices, based on the current North Carolina digital learning plan. Finally, I assumed that many participating teachers would not be well-versed on the WELL acronym, the TPACK framework, or the TESOL technology standards. Therefore, any evidence of their content, pedagogical, and technological integration and effective use would be assessed through the survey, interviews, and observations and analyzed through the abovementioned frameworks. After conducting the research study those assumptions were found to be accurate.

Definitions

The following definitions are listed to clarify some of the terms used in the presentation of this study.

Effective: The ways in which the educator successfully applies technology in the routine teaching and practice of language instruction to enhance or improve learning. This term is further defined by the Teachers of English as a Second Language (TESOL) teacher technology goals (TESOL, 2008).

World language: A language learned in addition to one's native language(s). World language is also known as 'second language' and 'foreign language' (ACTFL, 2017).

Teacher education: This term refers to any online, distance, or face-to-face interaction or any training intended to help educators improve their professional knowledge, skill, competence, or effectiveness (Darling-Hammond, Chung Wei, Andree, & Richardson, 2009).

WELL: The consolidation of multiple labels which describe technologies used in the teaching and learning of languages, such as CALL (computer-assisted language learning) or TELL (Technology enhanced language learning), into one general term; WELL (web-enhanced language learning). In the 2011 edition of the textbook *Present and Future Promises of CALL: From Theory and Research to New Directions in Language Teaching*, the authors used Beatty's (2003) definition of CALL, that he described as "any process in which a learner uses a computer and, as a result, improves his or her language" (Arnold & Ducate, 2011, p. 7). Although they chose to use the term CALL because of its dominance, Arnold & Ducate (2011) also acknowledged more labels related to teaching or learning with technology such as network-based language teaching (Warschauer, Shetzer, & Meloni, 2000), web-enhanced language learning (WELL), and technology enhanced language learning (TELL). For the purposes of this dissertation, I used the term WELL (web-enhanced language learning) to encompass these labels.

Technology: Computer-assisted or web-hosted specialized applications used in the teaching of world languages, as well as general audio and video applications, that enhance language instruction (Arnold & Ducate, 2011).

Summary

WELL teacher education is a growing area of research and it is predicted that there will be continued increase in the number of studies on the subject (Torsani, 2016). At the time this dissertation was written, there were three edited volumes dedicated to WELL teacher education, Hubbard and Levy (2006); Kassen, Lavine, Murphy-Judy and

Peters (2007) and the most recent Torsani (2016), as well as numerous journal publications. However, there are still gaps in this body of research; particularly relating to effective technology-based teacher education and its interaction in the world language classroom (Huhn, 2012).

The gaps in the literature surrounding the issues of teacher education and the use of technology by world language teachers form the basis of this study. In conjunction with those gaps, my interest in this topic stemmed from the importance of WELL and teachers' reliance on professional development and teacher education programs for new skills. In other words, I am interested in ways in which the instructional technology teaching methods learned in teacher education settings can be transferred to the actual classroom more seamlessly (Chao, 2015).

In Chapter II I discussed how the methods of teaching world languages have changed in the United States to align with a social constructivist paradigm and a student-centered approach to teaching. I used Mishra and Koehler's (2006) Technological Pedagogical Content Knowledge (TPACK) as a theoretical framework through the lens of the social constructivist paradigm. In conjunction with that, I used the Teachers of English as a Second Language (TESOL) Technology Standards (2008) to explore the ways in which world language teachers learn to use web enhanced language learning (WELL) technologies in the classroom and how the technologies were used. Chapter III focused on my methodology. In that chapter I included a description and a rationale of the mixed methods sequential design that I chose to use in this study. To answer my research questions, I gathered both quantitative and qualitative data from

surveys, interviews, and observations. In Chapter IV I presented the findings. I analyzed

each of the data types separately in Chapter IV and interpreted them together in Chapter

V.

In Chapter V, I discussed the findings by thematic construct in conjunction with

the research questions. I then presented the implications of this research for teachers,

teacher educators and school districts. Finally, I discussed the limitations of this study

and concluded with recommendations for future research.

CHAPTER II

REVIEW OF THE LITERATURE

Background

Methods of teaching world languages in the United States have continued to evolve over time. There have been several movements in the last century, a few of which are highlighted here.

Originating in the 16th century from the teaching of Latin, the grammar-translation method was widely used from the mid-1800s to the mid-1900s to teach language. It required students to translate from their first language (L1) to the language being learned, or the target language (L2). This method was designed for students to be able to read literature from other languages. It started with grammar rules and then led to translations. Reading and writing was the focus and there was no attention given to speaking or listening. The grammar was deductively taught, in other words the rules were presented explicitly. Accuracy was paramount, and everything was taught in the first language. The teacher's role was to verify accuracy and assign translations. The student's role was to reproduce written work (Richards & Rodgers, 2001).

Towards the end of the 1800s the direct method was introduced by Charles Berlitz. This method proposed that second language learning was like first language learning. Thus, the method was focused primarily on oral interaction in the target language with no

translation and very little grammar. This method was based in natural language learning

principles, which meant the class was conducted exclusively in the target language and

 grammar was acquired inductively. Vocabulary was taught through demonstration or

idea association. The teacher had to be a native or near native speaker as the method was

dependent on the teacher's skills, however, not all teachers were proficient enough to be

successful (Richards & Rodgers, 2001).

Still later, the audio-lingual method (ALM) came about during World War II

when the United States was in immediate need of multilingual personnel. This method

was developed within the Army Specialized Training Program. It was broadly used in the

United States and Canada and enjoyed increased popularity from the 1950s to the 1970s.

In this method, repetition and memorization were paramount. L2 learners were drilled on

prior information and errors were not permitted since instructors did not want bad habits

to be formed (Howatt & Smith, 2014). ALM focused on aural and oral training with the

understanding that language rules were not given until after repetitive practice. Teaching

culture was also important. Students' roles were reactive and mechanical. The teacher's

role was to model and direct the pace of learning (Richards & Rodgers, 2001).

Around this time, behaviorist B.F. Skinner (1957) connected language

development to environmental influence (Lemetyinen, 2012). He argued that language

was learned as habit formation. In other words, if a student said something correctly in

the target language, then the teacher would positively reinforce that utterance and the

student would learn to use the language correctly (Skinner, 1957). This theory supported

ALM since it relied on drills and repetition.

In the 1970s and 1980s the Total Physical Response (TPR) method was elevated to the forefront of language teaching. In this method, students were asked to listen to the instructor and physically respond to prompts issued in the target language (Asher, 1979). Asher believed that adult language acquisition paralleled children's first language acquisition. Therefore, instructor speech was the first form of communication and it directed students to respond physically to those commands, akin to a stimulus response situation. Listening was developed first, and it was determined that speech would evolve naturally. The learning environment was meant to be stress free and the learner's role was that of listener and performer. The teacher's role was to model, present, and determine what material to cover (Richards & Rodgers, 2001).

A few years after Skinner's contribution to ALM, Noam Chomsky (1965) rejected the behaviorist theory of language acquisition. He argued that language was not formed by habit; rather it was formed by innovation and creation. Therefore, he proposed the Universal Grammar Theory. This theory stated that people are born with an innate connection to grammar and that with vocabulary from their own language, they form meaningful phrases (Lemetyinen, 2012).

In line with Chomksy, and around the same time as TPR, the natural approach was introduced by Stephen Krashen and Tracy Terrell (1983). In the natural approach, the language classroom was made to be stress free with copious amounts of comprehensible input (Krashen & Terrell, 1983; Richards & Rodgers, 2001). This approach focused on listening and reading first and it was thought that speaking would eventually emerge. One of its principles included a low affective filter or low anxiety

level. It also preferred meaningful communication over form. The learner's role was that of the processor of comprehensible input and the decider of when to speak and what to say. The learner also was tasked with participating in interpersonal interactions. The teacher was the primary source of input, the creator of the relaxed classroom, and the facilitator of multi-varied interesting activities (Richards & Rodgers, 2001).

In more recent years, foreign language teaching has moved to a communicative language teaching approach. Although this is not considered a method, this approach requires frequent interactions in the second language along with a focus on input and the negotiation of meaning (Brandl, 2008; Lee & Van Patten, 2003). The approach uses tasks to organize teaching and encourages learning by doing. Access to rich input and authentic materials are important, as is meaningful, comprehensible, and elaborated input. Cooperative learning and collaboration, as well as corrective feedback are also foundational principles. Through this approach, grammar is taught in context and there is a great deal of respect for affective factors. The learner's role is to be a negotiator and participator, while the teacher's role is to be a facilitator, organizer, researcher, and guide (Brandl, 2008).

The task-based language teaching method is an expansion of the communicative language teaching approach. In this method, students should negotiate meaning by working through authentic, or real-world, tasks that require the use of the target language (Ellis, 2003; González-Lloret & Nielson, 2015; Norris, 2009). Although there are a variety of definitions for tasks, they all are communicative, goal-oriented, and the focus is on meaning and not form. Students learn through interaction and activities are based on

real-life situations. The learner's role is collaborator, monitor, and innovator. The teacher's role is to be the selector of tasks, to prepare learners for tasks and to raise learner consciousness (González-Lloret, 2015). The communicative approach and task-based teaching methods, which are still presently in use, align with a student-centered approach and a social constructivist paradigm.

In a 21st century skills map, the American Council on the Teaching of Foreign Languages (ACTFL) listed fifteen ways that the language classroom has changed in the last 20 plus years (P21.org, 2011). In the past, classrooms were more teacher-centered and all students received the same instruction, interacted with synthetic situations from a textbook, and used technology as a 'cool tool'. However, Goodwin-Jones (2011) noted that "In the mid-1990s a new technology brought considerable interest to language educators: the World Wide Web" (p. 7). Presently, classrooms are more student-centered; there is differentiated instruction, authentic tasks, and technologies are integrated into instruction to enhance student learning (P21.org, 2011). In other words, classrooms have changed from being teacher-centered to being geared toward the needs of the 21st century student who is being taught to develop a 21st century skill set. "Twenty-first century learning can be understood as the learning experiences that help students to foster the sociocultural, cognitive, metacognitive, productive, and technological competencies to function in a 21st century workplace" (Koh, Chai, & Lim, 2016, p.2; see also Silva, 2009; P21.org, 2011). This type of learning includes skills in communication, collaboration, critical thinking and problem solving, creativity, information literacy, media literacy, technology literacy, flexibility and adaptability, initiative and self-direction, social and

cross-cultural interactions, productivity and accountability, and leadership and

responsibility (P21.org, 2011). The research on WELL pointed to the notion that the

current trend of teaching communicative and task-based lessons with WELL integrated

technologies is helping students hone those skills.

Social Constructivism, Pedagogy, and WELL

Input is one of the vital components in effective language instruction (González-

Lloret & Nielsen, 2015; Krashen & Terrell, 1983; Lee & Van Patten, 2003; Norris,

2009). According to Lee and Van Patten (2003), in the field of language teaching, "input

is what the language learners (...) [receive] that is meant to convey a message" (p. 16).

Furthermore, input must be meaning-bearing and comprehensible. That way, students

then modify learned information through interaction & negotiation (Gass, 1997). Krashen

& Terrell (1983) noted however, that comprehensible input alone is not sufficient. The

student must also be 'open' or willing to receive the input, be in a low-anxiety situation,

and have some degree of self-confidence (p.19). Once input has taken place, the next step

is intake. Intake is the language that gets processed into the learner's working memory

which enables output or the production of the language (Lee & Van Patten, 2003).

Researchers have reported that WELL can help increase the amount and variety of input

received by a student in a language course, and further noted "that technology has created

entirely new types of input" (Youngs, Ducate, & Arnold, 2011). Second language

learning research has been going through a paradigm shift "away from a cognitive

orientation to a social orientation, from classroom contexts to naturalistic settings, from

an acquisition metaphor to a participation metaphor" (Wang & Vasquez, 2012, p. 413).

These researchers maintained that these changes align with many attributes of WELL; including participation, collaboration, sharing, and other forms of communication.

While researching the connection that WELL has with 21st century learning, it became apparent that the social constructivist theory also intersected with the 21st century classroom. O'Donnell (2012) noted that although there are a variety of constructivist perspectives, there are some common characteristics. They include the importance of the role of community, authentic tasks, and the use of tools to support learning. Social constructivism, which is one type of constructivism, articulates that the goal of learning is to "construct and reconstruct, meaning, knowledge and connect through discourse communities" (p. 63). In other words, "learners participate in the co-construction of knowledge" (p.63) through social interaction. This approach is heavily application-oriented and seeks to meet the developmental needs of 21st century students (P21.org, 2011). It calls for teachers to keep students learning actively in social contexts and provide experiences that challenge thinking. As such, social constructivism suggests that technology could help language students increase their understanding of the language by engaging them in authentic and collaborative type activities.

Social constructivist theory stems from Piaget's (1973) seminal work on constructivism and was honed by Vygotsky thirteen years later. Piaget believed that people used language to make sense of the world around them. He further argued that they used their prior knowledge to make sense of new knowledge and that one's individual development precedes learning (Amineh & Asl, 2015). On the contrary, Vygotsky and Kozulin (1986) stated that since the mind is naturally social, people learn

from the environment around them before they develop their individuality (Amineh &

Asl, 2015). To this end, Vygotsky and Kozulin's (1986) contribution to constructivism

led to social constructivism.

Social constructivism assumes that reality and knowledge are "constructed

through human activity" (Kim, 2001, as cited in Amineh & Asl, 2015, p. 13). It also

assumes that learning is done socially, not passively and not only within an individual

(McMahon, 1997 as cited in Amineh & Asl, 2015). This means that under the social

constructivism paradigm, "meaningful learning occurs when individuals are engaged in

social activities such as interaction and collaboration" (Amineh & Asl, 2015, p. 13).

In terms of language learning in the social constructivism paradigm, language is

used as a tool to participate in the exchange of knowledge (Vygotsky & Cole, 1978). For

example, people may use language to ask for help and to solve problems (Vygotsky &

Cole, 1978). As a result, language is effectively learned through collaboration and

authentic complex learning environments (Tuncer, 2009). Moreover, the goal of student

engagement, or motivation, is connected to social constructivism. Students, who are

motivated to learn, generally fare better in the world languages classroom.

Schunk (2016) defined motivation as "the process of instigating and sustaining

goal-directed behavior" (p. 393). Language students can be motivated by achievement

and based on those outcomes form attributions which affect future success; in other

words, they set goals and behave in ways that will help them reach their goals (Schunk,

2016). These goals can be intrinsic or extrinsic and their orientations can be learning or

performance-based. Ryan and Deci (2009) argued that students are most motivated if

they have a genuine interest (intrinsic motivation), or highly value the subject or concept being learned (integrated regulation from extrinsic motivation). They also argued that students' performance improves when they have choice, autonomy, and supportive feedback. Theories surrounding motivation intimate that technology enhanced language instruction could help language students improve their acquisition by providing autonomy, choice, and immediate supportive feedback.

In the last decade, language classrooms have been leaning towards a motivational, socially constructed classroom. They have focused more on proficiency and performance-based goals than skills and competencies (learning) based goals (Ellis, 2003; ACTFL, 2012; González-Lloret & Nielson, 2015). As the use of technology in world languages continues to permeate curricula, so do varied methodologies for the teaching of languages. As noted above, the field has moved from such approaches as the audio-lingual method favored by the military in the first half of the 20th century, to communicative language teaching (Lee & Van Patten, 2003). Often connected to communicative language teaching is task-based language learning and teaching. This approach involves tasks that connect to real-life situations and has become an increasingly popular way to make language instruction more relevant for the student. To this end, Ellis (2003) noted six key features of a task: (1) it is a work-plan, (2) it involves a primary focus on meaning, (3) it involves real-world process of language use, (4) it can involve reading, writing, listening, and speaking, (5) it engages cognitive process, and (6) it has a clearly defined communicative outcome. Task-based language teaching can also involve the consistent, integrated use of technology in the classroom. Coupled with the

potential for increasing student motivation and socially constructing knowledge, these features arguably make communicative and technology enhanced task-based learning some of the more effective methods of teaching world language.

The following studies corroborated this claim. Ketsman (2014) noted that this generation of so-called digital natives is accustomed receiving input via technology and concluded that technology enhanced language instruction provides opportunities for effective foreign language instruction. Egbert et al., (2002) confirmed this finding and noted that 70% of teachers used instructional technology because it was effective for students and it engages them. Moore (2006) noted that teachers in high schools with high socio-economic backgrounds showed success with using technology. Overall, the participants of these studies noted that technology enhanced multimedia instruction permitted more innovative and imaginative ideas, better suited classroom materials, encouraged students to be active thinkers, and allowed teachers to provide equal opportunities for diverse learners (Ketsman, 2014). The opportunities for autonomy and supportive feedback support student motivation as defined above. Moreover, the participants in one study thought that technology enhanced teaching was an integral part of learning a foreign language and that it was inseparable from pedagogically sound foreign language instruction (Arnold, 2007). The roles of technology enhanced multimedia instruction as defined by the study were: motivation, as a tool to exercise student creativity, and as a tool to help students take responsibility and ownership for their learning. In response to the question about what pedagogically sound technology enhanced multimedia is, the study found that it: teaches culture, provides hands-on

project-based learning, organizes and shares information, provides practice with instant

feedback, and provides the opportunity for assessment (Arnold, 2007; Ketsman, 2014).

Most of the findings of the research were consistent with social constructivism

and supported theoretical predictions. In their meta-analysis of second language learning

research, and in-line with the studies summarized here and the concept of motivation,

Wang and Vasquez (2012) reported that

> increasing the favorability of learning environments is among one of the most
> reported benefits associated with WELL. This is partly due to a shift away from
> merely reading and retrieving among users, toward more creating and sharing in
> social environments. Studies indicated that favorable learning environments
> included increased comfort and collaboration, increased confidence in speaking
> and writing the second language, and increased receptivity to using WELL
> technologies. (p.413)

The participatory capabilities provided via the web have enabled emerging technologies

to become more common in academia.

Richards (2005), Moore (2006) and Ketsman (2014) observed through the

availability and application of new technologies that pedagogy, curriculum, concepts, and

research are shifting emphasis from language *learning* to language *use*. In line with social

constructivism, some studies found that WELL offers new potential for collaboration and

community-based learning (Sturm, Kennell, McBride, & Kelly, 2009; Warschauer &

Grimes, 2007). Studies showed that benefits of effective technology-based instruction

include the ability to help teachers implement innovative ideas and to help motivate

learners (Carr, Crocco, Eyring, & Gallego, 2011; Ketsman, 2014). WELL also provides

immediate access to native speakers, helps shy students feel more comfortable with participation, and allows students to work at their own pace (Carr, et al., 2011).

In the last decade, many national secondary schools began transitioning to one-to-one technology schools. One-to-one schools are those in which each student has a laptop, tablet, or some such device that is provided to every individual student (Goodwin, 2011). Thus, as technology is increasingly used in educational settings, researchers continue to seek effective designs that incorporate technology into the classroom. Richards (2005) discussed the notion that such designs should move away from simply using technology as an encyclopedic type reference tool and focus on being learner-centered as students learn through technology despite the teacher, not because of the teacher. Richards (2005) concluded, to effectively use instructional technology, teachers should employ new design strategies that promote the applied integration of technology and avoid simply adding on technology without careful planning for integration.

Barriers to WELL Implementation

While there have been numerous studies that champion the use of WELL, there have also been studies that noted some challenges. Goodwin (2011) pointed out that while there have been some successes, such as more engaged learners and better technology skills, some evaluations show little to no academic growth. He concluded that technology alone does not hold the key to success. Moore (2006) also argued that the use of the computer does not constitute a method. In fact, Burnett (1998) found that use of the computer impeded use of the target language. One reason that this finding might be inconsistent with others is that teachers are not well-versed in integrating technology,

pedagogy, and content knowledge. Burnett (1998) suggested that "a great deal of thought needs to go into designing classrooms and computers that add to, rather than detract from, the lessons" (p. 118).

Moore (2006) found that some teachers do not engage with instructional technology. According to Moore's (2006) study, new teachers and teachers in rural settings tended to have the lowest scores surrounding technology use. Consequently, (Egbert et al., 2002) concluded that some teachers were prohibited by lack of time, support, and resources. Additionally, it is possible that others lacked the motivation and social support to successfully integrate it into their classrooms.

Burnett's (1998) study supported the claim that some teachers might lack sufficient social support. Her study found that a French teacher began to speak more English in the classroom to solve technology issues. He also spoke more French outside of the language lab than in it. This meant that he maintained the importance of students' abilities to work with technology took precedence over speaking in the target language. The researcher noted that computer programs shaped the events of the classroom rather than the target language shaping the events. In her conclusion, she suggested that teachers model the use of technology while using the target language, get more training on how to manage technology in the world language classroom, and discuss teacher beliefs and practices before implementing instructional technology. Ketsman's (2014) multiple regression analysis supported Burnett's (1998) conclusion in that the data showed teacher beliefs and teacher use were strongly correlated. The more teachers believed in the use of

technology, the more they tended to engage their students by using technology enhanced instruction.

The Ketsman (2014) findings also showed that teachers used technology to deliver instruction slightly more often than they used it to engage students in the use of technology tools. Arnold (2007) corroborated this finding and found that teachers used it often for online posting. Similarly, Richards (2005) found that the educators were using the internet as a reference source versus integrating it with authentic learning and student-centered activities. Moreover, teachers used technology to teach grammar, vocabulary and interpretive skills more than they used it to teach culture. Moore (2006) confirmed that teachers did not spend much time teaching culture because it wasn't going to be tested and therefore they made little or no use of the technology available to expose students to culture. In the end, the emphasis was on the grammar translation approach and little attention was paid to developing listening and speaking skills. This type of instruction was teacher-centered and did not fit with the social constructivist paradigm as it did not allow for students to construct and reconstruct knowledge in a social environment.

Factors that Influence WELL Implementation

Research confirms factors that influence use of technology in education occur at teacher, school, and district levels. According to Buabeng-Andoh (2012) these factors include self-efficacy when using technology in instruction, gender, teaching experience, teacher workload, institutional policies (including access to technology and training), professional development, infrastructure, technical support, leadership support, and

innovative attitudes. Other factors include the relationship between the teacher and technical support personnel (Tiene & Luff, 2001) as well as access (Chun, 2016).

Prior experiences with technology. Research has also shown that positive experiences and attitudes affect how teachers integrate technology into their teaching. Included in these attitudes is self-efficacy about computer use, in what Buabeng-Andoh (2012) called "computer confidence in competence" (p. 138). The degree of success a teacher encounters may also be determined by their knowledge and experience with technology (Kessler, 2007). However, in my study, it is important to note that being able and willing to use technology is not the same as being a digital native.

In 2001, Mark Prensky coined the term 'digital natives' and defined them as people born after 1980 who have an innate confidence in using digital age technologies (Selwyn, 2009). From there, the idea was promoted that older adults, those people who were born before 1980, generally assumed that all youth knew how to use new technologies (Boyd, 2014). However, Boyd (2014) rejected that notion and argued that this assumption was dangerous because it left many with the misconception that youth did not need to be supported in the use of technology. Selwyn (2009) joined Boyd in eschewing the term digital native as a divisive moniker, and instead, called for a joint study of ways to engage with technology amongst people of all ages. To that end, when looking at a teacher's ability and willingness to use technology for this study, I considered multiple factors and did not assume that birth year was a primary indicator.

Access, Equity and the Digital Divide

Access, equity, and the digital divide are important considerations when discussing factors that influence to WELL implementation. Resta and Laferrière (2015) defined digital equity as:

> [T]he social-justice goal of ensuring that everyone has equal access to technology tools, computers and the Internet, as well as the knowledge and skills to use these resources to enhance their personal lives. (p. 744).

As world language teachers learn to use WELL in the classroom, some must also learn to use it across a new digital divide. In the past, the term referred to classrooms that may or may not have access to computers and internet. Now there is a socioeconomic division that includes concerns about access to technology support, high-speed connections, and reliable individual devices (Day, 2013). Today's web technologies are personal and portable (Chun, 2016) and students who do not have access to devices that cater to these types of technologies are left with inequitable access to learning resources. The federal initiative in the United States of Every Student Succeeds Act (ESSA) seeks to bridge the digital divide amongst marginalized students through its resource equity pillar of opportunity (Cook-Harvey, Darling-Hammond, Lam, Mercer, & Roc, 2016). "ESSA establishes incentives for districts to adopt strategies that fund schools based on student needs and that enrich the curriculum opportunities available to historically underserved students" (p. v). There is also a National Education Technology Plan (NETP) that argues for a systemic change in educational resources to bridge the digital divide (Anders, 2017). Despite these initiatives, the new digital divide, as well as the previous one, still

pose a threat to some teachers' use and student access to WELL in classroom across multiple demographics (Resta & Laferrière, 2015). This is due, in part, to the lack of realization that educational change, in conjunction with technology initiatives, are complex, long-term undertakings which may not be immediate (Resta & Laferrière, 2015).

Internal and External Stressors

Egbert et al. (2002) noted a few studies that indicated that educators are impeded from using WELL in several ways:

> These include time pressures both outside and during class (Lam, 2000; Levy, 1997a; Reed et al., 1995; Smerdon et al., 2000; Strudler, Quinn, McKinney, & Jones, 1995); lack of resources and materials (Loehr,1996; Smerdon et al, 2000); insufficient or inflexible guidelines, standards, and curricula (Langone et al., 1998); lack of support or recognition for integrating computers (Grau 1996; Strudler, McKinney, & Jones, 1999); a clash between new technologies at universities and older ones in schools; lack of leadership (Smerdon et al., 2000); and inadequate training and technical support (Abdal-Haqq, 1995; Lam, 2000; Langone et al., 1998; Levy, 1997a; Smerdon et al., 2000). … Levy (1997a) also suggests that the rate of technological change poses a barrier to technology use. (p. 112)

In addition, the more recent stressor of access, equity and the new digital divide discussed above may impede the use of WELL.

Logistics and reliability of the application or system can also influence technology implementation in language learning (Butler & Sellbom, 2002; Chizmar & Williams, 2001). Not surprisingly, the lack of computer labs with updated hardware, internet connectivity, and a teacher's belief in the effectiveness of learning technologies can pose a barrier to the adoption of WELL (Wiebe & Kabata, 2010). As previously

mentioned above, the connection between the teacher and technical support personnel can also prove to be a barrier (Tiene & Luff, 2001). If teachers do not feel comfortable to ask the technical support personnel for help, they may be less inclined to use technology in the classroom.

WELL Teacher Education

Another factor that influences WELL implementation is teacher education. For this study the term teacher education refers to the ways that teachers are taught or learn how to use WELL in the classroom. WELL teacher education is a growing area of research and it is predicted that there will be a continued increase in the number of studies (Torsani, 2016). Since technology use has become increasingly prevalent, language teachers have called for more and better training in language learning technologies (Arnold & Ducate, 2015). Arnold and Ducate (2015) cited the need for both formal and informal preparation to help teachers learn about the capabilities of technology, followed by coaching during the experimentation or application of the technologies. Alternatives to formal training include teacher mentoring, communities of practice, and autonomous training (Hubbard & Levy, 2006; Torsani, 2016). Kessler (2007) reported that only a small percentage of teachers had any formal training in language learning technology in their teacher education programs. This issue, when combined with a lack of administrative support and preparation time, leaves teachers with little opportunity to develop and integrate new technologies into the curriculum. Issues of teacher education formed the basis of inquiry for this study as it investigated ways in which teachers learn to use instructional technology in the world language classroom.

Torsani (2016) highlighted training effectiveness as one of the themes of WELL teacher education. The questions of how teachers learn to use WELL and how they integrate it or transfer (Hubbard & Levy, 2006) it to the classroom have been broached since the Egbert et al. study in 2002. Since the publication of the study, there has been a constant evolution of technologies and increased one-to-one initiatives in schools across the country, and as such, the questions remain relevant. In a recent study, Chao (2015) expanded the question of training transfer through Beach's (2003) conceptualization of consequential transitions. His study moved past the method of questioning training effectiveness by addressing the integration of specific WELL technologies in specific ways. He sought to determine what deeper changes or "abstract competenc[ies]" (p. 59, Torsani, 2016) WELL training had developed in world language teachers. In other words, the study reported the ways in which teachers synthesized their WELL teacher education across various technologies in a variety of ways.

Torsani (2016) noted that teacher education effectiveness is influenced by a lack of adequate teacher educators, teachers or trainees with low digital competency, the variety of teaching approaches, the rapid change of technology, and teacher motivation (p. 70, 73). Tai (2015) affirmed that effective teacher education is experiential and developed the TPACK-in-Action model for technologies based on five stages:

1. Modelization – the instructor provides a model of linguistic activity with a given technology;

2. Analysis – the instructor analyses the activity through the concepts of TPACK model;

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3. Demonstration – the instructor shows how to carry out the activity through technology;

4. Application – the participants apply what they learned in the realization of a CALL activity;

5. Reflection – the participants reflect on their work. (p. 143)

Darling-Hammond, et al. (2009) and Gulamhussein (2013) determined that certain qualities promote effective and useful training in a general sense and that also align with Tai's (2015) model. Darling-Hammond et al. (2009) stated that "effective professional development is intensive, ongoing, and connected to practice; focuses on the teaching and learning of specific academic content; is connected to other school initiatives; and builds strong working relationships among teachers" (p.5).

Gulamhussein (2013) reported that there are five main principles of effective professional development:

- The duration of professional development must be significant and ongoing to allow time for teachers to learn a new strategy and grapple with the implementation problem.

- There must be support for a teacher during the implementation stage that addresses the specific challenges of changing classroom practice.

- Teachers' initial exposure to a concept should not be passive, but rather should engage teachers through varied approaches so they can participate actively in making sense of a new practice.
- Modeling has been found to be a highly effective way to introduce a new concept and help teachers understand a new practice.

- The content presented to teachers shouldn't be generic, but instead grounded in the teacher's discipline (for middle school and high school teachers) or grade-level (for elementary school teachers). (p. 3)

The above listed qualities for effective and useful teacher education directly align with the principles of the theoretical framework for this study.

Using TPACK as a Theoretical Framework

The notion of technological pedagogical content knowledge (TPACK) is used as a theoretical framework for this research study because it allowed me to inquire about how teachers learn to use instructional technology while conceptualizing and integrating its complex relationship to both content and pedagogy (Mishra & Koehler, 2006). Unique to the field of world languages, interpersonal communication is a key component of learning a second language. It is one of the primary ways in which language is taught, and input from a myriad of sources is vital (González-Lloret & Nielsen, 2015; Krashen & Terrell, 1983; Lee & Van Patten, 2003; Norris, 2009). Sound pedagogical practice based on researched teaching methodology combined with relevant WELL technologies and appropriate content can produce an effective learning environment for language students (TESOL, 2008). TPACK offers a framework for an arguably more effective learning environment that rejects "teaching technology in isolation and supports integrated and design-based approaches" (Mishra & Koehler, 2006, p. 1045).

What is TPACK?

The technology, pedagogy, and content knowledge (TPACK) framework was created by Mishra and Koehler (2006) to address teacher knowledge for technology integration (Koehler & Mishra, 2009). It was expanded from Shulman's (1987) influential work, "Knowledge and Teaching: Foundations of the New Reform", about pedagogical content knowledge (PCK). He argued that the conversations surrounding

education at that time did not "say what teachers should know, do, understand, or profess" (p. 4). He concluded that PCK lay at the

> intersection of content and pedagogy, in the capacity of a teacher to transform the content knowledge he or she possesses into forms that are pedagogically powerful and yet adaptive to the variations in ability and background presented by the students (p. 15).

PCK set the tone that different types of teacher knowledge should not be presented in insolation; rather, they should be integrated in such a way that makes instruction more powerful. From this foundation and their observations from the challenges of teaching with technology, Mishra and Koehler (2006) posited TPACK.

The authors noted the question of *what* teachers needed to know in order integrate technology in the classroom had been given quite a bit of attention over the years, but they argued that researchers should be focusing on *how* the technology was used - in other words, how to integrate technology use into teachers' instruction. The issue was that there was a lack of a theoretical framework for "developing or understanding [the] process of integration" (Mishra & Koehler, 2006, p.1018). They proposed such a framework that accounted for complexities of relationships that are contextually bound. The framework assumed that teachers must have access to a variety of knowledge systems to be effective. They noted that although teaching, heretofore, focused on content knowledge, there had been a shift towards general pedagogical knowledge in teacher education.

After the presentation of TPACK, additions were made to the types of knowledge teachers might hone throughout their careers from various content area backgrounds. For example, in an article with a mathematics focus, Ball, Thames and Phelps (2008) argued that PCK was not defined enough to be clearly distinguishable from other forms of teacher knowledge. They therefore suggested the subdomains of 'knowledge of content and students' and 'knowledge of content and teaching' to further delineate teacher knowledge. In terms of content knowledge, they proposed the subdomains of common content knowledge (CCK), horizon content knowledge (HCK), and specialized content knowledge (SCK). Van Olphen (2008) further defined content knowledge (CK) specified for world language teachers as encompassing "all the necessary elements that help language learners to communicate both verbally and non-verbally across linguistic and cultural borders" (p. 4). She also defined PCK as "what teachers know about teaching the target language to empower students to communicate across linguistic and cultural borders" (p.5). This content-specific foray into what teachers should know gave teacher educators the wherewithal to hone their instructional techniques by content area, rather than offer instruction in a general sense.

TPACK is divided into three components; content, pedagogy and technology. The components are then interconnected to form pedagogical content knowledge (PCK), technological pedagogical knowledge (TPK), technological content knowledge (TCK), and technological pedagogical content knowledge (TPACK). Content knowledge refers to the teacher's knowledge of the subject matter. For example, an Arabic teacher's knowledge of the Arabic language and culture would be considered content knowledge.

Pedagogical knowledge refers to a teacher's knowledge of methods of teaching and learning. Shulman (1987) introduced the notion of pedagogical content knowledge (PCK) which combined the two types of knowledge instead of addressing them separately. PCK includes knowing how to align teaching approaches with content and student ways of thinking. Shulman (1987) contended that teacher education programs would no longer need to focus exclusively on one or the other at separate intervals; rather they could merge the two to help teachers best attend to how students learned and thought about their specific content. For example, an Arabic teacher could engage in content-focused courses that highlight best practices for teaching Arabic rather than taking courses about the language separately from courses that focused on how students learn.

Mishra and Koehler (2006) represented the idea of PCK by overlapping two separate circles, one representing pedagogical knowledge and the other representing content knowledge, in a structure resembling a Venn diagram. The PCK was represented at the intersection of those two knowledge systems. The authors then introduced an additional circle, technology knowledge. Technology knowledge (TK) included what the authors termed as standard technologies including books and blackboards, as well as the internet and various computer software and hardware programs and devices. Like the separation of content knowledge and pedagogical knowledge of the past, the authors noted a separation of technology knowledge from the abovementioned bodies of knowledge. The lack of relationship between the three caused a weakening in teacher practice, in that they were not intentionally thinking through how each body of knowledge could be intertwined to make student learning more effective. Their

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framework proposed that each of the three separate bodies be integrated together at different points to form more collaborative relationships.

In addition to the PCK combination proposed by Shulman (1987), Mishra and Koehler (2006) introduced technological content knowledge (TCK), technological pedagogical knowledge (TPK) and all three bodies as technological pedagogical content knowledge (TPACK). They believed their "model of technology integration in teaching and learning argues that developing good content requires a thoughtful interweaving of all three key sources of knowledge: technology, pedagogy, and content" (Mishra & Koehler, 2006, p. 1029).

Technological content knowledge requires teachers to know how their content can be altered by the application of technology. Technological pedagogical knowledge asks teachers to know how technology interacts with teaching practices including lesson presentation, assessments, class records, classroom management, and more. Mishra and Koehler (2006) defined technological pedagogical content knowledge (TPACK) as

> the basis of good teaching with technology and requires an understanding of the representation of concepts using technologies: pedagogical techniques that use technologies in constructive ways to teach content; knowledge of what makes concepts difficult or easy to learn and how technology can help redress some of the problems that students face; knowledge of students' prior knowledge and theories of epistemology; and knowledge of how technologies can be used to build on existing knowledge and to develop new epistemologies or strengthen old ones (p.1029)

Being able to incorporate all three together requires a nuanced understanding of each factor. Mishra and Koehler (2006) recognized that the combination might raise

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complex questions about each individual factor that can be challenging to address. Especially with the ever-changing technology made available to students, teachers must constantly adapt their understanding of technology, pedagogy, and content. Consequently, the TPACK framework approached professional development and teacher education through learning technology by design. In other words, they advocated for having content specific technology-based workshops instead of content-neutral workshops that prevent teachers from making meaningful and individualized connections with the two factors. Having more content-specific focused workshops would allow teachers to apply their new technology knowledge rather than just absorb information. They also championed the idea that "the design of educational technology represented an authentic context for teachers to learn about educational technology" (Mishra & Koehler, 2006, p.1034). In other words, teachers learn by doing rather than through the traditional lecture format.

TPACK and Social Constructivism

In selecting TPACK to be used as a theoretical framework for this study, its connection to social constructivism must be considered. The integrated nature of TPACK, and its rejection of learning in isolation, align with Vygotsky and Kozulin's (1986) belief that meaningful learning is constructed socially. "Knowledge is constructed by learners through an active, mental process of development; learners are the builders and creators of meaning and knowledge" (Gray, 1997 p.274). In this case, teachers are building a knowledge base that centers their individual technological, pedagogical and

content skills. Because of such interaction and integration, they are creating new knowledge and meaning that takes on the synthesized form of TPACK.

Inherent in the concept of TPACK, is a learner-centered, constructivist approach that "support[s] individualization of learning and autonomy" (Tuncer, 2009, p. 68). As a result, TPACK has been considered a way to conduct teacher education for WELL (Koh et al., 2016; Matherson, Wilson, & Wright, 2014; Ndongfack, 2015). Teacher educators have used TPACK to present an integrated model for teachers of how to teach using WELL technologies. Typically, teacher educators instruct groups of pre-service or in-service teachers, so to take this connection one step further, one could assume that teachers who are learning to use their TPACK in an integrated manner are doing so with other teachers. Therefore, they are not creating meaning surrounding the use of technology in the classroom on their own; rather they are doing so socially.

Furthermore, they are doing it in their zone of proximal development (ZPD). The ZPD is defined as "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance, or in collaboration with more capable peers" (Vygotsky & Cole, 1978, p. 86). The TPACK framework allows teachers to interact with their knowledge base, and with others in a way that encourages "movement from the current intellectual level to a higher level which more closely approximates the learner's potential (Amineh & Asl, 2015, p.14). In other words, using the TPACK framework to present the use of WELL in a group setting offers teachers more opportunities for growth than doing so in an isolated manner.

In addition, studies found that language teachers from constructivist backgrounds are more willing to work with technology and are more likely to find their efforts useful and effective (Kessler, 2007; Moore, 2006). Spodark (2005) recommended that pedagogical practices afforded by constructivism be combined with the benefits of technology to become what she called a "technoconstructivist approach [which is] a blending of the pedagogical practices advocated by social constructivism with the benefits of educational technology [that] whenever possible can satisfy both the impetus for a practical application of the tools of technology and the desire to preserve classroom social interaction" (p. 429). The definition of the technoconstructivist approach succinctly articulates how TPACK aligns with social constructivism.

Conceptual Framework

My conceptual framework (see Figure 1) for this study connected ways of learning to implement WELL technologies to effective technology-based classroom practice. It then went on to connect how those ways of learning affect student outcomes. The entire conceptual framework is based on the social constructivist assumption that knowledge is created socially and in tandem with others. Therefore, through a two-way arrow, the map attempted to illustrate how student outcomes are reflective, in that they in turn determine the effectiveness of classroom practice characteristics. In other words, the teacher's classroom practices are based on student response and vice versa. Furthermore, the meanings are constructed socially in the classroom.

I used the Teachers of English as a Second Language (TESOL) Technology Standards Framework (2008) to identify the goals of effective technology-based

classroom practices and their corresponding expected student outcomes in world language classrooms. These standards were selected because they specifically integrate world language instruction and technology. The TESOL technology framework was created to "guide teachers to more effective practice (p. 9)." It was intended to "help educators realize the potential benefits of technology, and prompt educators to learn to use technology in their teaching (p.9)." The standards were also designed to differentiate between simplistic technology use and quality technology use which includes critical thinking development, student autonomy, and communicative interactions. Additionally, the standards were based on three general research themes. The first theme addressed the benefits of technology in language teaching and learning (Grgurović & Chapelle, 2007). The second theme noted that technology should be integrated into pedagogy for second language acquisition as well as to develop electronic literacy skills (Lee, 2002; Levy & Stockwell, 2006; Warschauer et al., 2000). The final theme articulated that instructional technology is "not being used to its full potential (p.16)" and that inadequate WELL teacher education is a primary reason (Hubbard & Levy, 2006; Kessler, 2006; Oxford, 2007). This conceptual framework aligns with the TPACK theoretical framework in that they both addressed the notion of improving practice by integrating technology and pedagogical practice through teacher education.

Figure 1. Research Study Conceptual Framework

Way of Learning?

Way of Learning?

Way of Learning?

Way of Learning?

WELL Teacher Education: Ways of Learning to use WELL Technologies

Goal 1: Language teachers acquire & maintain foundational technology-based knowledge & skills for professional purposes.

Goal 2: Language teachers integrate pedagogical knowledge & skills with technology to enhance teaching and learning.

Effective Technology Based Classroom Practices for World Language Teachers

Goal 3: Language teachers apply technology in record-keeping, feedback, and assessment.

Goal 4: Language teachers use technology to improve communication, collaboration & efficiency.

Goal 1: Language learners demonstrate foundational knowledge and skills in technology for a multilingual world.

Goal 2: Language learners use technology in socially and culturally appropriate, legal, and ethical ways.

Expected Student Outcomes

Goal 3: Language learners effectively use and critically evaluate technology-based tools as aids in the development of their language learning competence as part of formal instruction and for further learning.

Adapted from the TESOL Technology Standards Framework goals (2008).

Using the TESOL Standards

The Teaching of English to Speakers of Other Languages organization created a set of standards surrounding the effective use of technology in language classrooms that I used to analyze data collected in this study. In a journal review of the TESOL technology standards (2008), the author noted TESOL's attempts to offer clear guidelines on how to successfully implement technology to promote language teaching and learning (Gonzalez, 2012). Gonzalez (2012) affirmed that the goal was "to give this target audience a clear idea of what technology standards are, their importance in CALL (Computer Assisted Language Learning), and how they can be put into practice in different contexts" (p.31).

My framework also pointed to a belief in the benefits of web-enhanced language learning technology in teaching and learning. While research indicated that technology itself is neither effective nor ineffective in the classroom, the pedagogy that stands behind the use of technology and the way teachers can make use of it are what makes technology effective (Armstrong & Yetter-Vassot, 1994; Zhao & Frank, 2003).

Teacher Education and Ways of Learning to use WELL Technologies

The first portion of the conceptual framework focuses on teacher education and how teachers learn to use WELL technologies in the classroom. Researchers like Darling-Hammond et al. (2009) and Gulamhussein (2013) determined that certain qualities promote effective and useful professional development in a general sense. In this inquiry, I plan to focus on what specific characteristics world language teachers find useful in technology-based teacher training for world language teachers.

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There have been past discussions related to how world language teachers can learn to use WELL technologies in in the classroom. However, there is still a need for more research connecting related to effective technology-based professional development to its interaction in the world language classroom. This portion of the concept map is represented by the arrow between the 'WELL Teacher Education' circle and the 'Effective Technology-Based Classroom Practices for World Language Teachers' circle.

Technology-Based Practices

As technology is increasingly used in educational settings, researchers continue to seek out effective designs that incorporate technology into the classroom. The TESOL technology standards (2008) have addressed goals that help world language teachers determine the best practices to use in their classrooms. For effective technology-based classroom practices TESOL identified the following main four goals:

> Goal 1: Language teachers acquire and maintain foundational knowledge and skills for professional purposes.
>
> Goal 2: Language teachers integrate pedagogical knowledge and skills with technology to enhance teaching and learning.
>
> Goal 3: Language teachers apply technology in record-keeping, feedback, and assessment.
>
> Goal 4: Language teachers use technology to improve communication, collaboration and efficiency (TESOL, 2008).

These goals, specifically goals one and two, were used to help structure the analysis of data collected for this study, as well as to set a standard of what 'effective' practices are for the purposes of this study. In examining teachers' perceptions on technology use and

technology-based teacher education I aimed to identify ways in which teachers learn to effectively use technology in the classroom that consequently lead to expected student outcomes.

Connections and Student Outcomes

In Figure 1 there is a reciprocal connection between classroom practices and student outcomes. This framework illustrates that when teachers are impeded from implementing effective technology-based classroom practices, expected student outcomes may not be reached. Teaching practices not only affect student outcomes, student outcomes inform what are considered effective teaching practices. Ketsman (2012) reported that teachers' expectations of students strongly correlate with student achievement. Similarly, teachers' attitudes and expectations about language learning technology strongly influence its effectiveness in learning. I believe most teachers would agree that, the final goal of any new strategy, teaching tool, or lesson is the same - to enhance student learning and achievement.

To this end, as the use of WELL increases in the classroom, the need for it to be effectively used by students to enhance their own achievement is paramount. Youngs et al. (2011) noted that "[a]s language teachers, we may not consider it 'our job' to teach our students how to use computers, but even "digital natives" (Prensky, 2001) of the Net Generation need teachers to help direct their time and energy toward the efficient and effective use of CALL tools." (p. 45). Although they are accustomed to web-based technologies, students need support with transforming those everyday applications into useful WELL tools (Hubbard & Levy, 2006a; Youngs et al., 2011)

To connect effective technology-based classroom practices to student outcomes, I used the TESOL goals for student outcomes to articulate what students should be able to do with technology after successful effective WELL implementation.

Goal 1: Language learners demonstrate foundational knowledge and skills in technology for a multilingual world.

Goal 2: Language learners used technology in socially and culturally appropriate, legal, and ethical ways.

Goal 3: Language learners effectively use and critically evaluate technology-based tools as aids in the development of their language learning competence as part of formal instruction and for further learning. (TESOL, 2008)

While this study did not focus on the portion of the concept map concerning student outcomes, I believed that it was helpful to illustrate how student outcomes are related to this study. This framework guided this study by helping me determine the ways in which teachers learn to teach instructional technology that ensure effective technology-based classroom practices. As I assumed that student outcomes are the goal of effective teaching, I thought it important to show how such effective practices connect in a reciprocal manner to student outcomes.

TPACK and TESOL

The TESOL (2008) standards work in tandem with the abovementioned purpose of TPACK and encourages "language teachers [to] integrate pedagogical knowledge and skills with technology to enhance teaching and learning" (p.32). The TPACK framework allows the researchers to "make predictions and inferences about contexts under which good teaching will occur" (Mishra & Koehler, 2006, p.1045). It aligns with the TESOL

standards that define effective technology-based practices for world language teachers in that it requires a strong integration of pedagogical and technology-based knowledge to support students' development of the content (TESOL, 2008). TPACK acts as the path that teachers can take to arrive to the end goal of the TESOL standards. In other words, teacher educators can use the method of technological, pedagogical and content knowledge integration to prepare pre-service and in-service teachers to meet the TESOL technology standards.

Teacher Education, TPACK, WELL and Social Constructivism

In this section, I connected teacher education, TPACK, and WELL from a social constructivist viewpoint in terms of my study. I began with an explanation of teacher education and the integration of content and context specific technologies into coursework. I then explained how TPACK and WELL both align with the social constructivist paradigm and how they connect to teacher education.

In the decade since the TPACK theoretical framework was produced by Mishra and Koehler (2006), technology has continued to evolve by leaps and bounds. However, the need for adequate TPACK has not. In fact, software applications have increasingly grown to be content-specific. For example, web applications such as spanishlistening.org, ISideWith.Com (Beeson, Journell, & Ayers, 2014) and Tinker Plots (Wilson, Lee, & Hollebrands, 2011) are geared towards Spanish Language Learning, social studies and mathematics respectively.

One of the themes that resonates throughout the discussion around TPACK is the belief that technological knowledge by itself does not equate to effective teaching

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(Beeson et al., 2014; Mishra & Koehler, 2006; Williams et al., 2014). More specifically, Beeson et al. (2014) considered teachers more effective when they "[use] technology as a tool for exploration and creation" (p. 122). Moreover, in efforts to keep up with the ever-changing nature of technology, Williams et al. (2014) suggested that technology not be taught as an afterthought in methods classes. Mishra and Koehler (2006) argued that technology instruction not be decontextualized, and Beeson et al. (2014) postulated that more focus needs to be on developing teachers' TPACK in specific content areas.

As noted in the studies related to TPACK, teachers should have more content-specific technology integration training in the classroom (DelliCarpini, 2012; Ertmer & Ottenbreit-Leftwich, 2010; Kessler, 2007). Researchers noted a need for technology to be integrated into pedagogy for teaching second languages (DelliCarpini, 2012) and for world language teachers to have less general education training, and more focus on application and language proficiency thus advocating for more content-specific instruction (Cooper, Hall, Hawkins, LaFleur, Rossbacher, & Tesser, 2004). Although teachers have used technology in the classroom, Ertmer & Ottenbreit-Leftwich (2010) contended that there had not been high levels of effective use and that most technology had been used to promote low-level skills rather than content. While pre-service teachers might be more likely to be digital natives, many in-service teachers may not be considered digital natives, be which can lead to lack of use (Ertmer & Ottenbreit-Leftwich, 2010). However, being considered a 'digital native' does not necessarily guarantee effective interaction with technology (Boyd, 2014; Selwyn, 2009). Teachers' struggles with classroom management, self-efficacy of content standards along with

addressing them with technology and differentiation are some of the factors impeding

them from effective use of instructional technology in the world language classroom.

However, studies have shown that after training, world language teachers have

experienced growth in all the areas mentioned above. Hands-on practice with technology

during teacher education activities increases self-efficacy and confidence (DelliCarpini,

2012). In fact, Kessler (2007) suggested that WELL be integrated into a variety of

pedagogical classes, thus allowing it to be introduced in a contextualized and relevant

manner" (p. 184). Ertmer & Ottenbreit-Leftwich (2010) argued that "when introducing

in-service teachers to specific technology tools, it is important that professional

development programs also include information about how they can use these tools in

very specific ways, within specific content domains, to increase student content learning

outcomes" (p. 272).

The use of WELL technologies in the classroom align with a social constructivist

approach. They allow the students to collaborate or create meaningful connections to

language with others. They also promote students' communicative skills and foster

autonomy (Tuncer, 2009). The TPACK framework, in conjunction with teacher

education, also aligns with a social constructivist approach in the same manner. The

studies listed above clearly point to the benefit of content specific teacher education in

instructional technology and this study seeks to identify the types of training that support

effective classroom technology integration.

As previously mentioned, recent studies have shown that the TPACK model can

be used as a method of professional development or teacher education due to its

integration of technological, pedagogical, and content knowledge (Koh et al., 2016; Matherson et al., 2014; Ndongfack, 2015). Outcomes include increased teacher confidence, increased teacher ownership, and time for teachers to feel more comfortable (Koh et al., 2016). By allowing teachers to make meaning of their technological, pedagogical, and content knowledge in an integrated fashion and with other teachers, the TPACK model promotes the idea that knowledge and language are learned through collaboration (Tuncer, 2009; Vygotsky & Kozulin, 1986). The corollary is that, in the same way that students learn to use language through social interaction and connections, teachers learn to use their TPACK through social interaction and meaningful connections.

In accordance with Vygotsky's belief that a student's mind moves from communicative social thought to individual thought (Amineh & Asl, 2015), autonomy is the end goal for both students and teachers. That is, after one makes meaning of knowledge in a social setting, then they can branch out and use what they have learned on their own. Amineh and Asl (2015), suggested "that with the importance given to collaboration, knowledge, and creativity through both social constructivism and constructivism; the learners can start learning in pair work, group work, and teamwork, and later make their own contributions to the world of knowledge" (p. 15). The hypothesis is that, in this way, language students who learn in a classroom based on a social constructivist design can be taught to use their second language outside of the classroom meaningfully. Teacher education can operate in a similar manner based on the same social constructivist design. Teachers who have been taught to use technology in a

way that is reminiscent of TPACK, meaning it is intertwined with pedagogy and content, can also effectively use WELL in the classroom.

Summary

This study aimed to add to the small body of literature that connects WELL teacher education to effective implementation in the classroom. After a review of the literature, what I found to be missing in the research is an understanding of the types of teacher education that world language teachers need to effectively integrate technology into their everyday teaching (Hong, 2010). While other studies have begun to investigate this phenomenon, their limitations include a relatively small number of participants (Hong, 2010; Tai, 2015) and a qualitative centric research approach which relies only on descriptive analysis and does not include factor analysis (Hong, 2010). To address these limitations, I conducted a mixed methods study that analyzed the survey results of 113 in-service world language teachers from North Carolina using both qualitative and quantitative data and analytic methodology.

Some of the strengths of similar studies included the use of TPACK as a framework in conjunction with language learning technologies. Adding to the body of research in which TPACK and WELL are integrated could possibly lead to a robust content specific theory such as the spherical model proposed by Hong (2010) that supports the ways in which L2 teachers integrate WELL into the classroom. The end goal, and the most important in my opinion, is to foster student learning and academic growth. By taking steps to make sure that world language teachers are well equipped to

instruct 21st century students using current technologies; we are setting up our students to

be both linguistically and technologically diverse contributors to society.

CHAPTER III

METHODOLOGY

Introduction

The purpose of this study was to identify ways in which K-12 world language instructors learn to effectively use web-enhanced language learning (WELL) in the classroom as well as ways in which WELL training is applied in the classroom. I explored the following research questions:

1. In what ways do K-12 world language teachers learn to use WELL technologies in the classroom?

    a. What access do teachers have to WELL teacher education?

    b. What are the characteristics of effective WELL teacher education?

2. In what ways do teachers apply WELL in the classroom?

    a. Why do teachers use WELL in the classroom?

    b. What types of WELL technologies are being used by world language teachers?

    c. How often are WELL technologies being used in the classroom?

Rationale for Mixed Methods Design

Pragmatism and transformative are two world views primarily associated with mixed methods research (Creswell & Plano Clark, 2011; Tashakkori & Teddlie, 1998; Teddlie & Tashakkori, 2009). I employed a mixed methods design for my study from a pragmatic paradigm (Creswell & Plano Clark, 2011; Tashakkori & Teddlie, 1998;

Teddlie & Tashakkori, 2009). Pragmatic researchers recognize that there are multiple ways of interpreting the world and have an "inclusive ontological realism where virtually everything a qualitative or quantitative researcher deems to be real can be considered" (Onwuegbuzie & Johnson, 2006, p. 54). In this way I believed that both quantitative and qualitative methods could offer valuable insight about my research questions.

Although mixed methods share similar benefits to quantitative and qualitative studies, it is important to note that this methodology is not a simple combination of the two methods, rather it is an integration of the methods that can be complex and user specific (Johnson & Onwuegbuzie, 2004). The benefits of mixed methods include data triangulation; the opportunity for contextual connections to be made; in-depth connections to individual experiences; the ability to study the relationship between variables in detail; and generalizability.

In this study, I prioritized the quantitative strand in the analysis and reporting. While previous research on WELL teacher education has used surveys, interviews, observations and teacher narratives (Torsani, 2016), these studies have been primarily case studies which present challenges for generalization (Hong, 2010; Torsani, 2016). My research questions were descriptive and called for the analysis of data collected from participants with a wide range of backgrounds and experiences. The use of the quantitative survey instrument allowed me to address the limitation of generalizability by reaching a larger number of teacher participants to gather their input. Due to time constraints and travel costs, more participants were involved through the survey than through the interviews and observations in this study.

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Using a sequential mixed methods design, I administered the survey first and then followed up with interviews and observations to verify and explain my initial survey results (Creswell & Plano Clark, 2011). According to Tashakkori and Teddlie (2006), in a sequential design, the strands occur in chronological order with the second strand "emerg[ing] from the outcomes and inferences of a previous strand" (p. 17) and "the inferences based on the results of both strands of the study" (p.18). A strength of this merged design type is that it is efficient and intuitive for researchers new to mixed methods, like I am (Creswell & Plano Clark, 2011), and it allows the researcher to keep both strands separate (Tashakkori & Teddlie, 2006). Having multiple research phases also allowed me to understand and analyze my research objective with more depth (Creswell & Plano Clark, 2011). Furthermore, using both quantitative and qualitative data to address the research questions helped me corroborate my survey, interview, and observation data.

Mixed methods research also has benefits that are unique to its own design. It allows for different yet complementary data to be collected and analyzed. The qualitative data can be compared to the quantitative data and provide stronger evidence for a conclusion. This benefit also coincides with my justification for using mixed-method research. My rationales for mixing quantitative and qualitative techniques included instrument fidelity and significance enhancement (Onwuegbuzie & Leech, 2006). In research focusing on WELL technology use in the classroom and WELL teacher training, quantitative studies can be too sterile, lacking the context needed to understand the nuances of the phenomena. On the other hand, qualitative studies can limit the researcher

to descriptive analysis only, lacking the systematic investigation of relationships between factors (Hong, 2010).

Using mixed methods for my research not only reduced the threats to the validity of my survey instrument, it also maximized my interpretation of the data (Onwuegbuzie & Leech, 2006). Furthermore, like the mixed methods studies highlighted in Chapter II (Ketsman, 2014; Koh et al., 2016; Tai, 2015), since the data in this study was be both parametric and non-parametric, the power of my data analysis will be increased. Instead of only being able to use descriptive statistics for non-parametric measures, I used stronger statistical analysis procedures such as chi square tests to interpret my data and factor analysis to validate my instrument.

As previously mentioned above, the challenges of using mixed methods might be like those present in each of the qualitative and quantitative methods. For example, self-reported responses might be inaccurate and small participant numbers might not allow for generalizability of construct validation. More unique to this method, however, is that the time required to collect and analyze the data can be even more extensive than qualitative methods. The researcher in mixed methods research needs to play multiple roles and needs to understand multiple methods to appropriately mix the quantitative and qualitative methods which can increase the time spent planning and conducting the study.

The challenges of using sequential design also needed to be considered for this study. They included the amount of time needed to implement both phases, particularly, the time needed to determine how to select participants for the qualitative phase and the

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time required to secure Institutional Review Board (IRB) approval since the researcher cannot specify the participants ahead of time. (Creswell & Plano Clark, 2011).

Mixed Methods Research Study Design

A mixed methods design was employed to address the research questions. Mixed method designs can consist of a variety of typologies and/or prototypes. They can be exploratory, explanatory (Creswell & Plano Clark, 2011), concurrent, sequential (Onwuegbuzie & Leech, 2006), embedded, and/or transformative (Creswell & Plano Clark, 2011). The researcher must make sure the research question requires mixed methods and be flexible about choosing from a pre-established typology or creating one that bests fits the study. S/he must also be mindful of the data collection and sampling processes and how validity and reliability fit specifically into mixed methods research (Teddlie & Tashakkori, 2009). Although mixed methods research does inherently combine two methods into a study, it is important to note that it can do so at varying levels (i.e., QUAN+qual, qual + QUAN, qual→QUAN, etc.).

This mixed methods study integrated quantitative and qualitative data in a sequential design (see Figure 2) as suggested by Tashakkori and Teddlie (1998) and Teddlie and Tashakkori (2009). In this design the quantitative data is collected first and then the qualitative data is collected. The analysis of the quantitative data collected during the first phase of this study allowed me to identify participants for the second qualitative phase of the study. During the quantitative phase, survey data was collected from 113 participants. Demographic information and responses to certain survey

questions were used to obtain a maximum variation sample of teacher participants to be

invited for follow-up interviews and observations.

Figure 2. Sequential Design
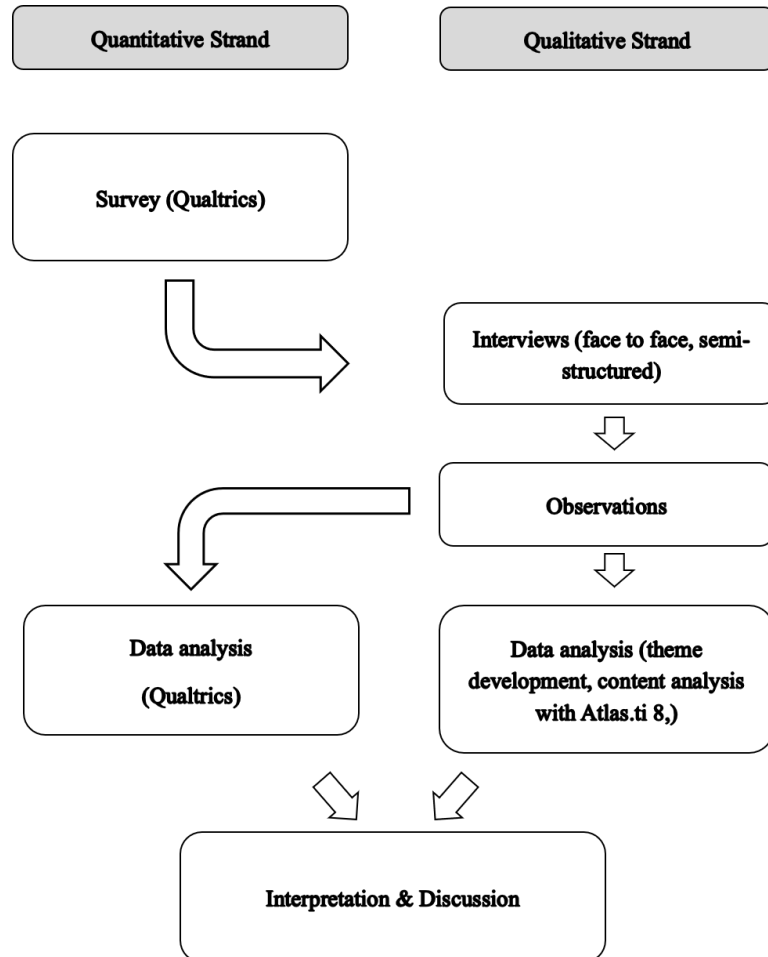
Both quantitative data and qualitative data were used to address all research

questions in this study. After summarizing and interpreting the quantitative and

qualitative data separately, the results were combined during interpretation when I

discussed the extent to which the qualitative data helped explain the quantitative results

(Creswell & Plano Clark, 2011). As seen in Table 1, the survey, interview questions, and observation questions were designed to be similar in efforts to verify data collected within the study. Tashakkori and Teddlie (2006) postulated that this is one of the advantages of mixed methods because "it enables researchers to simultaneously ask confirmatory and explanatory questions, and therefore verify and generate theory in the same study" (p. 20).

Table 1

Integration of Mixed Methods RQs, Analysis Procedures and Data Sources

	Research Questions	Analysis Procedures	Data Sources
1. In what ways do K-12 world language teachers learn to use WELL technologies in the classroom?	a. What access do teachers have to WELL training?	Quantitative: Descriptive Statistics, Chi Square Test	Quantitative: Survey
		Qualitative: Theme Development, Coding and Categorization	Qualitative: Interview
	b. What are the characteristics of effective WELL teacher education from a teacher's perspective?	Quantitative: Descriptive Statistics, Chi Square	Quantitative: Survey
		Qualitative: Theme Development, Coding and Categorization	Qualitative: Interview
2. In what ways do teachers apply WELL teacher education in the classroom?	a. Why do teachers use WELL in the classroom?	Quantitative: Descriptive Statistics,	Quantitative: Survey
		Qualitative: Theme Development, Coding and Categorization	Qualitative: Interview, Observation
	b. What types of WELL technologies	Quantitative: Descriptive Statistics,	Quantitative: Survey

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	Chi Square	
are being used by world language teachers?		Qualitative: Interview, Observation
	Qualitative: Theme Development, Coding and Categorization	
c. How often are WELL technologies being used in the classroom?	Quantitative: Descriptive Statistics,	Quantitative: Survey
	Qualitative: Theme Development, Coding and Categorization	Qualitative: Interview, Observation

Note. RQ = Research Question.

Researcher Positionality

My formal teaching experiences are centered on world languages. I have been a Spanish teacher since 2004. Throughout my tenure as a teacher I worked at elementary, middle, and high schools. I also conducted and presented a study on teacher action research concerning world languages. In addition, I presented on world languages and technology at statewide conferences. Furthermore, I have attended numerous conferences that addressed instructional technology. I am also an avid user of technology in my classroom. Attending professional development can be an invigorating process that causes me to feel renewed and excited about trying something new in my classroom. It can also be an overwhelming experience that makes me feel burdened and resistant to making changes in my instruction. Ideally, more professional development sessions would inspire the former rather than the latter in teachers. Unfortunately, as I can attest, the latter seems to occur more often.

After being both a presenter and an attendee, I have come to wonder about how teacher education activities concerning technology in the field of world languages can transition to the actual classroom more seamlessly. I have observed that integrating new technologies and methodologies into my current classroom practice can be wonderful or a complete flop. Therefore, both my personal and professional research goals are to find out what strategies and practical experiences are used in professional development that makes the strategies learned more likely to stick.

My connection to world languages could have led to researcher bias. I needed to be aware of the possibility that I might interpret my data based on my own personal experiences versus the actual observed experiences of the study participants. I am in favor of technology use in the world language classroom. I believe that it is a necessity in the tool-kit of a 21st century educator. This perception and assumption could have colored the information that I obtained from data collection because I could have been prone to focus only on those portions of the data that aligned with my stance around the necessity of technology in the world language classroom. Respondent validation helped me address this bias.

My subjectivities could have also constrained the information obtained from the interviews or observations. Peshkin (1988) noted that researchers' subjectivities, or the opinions that influence their investigation, must be constantly addressed throughout the research process to minimize their interference in the outcome of the study. Of Peshkin's (1988) subjectivities, the 'non-research human I', the 'community-maintenance I', and the 'pedagogical-meliorist I' impacted my perceptions of the interviews and observations

the most. Concerning the first subjectivity as the 'non-research human I' I had to reduce my desire to connect with the participants and venture into conversations and observations that were not relevant to my research.

For the second subjectivity, the 'community-maintenance I', I am a part of the world language educator community and I could have found myself identifying with other educators and desiring to protect my community from any negativity in the outcome of the study. However, being a part of this community could be considered an advantage in that I had increased access to the participants and I was easily able to understand their teaching methods and terms during the interviews and observation. Conversely, that same connection could be considered a disadvantage. As a part of the community I have an understanding and my own opinions of how world language classrooms are conducted and ideas on how they should be conducted. Therefore, I know that I had to work to maintain a researcher's distance that would allow my interpretations and analysis to be as clear as possible.

In terms of the 'pedagogical-meliorist I', the third subjectivity, I am a current teacher and I constantly looked for student engagement/understanding as well as teacher methodology and pedagogy. To reduce the ever-present threat of bias and increase confirmability, I overtly recognized my position (Suter, 2012) as a current language teacher with her own ideas on how technology should be integrated into the classroom and considered that when I created my observation protocol. In my protocol, I not only included questions about my research study, I also made sure to ask who, what, when, where and why I watched. By explicitly articulating my biases through self-reflection I

increased the likelihood that my findings would be as unbiased as possible. During the observations I attempted to take note of all that I saw, not just what I perceived to be positive or negative in terms of student engagement and teacher methodology.

I used a video camera to record the observation to allow for review for accuracy. I also asked the participants to complete member checks of the interview transcripts to verify the accurate representation of their voices. I also searched for counter evidence and triangulated my data with the observation data and survey (Suter, 2012) and used peer debrief on one transcription to check my bias. The peer debriefs challenged me to redefine some of my codes and to clarify why particular text selections were relevant to their assigned codes. I coded and recoded to the point of saturation, where any new codes only "served to confirm an emerging understanding" (Suter, 2012, p. 350). Furthermore, I intentionally included examples of teacher voices from the interview in the study instead of only presenting my interpretations of their commentary to allow the reader as much access as possible to primary source data.

Pilot Study

Pilot Study Rationale

The use of questionnaires, or surveys, is one common method of data collection. A survey is "a systematic method for gathering information from (a sample of) entities for the purposes of constructing quantitative descriptors of the attributes of the larger population of which the entities are members" (p. 2, Groves, Fowler, Couper, Lepkowski, Singer, & Tourangeau, 2009). Prior to administering a survey for a research study, it must first be evaluated.

The purpose of a pilot study is to test the data collection instrument(s) and methods of analysis prior to the official study to determine if the instruments are both valid and reliable. This pilot study also included a participant debrief to "gain insight into the problems [that] the respondents hand in answering [the questions]" (p. 260, Groves et al., 2009). For this study, the instrument was evaluated using expert review and field pretests with debriefing. For the expert review, content area experts reviewed the questions to "assess whether the content [was] appropriate for measuring the intended concept" (p. 260, Groves, et al., 2009). The second part of the evaluation process included the administration of a field pretest, or a pilot study.

How the Pilot Study Informed the Survey Instrument

The administration of the pilot study survey informed my survey protocol in a few ways. One of the first insights gleaned from this process was the importance of relationship building (Groves et al., 2009). As I prepared to administer the survey, I reached out to organizations dedicated to world language teacher education and support. Taking this step allowed me to begin a relationship with organizations that proved useful when I solicited participants for my dissertation study. Most of the organizations were willing to support my pilot study survey right away, while one of them needed to put it to an executive vote. It was also beneficial to have reached out to the organizations well in advance of the administration of the final survey so that I could become more aware of potential obstacles and make a plan to address them.

This process also helped me further refine my survey questions. After I revised multiple iterations of my survey questions, I sought experts in the field of world language

and technology to review the survey for content validity and to reduce measurement error (p. 259, Groves et al., 2009). A total of four professionals offered commentary about my survey questions. In summary, they suggested the following changes: revisions to the question wording to make the questions clearer, revisions to the answer choices to better collect the desired information as it relates to my research, and finally revisions to the order for the responses of the Likert scale so that the choices are consistently listed as positive to negative throughout the entire survey.

The verbal feedback from these participants were particularly beneficial for two main reasons. The first is that I could ask clarifying questions about their feedback which allowed me to have a better understanding about their suggestions for improvement. The second reason is since I did not know them, they were able to offer feedback from a more objective viewpoint than my colleagues might have offered. Receiving feedback from survey participants about the survey construction allowed me to reflect on it from a participant point-of-view and to further modify it to be more user-friendly, thus increasing survey participation. Concurrently, their responses to the pilot survey served to validate the questions, thus strengthening the results of the study.

The exercise of reporting the pilot study survey results was similarly beneficial. Organizing the survey results by construct helped me to get a comprehensive overview of how the survey questions offered responses to my research questions. Furthermore, a reliability score of .861 based on Cronbach's alpha noted that the survey items were "good" (George & Mallery, 2003). It also aided me in fine-tuning my concept map and how I connected the survey questions to my thematic constructs. I realized that some of

the questions were not initially considered in the concept map and/or were misplaced. This last step allowed me to complete the evaluation cycle to determine if my survey results answered my research questions and connected to my review of the literature.

<div align="center">**Sampling**</div>

Mixed Methods Sampling

Mixed methods sampling involves the use of both probability and non-probability techniques to increase external validity and transferability, respectively (Teddlie & Yu, 2007). Teddlie and Yu (2007) noted that "purposive sampling leads to greater depth of information from a smaller number of carefully selected cases, whereas probability sampling leads to greater breadth of information from a larger number of units selected to be representative of the population" (p. 83). They also offered five types of mixed methods sampling: basic mixed methods sampling, sequential mixed methods sampling, concurrent mixed methods sampling, multilevel mixed methods sampling, and a combination of mixed methods sampling strategies.

For this study, and in line with my research design, I used a combination of basic along with sequential mixed methods sampling. I began with a survey for the quantitative portion of the study and used stratified random sampling. Sequentially, I followed the survey with interviews. I obtained interview participants using purposive, stratified sampling also known as quota sampling (Teddlie & Yu, 2007). To obtain a wide representation of the population for the qualitative portion of my data collection, I purposefully chose members of the following groups or strata: public schools, private/independent schools, elementary school teachers, middle school teachers, and

high school teachers. I used the same sampling technique listed above for the observation participants as well as convenience sampling to identify teachers who I could observe within a drivable distance.

Target Population Rationale

The target population for this study was North Carolina kindergarten through twelfth grade world language teachers who were teaching in a variety of school settings. To make sure my data was inclusive, rich, and varied, I attempted to reach out to a diverse set of teachers, including but not limited to the following descriptors: teachers who worked in public, independent, faith-based, or charter schools. Within this targeted population, I hoped to also reach teachers who were proficient or beginning uses of technology in the classroom; teachers who had and had not attended technology based professional development; and teachers whose schools did and did not have one-to-one laptop programs.

The unit of analysis were full and part time teachers of Kindergarten-12th grade students in the state of North Carolina. The population of inference were those teachers, whom at the time, were currently employed and actively working as world language teachers in North Carolina. The teachers in this study were primarily identified at a state conference for language teachers, and through a world language teacher listserv governed by the North Carolina Department of Public Instruction.

Sample Size

There were approximately 87,324 public school teachers (including charter school teachers) in North Carolina for the 2016-2017 school year. However, only a small

fraction, approximately 2%, were licensed to teach world languages, which amounts to 1,746 teachers. According to the North Carolina Department of Public Instruction (NCDPI) World Languages Consultant, of that 1,746, some were teaching, some had left the system, and some were working in administration. However, that number does not necessarily include a significant amount of lateral entry teachers, pre-service coordinators, and independent school teachers the total of which (including the public-school teachers) is estimated at 2,200. Of that number, 1,721 K-20 (kindergarten through baccalaureate) teachers have voluntarily signed up for a world languages instructor listserv. The NCDPI also has a world language education newsletter to which 2,721 people are subscribed. Some recipients of the newsletters were out-of-state educators and/or administrators. There were also some teachers who are subscribed to both the listserv and the newsletter. Considering the number of world language licensed teachers (1,746) (as well as those who may no longer be teaching K-12 world languages classes) and the total estimation of lateral entry teachers, pre-service coordinators and independent school teachers (2,200), I anticipated that my population size would be between 1,746 and 2,200.

My sample size was estimated at 140 survey participants. I used an 8% margin of error, a typical confidence level of 90% and an estimated population size 2000 to calculate my estimated sample size. I selected the higher range (4%-8%) of typically reported margins of error. Although, 5% is considered a frequently utilized norm, studies that depart from simple random sampling tend to make that standard an underestimate

(Groves, et al., 2009). Since I employed stratified random sampling, I estimated my sample size using the higher of the acceptable margin of error ranges.

Sampling Frames and Survey Administration

I used multiple sampling frames to have a wide representation of my target population, North Carolina K-12 world language teachers. I will discuss the frames individually and provide a rationale for each before providing a summary of why it was necessary to use them in conjunction with one another.

The first sampling frame that I used was the listserv from the Foreign Language Association of North Carolina (FLANC). This organization offers a biannual conference and resources specifically designed for world language teachers, my target population. The executive board agreed to share my survey through the newsletters that were sent through the listserv. However, I only saw evidence of that one newsletter was distributed with my flyer attached. They also permitted me to mention the survey and to hand out flyers soliciting survey participants during workshops at the Fall 2017 conference. Overall, I handed out approximately 400 flyers.

The second sampling frame I used was a membership list from the North Carolina Association of Independent Schools (NCAIS). This list was comprised of teachers from private and independent schools in North Carolina. Based on my membership, I sent an email to a listserv of NCAIS world language teachers. I also posted three messages on the NCAIS open forum soliciting and reminding potential participants to complete the survey. As with my first sampling frame, membership or a viable connection to the group

from which information is connected increased the likelihood that my survey would be completed (Groves, et al., 2009).

Lastly, my third sampling frame was a listserv of North Carolina public school secondary world language educators. This frame was the most robust as it did not require additional membership fees or conference fees from anyone to participate. I distributed my survey to the sampling frame in its totality and removed the data of teachers who did not teach students in grades K-12. I administered my survey online based on the assumption that teachers taking part in technology-based workshops use email and are computer literate. The system was also capable of sending timed emails so that the survey could be sent out during a timeframe in which participants were more likely to respond. I followed the suggestions of the NCDPI world languages consultant in addition to research-based suggestions (Sue & Ritter, 2012) to maximize the number of survey participants. The data collection by survey section further explains the survey administration.

I chose to combine these three sampling frames because I felt that together they offered the most representative list of North Carolina K-12 world language educators. While the registration list from FLANC offered a very targeted list in terms of teachers who were participating in professional development, I had concerns over it eliminating teachers who were unwilling or unable to pay the registration fee. The membership list from NCAIS provided a complement to the list of public school secondary world language educators being that it only includes independent school teachers. Without

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using both sampling frames I would suffer from under coverage by either excluding private school teachers or public-school teachers.

There was also the possibility that some members of the sampling frame would not be K-12 world language teachers because some of the listservs may have include higher education teachers and school administrators. Therefore, I used systematic sampling (Abels, 2016) to select only current K-12 world language teachers to complete the survey. However, as it was impossible to satisfactorily trim the sampling frame; I removed any non-secondary or non-world language teachers' responses from my final analyses by making my first question lead to the end of the survey if the participant did not currently teach world languages in a K-12 program in North Carolina.

As intimated above, subpopulations were important for this study, therefore I used stratified sampling as well. Stratified sampling "assures representation of population subgroups in the sample" (Groves, et al., 2009 p.113). I sought organizations with listservs that not only connected me to public school world language teachers, but private and independent school teachers as well. This decision helped to address potential differences in access to technology resources. When reporting overall statistics, the results of my data were driven by public school non- charter teacher responses (72%) as they represent a larger proportion of the total sample.

I had more control over the participants for the qualitative interview and observation portions of the research design. Therefore, I used stratified purposive (or quota) sampling (Teddlie & Yu, 2007) for each of those portions of the study to obtain a close approximation to the ratio of public school to private/independent school world

language teachers who participated in my survey (Abels, 2016). While there was data available on the total number of North Carolina teachers, I was unable to access data with an exact number of public and private school world language teachers in the state. Of the teachers who participated in the survey, 71.7% were public non-charter school teachers and 12.4% private school teachers participated. The participation percentage for the observation was 75% public non-charter school teachers to 25% private school teachers. The participation breakdown for the interview was 80% public non-charter school teachers to 20% private school teachers. The ratios of public to private school teachers were not exact, however, that could be due to the small number of total interviews (5) and observations (4).

I also attempted to stratify my population based on grade level taught (elementary school 16%, middle school 28%, high school 67%) to address the different needs of teachers across various student developmental levels. However, I was not able to observe or interview any middle school teachers; therefore, of the interviews conducted, 20% were elementary school teachers and 80% were high school teachers. Concerning the observations, 25% were elementary school teachers and 75% were high school teachers.

In addition, I attempted to stratify based on participant responses to certain survey questions. Due the ambiguous nature of purposeful sampling strategies, it is imperative that they are described in the context of the study (Gentles, Charles, Nicholas, Ploeg & McKibbon, 2016). For this study, initially six participants were asked to be interviewed and observed using maximum variation sampling as nuanced by LeCompte, Preissle, and Tesch (1993), Patton (2015) and Miles, Huberman, and Saldaña (2014) to achieve

representativeness. At the end of data collection, a total of nine participants were asked to be interviewed and observed. This number increased from the initial six participants due to a lack of availability and/or response from some of the initial six invited participants. In the outlined version of the procedure by LeCompte, et al. (1993), the researcher first identifies the major subgroups and then selects an arbitrary number of participants in each category. As the participants might represent different percentages of the population, the researcher might weight the data from the participants to reflect the ratios. While this method "does not supply the precise representation provided by random and systematic sampling, the selected units do correspond to relevant dimensions characterizing the population" (p. 73). Participants were also aggregated by using the definition supplied by Miles et al. (2014) which suggests the selection of cases at the far ends of a range. For example, participants who might have selected 'never' versus those who selected 'always' on a survey question.

As my study lacked sufficient resources and participants to generalize across all North Carolina world language teachers, I aimed to gather more information from a few teachers across a selection of criteria to be sure that diverse situations were represented in the study. In this way the data analysis would demonstrate the distinctions in participants' situations as well as highlight commonalities among individuals (Patton, 2015, p. 283). Patton (2015) identified the creation of a matrix in a study of the MacArthur Foundation Fellowship Program, in which everyone in the sample was as different as possible from one another using certain criteria. Patton (2015) surmised that

When selecting a small sample of great diversity, the data collection will yield two kinds of findings: (1) high-quality, detailed descriptions of each case, which are useful for documenting uniqueness and diversity, and (2) important shared patterns that cut across cases and derive their significance from having emerged out of heterogeneity (p. 283).

I used a combination of the procedures listed above to select potential participants for observations and interviews. I first determined which survey questions to use to identify my major subgroups. Those questions were selected based on their relationship to my research questions, interview questions, and observation focus questions. See Appendix B for question selection rationale.

After cleaning my survey data for the total number of survey participants, I used data from the entire sample size to determine what numbers constituted the low, medium, and, high ends of a range as it related to the question response frequencies for each of the 13 questions selected. I used the 5 item Likert Scale and the visual binning feature in SPSS to accomplish this goal. For the Likert Scale questions, low was considered (1) and (2) which represented responses such as strongly disagree or somewhat disagree, medium was categorized as (3) which was neither agree nor disagree, and high was identified as (4) and (5) which represented responses such as somewhat agree and strongly agree.

I used visual binning to categorize the 'select all that apply' option questions. I first determined the number of different methods used by each participant and then I visually binned the total count of methods used. In other words, I separated the participants into three groups that represented approximately the low, middle, and upper third of the total count. For questions that had 3 or fewer response options, I chose

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participants who represented each response. For 'select one' options, I visually binned the

frequency percentages of the responses into thirds and selected participants from each

third. I used color coding to visually identify differences in participants' categories; red

represented the 'low' category, yellow represented the 'middle' category and green

represented the 'high' category. Once the low, middle, and high categories were

determined based on my entire survey sample, I narrowed my selection pool to

individuals who were willing to be observed and interviewed. My goal was to identify as

many participants needed to interview or observe at least one person who represented a

low, middle and high for each of the fourteen (14) questions or subgroupings. Due to

financial and time constraints, I also used convenience sampling when selecting

participants for the observations. This allowed me access teachers in proximity to my

residence and participants whom I might observe on select dates. The initial number of

participants who represented each of the subgroupings was six. The variation between the

initial six and the actual five participants was due in part to a lack of response to my

emails to schedule interviews and observations, as well as the school districts' denial of

the requests to observe the volunteer teachers.

<div align="center">**Data Collection Plan**</div>

Data Collection by Survey

Quantitative data was collected via an online survey using Qualtrics. The survey

consisted of 34 close-ended items, with the opportunity for participants to include a

written rationale for some of their selections, and 2 open-ended items (see Appendix G).

Quantitative data from the survey measured participant responses related to frequency of

WELL use, teacher attitudes towards the use of WELL, the level of teacher preparation to use WELL, the connection to student outcomes, and the quality and use of training. The survey also addressed the types of technology used and the methods of learning how to use WELL in the classroom. Teachers were asked to indicate their frequency of use and opinions surrounding WELL using a rating system. Additionally, they were asked to choose from lists provided to determine types of technology used and their methods of learning how to use technology.

The survey was available for a total of 14 weeks. One month prior to the survey launch, there was an electronic distribution of an introduction letter through a Foreign Language Association of North Carolina (FLANC) newsletter. The letter briefly described the research study and made readers aware of the distribution date for the survey. The purpose of the introduction letter was to establish trust through sponsorship by a legitimate authority (Dillman, Smyth, & Christian, 2014). Emails were also sent to eleven presenters of technology-based workshops requesting that they (a) add a slide to their presentation with a QR code and website link directing participants to the survey and/or (b) hand out printed handbills with a QR code and website link to the survey. None of the presenters replied to my request and to my knowledge none of them discussed my survey in their presentation. In October, on the Friday and Saturday of the Fall 2017 FLANC Conference I promoted the survey using several methods. Prior to the start of the conference provided lunch, I placed handbills, which included a QR code and link to the survey, on tables along with a piece of candy as an incentive. Lunch was provided for approximately 500 people. In addition, I placed handbills in chairs in

workshop sessions and in lounge areas. A link to the survey was posted on the conference's Twitter page and I used the conference twitter hashtag to distribute the survey link. Additionally, I made announcements in four different workshop sessions soliciting participants. Ten people completed the survey during that time frame.

Next, I sent the surveys out through the NCDPI listserv. The surveys were timed to be sent on Tuesdays and Thursdays. For professional audiences, Fridays through Mondays tend to be less fruitful in terms of completion rates (Sue & Ritter, 2012). Consideration of the audience is paramount when conducting online surveys (Sue & Ritter, 2012). The timing of the emails was thoughtfully considered in terms of which times would best suit the audience of K-12 world language teachers. The NCDPI world languages consultant suggested that I schedule the emails to be sent before lunch time (11:30a), at the end of the school day (3:00p) and mid-morning (10:00am) based on her experiences in sending emails to the listserv. She noted that members tended to read their emails mid-morning to check for any updates to the day and during lunch because it is their down time (A. Gunter, personal communication, December 11, 2017). A total of four emails (December 14, 2017, 11:30am, December 28, 2017, 3:00pm, January 4, 2018 and January 9, 2018 10:00am) were sent to members of the listserv, one initial email and three reminder emails. Although three reminder emails can be considered as borderline harassment (Sue & Ritter, 2012), the emails were spaced out over a school break and it was agreed that one reminder during the break, after some major US holidays might prove beneficial, since some teachers might have been slowly reconnecting to school business.

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I posted three of the same emails on the NCAIS open electronic forum. Since these emails had to be vetted by a forum moderator before being posted, the times that they were posted varied greatly (December 15, 2017 1:56am, January 3, 2018 2:04am, and January 14, 2018 2:30am). I also sent an email to the FLANC listserv for independent school world language teachers to cover as many avenues for the distribution of the survey as possible (January 11, 2018 5:19p). Except for January 14, each time an email was sent, some surveys were completed that same day. The last survey was completed on January 22, 2018. The most completed in one day was on December 14 with a total 22 completed surveys, that was the first day the NCDPI email to their world languages listserv was distributed.

The emails were designed to be as "short and simple as possible while still conveying the necessary information about the survey" (Sue & Ritter, 2012 p.132). The subject lines, as well as the emails, were changed to reduce boredom and fatigue as suggested by the NCDPI world languages coordinator (A. Gunter, personal communication, December 11, 2017). In the initial email I explained why the individual received the message, the purpose of the study, the time needed to complete the survey, a highlighted survey link, and a personalized signature line (Sue & Ritter, 2012) to make the message appeared "friendly, respectful, motivating, and trustworthy" (Sue & Ritter, 2012, pp. 112). I employed cognitive dissonance and level of involvement as behavioral theories to increase participation of the survey by reminding potential participants that their knowledge, experiences and expertise were necessary to answering my research questions (Sue & Ritter, 2012). Cognitive dissonance is when one's behaviors do not

match their perceptions of themselves. By letting potential participants know how much their knowledge was needed, I reminded them of their connection to the professional world languages teacher community. In that way, participants who identified as givers or helpful people to that community may have felt obligated to complete the survey so that their behavior would match their perceptions of themselves; thus, reducing or eliminating the discomfort of cognitive dissonance (Sue & Ritter, 2012). The level of involvement theory was also employed in a similar manner. The commitment of teachers to the world languages community, particularly those interested in technology, may have acted as a motivator for some participants (Sue & Ritter, 2012).

Through survey administration, I probed teachers on the characteristics of teacher education activities they have attended, their perceptions of the training, and the applicability to their classroom. Using a survey allowed for the quantification of teacher education attributes. I also addressed the number of training activities attended and teachers' self-reported usage of technology in the classroom. Without survey use this topic would have been difficult to broach. K-12 world language teachers could have been observed to capture their technology usage. However, conducting extensive observations would have been both time consuming and expensive to implement. It would have necessitated developing a rubric for technology use, training observers, and conducting observations across the state of a representative sample of world language teachers. Measuring multiple teacher education attributes would have been equally difficult. In addition to a time commitment, attending teacher education workshops would have required researchers to pay registration fees. Also, during a conference, workshops take

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place concurrently requiring multiple observers and introducing issues of inter-rater reliability. Solely observing the workshops would not provide information on teachers' perceptions of the training which are vital to answering my research questions. The administration of a survey allowed me to gain key information about the ways that world language teachers learn to use WELL without having to visit a multitude of locations, thus minimizing time and financial burdens and maximizing information gained.

Survey Design Rationale

As discussed in the pilot study explanation, the survey was designed in order to gain the following information: ways of learning WELL technologies, teacher education participation, technological pedagogical content knowledge (TPACK) (Mishra & Koehler, 2006) , perception of teacher education activities, characteristics of teacher education, ways teacher education is applied, technology use, student outcomes/motivation, perception of technology, effective classroom practices, barriers to use, types of WELL technologies used, access to technology and logistics, and frequency of use. I used a research crosswalk to create questions for the survey and to verify that my survey questions were aligned with my research questions and literature review (see Appendix A). Using the literature review surrounding my research questions, I assembled thirteen thematic constructs that I used in tandem with my research questions to create survey questions.

By addressing these constructs, I could better justify the conclusions I made from the data. The constructs and rationale for their inclusion in the research crosswalk is listed below. There is also a graphical representation of the items (questions) mapped to

the observable variables (RQs) along with the hypothesized relationships between the

variables measured (constructs) and the observable variables (see Figure 3).

Figure 3. Research Questions, Survey Questions, and Thematic Constructs Concept Map
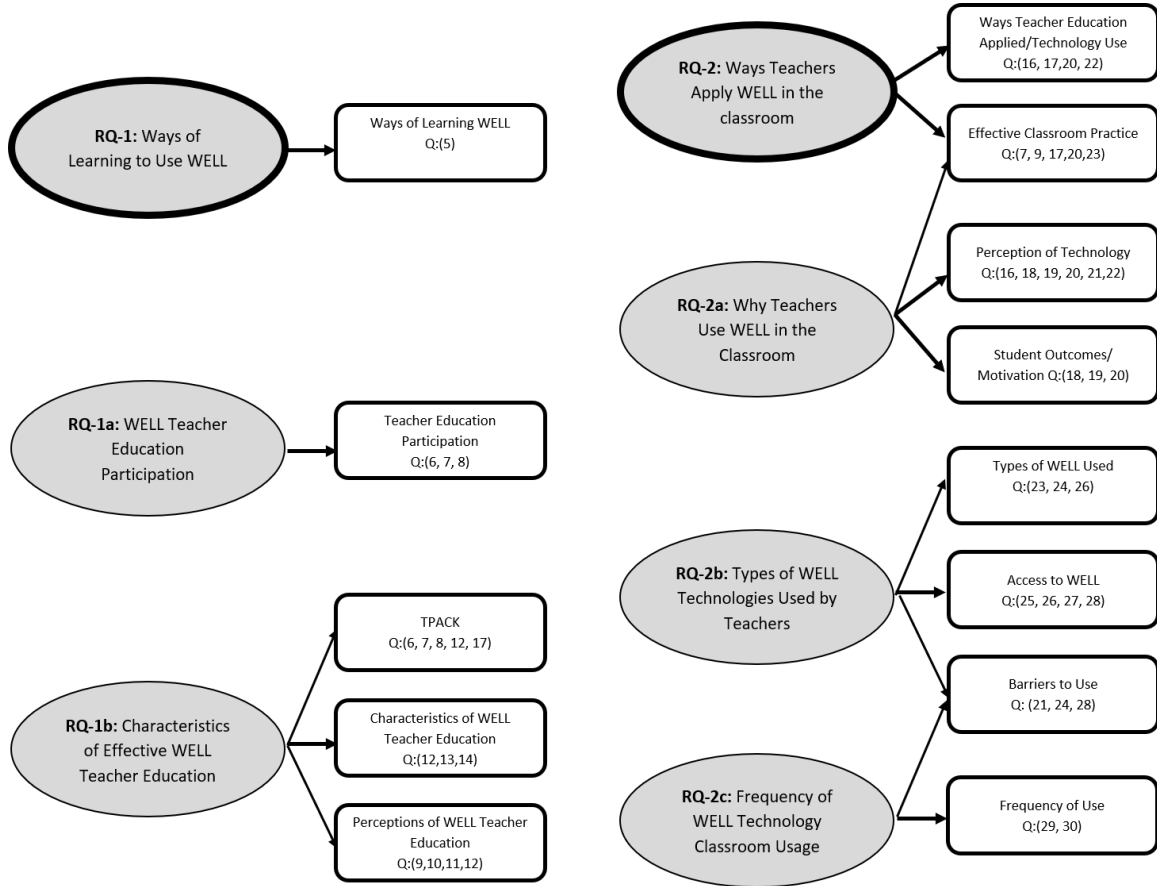
Developed Constructs

> **Ways of learning to use WELL technologies.** The questions related to this

construct focus directly on collecting information on the ways in which world language

teachers learn to use WELL technologies. The question for this construct include a

variety of responses, as well as an open response option, to allow participants to define 'teacher education' in more than the prescribed ways.

Teacher education participation. This construct addresses the extent to which teachers participate in any type of training for WELL. Questions related to this construct also act as screening questions for the survey.

Technological pedagogical content knowledge (TPACK). This is the theoretical framework for the study. Research shows that it can be used as a model for teacher education and that teachers should have more training in content specific technology integration (Koh et al., 2016; Matherson et al., 2014; Mishra & Koehler, 2006; Ndongfack, 2015). This model served as a framework for how training in content specific technology integration might influence the ways in which WELL is used in the classroom.

Effective classroom practices. According to the Conceptual Framework/TESOL standards, effective classroom practices are:

> Goal 1: Language teachers acquire and maintain foundational knowledge & skills for professional purposes. Goal 2: Language teachers integrate pedagogical knowledge and skills with technology to enhance teaching and learning. Goal 3: Language teachers apply technology in record-keeping, feedback, and assessment. Goal 4: Language teachers use technology to improve communication, collaboration and efficiency (TESOL, 2008).

These practices also influence the types of WELL used and how often technology is used (i.e. Goal #3).

Perception of teacher education. Multiple factors may influence why educators use WELL technology to the extent that they do. In addition to access to teacher education and access to technology devices, attitudes toward teacher education activities may be impactful. Teachers have called for more & better training in WELL. Research noted this as one of the factors that influence WELL implementation (Arnold & Ducate, 2015; Buabeng-Andoh, 2012).

Characteristics of effective WELL teacher education. These questions are related to characteristics of effective teacher education activities as they have been identified in the literature. Specifically, the question attempted to discern the extent to which these characteristics are present in teacher education activities about WELL technology. An opportunity was also provided for a free response. Research listed that effective teacher education is ongoing, of significant duration, offers support, engaging, utilizes modeling, and is content specific. Noting the characteristics of teacher education activities that participants attended can give additional insight into types of training that are effective (Darling-Hammond et al., 2009; Gulamhussein, 2013).

Ways WELL teacher education is applied and technology use. The questions related to this construct were written to determine the ways in which WELL training is applied in the classroom. The responses for this question are based on the TESOL (2008) performance indicators for each goal. Questions related to this construct also sought to analyze classroom technology use in different ways.

Student outcomes and motivation. Social constructivism and student motivation align with the reasons for using WELL and student outcomes are one of the main reasons

why WELL is used (Arnold, 2007; Ketsman, 2012; Ketsman, 2014; Moore, 2006; Spodark, 2005). According to the Conceptual Framework/TESOL standards, desired student outcomes are:

> Goal 1: Language learners demonstrate foundational knowledge and skills in technology for a multilingual world. Goal 2: Language learners used technology in socially and culturally appropriate, legal, and ethical ways. Goal 3: Language learners effectively use and critically evaluate technology-based tools as aids in the development of their language learning competence as part of formal instruction and for further learning (TESOL, 2008).

Perception of technology. Research listed advantages of using WELL (Egbert et al., 2002; Kessler, 2007; Ketsman, 2012; Moore, 2006). Teachers' perceptions about technology were important to note as they directly affect their use of WELL implementation (Buabeng-Andoh, 2012).

Barriers to use. According to Egbert et al. (2002), the overall purpose of web-based language instruction is to enhance teaching effectiveness and student achievement. However, lack of time, resources, support, and motivation are some issues that negatively affect use of WELL. Inquiring into teachers' barriers as well as positive reasons for use will allow for a deeper analysis for RQ2 (Burnett, 1998; Egbert et al., 2002; Ketsman, 2014; Moore, 2006).

Types of WELL technologies used. This construct directly addressed RQ2. Examples of the types of WELL technologies used were listed as response options and there was also an open response option to determine what other types of technology were being used that were not listed.

Access to technology and logistics. Teachers' access to technology directly influences their use of technology. Research noted this as one of the factors that influence WELL implementation (Buabeng-Andoh, 2012). Furthermore, teachers with minimal access to technology would not be able to use it often in the classroom regardless of the time spent in WELL technology teacher education activities. Questions for this construct were also important in screening educators that have minimal access to WELL technology.

Frequency of use. This construct sought to determine how often WELL technologies were used in the world language classroom. The frequency of use is also connected to how WELL is used in the classroom and could offer a more nuanced response to RQ2.

Qualitative Data Collection

Qualitative data was collected through interviews and observations. The interview and observation participants were purposively selected. My goal was to interview and observe a representative number of elementary, middle and high school teachers; teachers from public schools and private intuitions; teachers of different languages and teachers who responded differently to certain survey questions concerning the number of years in the classroom and their beliefs surrounding technology. Maximum variation sampling was used to determine the qualitative participants. However, I was not able to secure representatives from each of those sub-populations, most notably, I was unable to observe or interview a teacher from a middle school or a male teacher.

Data collection by interview. Qualitative data was collected from an interview protocol that provided more detailed context and descriptions about instructors' experience with technology implementation and enhanced validity by triangulating data collected via the survey (Creswell, 2013). The semi-structured interview consisted of questions to determine frequency and types of WELL usage; attitudes and opinions about using WELL and its effectiveness on learning outcomes; how and what WELL technologies were employed; availability and access to technology for students and teachers, and availability and quality of WELL teacher education. The questions also asked how teachers learned about WELL and how they use it (see Appendix C for the Interview Protocol).

The interviews were semi-structured, and each participant was asked a total of 11 planned questions. Depending on the initial responses, follow up questions were asked to provide additional detail or clarification. I replicated the pattern in each interview as much as possible to make the qualitative findings more reliable.

The interviews were conducted over the telephone using Google Voice and Audacity, a sound recorder application, as a secondary device to record the audio. The two devices were used to limit the negative effect of any potential technical difficulties with my collection methods. I also took notes using the interview protocol. The audio files were then converted into videos and uploaded to YouTube to assist with the transcription process. The automatic transcription of the audio was edited for accuracy and utilized to determine what themes emerged from the data. See Appendix D for a sample interview transcription. The transcripts were then coded using Atlas.ti8 based on

pre-determined thematic constructs. I conducted five interviews from the end of March through the end of April for an average of 18 minutes per interview. The first interview was 16 minutes, the second and third were both 20 minutes, the fourth was 29 minutes and the last interview was 15 minutes. I used the same interview protocol from Appendix C for all five interviewees with minor revisions after the first interview. After that experience, I made sure to clarify the difference between usefulness and quality in questions three and four. I also revised my introduction for estimated time it would take to complete the interview and I reprinted the interview protocol to include more space for writing notes.

All the people I interviewed identified as females and pseudonyms were used through this study to identify participants. Alba (personal communication, April 5, 2018) and Malina (personal communication, March 27, 2018) were public high school Spanish teachers and Alice Bryant (personal communication, April 24, 2018) was an independent high school French teacher. Monique (personal communication, April 11, 2018) was a public elementary school French teacher and Mabel (personal communication, April 3, 2018) was an early college Spanish teacher. Each agreed to the recording of the interviews and verified the transcription of our conversation to ensure accurate representation of their voices.

Data collection by observation. Qualitative data was also collected from an observation protocol to provide additional context and descriptors about the ways in which WELL is applied in the classroom, the types of technology used, and the frequency of use (see Appendix E). The observation portions lasted an entire class period, between

30 and 90 minutes long. The observation protocol had six focusing questions extracted

from the research questions with seven general questions to help me focus my field notes

to gather the most pertinent information. I observed a total of four teachers in four

different counties. In one situation, I observed two back to back classes to help me obtain

a more complete understanding of technology use in the classroom.

Each observation was conducted in April 2018. Teachers who agreed to

participate received IRB letters of consent and sent home video consent forms with the

students prior to the observation. Observations were video-taped, and field notes were

taken by using the observation protocol (see sample completed observation protocol

Appendix F). Observation field notes and videos were coded using Atlas.ti8 software. Of

the five teachers interviewed, I could only observe four. I did not observe Malina's

classroom due to the inability of the school district and the university IRB board to settle

on an agreement about a memorandum of understanding for observing teachers. The

observations ranged from 60 minutes to 90 minutes. Alba's observation was for one class

period and lasted 85 minutes, Alice Bryant's class observation lasted 90 minutes, I

observed Monique for two 30-minute class periods, and Mabel's observation was an 80-

minute class.

<p style="text-align:center">**Data Analysis**</p>

Quantitative Analysis

The survey was analyzed with SPSS 25 statistical software. Descriptive statistics

and Pearson's Chi Square goodness of fit tests were used for the quantifiable responses

and thematic coding was used for the open responses (DelliCarpini, 2012; Ketsman,

2014; Tai, 2015). As previously mentioned, one of the critiques of studies surrounding technology and teacher education for world language teachers was that the studies lacked strong quantitative statistical analysis (Huhn, 2012). Hong (2010) argued that future research on world language teachers' integration of WELL into the classroom should seek to be more powerful. At the time of his analysis, much of the research studies only offered descriptive analysis and did not sufficiently indicate any systemic relationship between the factors (Hong, 2010). To address that critique, I sought to increase the rigor of my study by using chi square tests to help determine if there were any relationships between the items/questions asked in my survey (Ebsworth, Kim, & Klein, 2010). I also used factor analysis in addition to descriptive statistics to strengthen the interpretation of the results of this study. However, the low number of survey participants (113) could have greatly influenced the results.

Reliability, Validity and Goodness of Fit

  Factor analysis. To further test the construct validity on the self-reporting survey instrument, I completed a factor analysis (Williams, Onsman, & Brown, 2010). There are varying ideas about the minimum sample size needed to do a factor analysis. Although my sample size, N=113, might be considered too small for some scholars, it has been determined that sample sizes of 100 can be used to produce valuable results (Arrindell & van der Ende, 1985; Hair, Anderson, Tatham, & Black, 1995). To complete the analysis, I first reduced the data so that matrix questions (numbers 12, 17, 26, 28) and multiple response questions (numbers 5, 13, 20, 23, 24) represented one variable (Merrifield, 1974). There was one exception in question number 28 that was reduced to two variables.

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Questions that allowed for only one response were not modified or reduced. The matrix

questions were reduced by calculating the mean of each participant's responses for each

option and modifying the variable into a single response. Reponses marked 'unsure' or

'other' were not considered in the data reduction so that they would not skew the mean

calculation. Table 2 and Table 3 provide examples of the reduction methods used.

Table 2

Sample Matrix Data Reduction

Respondent	Computer (Laptop, Chromebook, etc.)	Smartphone	Tablet	Smart Board	Projector	Classroom Audio Speakers	Wireless Internet Access	Wired Internet Access	Frequency of Access Mean
1	4	4	X	3	3	3	4	3	3.43
2	4	4	2	5	5	1	4	1	3.25

The multiple response questions were reduced by first aggregating the data to

determine all the possible combinations that were made by the participants. Each

combination was then assigned a value and respondents answers were condensed into one

variable that considered each of their choices.

Table 3

Sample Multiple Response Data Reduction

Respondents	1-Self Taught	2 Teacher Education Program	3 From Colleagues	4 From Technology Staff	5 From online sources	6 Attended Teacher Workshops		New Variable How WELL Learned
1	1	2	3	4	5	6	'Selected Choices:1,2,3,4,5,6'	1.00
2	1	2	3	4		6	'Selected Choices:1,2,3,4,6'	2.00
3	1	2	3	4			'Selected Choices:1,2,3,4'	3.00
4	1	2	3		5	6	'Selected Choices:1,2,3,5,6'	4.00

After the variables were reduced, I completed an exploratory factor analysis. I considered all the variables (N=32) except question number 27. Since all the teachers responded yes to that question, the system could not calculate the analysis because it only contained one case. The Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy was .707, exceeding the suggested minimum of measure of .600 and confirming that my data was suited for factor analysis and could account for a fair amount of variance, but not a substantial amount (Tabachnick & Fidell, 2013; Watson, 2017). Bartlett's Test of Sphericity was reported as significant at .000 (Watson, 2017). With the Eigen value set at 1.0, there were 11 total components which made up 71.6% of the cumulative percent of variance. The Scree Plot, Figure 4, also confirmed this output with 11 factor components being plotted at 1 or higher.

Figure 4. Scree Plot
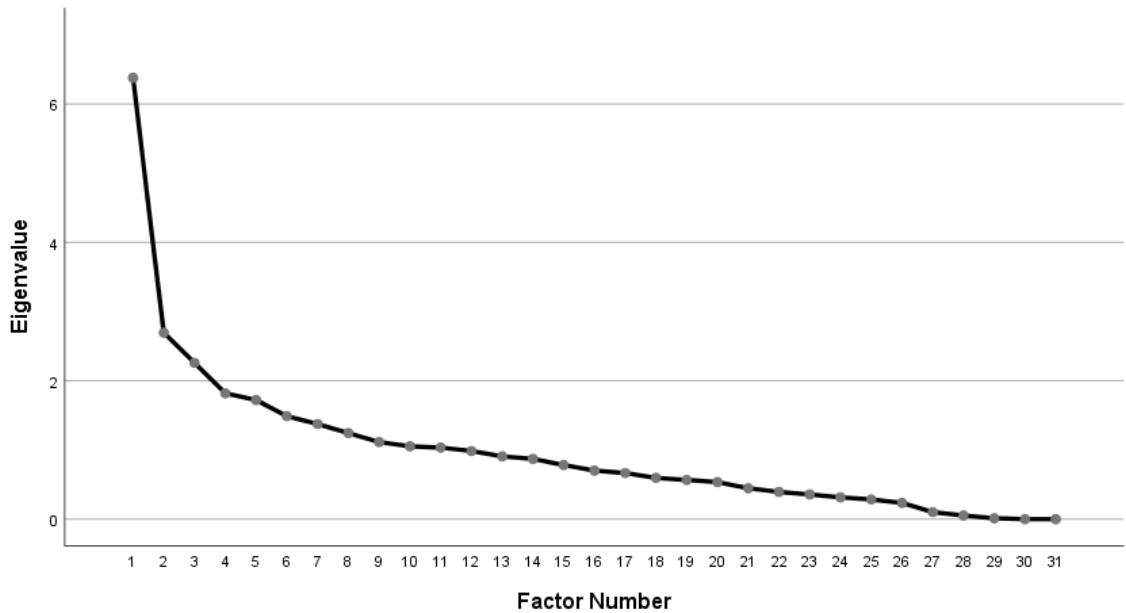
The eleven components (labeled by letter and number in Table 4) referred to the listed survey questions in order of relationship significance with the first component having the most significant relationship. Six of the eleven components had fewer than three variables and were not considered (Tabachnick & Fidell, 2013). Five survey questions (4, 8, 18, 25, 31) did not load onto any of the eleven components which may mean that they did not have significant variance, relationships to the other questions, or that there was not sufficient data in those questions for the factor analysis to be considered. Question number 4 is about language taught and question 31 is about gender. Their lack of relationship might suggest that neither language taught, nor gender has any bearing on ways of learning WELL teacher education or the use of WELL. Question 8 asks if teachers have been to teacher training entirely focused on WELL which also may not be an important factor. It could be because almost 70% of teachers have attended

teacher education that focused only on WELL and that the data is skewed. Questions 18 and 25 asked about student outcomes and access. Both questions skewed over 80% to the positive which could account for the lack of variance. Except for question 16, all of Component A-1 questions loaded on to RQ1b. All the questions from B-2 loaded onto RQ2. C-3 questions, except for 35 which was a demographic question related to school type, loaded onto RQ 2b. F-6 questions were split between RQs 1 and 2 with question 12 not loading well onto RQ1b. All J-10 questions loaded onto RQ2 with the exception of question 33 which was another demographic question related to age. Table 4 shows a side by side alignment of components and survey questions.

Table 4

Exploratory Factor Analysis Components

Component	Factor Name	Survey Questions
A-1:	RQ 1b	9, 10, 13, 14, 16, 17
B-2	RQ 2, 2a, 2b, 2c	20, 22, 23, 24, 29
C-3	RQ 2b	26a, 26b, 28, 35
F-6	RQ 1b, RQ 2c	12, 28a, 30
J-10	RQ 2c	28a, 30, 33

The exploratory factor analysis provided evidence for additional substantiation through a confirmatory factor analysis. The rationale was to confirm if there was a significant relationship between the selected research questions, constructs, and the associated survey questions. The rotate factor loading of 0.32 was used as a baseline to

determine the significance (Tabachnick & Fidell, 2013). The results are listed by research

question and construct, if applicable, in Chapter IV. An illustration of survey question

alignment is shown in Table 5. As suggested by Costello and Osborne (2005), principal

axis factoring with direct oblimin rotation was used.

Table 5

Research and Survey Question Alignment.

Research Question	Survey Questions	KMO Measure
1	5	n/a
1a	6, 7, 8	.500
1b	6, 7, 8, 9, 10,**11**, 12, 13, 14, 17	.411
2	7, 9, 16, 17, 20, 22, 23	.777
2a	7, 9, 16, 17, 18, 19, 20, 21, 22, 23	.768
2b	21, 23, 24, 25, 26, **27**, 28	.507
2c	21, 24, 28, 29, 30	.548

Reliability of the survey instrument. After conducting the pilot study, the

survey instrument was found to have a 'good' Cronbach's alpha of .861. Upon

completion of the revised instrument used for the actual study, the reliability score was

.968 or 'excellent'. This improvement of the reliability score confirmed the usefulness of

the pilot study and reaffirmed that the instrument was reliable. Reliability tests were also

completed for each of the thematic constructs used in this study. With one exception,

there were no significant increases (>.005) in alpha that could have been reached if more items were deleted.

Goodness of fit. To further analyze the data, I completed a cross tabulation with survey questions that might be dependent on one another according to my review of the literature. In conjunction with the cross tabulations, I used the Pearson Chi-Square goodness of fit statistic to determine if certain variables accepted the null hypothesis and were independent of one another or rejected the null and were dependent. In other words, I wanted to analyze my data to determine if factors like gender and teaching experience were factors that influenced the use of WELL in the world language classroom (Buabeng-Andoh, 2012). Ebsworth et al. (2010) also used Chi Square tests to analyze the survey data in their study conducted on world languages and technology.

Prior to completing the crosstabs, I reduced the data for the ordinal questions to two variables to minimize the possibility of the chi square value being unusable due to a less than 80% expected count of 5 or more (Marshall & Boggis, 2016). Reducing the data to two variables also allowed for the possibility of Fisher's Exact Test, which accounts for low expected counts if the assumptions for chi square are not met on 2x2 tables (Marshall & Boggis, 2016). The variables for ordinal questions were generally re-coded from Likert scale questions with original response options like the following: strongly disagree (1), somewhat disagree (2), neither agree nor disagree (3), somewhat agree (4), strongly agree (5). The responses were re-coded to disagree (1), agree (2). Other Likert type responses were re-coded to never, rarely, sometimes (1), most of the time always (2). In reducing the data to two variables, these Likert scales were adjusted this way to

account for positive and negative feelings about the presence of certain characteristics.

For questions like 12 and 17 where there were multiple Likert scale questions on a

matrix, the mode was calculated for each participant's response and then re-coded to fit

the two variables explained above. 'Select all' types of questions were given a code of 1

(selected by the participant) or 0 (not selected by the participant). 'Unsure' options were

not considered. Of the 18 cross tabulations completed, chi-square tests revealed 11

significant p-values ($p < .05$). In these cases, the null hypothesis that there was no

relationship between the variables was rejected. This information is summarized in Table

6. The outcomes of the goodness of fit tests were discussed in Chapter IV by research

question.

Table 6

Literature Based Relationships for Chi Square Test

Literature Based Relationship	Question Pairings	Accepted or Rejected the Null Hypothesis
	7 and 17	Accepted
	12 and 17	Rejected based on 3 Specific Statements
	9 and 10	Accepted
Teacher Training	21 and 22	less than 80% expected count > 5 Rejected w/Fisher p value of .002
	22 and 7	Accepted
	22 and 8	Rejected .05
Age	33 and 21	Accepted
	33 and 22	Accepted
Perceptions of Technology	20 and 29	Rejected 2 Specific Statements
	18 and 29	Accepted
Student Outcomes	18 and 20	Accepted
	18 and 21	less than 80% expected count more than 5 Rejected w/Fisher p value of .038
Access	35 and 26	Accepted
	35 and 28	Accepted
Gender	31 and 18, 21, 22, 29	Accepted
Teaching Experience	34 and 18, 21, 22, 29	Accepted
Frequency of Use	29 and 30	Rejected .0001
Barriers	21 and 24	Rejected 2 Specific Statements

Qualitative Analysis

Saldaña (2013) and Creswell (2013) stated that coding, like many qualitative methods, does not have a one size fits all plan, but there were recommended methods that I was able to draw from to create an open-ended recipe that fit my needs. I stress open-ended because like Saldaña (2013) asserted, coding is cyclical, each cycle informs the next and the codes evolve as new insights are made. To analyze my qualitative data, I transcribed all my interviews and used preliminary codes (see Appendix C) that were created based on my literature review. I also revised codes from patterns I saw emerging.

To code my interview and observation data I used Atlas.ti8 version 8 software. I uploaded the interview transcript and the observation field notes as documents and added my preliminary codes to the program. I then read each of the transcripts and field notes to familiarize myself anew with the material, coded each document, and reviewed and revised my selections multiple times to ensure consistency. I used computer programs such as Microsoft Word and Excel to help me code the open responses to my survey data. However, I used ATLAS.ti8 as my primary computer assisted qualitative data analysis software (CAQDAS) to sort the codes from the qualitative data more efficiently and to be able to merge them with my quantitative data.

I began with start codes such as 'characteristics of effective teacher training', 'how tech is used', and 'ways training applied'. I then edited them to combine any similar codes that overlapped in the process. I also reviewed my research questions along with my framework and removed codes that did not seem relevant to either. I completed another cycle of coding while using my concept map to extract additional themes that

emerged. This process allowed me to organize my codes into themes and reconnect with my research questions.

During my next pass through the data I compared the codes that emerged from my interviews and those that came from my observations to synthesize the data. I also looked for counter evidence, or instances that did not fit my thematic constructs (Suter, 2012). In this way, I sought to guard against confirmation bias which would cause me to only search for evidence that fit my personal view and ignore other potentially relevant data (Suter, 2012).

Saldaña (2013) noted that the final number of major themes or concepts should be held to a minimum to keep the analysis coherent, but there's no standardized or magic number to achieve. She did recommend also that there could be a code book dictionary of sorts made through a CAQDAS program. In following this advice, I attempted to limit the number of my themes to twelve but ended up with thirteen, which was satisfactorily close to my original goal.

After I reviewed the observations, eight codes emerged: access to technology and logistics, effective classroom practices, frequency of use, perceptions of technology and WELL, ways technology used, types of technology used, and ways of learning to use WELL technologies. In addition to those codes, five more codes emerged, for a total of 13 codes, from the interviews: barriers to use, characteristics of training, perceptions of teacher education, student outcomes, and teacher education participation. Student outcomes were not reported in the observation findings because the IRB video consent of a minor form confirmed that I would only be observing the teacher in the classroom.

Mixed Methods Design and Trustworthiness

Mixed method studies also have burden of being open to both quantitative and qualitative validity threats. However, combining the research methods can address the threats. For example, the completion of a survey in addition to the interview and observation addressed the threat to credibility. For this study, I addressed threats to validity and trustworthiness by using the methods previously listed for both the quantitative and qualitative strands. Furthermore, a reliability score of .968 based on Cronbach's alpha noted that the survey items were "excellent" (George & Mallery, 2003).

Unique to mixed methods are the problems of representation, integration, and legitimization in the data analysis stage (Onwuegbuzie & Johnson, 2006) as well as inference quality and inference transferability in the design and interpretation phases (Teddlie & Tashakkori, 2009). Creswell and Plano Clark (2011) synthesized the abovementioned threats and organized them according to the stages in the specified design process. For example, a convergent design might face different threats than a transformative design.

For this study, I anticipated the following data collection threats and addressed them accordingly. Selection procedures were addressed by taking qualitative samples from my quantitative population to make my data comparable. Potential bias from quantitative to qualitative data was addressed using separate data collection procedures. The threat concerning collection of data that does not relate to the same topic was addressed by ensuring that my interview questions and observation focus questions were

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in sync through the creation of the research crosswalk. Concerning data analysis threats, I addressed uninterpretable display by developing a joint visual that contained both quantitative categorical data and qualitative themes. Data transformation was addressed by using consistent procedures that enhanced reliability and validity. I addressed the use of inappropriate statistics by being mindful of the fact that relationships amongst variables may not exist and I used nonparametric statistics to analyze results when that was the case. Threats to interpretation were addressed as well. Divergent findings were addressed by re-analyzing current data and/or re-evaluating interpretation procedures. Finally, the issue of not discussing the mixed methods questions in the interpretation were addressed by discussing the results in terms of each individual research question.

By addressing issues of validity and trustworthiness and being intentional and consistent throughout the design process and the administration process, I am confident that I conducted a rigorous mixed methods research study that yielded sustainable, replicable results.

Participants

Survey participants. The survey (see Appendix G for a list of survey questions) was started by 238 people but completed by 113 people who identified as K-12 world language teachers in North Carolina. Of this number 82 identified as female (72.6%), 23 identified as male (20.4%), and eight (7.1%) decline to respond.

Survey participants' education levels included bachelor's degrees (22.1%), post-baccalaureate or teacher certification (10.6%), some master's degree coursework

(13.3%), master's degrees (43.4%), some doctoral coursework (6.2%) and doctoral

degrees (3.5%).

As shown in Figure 5, although their ages varied, most participants were between

40 and 59 years of age (67.3 %).

Figure 5. Survey Participants' Ages
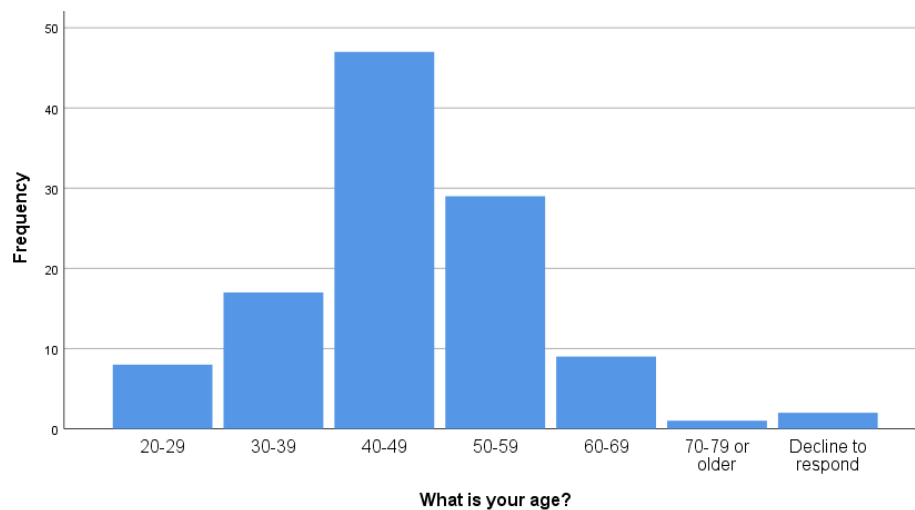
Figure 6 shows that the teachers worked at primarily public, non-charter schools

(71.7%), while the remaining teachers worked in public, charter schools (13.3%), private,

non-religiously affiliated schools (7.1%), private, religiously affiliated schools (5.3%),

and online schools (1.8%). The participants were primarily 9-12th grade teachers (57.5%),

a few (28.3%) were 6-8th grade teachers and some (9.7%) were K-5th grade teachers.

Teachers who taught across grade levels made up 16.8% of participants.

Figure 6. Type of School
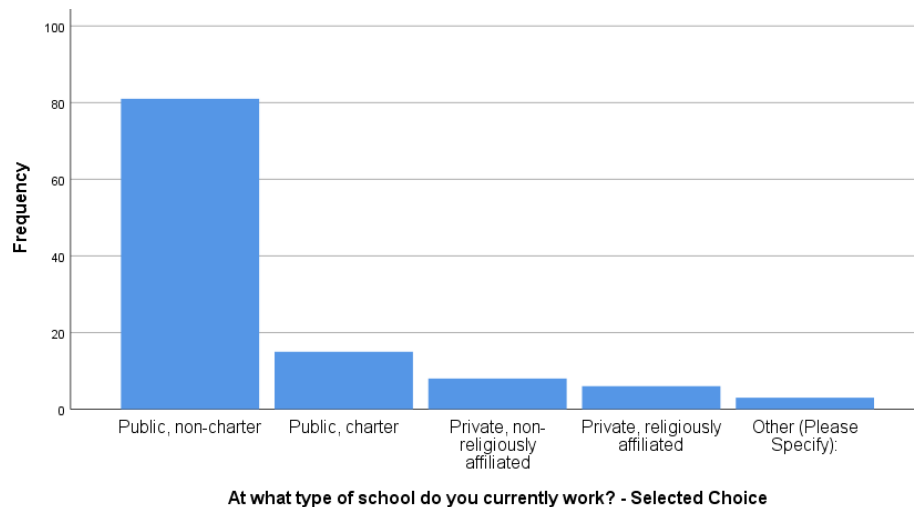
Most of the participants had more than ten years' teaching experience (69%). There were a few who had 5-10 years of experience (19.5%) and still others who had less than 5 years of experience (11.5%).

A profile of interview and observation participants' survey responses. After conducting the analysis for maximum variation sampling, reaching out to the potential teachers and securing district approval, I interviewed 5 teachers and observed 4 of them. The respondents who were interviewed and observed were 9-12th grade teachers with one K-5th teacher. Three of them taught Spanish and two taught French. The teachers ranged in age from their twenties to fifties with the majority being in their forties. Most of them taught at public schools and one taught at a private school. Their teaching experience varied greatly with two participants having less than five years' experience, one participant with five to ten years' experience, and two having more than ten years' experience.

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As recommended by the TESOL standards (2008), the participants sought opportunities to increase their knowledge of how to use WELL technologies in the classroom. They did so in a variety of ways. While the majority reported being self-taught, they also subscribed to a social constructivist paradigm by learning with colleagues. Furthermore, the participants learned from technology staff, from online sources, and through teacher training workshops. They reported that they would like teacher education activities to be differentiated, to allow time for expert support, to be presented in context, and to offer updates on new resources. The interview and observation participants preferred that teacher education activities be interactive and focused on content but noted that they did not experience those characteristics very often in the teacher education activities they had attended.

The majority agreed that WELL teacher education activities have made them more likely to integrate WELL technologies into their classroom. The participants' survey responses aligned with previous research that noted the positive impact that appropriately integrated instructional technology can have on student outcomes (Carr, Crocco, Eyring, & Gallego, 2011; Ketsman, 2014). They use WELL for individualized practice, student assessment, student motivation, for authentic materials, to give immediate feedback, and to provide access to content-rich activities. They all felt prepared to use WELL and reported that they have few perceived barriers that prevented them from doing so.

CHAPTER IV

FINDINGS

Introduction

This chapter reported the results for this study by research questions (RQ) and thematic constructs. The thematic constructs were presented in Chapter III and used to construct the survey as well as the interview and observation protocols.

This chapter included an overview of the interviews and observations and an analysis of the survey demographics. Factor analysis of the survey data by research question was conducted to further validate the survey instrument and reliability tests by construct were completed using Cronbach's alpha. The validity of the survey data was reported by research question along with the outcomes of chi square goodness of fit tests. Next, aligned with the research questions and within each construct, the quantitative data was presented followed by the qualitative data. The survey data is reported using descriptive statistics, and thematic coding for the open-response questions. Tables and figures were used to illustrate those findings. The coded interview and observation data were presented with quotations and field notes as examples. All identifying information was removed and pseudonyms were used for all participants.

Research Question 1: Ways of Learning to Use WELL Technologies

Overwhelmingly, teachers (82.3%) indicated they were self-taught. The next two most popular methods for learning how to use WELL technology were from colleagues

(58.4%) and teacher training workshops (57.5%). Teachers have also learned from online sources (51.3%) and technology staff (47.8%). Fewer teachers (30.1%) have learned through their teacher education programs. Some teachers (12.4%) also noted additional ways that they learn to use well. Those additional ways of learning to use WELL technology and the number of teachers for whom that method applies are as follows: blogs (1), their students (1), the world languages instructional director (1), the Science Technology Engineering and Math (STEM) coach (1), the Imagine Learning curriculum language and literacy curriculum (1), professional development and conferences (4) such as Foreign Language Association of North Carolina (FLANC), Southern Council on the Teaching of Foreign Languages (SCOLT), and the International Society for Technology in Education (ISTE). Figure 7 illustrates that the participants learned to use WELL technologies in a variety of ways.

Figure 7. Ways of Learning WELL Technologies
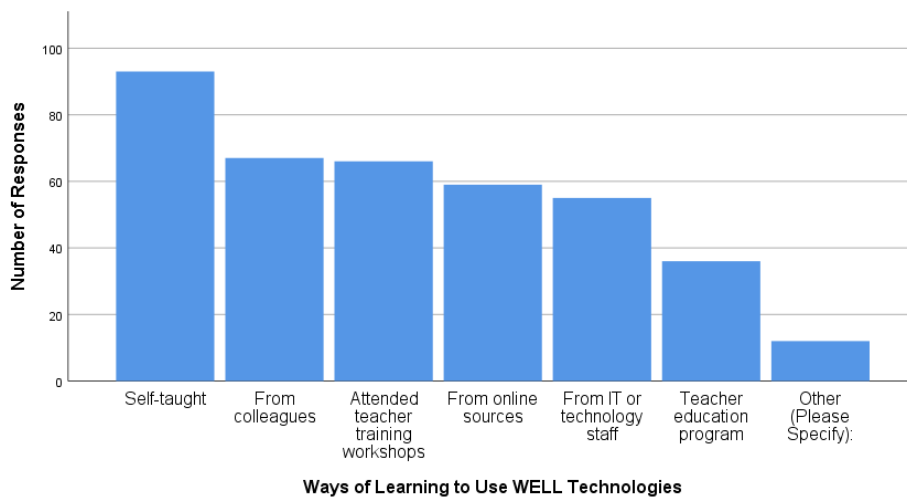
The interviewed teachers reported that they also learned to use WELL technologies in a variety of ways, although Alba and Mabel said they had not received any training that was specific to world languages. All the teachers said that they learned to use WELL technologies on their own and through professional development workshops. Mabel mentioned that they were not covered in her pre-service teacher education program, but Monique discussed her exposure to WELL in her master's program.

> Web based tools were never covered in any of my methods courses in college and while professional development at the county level does have some professional development with technology and with web-based tools, there's nothing specifically for world's language teachers that's offered in my district.

Alba subscribed to email listservs and since she felt comfortable finding WELL technologies on her own, she had not sought any teacher education opportunities surrounding WELL as of late. She also liked to involve her students when learning new technologies.

> I have them play with these new programs that come out and they help me figure out which ones work well, and which ones don't for what we're applying it to, so I let them be kind of like the guinea pigs.

Research Question 1a: Access to WELL Teacher Education

RQ 1a Validity

The KMO measure of .500 for RQ 1a was not adequate for a factor analysis. This research question and construct had an unacceptable reliability score of .064 and the item scale analysis found that if question 7 were removed the score would increase to .424.

This suggests that question 6, 7, and 8 may need to be revised and question 7 may need to be removed or associated with a different construct prior to a second administration of the survey. The factor analysis results highlighted below in the section for RQ 2 suggest that this question more closely aligns with the survey items for research question 2.

Teacher Education Participation

Most survey participants (69.9%) have attended professional development focused on WELL at some point during their careers. The majority (65.5%) of the respondents have had WELL teacher education opportunities over the last 12 months. Some respondents (32.7%) said that although they had opportunities to participate in teacher education opportunities that addressed WELL, they wished there had been more. An equal amount (32.7%) felt as though they had sufficient training opportunities. Of the people who had access to teacher education opportunities, 50.6% had attended one to two activities, 27.3% attended three to four activities, 9.1% attended five or more activities. Some respondents (23.9%) did not participate in teacher education activities but wished there had been more opportunities. A very few (8%) did not have opportunities, but were not interested in participating, and 2.7% were unsure about their access to teacher education opportunities.

From the interviews Mabel, Malina, Alba, and Monique mentioned that they had been a part of their district's technology training in the last 12 months. Malina participated in training on the district's new Learning Management System (LMS) and Alba completed a lateral entry teacher program through a dual face-to-face and online module. Mabel and Monique both attended district trainings for the new one-to-one

programs being implemented at their school. As a teacher leader, Monique was a part of her district's pilot program for one-to-one devices in the elementary school. As a result, she also attended a state and national conference on instructional technology.

> Our school is now a one-to-one school as of last year and there's been a big push and increase in all of our PD to be technology based and learning last year I was able to go with a team of teachers from my school to ISTE, which is the …the International Society for Technology and Education and it was in San Antonio and that was fantastic and then this year I went to NCTIES [North Carolina Technology in Education Society]. So, there's been some real money put towards this initiative in my school and I, being a leader in my field… in my school … I have been given the opportunity to go.

All the interviewees mentioned that although the district trainings were not focused on world languages specifically, they were able to use the technologies to suit their curricula. However, Alice had been to recent training geared towards world languages, FLANC, and went to some sessions that were specific to WELL. She also learned about some resources through class observations; however, as she did not like to miss class time, she did not go to many off-site trainings.

Research Question 1b: Characteristics of Effective WELL Teacher Education

RQ 1b: Validity, Reliability and Goodness of Fit Test

Validity and reliability. The KMO measure of .411 for RQ 1b was too low for a factor analysis with a reliability score of .990.

Goodness of fit. Although question 12 is aligned with RQ1b, question 17 helps answer RQ 2. Question 12 asked the respondent to 'think back over the WELL teacher training activities you attended and rate the following statements.' Of the 14 statements,

statement 13 'I attended with colleagues from my school' showed a relationship to the re-coded version of question 17. This version referred to the frequency of the ways in which effective WELL classroom practice are implemented based on TESOL (2008) guidelines. The relationship, $\chi^2(1, N = 90) = 3.86$, $p = .049$, shows that people who mostly use the TESOL effective practice standards attended WELL teacher training with someone from their school (58.8%). The opposite, that people who rarely employed effective practice do not attend WELL teacher training with school colleagues (64.3%) was also reported (see Table 7).

Table 7

Crosstab Questions 12 and 17

			Please think back over the WELL teacher training activities you attended and rate the following statements. - I attended with colleagues from my school		
			Never, Rarely, Sometimes	Most of the Time, Always	Total
Are Effective Practices Present in Teacher Education Activities	Never, Rarely, Sometimes	Count	18	10	28
		%	64.3%	35.7%	100.0%
	Most of the Time, Always	Count	21	30	51
		%	41.2%	58.8%	100.0%
Total		Count	39	40	79
		%	49.4%	50.6%	100.0%

Characteristics of Teacher Education Activities

According to Figure 8, the three most effective characteristics to have in teacher education activities were reported as: including interactive learning activities (46%), presenting solutions to potential obstacles for teachers (33.6%), and providing solutions to obstacles that students may face (29.2%). Respondents noted they felt these

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characteristics were present sometimes (42.5%) in the WELL teacher trainings they

attended.

Figure 8. Effective Characteristics of WELL Teacher Education Activities
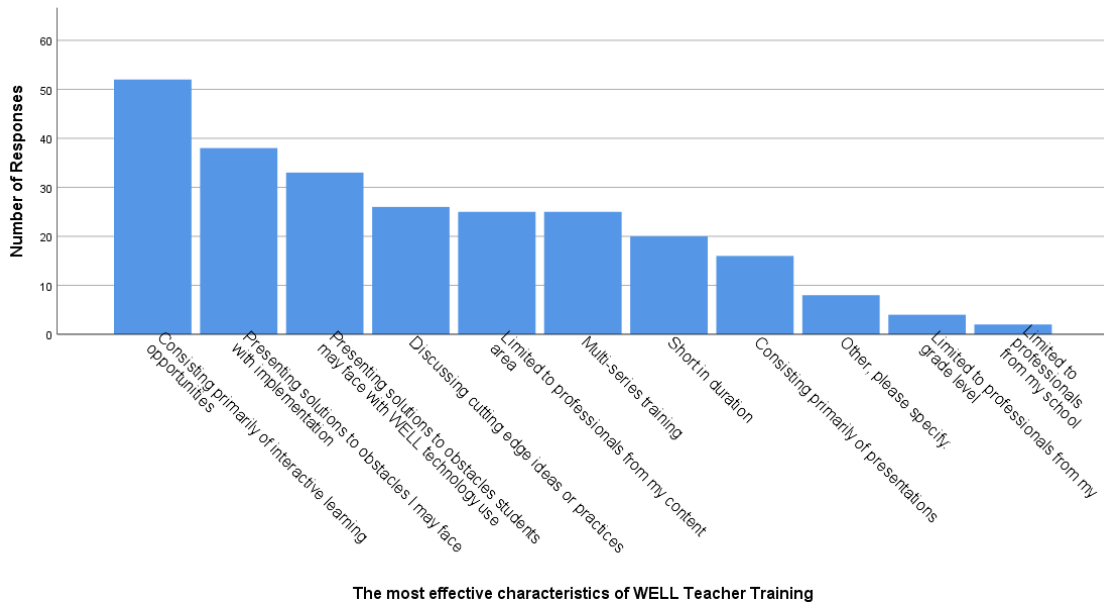
Participants believed the least important characteristics were homogeneous

groupings and that teacher education activities consist primarily of presentations. In the

open-answer section, respondents reported additional characteristics that made them most

likely to incorporate what they learned into their own classrooms. They said that they

preferred assistance at the time of developing lessons, ease of use and implementation,

when activities were adaptable to and in line with teachers' classroom content and beliefs

about how to promote proficiency, when the benefits far outweighed the time or effort

needed, when they were not limited to learning from professionals in the county, and

when teachers were given time to create an activity during training.

In question 12, the respondents were asked to report the extent to which the characteristics of effective teacher education were present in the activities that they attended. All together, they reported that modeling, the introduction of new technologies and attending with colleagues were the most present in teacher education activities (see Figure 9). The reliability score was excellent (.972) for this construct.

Figure 9. Presence of Effective WELL Teacher Education Characteristics
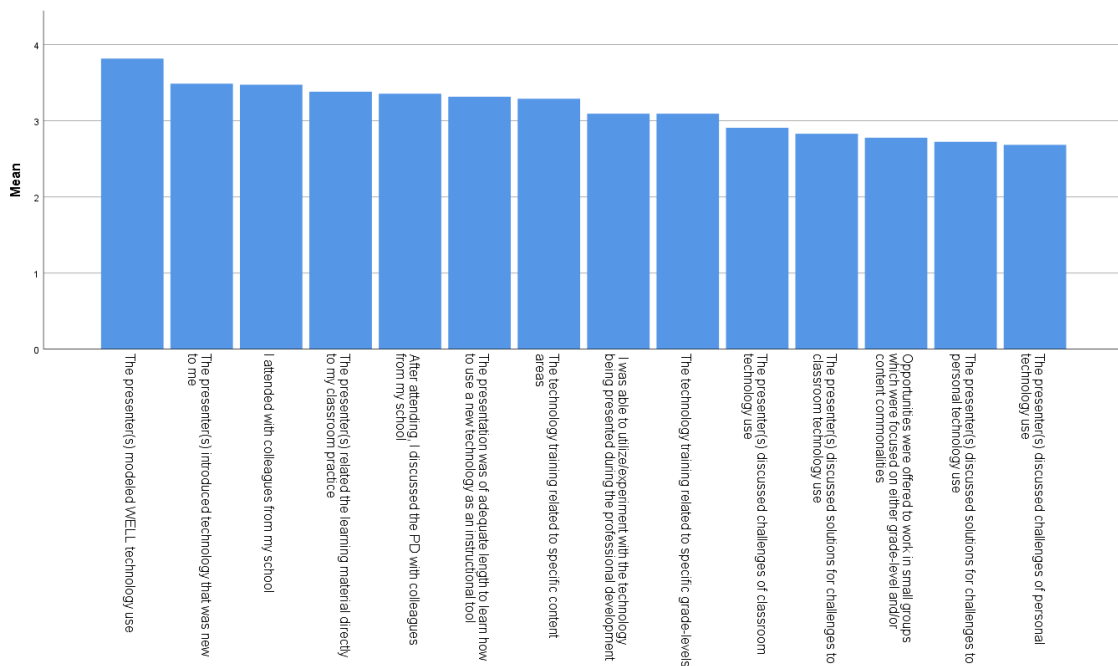
Resulting from their experiences with learning to use WELL technologies, the interviewed teachers noted a few characteristics of training that made them more likely to use the materials in the classroom. Malina expressed the need for actual access to the materials being presented. The interviewees also said that allowing participants time to practice with the materials during the presentation and modeling how the WELL could be used was important.

From the training, [Alba liked] the fact that we were able to use it during the training hands-on not just somebody telling us a whole bunch of websites and giving us examples that they used during the trainings. I actually got to use the technology and the programs that they were talking about so when I came back to school I could apply it even further to what I wanted to use, I'd already had a little bit of experience during the workshop so that was the most important part to me.

Having a follow-up session and/or some available support were also thought to be useful. Alba also noted that having a follow-up session where she and her presenter communicated about how the tools were being used in her classroom was wonderful. Mabel appreciated the opportunity to work with the tools, but she liked that she could "still have someone there to help [her] in case [she] wasn't doing a great job of applying it". Mabel and Monique both articulated their appreciation for a presenter who truly understood a classroom setting and one who could acknowledge the diversity in the types of teachers in a session. Monique was looking for recognition as a world languages teacher.

I think it would go a long way with someone like me if the trainer were to acknowledge that there are lots of different types of teachers in the room with them that day. [They] sometimes teach the sessions toward what they perceive as the teacher which a lot of times is as a classroom teacher who sits in the same room with the same kids and has math, science, PE. They do their planning everyday with their team of teachers and my world is very different. So, a good training is someone who recognizes the people in the room as being varied and then also might give opportunities for brainstorming, working together. Any good teacher, you would in your own classroom, recognizes all the different types of kids. I feel like in a good training I need to feel like I'm being seen …. there's generally not a lot of world language teachers …. more classroom teachers are there. So, to me a good training has someone who acknowledges that. (Monique)

Mabel would have liked to be grouped by technology level.

> Mabel: I mean I guess it's really helpful when the presenter sort of understands the classroom and some of the limitations and realities of the classroom because I've seen some like really great tech ideas that I couldn't really implement because I didn't really receive direction on like how to actually realistically implement it.
>
> Me: So, would you say that it would be beneficial for you to have a training that was geared towards varying levels of technology comfort?
>
> Mabel: Yeah definitely, and that that was one of the strengths of the training I had last year that I liked. Because for example, with Canvas, which is our district's sort of web-based classroom, they actually split us into two sections of beginning and then intermediate advanced, so I went to the intermediate advanced and got a lot more out of it.

Technological Pedagogical Content Knowledge (TPACK)

The TPACK construct intersects with previously discussed teacher education participation constructs in the following areas: characteristics of effective WELL training, barriers to using WELL, teacher perceptions of technology, and the ways WELL training is applied. Overall, the respondents reported that in WELL teacher education they had received, they sometimes experienced what they articulated as the most effective characteristics of WELL teacher education. Respondents had an overall positive perception of technology and they used TESOL technology standards often. Barriers included lack of time, lack of device reliability, and a lack of training. In reporting ways in which WELL teacher training has been used in the classroom, the respondents wrote that they chose WELL technologies that align with students' needs and abilities, that they identified more than one approach when attempting to meet an objective, that they prepared and maintained technology environments to meet teaching goals, and that they

evaluated WELL for curricula goals. In addition, they used their WELL teacher education to integrate pedagogical knowledge with technology to enhance WELL activities in the classroom. The reliability score was excellent (.996) for this construct.

Perception of WELL Teacher Education Activities

Overall teachers had a favorable perception of WELL teacher training. They agreed that it made them more likely to integrate WELL into their classroom. While over half of the participants reported that the training was either very useful (41.7%) or extremely useful (11.3%), others reported it as moderately useful (38%) or slightly useful (8.8%). Participants said that the presenter(s) modeled WELL technology use some of the time (38.1%).

Question 11 was an open response question that asked participants to say what they thought could be done to improve WELL teacher education activities. To analyze that question, I created 16 codes based on what teachers wrote and calculated the frequency of teachers' responses that corresponded to the codes. To improve WELL teacher education activities, 65 respondents to that question suggested the following: technology trainings geared to specific curriculum or world languages instruction (35.4%), hands-on instruction and practice time (27.7%), more one-on-one support (9.2), time for questions and follow-up after the presentation including updates (6.2%), training focused on how to integrate WELL into pedagogical practice (4.6%), smaller chunks of information (4.6%), having the technology equipment available for use in the training (4.6%), improving the lack of resources (3.1%), just more training in general (3.1%), learning from a colleague or other teachers (3.1%), online modules for learning and

practice (3.1%), differentiation for teachers with different technology abilities (3.1%), in

depth long term training (1.5%), training geared towards online classrooms (1.5%), more

activities to try out (1.5%), and improved web-based tools or device reliability (1.5%).

Below are some quotes from question 11 describing teachers' most desired

improvements to WELL teacher education. Respondents desired activities that focused

on their curriculum and world languages:

> Focus on ways to methodically integrate specific technologies in the overall course blueprint and in developing proficiency, rather than just a bag of ideas to use.
>
> Most of the information and platforms we use are in English only and some of them have a few materials in Spanish, then it would be great we can have access to more resources in the language we are teaching.
>
> Maintain a focus on content rather than tools.

Respondents also wanted more hands-on instruction and time to practice.

> It would be great if we could practice using it during the training instead of just watching someone use it.
>
> More time to work on actual things to use in the classroom. It's great to be showed a program, website, etc., but if you don't have time to make it useful for your classroom you either forget about it or don't have the time to incorporate it.
>
> Hands-on instruction in small groups is much more effective than a lecturer talking to a large room. Sufficient time needs to be given to create actual lessons and activities, and then a follow-up for review and suggestions.

Overall, the interviewed teachers noted that the teacher education activities that

they have attended were not consistently useful.

I would say pretty mediocrely, I don't think I've had like really high quality across the board (Monique).

With trainings I've been to about technology, it's kind of hit or miss. Some of the presenters and things I've learned have been really great and some of them have been just a lot of troubleshooting with teachers who didn't even really know how to use the computers (Mabel).

Most the time workshops you're sitting and listening to people and they're horrible (Alba).

Although the interviewees mentioned there were some that were of high quality, Monique thought there were too few opportunities related specifically to her curriculum. Monique also reported that what was often noted as training was "exposure to the existence of a platform or an app and then some examples." As a result, she would have to do most of the work herself behind the scenes to learn how to apply the technology to her classroom. Malina said that on a scale of 1-10, she would give WELL teacher education a six for the following reason.

It tends to be very generalized and it's only for like one website. For example, if we're using a textbook with Vista Higher Learning the training is generally geared towards that particular book, but since we don't use only that book in class it's very limited to what we can do and if they don't buy access for each one of the students then it's a little bit of a waste of time because I'm learning what the kids could do if they had a license. But since the district didn't buy the license then it's not very helpful.

This construct had a reliability score of .999 which suggests that the four questions (9, 10, 11, 12) associated with this construct may have been redundant in that they were asking the same question.

Research Questions 2, 2a, 2b and 2c Validity

In Table 8, RQs 2, 2a, 2b, and 2c as a super construct, yielded a KMO measure of .703 (N=85) and Bartlett's Test of Sphericity was reported as significant at .000 (Watson, 2017). The Cronbach's alpha for all survey question associated with RQ 2 is .936. Two factors emerged: the ways that WELL teacher education is applied and the perception of technology in connection to the frequency of use. Questions 7, 9, 16 and 17 loaded well (>.5) on to the ways that WELL is applied factor with question 7 touting a low (<.5) communality. This could mean that as we saw earlier, question 7, which asks about the number of teacher education activities attended, could be reworded or reworked to load with more communality on to research question 2. Questions 9 (participation in WELL teacher education makes participants more likely to use WELL technologies), 16 (frequency of WELL use before WELL teacher education) and 17(ways of using WELL teacher education in the classroom) had very high rotate factors which suggests that they could have been redundant. Questions 18 (WELL impact on student outcomes), 20 (purpose of using WELL), 22 (teachers prepared to use WELL) and 29 (frequency of WELL use) loaded onto the second factor. Questions 21, 23, 24, 25, 26, 28 and 30 did not load well on to any factor which means those responses accounted for little to no variance. This could be due to the wording of the questions or that those questions could be removed or condensed to garner more valid responses.

Table 8

Research Questions 2, 2a, 2b and 2c Descriptive Statistics, Factor Loadings, and Communality for Survey Questions

Survey Question	Mean	Std. Deviation	Communality	Ways WELL Applied	Perception of Tech &Use
07	32.09	44.68	0.41	0.56	
09	30.73	43.09	1.00	0.96	
16	30.34	43.33	1.00	0.96	
17	30.79	43.06	1.00	0.96	
18	4.26	0.86	0.51		0.54
20	22.99	20.46	0.65		-0.55
21	4.02	1.07	0.34		
22	3.84	1.23	0.56		0.60
23	4.40	3.59	0.25		
24	14.08	6.15	0.45		
25	2.15	10.63	0.04		
26a	3.21	0.71	0.59		
26b	1.71	0.36	0.84		
28a	3.48	0.37	0.51		
28b	1.71	0.25	0.32		
29	4.56	1.52	0.39		0.53
30	3.22	10.56	0.21		

Research Question 2: Ways Teachers Apply WELL in the Classroom

RQ 2: Validity, Reliability and Goodness of Fit Test

Validity and reliability. RQ 2 yielded a KMO measure of .777 (N=113).

Although two factors emerged, one was discarded due to the lack of 3 or more variables.

As noted before, questions 7, 9, 16 and 17 loaded well (>.5) on to the ways that WELL is

applied factor with a low communality for question 7. Once again, questions 20, 22, and

23, did not load well on to any factor (see Table 9). The reliability score was .951.

Table 9

Research Question 2 Descriptive Statistics, Factor Loadings, and Communality for Survey Questions

Survey Question	Mean	Std. Deviation	Communality	Ways WELL Applied
07	33.36	45.09	0.34	0.58
09	31.62	43.48	0.97	0.98
16	32.12	44.07	1.00	0.98
17	32.73	43.70	0.99	0.98
20	25.60	21.77	0.62	
22	3.76	1.28	0.19	
23	4.43	3.70	0.23	

Goodness of fit. Question 17 asked the respondent to 'think back over the ways in which you use your WELL teacher training in the classroom and rate the following statements.' Of the 16 statements, statements 4, 'I train students to use WELL appropriately to achieve their learning objectives', and 12, 'I use WELL technologies for record keeping', showed a relationship to the re-coded version of question 12. This version referred to the frequency that effective teacher education methods are present in WELL teacher education activities that align with TPACK. The relationships, $\chi^2(1, N = 90) = 7.15$, $p = .007$ and $\chi^2(1, N = 90) = 4.54$, $p = .033$ respectively, show that people who indicate that effective practices learned in their WELL teacher education activities are present, find themselves using WELL to teach students to use WELL appropriately to meet their learning objectives and for record keeping (see Tables 10 and Table 11).

Table 10

Crosstab Questions 17 and 12 Statement 4

			I train students to use WELL appropriately to achieve their learning objectives		
			Never, Rarely, Sometimes	Most of the Time, Always	Total
Effective Practices Present in Teacher Education Activities	Never, Rarely, Sometimes	Count	23	28	51
		%	45.1%	54.9%	100.0%
	Most of the Time, Always	Count	4	23	27
		%	14.8%	85.2%	100.0%
Total		Count	27	51	78
		%	34.6%	65.4%	100.0%

Table 11

Crosstab Questions 17 and 12 Statement 12

			I use WELL technologies for record keeping		
			Never, Rarely, Sometimes	Most of the Time, Always	Total
Effective Practices present in Teacher Education Activities	Never, Rarely, Sometimes	Count	16	36	52
		%	30.8%	69.2%	100.0%
	Most of the Time, Always	Count	9	17	26
		%	34.6%	65.4%	100.0%
Total		Count	25	53	78
		%	32.1%	67.9%	100.0%

Effective Classroom Practices

Concerning TESOL effective classroom practices, most respondents (69.9%)

noted that they attended WELL teacher education activities (see also Teacher Education

Participation). Of the people who attended WELL teacher education activities, most

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reported that attending teacher training activities that addressed WELL made them more likely to integrate WELL into their classroom (37.5% somewhat agree, 37.5% strongly agree). Most respondents said they felt prepared (41.6% somewhat agree, 31.9% strongly agree) to incorporate WELL technologies into the classroom. A few (8% somewhat disagree, 8% strongly disagree) did not feel prepared.

Most respondents have reported that they incorporate the TESOL effective classroom practice performance indicators as listed in survey question 17. Some (27.1%) incorporate them sometimes and 35.7% incorporate them often. Table 12 represents the mean of the degree, based on a five-point Likert scale, to which teachers felt they incorporated effective classroom practices in their teaching.

Table 12

Ways WELL Technologies Used in the Classroom and Effective Classroom Practices

		Responses		Percent of Cases
		N	Percent	
Ways WELL Used	Never	37	3.1%	46.8%
	Rarely	99	8.4%	125.3%
	Sometimes	319	27.1%	403.8%
	Often	421	35.7%	532.9%
	Always	303	25.7%	383.5%
Total		1179	100.0%	1492.4%

Teachers primarily used WELL technologies to increase student motivation and to provide individualized student feedback. Mostly, they use audio-visual sites and language learning practice sites. They also use many other self-reported sites (see Types of

Technology). Although many teachers learned to use WELL technologies on their own, they also learned from colleagues and from teacher education activities.

The qualitative data for this construct were collected through observations with Mabel (personal communication, April 27, 2018), Monique (personal communication, April 26, 2018), Alba (personal communication, April 4, 2018), and Alice (personal communication, April 24, 2018). The findings were reported by the conceptual framework/TESOL language teacher standards used to guide my classroom observations.

Goal 1. This goal refers to language teachers acquisition and maintenance of foundational knowledge and skills for professional purposes.

Standard 1: The teacher trains students to perform basic functions on digital devices. When the teachers instructed students to complete certain tasks with the technology (see the Student Outcomes section) they followed instructions without much fuss. When students ran into trouble, Alba either quickly determined what the issue was and resolved their problem or left it to another student to help with the solution. Mabel allowed students to use smartphones or laptops to perform the required tasks.

Standard 2: The teacher trains students to exercise appropriate caution when using online sources. Monique was sure to mute or turn off YouTube videos that were not appropriate for class time.

Standard 3: The teacher trains students to understand that communication norms differ across cultures communities and contexts. Monique used a video to teach students how to write the letters of the alphabet the way children in France learn to write them. Alice asked students to research a French speaking nation and present a current

commercial and music video. Alba made a note of communication differences between Argentina and Central America in terms of using the verb irse. She also showed a video of a Guna Yala woman from Panama which discussed how to make a mola in the Guna language. Mabel showed a documentary in Spanish about young baseball players from the Dominican Republic.

Standard 4: The teacher trains students to use WELL appropriately to achieve their learning objectives. The students were shown how to use the Smartboard to practice the weather and calendar in Monique's French class. Alba reminded the students to change the Lexile option on the Newsela reading application. Mabel had links on the board to SpanishDict and her Quizlet class to direct students to an online dictionary and vocabulary practice. Alice required the students to complete a presentation about francophone cultures.

Standard 5: The teacher evaluates WELL technologies for student internet safety. As an elementary school teacher, Monique was sure to minimize extraneous advertisements. Mabel only projected school-appropriate technology, but the high school students were permitted to use Google to search for information about the Dominican baseball players on their smartphones.

Goal 2. This goal relates to the integration of pedagogical knowledge and skills with technology to enhance teaching and learning.

Standard 1: The teacher evaluates WELL technologies for curricula goals. Monique used technology that was appropriate for first grade students, i.e. songs, Smartboard, and alphabet graphics. Both Alice and Alba used Quizlet to practice

vocabulary. Mabel used Kahoot to practice discrimination vocabulary. They all used videos to show students authentic materials.

Standard 2: The teacher prepares and maintains technology environments to meet specific teaching/learning goals. Alice and Monique began their classes with a warm up routine to practice learning goals and objectives. Mabel used Google forms to ask students if they had connected with the learning goals for this week. Alba used the Chromebooks to have students practice reading comprehension skills.

Standard 3: The teacher chooses WELL technologies that align with student needs and abilities. Each teacher chose technologies that were age appropriate. Many technologies could be differentiated for skill level (i.e. Newsela and Quizlet). Mabel also asked the students if a certain web-based application had met their needs. Alba and Mabel allowed students to complete their homework on their smartphones, and Alba mentioned that she gives brain breaks using dance videos.

Standard 4: The teacher identifies more than one approach to meet an objective i.e. when technology is not working. In addition to technology, the teachers used a variety of activities to meet their goals. For example, Monique's class used their bodies to practice the alphabet and a poem and then whiteboards to practice writing. In Alice's class, students took notes on paper to evaluate student presentations instead of giving feedback on their laptops. When the speakers stopped working in Alba's class, she played the audio from her computer instead. Mabel also had a list of essential questions for the unit on the whiteboard and a print out of the study guide.

Standard 5: The teacher maintains research-based knowledge about up-to-date WELL technology use in the classroom. In addition to teacher education activities and being self-taught, Monique was also reading a book about digital space to better integrate her classroom space with technology use. Mabel asked the digital learning facilitator to come to her class and present some new applications that might be useful for her students.

Goal 3. This goal attends to the notion that language teachers apply technology in record-keeping, feedback, and assessment**.** For example, Monique used Classroom Dojo to keep track of attendance and behavior incentives for her students. Alice used a tablet to video record and to take notes during student presentations. Additionally, Mabel and Alba used WELL technologies to keep track of a formative assessment in the form of a game. I observed three of the teachers using technology for communication with students. Monique used Classroom Dojo, Mabel used Google Forms, and Alice used her school LMS and a survey website.

Standard 1: The teacher uses WELL technologies in innovative, up-to-date ways. All the teachers used WELL in up to date ways through various web-based applications and one of them did so with a Smartboard.

When I ran the analysis with my thematic constructs, the 'effective classroom practices' was the only one that had a significant KMO measure, which was .635 (N=113). This construct had two factors comprised of questions 7, 9, 17 and, 20, 23 with all variables loading well to their respective factors (way WELL applied and why use WELL) and the low communality for question 7. This suggests that the questions for this

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construct were valid and that had a sufficient sample size to support this claim. The reliability score was excellent (.948) for the effective classroom practices construct.

Ways WELL Teacher Education is Applied and Technology Use

Most respondents felt prepared to use WELL in the classroom. The prompts for this construct were based on the TESOL technology standards for language teachers. The average response of the prompts in question 17 were calculated based on their relationships to the goals listed above. Table 12, Table 13, Table 14, and Table 15 represent the means of the degree to which teachers felt they applied their WELL teacher education training in their classrooms based on a five-point Likert scale. Considering Goal 1 of the TESOL technology standards for language teachers, Table 13 illustrates how participants reported that they use their WELL teacher education to train students in the use of technology in the classroom. Over half of the participants noted that they either often (33.7%) or always (20.6%) teach students to perform basic functions on digital devices, to use appropriate caution when using online sources, to understand that communication norms differ across cultures, and to use WELL to appropriately achieve learning objectives.

Table 13

Ways Teacher Education is Applied: Goal 1 Language Teacher Technology Standards

		Responses		Percent of Cases
		N	Percent	
Goals1TechStandardsLT	Never	15	4.8%	19.0%
	Rarely	42	13.3%	53.2%
	Sometimes	87	27.6%	110.1%
	Often	106	33.7%	134.2%
	Always	65	20.6%	82.3%
Total		315	100.0%	398.7%

Participants also evaluated WELL technologies for student internet safety sometimes (18.6%), often (23.9%), and always (19.5%).

As it pertains to TESOL's second goal for language teachers, participants responded that they integrate pedagogical knowledge with technology to enhance WELL. Table 14 illustrates that over half of the participants noted that they either evaluated WELL technologies for curricular goals and align them with student needs often (33.9%) or always (36.2%). They also identified more than one approach to meet an objective and remained up-to-date with WELL technologies.

Table 14

Ways Teacher Education is Applied: Goal 2 Language Teacher Technology
Standards

| | | Responses | | Percent of |
		N	Percent	Cases
Goals2TechStandardsLT	Never	6	1.5%	7.6%
	Rarely	23	5.9%	29.1%
	Sometimes	88	22.4%	111.4%
	Often	133	33.9%	168.4%
	Always	142	36.2%	179.7%
Total		392	100.0%	496.2%

Table 15 shows that concerning TESOL goal 3, participants used WELL

technologies for assessment and record-keeping less frequently than some of the other

TESOL standards. Results showed that 28% reported using them sometimes for

assessment and record-keeping and 39.5% reported using them often.

Table 15

Ways Teacher Education is Applied: Goal 3 Language Teacher Technology Standards

| | | Responses | | |
		N	Percent	Percent of Cases
Goal 3 Tech Standards LT	Never	5	3.2%	6.3%
	Rarely	9	5.7%	11.4%
	Sometimes	44	28.0%	55.7%
	Often	62	39.5%	78.5%
	Always	37	23.6%	46.8%
Total		157	100.0%	198.7%

In line with goal 4, participants used technology to improve communication, collaboration, and efficiency. Over half of the participants noted that they sometimes (33.5%) or often (39.4%) use WELL for student feedback, communication, and in innovative ways (see Table 16).

Table 16

Ways Teacher Education is Applied: Goal 4 Language Teacher Technology Standards

		Responses		Percent of Cases
		N	Percent	
Goals 4Tech Standards LT	Never	8	3.4%	10.1%
	Rarely	19	8.1%	24.1%
	Sometimes	79	33.5%	100.0%
	Often	93	39.4%	117.7%
	Always	37	15.7%	46.8%
Total		236	100.0%	298.7%

Overall, the respondents reported that they chose WELL technologies that align with student's needs and abilities, that they identified more than one approach when attempting to meet an objective, that they prepared and maintained technology environments to meet teaching goals, and that they evaluated WELL for curricula goals. In addition, 35.7% of teachers reported that they incorporated TESOL standards often and 25.7% reported that they always used them, shown in Table 17.

Table 17

Ways WELL Technologies are Used

		Responses		
		N	Percent	Percent of Cases
Ways WELL Used	Never	37	3.1%	46.8%
	Rarely	99	8.4%	125.3%
	Sometimes	319	27.1%	403.8%
	Often	421	35.7%	532.9%
	Always	303	25.7%	383.5%
Total		1179	100.0%	1492.4%

Respondents reported, as seen in Figure 10, that they mostly use technology to increase student motivation (83.2%), for student individualized practice (83.2%), and to provide student access to authentic sources (73.5%). To a lesser extent, they used WELL technologies to improve student technological skills (48.7%) and to improve student communication in culturally appropriate ways (40.7%).

Figure 10. Purpose of Using WELL.

For what purpose is the WELL technology used in your world language course ?
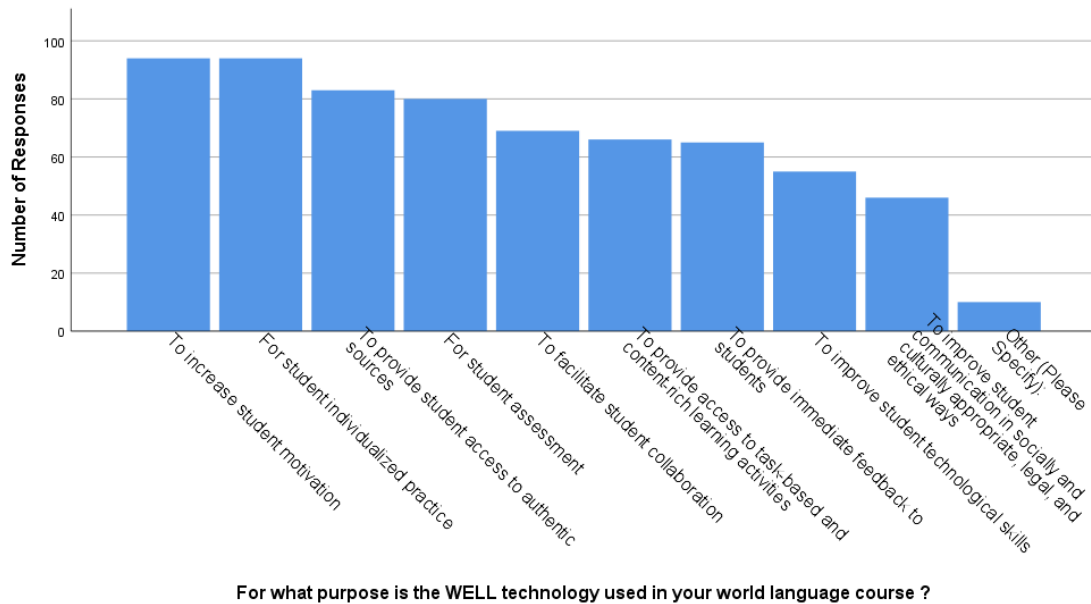
Prior to WELL training, teachers used WELL technologies sometimes (31.9%), and most of the time (22.1%). In a typical five-day school week, teachers used WELL sometimes (16.8%) (about half of the week), most of the time (26.5%) (more than half the week), and usually (19.5%) (the majority of the week). The number of different activities most often used per week were one to three activities (33.6%) and four to six activities (38.9%). The reliability score was excellent (.956) for this construct.

The observed teachers used WELL technologies for presentations and homework. In Alice's and Alba's classes, students presented to the class in the target language. Alice used a tablet to record the presentations to grade them later. Monique, Mabel, and Alba also used it to show authentic resources during the class. Monique showed a video of a French child learning to write, Mabel showed a documentary on some Dominican baseball player's rise to fame, and Alba showed a video of how Guna Yala women from

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Panama make traditional molas, ornate hand-sewn pieces of cloth to be worn on the front of women's clothing. Monique and Mabel played music in the target language and Alba mentioned that in her Spanish V class she plays Just Dance videos with a Spanish song to allow students to take a short brain break while staying in the target language. Alba and Mabel expressed their appreciation for Newsela and Textivate as ways for students to improve their reading comprehension at different Lexile levels. During the observation, Alba repeatedly reminded students that they could change the Lexile level for a reading on Panama that they were doing prior to answering reading comprehension questions. They also used technology for vocabulary practice, conduct surveys, to record student data, practice in the target language, assessments, feedback, to practice writing, to communicate with parents, and to keep track of student behavior.

Research Question 2a: Why Teachers Use WELL in the Classroom

RQ 2a: Validity, Reliability and Goodness of Fit Test

Validity and reliability. There was a .768 KMO measure for RQ 2a (N=113) and yielded the same result as RQ2 for questions 7, 9, 16 and 17. Cronbach's alpha was .949.

Goodness of fit. Question 21 asked respondents to use a Likert scale to answer the following statement: 'I would like to use WELL technology in my classroom more often.' Question 22 was similar and asked them to respond to the statement: 'I feel prepared to incorporate WELL technology in the classroom to support student learning.' The relationship, $\chi^2(1, N = 90) = 12.43$, $p = .0001$, showed that people who felt prepared also would like to use WELL technologies in the classroom more often (see Table 18).

Table 18

Crosstab Questions 22 and 21

			Question 21		
			Disagree	Agree	Total
Question 22	Disagree	Count	7	13	20
		%	35.0%	65.0%	100.0%
	Agree	Count	4	66	70
		%	5.7%	94.3%	100.0%
Total		Count	11	79	90
		%	12.2%	87.8%	100.0%

This crosstab in Table 18 also intersected with RQs 2 and 2c. Question 29 was on a Likert scale and asked, 'In a typical five-day school week, how often do you utilize WELL technologies in your classroom?' The relationship to question 20 with answer choices (1), 'For student individualized practice…' $\chi^2(1, N = 90) = 4.15$, $p = .042$, and (4), 'To improve student communication in socially and culturally appropriate, legal, and ethical ways' $\chi^2(1, N = 90) = 4.56$, $p = .034$ for the Fisher Exact Test, rejected the null hypothesis. It showed that people who used WELL less often (0-40%) tended to use it for individualized student practice. Also, people who used it more often (60-100%) tended to not use it to improve student communication in socially and culturally appropriate, legal and ethical ways (see Table 19 and Table 20).

Table 19

Crosstab Questions 29 and 20 Statement 1

			Not Selected	To improve student communication in socially and culturally appropriate, legal, and ethical ways	Total
Question 29	0-40%	Count	11	17	28
		%	39.3%	60.7%	100.0%
	60-100%	Count	41	25	66
		%	62.1%	37.9%	100.0%
Total		Count	52	42	94
		%	55.3%	44.7%	100.0%

Table 20

Crosstab Questions 29 and 20 Statement 4

			Not Selected	For student individualized practice	Total
Question 29	0-40%	Count	<5	27	28
		%	n<5	96.4%	100.0%
	60-100%	Count	14	52	66
		%	21.2%	78.8%	100.0%
Total		Count	15	79	94
			16.0%	84.0%	100.0%

Question 18 was on a Likert scale and asked, 'How do you think WELL technology use in your course affects student language acquisition?' The relationship of question 18 to question 21, $\chi 2(1, N = 90) = 8.70$, p = .003, showed that people who

wanted to use WELL technologies more often agreed that technology positively affected

student language acquisition, the reverse was also evident.

Student Outcomes and Motivation

Teachers reported that student individualized practice and motivation were

paramount in their classes. They believed that WELL technologies positively (somewhat

positively 44.2% and positively 44.2%) affected student language learning. They

believed that the use of WELL technologies helps students engage in language learning,

allows students to work at their own pace, and that it allows for more access to authentic

materials. However, they also noted that some students are distracted by technology; they

can become too dependent on it and not actually engage in acquiring the foundations of

the language. This construct had an acceptable (.785) reliability score (George &

Mallery, 2003).

As evidenced in the qualitative data, teachers demonstrated and reported that they

used WELL to meet the goals outlined on the conceptual framework with the TESOL

standards. In each observation, teachers instructed their students to access various web-

based applications and various devices. Students were asked to present, interact with the

smartboard to find letters, complete the calendar, and report the weather. Teachers also

asked them to look up information, complete surveys, practice vocabulary, and complete

reading comprehension exercises. Furthermore, teachers mentioned they assigned

homework to students online. Those practices align with Goal 1 for language learners on

the conceptual framework. As Alice mentioned, Goal 3 is what's missing from her

student outcomes. She found that students were not using their meta-cognition skills as

well as she had hoped. In her opinion, they were not being critical about using technology

to master the language. Conversely, to achieve goal 3, Alba asked students to help her

determine which tools were best suited to their needs. She also said that she wanted them

to be able to "wow" their professors with their skills at producing innovative

presentations and figuring out how different platforms work. During her class, Mabel

asked the students to give feedback on Flipgrid, a new application that they had used the

day before. She asked them to respond in the target language and to express why they did

or did not enjoy about the application.

Perception of Technology and WELL

As noted above, the respondents have an overall positive perception of

technology. They felt that it positively affected student outcomes. They use it in their

classrooms for student motivation and individualized practice and they feel prepared to

do so. In addition, most participants somewhat agreed (36.3%) or strongly agreed

(40.7%), that they would like to use WELL more often in the classroom (See Figure 12).

Figure 11. Using WELL More Often
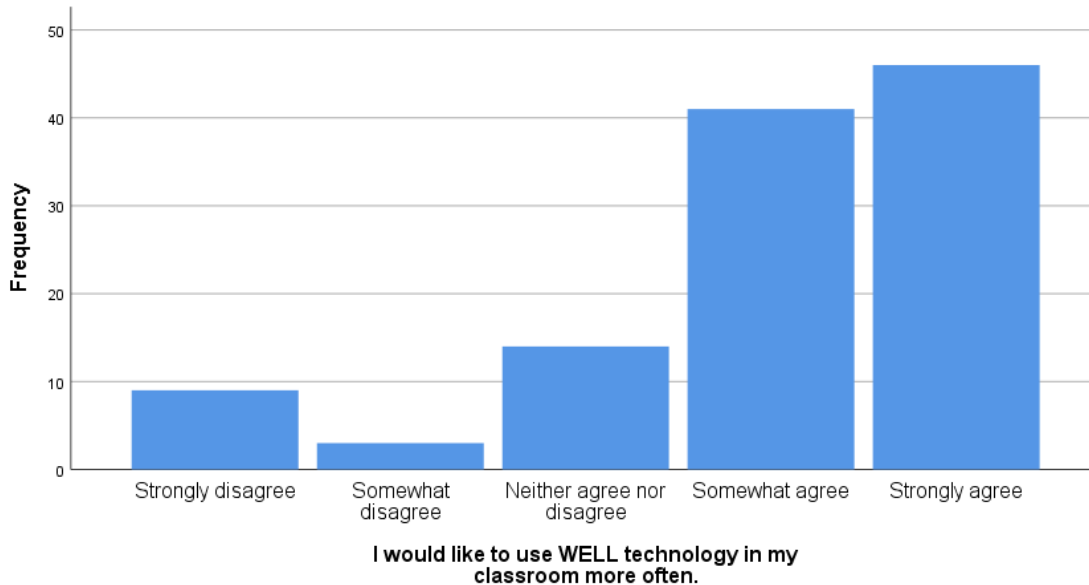
While the overall perception of technology was positive, there were some
concerns about the use of WELL technologies interspersed with praise for its utility in the
classroom. In question 19, participants were asked to explain how they think WELL
affects student language acquisition. To analyze this question, I once again created codes
based on what teachers wrote and calculated the frequency of teachers' responses that
corresponded to the codes. From the set of responses, I created 14 codes for 80 responses.
The participants said WELL positively affected student outcomes by: increasing student
engagement (22.5%), increasing student empowerment, individualized instruction and
self-monitoring (15%), supplementing the lesson and facilitating language learning
(17.5%), giving access to authentic sources and adding variety to language learning
(16.3%), providing more comprehensible input to improve (6.3%), showing students how
to use technology in a 21st century global society (3.8%), extending opportunities to

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expand language learning outside of the classroom (3.8%), and by allowing students to receive immediate feedback (5%).

      The following quotes demonstrate the respondents' feelings about how well positively affected student outcomes.

> WELL technology engages students, but I am unsure if it is the only reason for student success (Code: Student Engagement).

> Using videos from YouTube helps students hear authentic language and see visuals of the cultures and countries of the language. I use these tools every unit. WELL allows students to exercise listening skills at a personalized rate (educannon, etc.) Students appreciate immediate feedback and practice opportunities (Duolingo, Quizlet, etc.). Students love to create projects using video and greenscreen to show knowledge (Code: Student Empowerment and Access to Authentic Sources).

> Students use technology every day in my classes, whether they are recording and listening to themselves to improve pronunciation or writing illustrated reports based on information they found out through our interpersonal activities, they love technology and using it makes sharing their work easy and effective (Code: Facilitate Learning).

      On the other hand, respondents also said technology negatively affects student outcomes because students rely on it to do the learning for them (10%), students learn language better with a live teacher and hands-on practice (7.5%), students can be distracted by technology (3.8%), and because lack of student access to technology can be a problem (3.8%).

      The following quotes represent the feelings of how technology can negatively affect student outcomes.

I think that students often trust the technology and use translation site to help them rather than actually learning the vocabulary and how to structure sentences (Code: Rely on Technology).

There's nothing to replace live, face-to-face conversation. Not Skype, nothing is quite the same (Code: Live Teacher).

Respondents also noted that students must use technology with fidelity and frequency for it work (1.3%) and that it needs to be integrated well for it to be a positive influence (2.5%). These thoughts are represented by the following quote.

Technology use in the language class needs to be carefully selected to make sure that it is in the best interest of the student and not just to use a tech tool. Even though we are one to one, there are days that we do not use their Chromebook (Code: Strong Integration).

The perception of technology construct had an acceptable (.760) reliability score (George & Mallery, 2003).

The interviewed teachers all reported a favorable perception of WELL technologies. Malina liked that they "enhance the learning experience for [the students] and they feel comfortable" and Monique was so accustomed to using WELL technologies that some of it felt "basic". Furthermore, during the observations, all teachers demonstrated ease of use with the various technologies that they used in their classrooms. I only observed a few issues with the technology in the classroom, but they were handled quickly and without any observed frustration. In Monique's classroom when an O'Reilly's Auto Parts commercial came on YouTube, she quickly turned down the audio and another commercial was turned off to prevent the elementary students from getting

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distracted. In Alba's classroom when her wireless speakers went out, she played the audio from the computer. She also quickly solved an issue with a student who had trouble accessing a website on the Chromebook while continuing to give instructions. Additionally, I observed in Mabel's classroom how she quickly integrated additional technology into her lesson. *Since the video was over quickly, she told the kids while they did their exit form she would find a Kahoot (that is what they asked for) and students had to complete a Google form before signing in to Kahoot. Froze the projector while checking the Google form. Found Kahoot related to the video in a matter of minutes. (Observation Notes, April 24, 2018)*

The teachers also mentioned that they were interested in technology and that they thought it brought more fun and engagement into the classroom.

> Now there's sort of aspect of all the websites are used is they tend to just bring a little bit more fun in the classroom and a lot of them target certain skills that like I could just do on paper but using the technology makes it a little bit gamified and more appealing to the students. (Mabel)

Additionally, they appreciated how technology helps to support language acquisition. "As far as Textivate goes I really love that for reading comprehension" (Mabel). Referring to a web-based application called SeeSaw, Monique talked about how this technology allowed her to maximize her class time and engage the students in presentational and interpersonal communication.

> The video we're doing all the same time you know, or the picture is happening in the same class so within minutes I have all these data points done where as it used to be I would stand with my own camera with one kid at a time and take the

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video. So, it's really quick and then the more they use it the better they get at it and then they can also comment on each other's and that's really, really fun, when you teach them to do that in the target language so it's also meaningful and the feedback is real-time.

Conversely, while Alice appreciated technology in general, she was not convinced of its impact on her student's understanding of the language.

As far as how effective I feel it has been in implementation in my own classroom, I think the jury's still out on that. I think for students in general, there's a sense of comfort and familiarity of being able to you know come in with their laptop, plug it in, and you know listen to something or watch something. But I am not entirely convinced, and I don't know how much that's because the students are not applying what they are encountering in the classroom or they're not working outside the classroom on it even though they have access to a lot of these materials. I'm not sure that it is always transferring to their greater mastery. They like the play aspect but … I don't think it's always leading to the mastery results that one would hope for.

Research Question 2b: Types of WELL Technologies Being Used by World Language Teachers

RQ2b: Validity and Goodness of Fit Tests

Validity and reliability. The KMO measure of .507 for RQ 2b did not suit a factor analysis. The score for reliability was .902.

Goodness of fit. Question 24 was a 'select all that apply' question and asked, 'What barriers prevent you from using WELL in the classroom?' The relationship of it to question 21's answer choices of statements (5) 'Lack of device reliability', $\chi^2(1, N = 90) = 9.39$, $p = .002$, and (7) 'I do not have any perceived barriers', $\chi^2(1, N = 90) = 4.13$, $p = .042$, showed that people who did not want to use WELL technologies more often had

trouble with device reliability. Also, the people that did not want to use WELL said they

did not have any perceived barriers that prevented them from the use of WELL. These

relationships seem to contradict one another (see Table 21 and Table 22).

Table 21

Crosstab Questions 24 and 21 Answer Choice 5

			Not selected	Lack of device reliability	Total
Question 21	Disagree, do not want to use more often	Count	3	9	12
		%	25.0%	75.0%	100.0%
	Agree	Count	61	26	87
		%	70.1%	29.9%	100.0%
Total		Count	64	35	99
			64.6%	35.4%	100.0%

Table 22

Crosstab Questions 24 and 21 Answer Choice 7

			Not selected	I do not have any perceived barriers that prevent me from using WELL.	Total
Question 21	Disagree, do not want to use more often	Count	12	0	12
		%	100.0%	0.0%	100.0%
	Agree	Count	64	23	87
		%	73.6%	26.4%	100.0%
Total		Count	76	23	99
		%	76.8%	23.2%	100.0%

Types of WELL Technologies Used

In addition to computers, smartphones, headphones, projectors, wireless internet, and tablets, most survey respondents used audio visual sites (86.7%), and language learning practice sites (70.8%). Although some of the reported sites are not specifically geared towards language learning, 38.9 % of teachers also used the following in their world language classrooms: class blogs, Learning Management Systems (such as Google classroom, CANVAS, Power Learning), digital books, online news media sites and podcasts, game sites (such as Kahoot and Quizizz), and online textbooks. They also used many other websites and apps such as Adiostexbook.com, Edmodo, Educannon, Imagine Learning, Discovery ED, Flipgrid, Prezi, Storybird, Remind, Exittix, Padlet, Nearpod.com, iMovie, StopMotion, Drones, LitteBits, Vocaroo, Voki, Conjuguemos, Pig Quiz, Voicethread, Vocaroo, Radio France International, Rosetta Stone, Seesaw, Pear Deck, Class Dojo, and Wizer.me. Additionally, they used non-internet-based audio and video files (See Figure 12). This construct had a good (.854) reliability score.

Figure 12. Types of WELL Technologies.
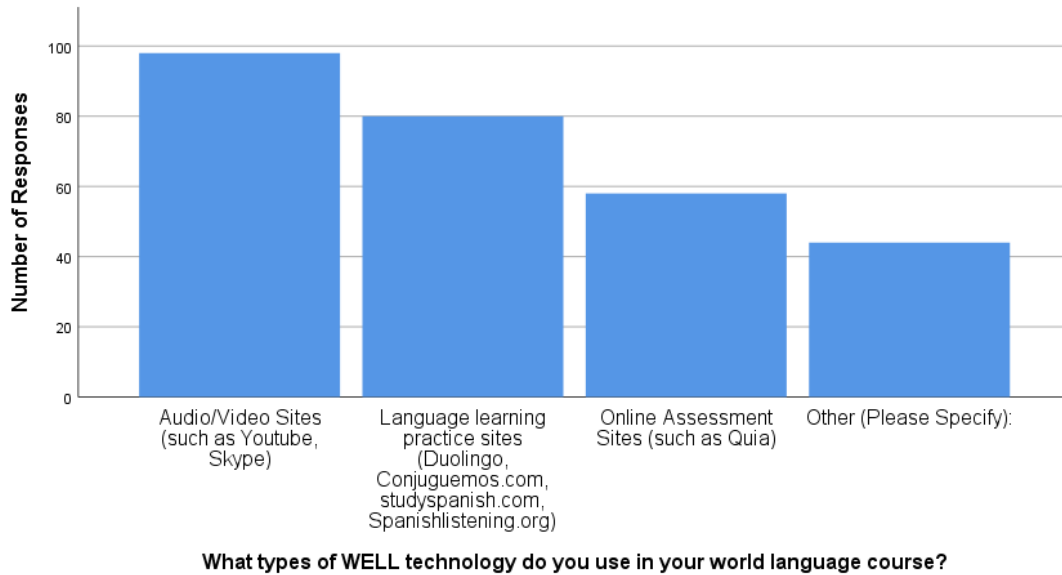
Barriers to Use

Most respondents felt prepared to use WELL technologies and would like to use it more often. In terms of access, they reported that teachers (100%) and students (81%) have access to laptops. Sixty two percent of teachers and 56% of students were reported to have access to those devices seven days a week. They felt as though lack of time (38.9%%) was the most prevalent barrier to WELL use, followed by a lack of device reliability (36.3%), and lack of training (31%). The barriers to use of WELL technologies are presented in Figure 13.

Figure 13. Barriers to WELL Use
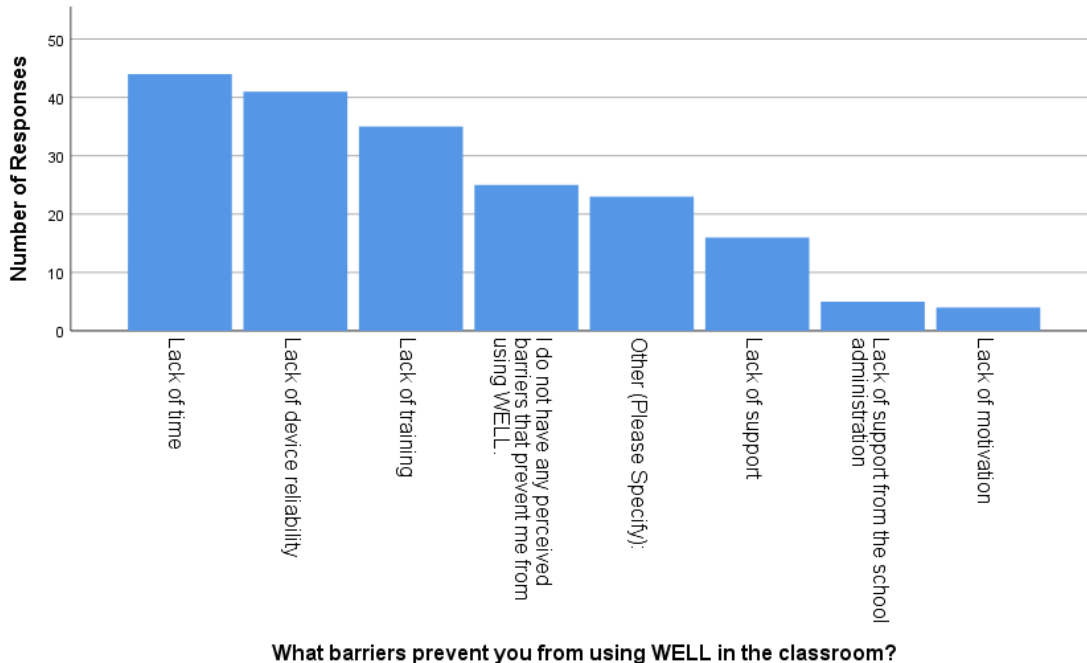
Self-reported barriers also included: bandwidth issues, device availability, costs, the digital divide, software bias, blocked websites and apps, internet access, and Wi-Fi issues. A few (22.1%) did not have any perceived barriers. This construct had a good (.847) reliability score.

Interviewees Alba, Monique, and Alice said that they did not have many barriers to the use of WELL. Alba was especially appreciative of the new addition of Chromebooks to her department this year. She mentioned that the internet occasionally goes out in their area, but not for the whole day. She also said that she was sure to assign homework that could quickly be done on smartphones as an alternative for students who did not have access to the internet and for those who work part time afterschool. Alice mentioned that while she did not have anything necessarily preventing her from using

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technology, she was still "soul-searching" to try and figure out why students were not

making the transfer from technology use to language acquisition. Monique articulated

that while there were perceived barriers, she did not have any. When asked to explain,

she said:

> I mean I'm sure there are people who would perceive me teaching 400 kids a
> week like oh god. I've worked in my PLC where there are language teachers in
> our district [who say] oh I couldn't, like there's just too much to deal with all the
> kids bringing in devices that they have PE. So, for example, my kids do have to
> go to PE after French with their devices, so you could see the problem, but I
> couldn't. I just worked it out where they put it in these little cubbies instead from
> the afterschool program… We've trained them to hug them in the hallway … you
> know, you figure it out.

Mabel and Malina said that they both had issues with the internet going out on

occasion. As discussed further in the Access to Technology section in this chapter, Mabel

also spoke about issues with filters that were too strong. Malina commented on

inaccessibility to individual devices on a regular basis. Although she has attempted to use

cellphones, she did not find them to work well because students got side-tracked by their

own notifications and lose engagement.

Access to WELL Technology and Logistics

Teachers reported that they (100%) and their students (86.7%) have access to

technology at their schools and that they use it for about a third or more of the school

week. However, they were concerned with a lack of device reliability. Teachers reported

that their students (61.1%) have access to a computer both at home and at school five

(27.4%) days per week and seven (32.7%) days per week. Their students also have access

to smartphones (42.5%), wireless internet (46.9%), and headphones (54.9%) at home and at school for five to seven days per week. Teachers were unsure about student access to tablets (38.9%) and wired internet access (54%). Participants also noted that they have a wide range of students with and without access to technologies and that some students only have internet access on their phones but no laptops or tablets. Others said that their students also have access to liquid crystal display (LCD) projectors, and interactive whiteboards at their schools.

Respondents also reported that as teachers, they have access to a computer (92.9%) at home and at school (69.9%) seven days per week. They also have access to smartphones (81.4%), tablets (54.9%), and wireless internet access (83.2%) at home and at school five to seven days per week. Primarily at school, they have access to speakers (46%) and a projector (54%). There was less teacher access to smartboards (23.9%) or wired internet access (31%). Teachers also reported access to printers, microphones, an IPEVO interactive whiteboard system, a computer lab with no headphones, and an Apple TV. The reliability score was excellent (.944) for this construct.

At the start of each observation, I drew a layout of the classroom to illustrate where the technology was situated in the classroom. Figure 14 represents a layout of Alba's classroom.

Figure 14. Alba's Classroom Layout
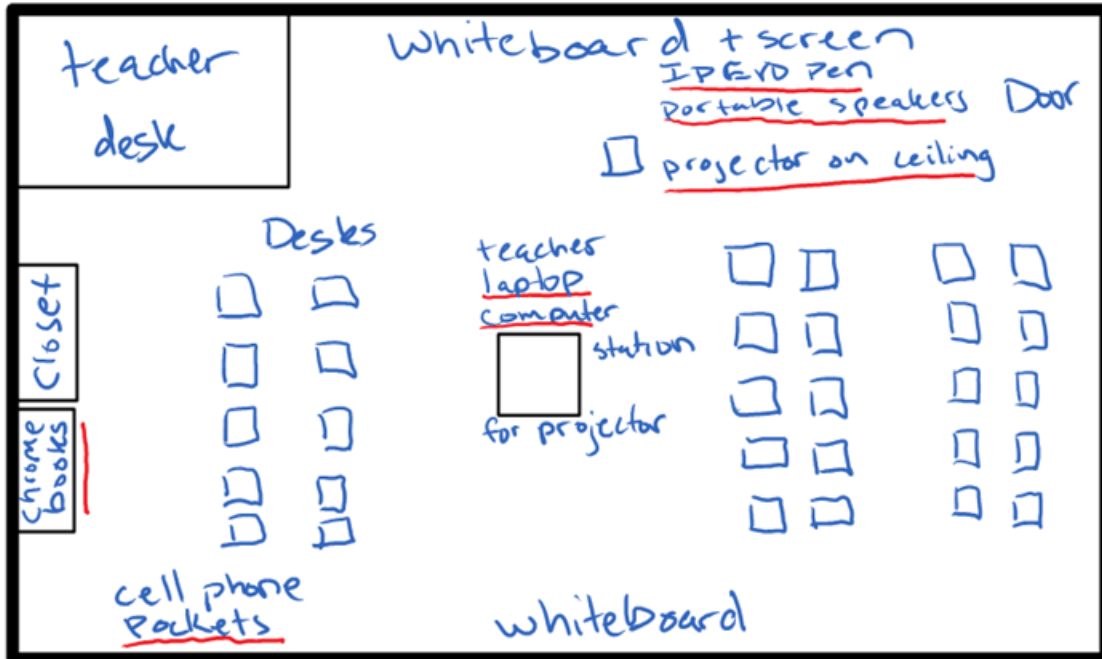
Each of the classrooms had projectors on the ceiling and the screens or

smartboards were at the front of the room. Two of the classrooms had projector screens

and two had interactive smartboards; however, Monique was the only one who used the

smartboard during my observation. Alba's classroom had a projector, but she also used a

Bluetooth pen called Ipevo, to interact with the material being projected. She used it by

touching the pen to the screen to start and stop videos and to advance slides. In her

interview she talked about how much she loved using it in the classroom and how it

grants her access to interactive projection at a fraction of the cost.

> I love my Ipevo that's the little wand thing that I use. So, it what it does is, I think
> it's a growing company, but it's a small company out of California and it's kind of
> like Bluetooth technology but with this little wand and a set in a sensor thing that
> I have mounted on the bottom of my projector which I use every day. Then it

communicates with my computer and projects what's on my computer onto any screen that makes it into a smart board basically. So, with the Ipevo I can do anything that a smart board would do but it only costs like 100 or 125 dollars as opposed to smart board which I think is a thousand dollars and also, it's portable so if I wanted to go do a presentation anywhere I could take it with me. I like it because I can scroll back through videos to go back and say oh yeah this is what they said here or once in a while we do like Quizlet games like matching games and the kids can get up on the on the board and use the Ipevo like a magic wand. Oh, and like when Arianna did her presentation, she could use it just to click to go to the next slide and you don't need a clicker thing to go ahead to go forward and backwards with the slide presentation. So, I love my Ipevo.

In each classroom, the projector and screen were placed in the front of the classroom in the center of the student space. Each classroom had wireless internet access and the students in each of the observed high school classes had access to laptops or Chromebooks. In Mabel's classroom, students also had access to their smartphones. Monique's class of first grade students had not been asked to bring their devices to class the day that I observed them. Three of the five participants' students had access to one-to-one devices except Malina and Alba. Both reported that the teachers at their schools shared Chromebook carts. Alba was excited, however, when her school elected to purchase a Chromebook cart for the world languages department at her request. The carts were stored in her room, as she mentioned that she tends to use them the most. Despite the access to individual devices, Malina and Alba still noted that they run into problems with the internet being unreliable. Mabel also had issues with the quality of the internet, but she was more concerned about students' access to certain websites. Due to the strong filters at her school, high school students find it difficult to complete certain tasks.

I still run into a lot of problems with the internet going out. There's also really strong filters on not just our internet at school, but also what they can access on their [school] computers at home. The filters often block websites that are actually educational. I work at an early college, so students are on a college campus and they're taking college classes at the same time at high school classes and it's really frustrating for them because they used to be able to access the Community College Network which was open Wi-Fi unfiltered, and then the school the district actually took away that ability. So now I have students that can't access sites that they need for their college classes because of the district filter and it's not really something we can change.

In each of the classrooms observed, the teacher seemed to have an established method of using the devices. There were a few minor hiccups, but overall each teacher seemed to have regular access to individual technology devices for themselves and for their students. They also all seemed to have an established routine for utilizing the devices in class.

Research Question 2c: Frequency of WELL Technology Use

RQ 2c: Validity, Reliability and Goodness of Fit Tests

Validity and reliability. The KMO measure of .548 for RQ 2c did not merit a factor analysis. Cronbach's alpha for this question was .843.

Goodness of fit. Question 30 asked 'Thinking back over the last five-day school week, what was the average number of different activities that you used that involved WELL technologies?' The relationship of it to question 29, $\chi^2(1, N = 90) = 15.56$, $p = .0001$, showed that people who used WELL 40% or less per week, used it for six or less activities per week; these were at the lower end of the two options for each question.

Frequency of Use

This construct with questions 29 and 30 demonstrated a negative reliability score of -.068 which suggests the need for removal or revision of these questions in a future survey administration. As noted above, WELL technologies were used throughout the school week by teachers. Prior to WELL training, teachers used WELL technologies sometimes and most of the time. In a typical five-day school week, most teachers use technology at least 40% the school week. Most teachers used WELL technologies in four to six different activities per week.

During my observations, three of the four teachers used technology for the entire class period. Alba used it as a sort of bookend. She began the class with authentic resources, had the students do some writing in their notebooks and on the whiteboard while walking to different stations around the room, and ended the class with a reading comprehension activity on Chromebooks and played Quizlet.live. Except for the documentary in Mabel's class, each technology-based activity lasted no more than eight minutes in each of the classes. In the interviews, Alba, Alice, Monique, and Malina said they used technology every day in their classrooms. Mabel noted that she uses technology "probably every other day". Malina said she uses it about 50% of the class time every day. Monique and Alice used it as a warm-up to their daily classes. Alice did a Bible verse and students read about events that happened in French speaking nations on that day. They also sang happy birthday to students born in April along with viewing a video in French. Monique's students worked with the weather and calendar on the smartboard and sang a song. She said this was their daily routine. Alice mentioned that although she

typically uses technology every day, she recently felt a need for "a massive review on all topics ever covered in French, [and she's] actually gone more to paper and pencil."

Summary

In this chapter, the findings were reported for the study. The quantitative data, or survey, and the qualitative data, the interviews and observations, were presented separately. Each analysis was completed using the thematic constructs. For the quantitative analysis, the descriptive statistics were reported, a factor analysis was done to further validate the survey instrument, and Cronbach's alpha was calculated to determine reliability. Finally, cross tabulations with chi square goodness of fit tests were completed to determine significant dependency or connections between variables. For the qualitative analysis, the interview and observation data were reported together and included samples of quotations from the interviews and observational notes.

It is evident from the exploratory factor analysis that many of the survey questions loaded correctly onto the research questions. However, due to the moderate sample size (N=113), the factor analysis results only offer modest support to the validity of the instrument. The confirmatory factor analysis results suggest that some questions could be revised, removed or condensed to secure stronger data (Costello & Osborne, 2005) to offer more robust results.

The results of the reliability test showed that the instrument was reliable, but for future use, questions 9, 10, 11 and 12 might be condensed, question 7 may be considered for removal or revision, and the frequency of use construct may need to be revised or reduced to one question.

The survey findings showed the participants' overall appreciation for WELL teacher education activities and the desire for their improvement. The interview and observation findings revealed that although the teachers were well-versed in the use of effective classroom practices, they would like access to impactful teacher education activities that focused more on their content area. The overall findings showed that except for participants' perception of the usefulness of WELL technologies, the interview and observation data served to accurately triangulate the data from the survey and made more in-depth connections to individual experiences. I collected individual, yet complementary, data and compared quantitative and qualitative data to produce stronger evidence for a conclusion.

CHAPTER V

DISCUSSION AND IMPLICATIONS

Introduction

In this mixed methods study, I sought to understand the ways teachers learned to use web enhanced language learning (WELL) technologies and how that knowledge was applied in world language classrooms. I used Mishra and Koehler's (2006) Technological Pedagogical Content Knowledge (TPACK) as a theoretical framework as viewed through the lens of the social constructivist paradigm. In conjunction with TPACK, I used the Teachers of English as a Second Language (TESOL) Technology Standards (2008) as my conceptual framework. To answer my research questions, I gathered both quantitative and qualitative data from surveys, interviews, and observations. The participants of this study were K-12 world language teachers from North Carolina. They were mostly female (72.6%), with master's degrees (43.4%), between the ages of 40-49 (67.3%), with more than 10 years teaching experience (69%) and worked in public non-charter schools (72.6%).

In this chapter, the findings were presented by thematic construct in conjunction with the research questions. Throughout the discussion, I integrated the findings with the literature as well as the theoretical and conceptual frameworks related to this study. Next, the contributions that this study made to scholarship surrounding WELL teacher education were presented. Then, I presented the implications of this research for teacher

educators and school districts. Finally, I considered the limitations of this study and

concluded with recommendations for future research.

<center>**Research Questions 1, 1a, & 1b**</center>

Research questions 1, 1a, and 1b intersected with the conceptual framework

through TESOL's first goal for language teachers. They also connected to the TK, PK,

and TPACK combinations of the TPACK theoretical framework. Technology knowledge

(TK) includes what the authors termed as standard technologies including books and

blackboards, as well as the Internet and various computer software and hardware

programs and devices. Pedagogical knowledge (PK) refers to a teacher's knowledge of

methods of teaching and learning. Table 23 illustrates this relationship.

Table 23

Relationship Between Research Question 1, Themes, TESOL, and TPACK Frameworks

Conceptual Framework (TESOL Goals)	Theoretical Framework TPACK	Themes	RQs
Teacher Goal 1: Language teachers acquire & maintain foundational knowledge & skills for professional purposes.	Pedagogical Knowledge (PK) Technological Knowledge (TK) Technological Pedagogical Content Knowledge (TPACK)	**Ways of Learning Instructional Technology**-addresses the varied ways that WELL is learned **Effective Classroom Practices-** According to the Conceptual Framework/TESOL standards, effective classroom practices are Goal 1: Language teachers acquire and maintain foundational knowledge & skills for professional purposes. Goal 2: Language teachers integrate pedagogical knowledge and skills with technology to enhance teaching and learning. Goal 3:	1

	Language teachers apply technology in record-keeping, feedback, and assessment. Goal 4: Language teachers use technology to improve communication, collaboration and efficiency (TESOL, 2008). These practices also influence the types of WELL used.	
	Training Participation-addresses the extent to which teachers participate in any type of training for WELL	1a
	TPACK	
	Perception of Teacher Training- teachers' have called for more & better training in WELL. Research notes this as one of the factors that influence WELL implementation (Buabeng-Andoh, 2012; Arnold & Ducate, 2015).	1b
	Characteristics of Training-research lists that effective training is ongoing, of significant duration, offers support, engaging, utilizes modeling, and content specific. Noting the characteristics of training of the participants can give additional insight into types of training that are effective (Darling-Hammond et al., 2009; and Gulamhussein, 2013)	

Note. RQ = Research Question.

Research Question 1

Research question 1 asked "In what ways do K-12 world language teachers learn to use WELL technologies in the classroom?" To answer this question, I used the ways of learning WELL technologies construct.

For world language teachers to be effective practitioners in terms of integrating technology into their curricula, they must acquire a foundational knowledge of technology. In other words, they must hone their technology knowledge. According to survey and interview/observation data, teachers rely on their own "personal research" (Mabel) to determine ways to use web enhanced language learning technologies in their classrooms. They reported that they would "just play with it [themselves]" (Alba) because "there's nothing really specifically for world language teachers that's offered in [their] districts" (Mabel). Although teachers are widely (82.3%) self-taught, 58.4% of them learn from colleagues, 57.5% learn from teacher training workshops, and 51.3% learn from online sources. Alba discussed her lateral entry class and how much she appreciated the online module. However, none of the other interviewees discussed learning from online sources. Additionally, while none of the interview participants mentioned learning how to use WELL technologies from colleagues, I speculated that for two of them (Mabel and Monique) it is because they are the only world language teachers in their schools and may not have immediate access to another person in their content area.

The qualitative data confirmed that while teachers learn to use WELL through teacher training workshops, the workshops are not often geared towards world languages specifically, and some teachers (35.4% of the 65 respondents to question 11) would prefer more content specific trainings as noted by previous literature (DelliCarpini, 2012; Ertmer & Ottenbreit-Leftwich, 2010). Monique noted that while she has been to technology-based workshops, there have not been enough dedicated to world languages.

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"So, I have been to very few sessions that were geared specifically or too few trainings to my content area to foreign language instruction or a specifically French in elementary school there's a lot of layers there." By 'layers' she was referring to the small number of elementary school language teachers in the state and even smaller number of elementary school French teachers. In that regard, finding specific WELL teacher education opportunities became very difficult for her. She frequently had to mold the information she acquired to "see how it work[ed] for [her]".

Previous studies noted that although world language teachers have called for more and better training in terms of WELL (Arnold & Ducate, 2015), teacher education effectiveness is influenced by a lack of adequate teacher educators or teacher educators and trainees with low digital competency (Torsani, 2016). The data from this study confirmed that teachers also access alternatives to formal training which included communities of practice, autonomous training, and teacher mentoring to a lesser degree (Hubbard & Levy, 2006; Torsani, 2016). Forty seven percent of the respondents said they learned from technology staff. The data also confirmed lack of effective teacher education programs since only 30.1% of the participants learned to use WELL through such programs (Kessler, 2007). Mabel noted that "web-based tools were never covered in any of [her] methods courses in college." It appeared that a lack of effective programs led to teachers deciding to find ways to learn WELL on their own. They also learned to use WELL with other colleagues which is supported by the social constructivist paradigm, as Tuncer (2009) confirmed the effectiveness of learning through collaborative learning environments.

According to data from this study, the answer to research question 1 is that teachers chiefly learn to use WELL technologies by themselves, with colleagues, through teacher education activities, and through online sources. This response to RQ1 leads to the next question about teachers' participation in WELL teacher education activities. The response to RQ 1a allowed me to delve deeper into the potential reasoning behind why more teachers were self-taught than those who chose to learn from teacher education activities.

Research Question 1a

Research question 1a asked "What access do teachers have to WELL teacher education?" To answer this question, I used the teacher education participation construct.

Most of the teachers have had access to teacher education activities that were geared towards WELL at some point in their careers (69.9%) and 65.5% attended WELL teacher education activities within the last 12 months of the survey's administration. All the interviewees had some teacher education opportunities during that time. For Monique, Malina, and Mabel, the opportunities were due to new one-to-one initiatives or districtwide learning management system changes. The professional development that Alba received seemed to be a requirement related to her lateral entry status. This finding points to the influence that districts may have over teacher access to WELL education and confirms that effective professional development is connected to school initiatives (Darling-Hammond et al., 2009).

The same number of respondents (32.7%) who reported that they would have liked more access to teacher education activities also reported that they had a sufficient

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amount of activities. However, of the respondents who had not had any opportunities for training, 23.9% wished there had been more. According to the participants who reported that they had enough opportunities, 'sufficient' meant one to four activities. Most of the participants who would have liked more opportunities reported one to two activities as 'insufficient'. Only eight percent of the respondent stated they neither had opportunities nor did they desire to have them. This data corroborates the claim made by Arnold and Ducate (2015) concerning the desire of teachers to have more teacher education activities which speaks to their desires to reach TESOL goal 1 and solidify their TK (see Table 24).

Table 24

Crosstab Access to WELL Technology and Teacher Education Participation

		In the last twelve months, how many teacher training activities have you attended that included WELL technology use in the classroom as one of the topics?				
		None	1-2	3-4	5 or more	Total
Within the past twelve months, did you have access to any teacher training opportunities that addressed WELL technology?	Yes, and I had sufficient opportunities	7	12	14	4	37
	Yes, but I wish there had been more opportunities	2	25	7	3	37
	Unsure	1	2	0	0	3
Total		10	39	21	7	77

Overall, in response to research question 1a, the participants noted that they had some access to WELL teacher education activities, but they wanted more (Arnold & Ducate, 2015). Interestingly, seven of the respondents said they had sufficient opportunities for WELL teacher training, but they reported they had not attended any activities. Non-attendance could be attributed to a negative perception of WELL teacher training.

Research Question 1b

Research question 1b asked, "What are the characteristics of effective WELL teacher education?" To answer this question, I analyzed the characteristics of WELL teacher education and perceptions of WELL teacher education constructs.

As noted above, the perceptions of teachers toward teacher education may be impactful in terms of their access and desires to attend teacher education activities. Even if teachers desire to enhance their TK, they may not want to do so through trainings that they do not find useful, which could influence their implementation of WELL in the classroom (Buabeng-Andoh, 2012). According to survey data, teachers generally had a favorable perception of WELL teacher education activities and they agreed that it made them more likely to integrate WELL into their classroom (Sardegna & Dugartsyrenova, 2014); however, they desired more opportunities to learn (Arnold & Ducate, 2015). To improve the teacher education activities, survey participants mostly wanted to see more hands-on activities and practice time, which aligns with 'application' according to Tai (2015). Conversely, the interviewees had an unfavorable view of WELL teacher education. They thought them to be inconsistent and would have liked them to be more

specified and differentiated for different types of teachers. In this instance, interview data did not confirm survey data and contradicted the study about favorable views of WELL teacher education (Sardegna & Dugartsyrenova, 2014). This finding could be due, in part, to the relatively high level of technology understanding and engagement that the interviewees possessed. Considering, they already knew how to use a variety of technologies; they may have been unimpressed by what they considered rudimentary teacher education activities and would have preferred better ones (Arnold & Ducate, 2015).

The characteristics listed in the survey that define effective WELL teacher education were identified from the literature on effective professional development (Darling-Hammond et al., 2009; Gulamhussein, 2013; Lieberman & Pointer Mace, 2008). To make the transition from acquisition to application more seamless (Chao, 2015), the participants noted they preferred interactive learning activities (46%) and learning about solutions to potential obstacles that teachers (33.6%) and that students may face (29.2%) (Darling-Hammond et al., 2009; Gulamhussein, 2013; Tai, 2015). The interviewees also appreciated time to practice with the materials being presented and modeling how it could be used. Malina liked it when she had access to materials her students could use, Alba appreciated the opportunity for follow-up, and Monique and Mabel enjoyed experiencing presenters who geared the training to their situations as much as possible. Alice reported "I would say that obviously seeing things in action and seeing how it can be used is always helpful." These characteristics aligned with three out of five of Tai's

(2015) TPACK-in-Action model stages for teaching WELL; 'application', 'demonstration', and 'reflection'.

In response to research question 1b, the characteristics of effective WELL teacher education reported in this study confirm previous recommendations made. Effective WELL teacher education activities are interactive, allow for practice time, and help teachers pre-emptively troubleshoot potential problems (Darling-Hammond et al., 2009; Gulamhussein, 2013). Furthermore, effective teacher education activities, such as those modeled after TPACK can be used for teacher education and teachers should have more training in content specific technology integration (Koh et al., 2016; Matherson et al., 2014; Mishra & Koehler, 2006; Ndongfack, 2015; Richards, 2005; Wu & Wang, 2015). In accordance with the TPACK framework, teachers who can successfully integrate their technological, pedagogical, and content knowledge might be more likely to implement effective classroom practices; as the framework encourages meaningful connections, promotes communicative skills, and fosters autonomy (Amineh & Asl, 2015; Mishra & Koehler, 2006). In other words, TPACK aligns with a social constructivist paradigm that encourages people to learn from one another and to feel more empowered to strike out on their own with the support of others. This model serves as a framework for how training in content specific technology integration might influence the ways in which WELL is used in the classroom.

Research Questions 2, 2a, 2b, & 2c

Research Question 2

Research question 2 intersects with TESOL goals 2, 3, and 4 for language teachers. It also connects to the TPK, TK, and TPACK combinations of the TPACK framework. Technology Pedagogical Knowledge (TPK) is the knowledge of knowing how to integrate technology into the methods of teaching and learning (see Table 25).

Table 25

Relationship Between Research Question 2, Themes, TESOL, and TPACK Frameworks

Conceptual Framework (TESOL Goals)	Theoretical Framework TPACK	Themes	RQs
Teacher Goal 2: Language teachers integrate pedagogical knowledge & skills with technology to enhance teaching and learning.	Technological Pedagogical Knowledge (TPK)	**Ways WELL teacher education is applied and Technology Use**	2
Teacher Goal 3: Language teachers apply technology in record-keeping, feedback, and assessment.	Technological Knowledge (TK)	**Effective Classroom Practices**	
Teacher Goal 4: Language teachers use technology to improve communication, collaboration & efficiency.	Technological Pedagogical Content Knowledge (TPACK)		

Note. RQ = Research Question.

Research question 2 asked "In what ways do teachers apply WELL in the classroom?" To answer this question, I used the ways teacher education is applied/technology used and the effective classroom practices constructs.

The effective classroom practices were defined using the TESOL technology standards for language teachers for goals 1, 2, and 3. Overall, most teachers reported that they incorporate the TESOL standards often (35.7%) or always (25.7%). I used a chi-square test to see if this could indicate that the ways in which teachers are learning to use WELL in the classroom are effective according to the TESOL standards; however, the null hypothesis between questions 5 and 17 was accepted at $p = .05$. This meant that one variable was not dependent upon the other and there was no relationship between them. As the p value was incredibly close to rejecting the null hypothesis however, the hypothesized relationship between ways of learning WELL and effective classroom practice could be further substantiated through question revision and/or an increase in sample size.

Although most teachers said they incorporated TESOL standards often, less than half (43.4%) reported they evaluated the technologies for internet safety. Perhaps this is due, in part, to fact that the majority (57.5%) of participants taught 9-12th grade students. It could be that they did not see a need to check the technologies for safety due to the ages of their students. Teachers chiefly used technology to increase student motivation (83.2%) and for individualized student practice (83.2%). They also used it to provide students access to authentic sources (73.5%). A chi square test indicated a connection between the frequency of use of effective classroom practice and attending a teacher education activity with a colleague from their school. Corresponding with the social constructivist paradigm, teachers tend to perform better when they have support (Amineh & Asl, 2015; Tuncer, 2009). Another chi square test showed that people who indicated

there were effective practices learned in their WELL teacher education activities, found themselves using WELL to teach students to use WELL appropriately to meet their learning objectives and for record keeping.

Through observations, I had the opportunity to witness effective classroom practices and ways that teachers use technology. I used the same TESOL (2008) standards listed in survey question 17 to observe the teachers. As reported in Chapter IV, the teachers demonstrated effective classroom practices for almost all the standards except for internet safety. Monique, the elementary teacher, was the only one who I saw actively model how to show appropriate caution when using online sources. The age of the students could be a factor since each of the other observed teachers worked with older high school students.

The qualitative participants used WELL technologies for a variety of purposes including: to have students complete homework and presentations, to access authentic sources, and to engage students in language learning. During an observation, Mabel finished showing a documentary on Dominican baseball players, which corresponded with accessing authentic sources. In her observation, there was still time left in the class period after she completed the focus of the lesson. Students asked if they could play Kahoot with discrimination vocabulary, a web-based application that allows them to review concepts in a game format. While they each did an exit ticket, she located a Kahoot that was related to the documentary and they played the game.

Some of the ways in which teachers used WELL technologies in this study corresponded with the literature. Teachers used it to motivate students (Ketsman, 2014;

Carr et al., 2011), and to allow students to work at their own pace (Carr, et al., 2011). Conversely, teachers were not observed using it for grammar practice (Moore, 2006), as a reference tool (Richards, 2005), nor for online posting (Arnold, 2007). Effective practice was defined through the TESOL goals and teachers either reported or demonstrated through the effective practices standards that they had a solid grasp on how to not only integrate technology knowledge with pedagogy in the classroom, but they also demonstrated they could effectively integrate TPACK into the classroom.

In response to research question 2, teachers applied their WELL training in the classroom by using effective practices, providing individualized practice, increasing student motivation and engaging students into language learning, and providing access to authentic resources (Carr et al., 2011; Ketsman, 2014). Overlapping with the ways that teachers used WELL in the classroom were the reasons why WELL was used.

Research Question 2a

Research question 2a connects to TESOL goals 2, 3, and 4 for language teachers and the TPK and TPACK combinations of the TPACK framework. It also includes the TESOL goals for language learners or students (see Table 26).

Table 26

Relationship between Research Question 2a, Themes, TESOL, and TPACK Frameworks

Conceptual Framework (TESOL Goals)	Theoretical Framework TPACK	Themes	RQ
Teacher Goal 2: Language teachers integrate pedagogical knowledge & skills with technology to enhance teaching and learning. Teacher Goal 3: Language teachers apply technology in record-keeping, feedback, and assessment. Teacher Goal 4: Language teachers use technology to improve communication, collaboration & efficiency. Student Goal 1: Language learners demonstrate foundational knowledge and skills in technology for a multilingual world. Student Goal 2: Language learners used technology in socially and culturally appropriate, legal, and ethical ways. Student Goal 3: Language learners effectively use and critically evaluate technology-based tools as	Technological Pedagogical Knowledge (TPK) Technological Pedagogical Content Knowledge (TPACK)	**Perception of Technology**—Research lists advantages of using WELL (Egbert et al., 2002; Kessler, 2007; Ketsman, 2012; Moore, 2006). Teachers' perceptions are important to note as they directly affect their use of WELL implementation (Buabeng-Andoh, 2012). **Effective Classroom Practices** **Student outcomes/motivation**—Social constructivism & student motivation align with the types of WELL used and student outcomes are one of the main reasons WHY WELL is used (Arnold, 2007; Ketsman, 2014; Moore, 2006; Spodark, 2005). According to the Conceptual Framework/TESOL standards, desired student outcomes are Goal 1: Language learners demonstrate foundational knowledge and skills in technology for a multilingual world. Goal 2: Language learners used technology in socially and culturally appropriate, legal, and ethical ways. Goal 3: Language learners effectively use and critically evaluate technology-based tools as aids in the development of their language learning competence as part of formal instruction and for further learning (TESOL, 2008).	2a

aids in the development of their language learning competence as part of formal instruction and for further learning.

Research question 2a asked, "Why do teachers use WELL in the classroom?" To answer this question, I used the perception of technology, effective classroom practices, and student outcomes/motivation constructs.

While survey participants reported a positive perception of technology, there were concerns about misuse of technology in terms of students using it to do the work for them, rather than engaging with it to understand the content more deeply. In terms of the qualitative data, even though Alice expressed some concern over the effectiveness of technology use, the interviewees also reported an overall favorable perception of WELL technologies as there were no instances observed where the teachers displayed frustration with the technology use. Even when minor problems arose (i.e., the battery running out on a speaker or student presentation delays due to lack of audio), teachers appeared to remain calm and quickly dealt with the issue or allowed other students to help. Researchers noted the importance of a positive perception of WELL technologies for teachers as it influences the use of WELL in the classroom (Buabeng-Andoh, 2012; Arnold & Ducate, 2015). A rejection of the null hypothesis, $\chi 2(1, N = 90) = 8.70$, p = .003, for questions 18 and 21 confirmed previous studies by highlighting a connection between student language acquisition and the desire to use WELL technologies more often (see Table 27).

Table 27

Crosstab Questions 18 and 21

| | | | Question 21 | | |
			Disagree	Agree	Total
Question 18	Neg affects student outcomes	Count	<5	<5	<5
		%	n<5	n<5	100.0%
	pos affects student outcomes	Count	9	79	88
		%	10.2%	89.8%	100.0%
Total		Count	11	80	91
		%	12.1%	87.9%	100.0%

Note. Neg. = Negative and Pos. = Positive.

Effective classroom practices included using WELL technologies for record keeping and feedback and for collaboration and communication. In line with TPACK, these practices are designed to lead to desired student outcomes. Overall, teachers reported that WELL positively affects student outcomes (77%). The survey participants noted that it did so by increasing student engagement, empowerment, individualized instruction, self-monitoring, and facilitating and adding variety to language learning. However, there were also some participants who found student outcomes to be negatively affected which aligned with Wu and Wang's (2015) study. The participants noted that students relied too much on technology to do the learning for them and that nothing could compare to a live teacher and hands-on practice. The interviews and observations aligned with the survey. Teachers assessed student outcomes by asking them to do tasks that

aligned with TESOL language learner goals 1-3. For example, for goal 1, Monique asked her students to try and guess what the day's temperature might be in Celsius and write in on the Smartboard. In line with language learner goal 2, Alice's students were asked to present on a French speaking nation. Finally, in conjunction with goal 3, Alba's students were asked to complete a reading comprehension activity in the target language at their Lexile levels.

In response to the research question, student motivation and social constructivism coincide with one of the primary reasons WELL is used in the classroom. Teachers want students to acquire and use the target language (Arnold, 2007; Ketsman, 2012; Moore, 2006; Spodark, 2005) and as evidenced in the data, they believe WELL technologies can help them do so. Even if students can get a little distracted on occasion (Wu & Wang, 2015). Prior to using WELL technologies in the classroom, teachers must determine what types of technology they are going to use as outlined in RQ2b.

Research Question 2b

Research question 2b links to TESOL goals 3 and 4 for language teachers, goals 1-3 for language learners, and the TK and TPACK combinations of the TPACK framework (see Table 28).

Table 28

Relationship Between Research Question 2b, Themes, TESOL, and TPACK Frameworks

Conceptual Framework (TESOL Goals)	Theoretical Framework TPACK	Themes	RQs
Teacher Goal 3: Language teachers apply technology in record-keeping, feedback, and assessment.	Technological Pedagogical Knowledge (TPK)	**Access to Technology & Logistics**-teachers' access to technology directly influences their use of tech. Research notes this as one of the factors that influence WELL implementation (Buabeng-Andoh, 2012)	2b
Teacher Goal 4: Language teachers use technology to improve communication, collaboration & efficiency.	Technological Pedagogical Content Knowledge (TPACK)	**Barriers to use**—lack of time, resources, support, & motivation are some reasons that negatively affect use of WELL. Inquiring into teachers' barriers as well as positive reasons for use will allow for a deeper analysis RQ2 (Burnett, 1998; Butler & Sellbom, 2002; Chizmar & Williams, 2001; Egbert et al., 2002; Ketsman, 2014; Moore, 2006) According to Egbert et al., 2002), the overall purpose of web-based language instruction (WELL) is to enhance teaching effectiveness and student achievement. Positive reasons for using WELL (Egbert et al., 2002; Ketsman, 2012; Lee, 2002; Warschauer & Healey, 1998)	
Student Goal 1 Student Goal 2 Student Goal 3	Technological Pedagogical Content Knowledge (TPACK)	**Student outcomes/motivation**	

Note. RQ = Research Question.

Research question 2b asked "What types of WELL technologies are being used by world language teachers?" To answer this question, I used the access to technology and

logistics, barriers to technology use, types of technology used, and student outcomes/ motivation constructs.

As noted above, student motivation and engagement are some of the top reasons teachers use WELL technologies in the classroom. As a result, they used a wide variety of web-based applications as well as one-to-one devices to engage students in the process of language learning. In addition to computers, smartphones, headphones, projectors, wireless internet, and tablets, this study found audiovisual sites to be at the top of the list (86.7%) with language learning practice sites (70.8%) coming in second. To use these materials, students and teachers must have access to the materials. One hundred percent of the teachers reported that they had access to a computer and 86.7% of their students have access to technology at their schools. However, fewer teachers reported that their students have access to a computer both at school and at home (61.1%) and less than half (46.9%) have access to wireless internet at school and at home.

In addition, barriers that contributed to the reduced use of WELL in the classroom were lack of time (38.9%), lack of device reliability (36.3%), and lack of training (31%). Teachers also reported costs, device availability, software bias, filtered websites, and internet access as additional hindrances. The reported barriers were taken from previous scholarship on the subject, therefore they confirm those initial findings (Burnett, 1998; Butler & Sellbom, 2002; Chizmar & Williams, 2001; Egbert et al., 2002; Goodwin, 2011; Ketsman, 2014; Moore, 2006). The teacher interviews corroborated these findings. While most of them said they did not have many perceived barriers, lack of internet reliability presented an issue on occasion. Perhaps this is due to the lack of digital equity

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(Resta & Laferrière, 2015) that seems to persist in the North Carolina school system. Although students have access to computers, their wireless access is mediocre and speaks to school priorities. Furthermore, question 24 was a 'select all that apply' question and asked, 'What barriers prevent you from using WELL in the classroom?' The relationship to question 21 of answer choices (5) 'Lack of device reliability', and (7) 'I do not have any perceived barriers', demonstrated that people who did not want to use WELL technologies had trouble more often with device reliability. Also, all the people who did not want to use WELL said they did not have any perceived barriers that prevented them from its use. These relationships seemed to contradict one another but could mean that a teacher may not desire to use WELL if their devices are constantly in a state of disrepair (Day, 2013).

In response to the research question, teachers were using audio visual sites, language practice sites, computers or laptops. The frequency of use also contributed to the overarching question of how WELL teacher training is used in the classroom.

Research Question 2c

Finally, research question 2c aligns with TESOL goals 3 and 4 for language teachers and the TK and TPACK combinations of the TPACK framework (see Table 29).

Table 29

Relationship Between Research Question 2c, Themes, TESOL, and TPACK Frameworks

Conceptual Framework (TESOL Goals)	Theoretical Framework TPACK	Themes	RQs
Teacher Goal 3: Language teachers apply technology in record-keeping, feedback, and assessment.	Technological Knowledge (TK)	**Barriers to Use**	2c
Teacher Goal 4: Language teachers use technology to improve communication, collaboration & efficiency.	Technological Pedagogical Content Knowledge (TPACK)	**Frequency of Use**	

Note. RQ = Research Question.

Research question 2c asked "How often are WELL technologies being used in the classroom?" To answer this question, I used the barriers to technology use and frequency of technology use constructs.

The study reported that on average, teachers used WELL throughout the week. In a typical five-day week, teachers used WELL about 40% of the time. However, access to reliable devices and wireless could be problematic, something that might contribute to the low percentage (Chun, 2016). The four people that I interviewed reported they use WELL technologies in the classroom every day for at least half the class period. Interestingly, a chi square test showed that people who used WELL less often (0-40%) tended to use it for individualized student practice ($\chi^2(1, N = 94) = 4.56, p = .03$; Fisher's Exact Test $p = 034$. Also, people who used it more often (60-100%) tended to not use it to improve student communication in socially and culturally appropriate, legal, and ethical ways, $\chi^2(1, N = 90) = 4.56$, Fisher Exact Test $p = .034$. This could indicate that

people who used it more often did not feel the need to constantly remind students to communicate responsibly. As I mentioned previously, the age group who most of the survey participants are involved with may not need as much online supervision.

In response to the research question, WELL technologies were being used about 40% of the class period intermittently throughout the week for four to six activities with a chi square test confirming and mimicking these results. In terms of the teacher goals, teachers with highly developed TPACK or TK would most likely be sure to use WELL technologies for feedback and to improve collaboration in the time they allotted to use WELL on a weekly basis despite perceived barriers (Kessler, 2007; Moore, 2006).

Contributions to the Literature

WELL teacher education is a growing body of research and based on this study, several insights were made that add to the body of literature surrounding this topic. To reintegrate with the concepts that situated this study, a completed conceptual framework that displays the findings for RQ1 is included in this section. Starting with the two-way arrow connecting to the student outcome portion of the conceptual framework (see Figures 1 and 15), and going in reverse order, I discussed key takeaways of this study in this section. The first take away addresses a shift in the ways that technologies are being used and student outcomes as world language teachers embrace communicative, social constructivist classrooms. The next insight is connected to the ways that teachers learn to use WELL technologies and how teachers are taking their teacher education into their own hands.

The final takeaways are based on the research design of the study. By using a mixed methods design along with TESOL (2008) as a part of the conceptual framework, this study addressed critiques of current studies related to the topic of WELL teacher education and demonstrated the use of TESOL (2008) standards as an evaluative tool.

How WELL Teacher Education Impacts the Classroom

This study addressed the critiques concerning a lack of research on how WELL teacher education impacts the classroom (Huhn, 2012; Yoon et al., 2007). The results demonstrated that teachers were using effective WELL practices as defined by TESOL (2008) standards and that they felt students were positively affected by their use of WELL technologies as a result. A chi square test (see Table 27) confirmed that teacher beliefs and teacher use were strongly correlated (Burnett, 1998; Ketsman, 2014) because as the desire for teachers to use WELL increased, so did their perceptions of how WELL positively affected student outcomes. One reason that teachers were satisfied with how WELL technologies impacted student outcomes could point to a shift in how WELL is being used.

It is important to note, however, that the scope of this study focused mainly on teachers' perceptions of student outcomes. Further research needs to be done to determine if the effective WELL classroom practices lead to the desired results from a student's perspective. A teacher and student evaluation tool that uses TESOL standards as an assessment of effective classroom practices would be beneficial in carrying out such a study. By evaluating teachers' implementation of those standards, researchers can then

analyze how students are impacted by those practices through interviews, surveys, and observations.

Interestingly, this study contradicted the notion that teachers primarily use technology for instructional delivery (i.e. teacher presentations) (Ketsman, 2014), online posting (Arnold, 2017), or as a reference tool (Richards, 2005). The teachers that were observed in this study primarily used technology to engage the students in authentic materials and to have the students practice using the target language through the completion of tasks. The results of my observations also refuted Moore's (2006) claim that technology was used to teach grammar more than culture. In fact, in each of the classrooms that I visited, cultural experiences were the primary reason for using technology.

Teachers also used technology to engage, motivate and empower students (Carr et al., 2011; Ketsman, 2014) which aligns with what research points to as a shift from using technology to not only *learn* language but to *use* it as well (Richards, 2005; Moore, 2006; Ketsman, 2014). The evidence of the shift in ways WELL technologies are used corroborates the claims that world language educators are moving to a more social constructivist, communicative, content driven, student centered, 21st century classroom (ACTFL, 2012; Amineh & Asl, 2015; González-Lloret & Nielson, 2015; P21.org, 2011) and that in doing so, they are more likely to find their use of WELL technologies effective (Kessler, 2007; Moore, 2006).

Ways of Learning to Use WELL Technologies

The shift in WELL technology use discussed above, also intimates that the combination of being self-taught, working with colleagues, accessing online resources, and attending WELL teacher training could be the reasons why WELL teacher education had a positive impact on the classroom in this study. As the results of this study demonstrate, effective WELL classroom practices lead to student outcomes. The research also showed that the ways WELL is learned lead to effective classroom practices (see Figure 15).

Figure 15. Completed Conceptual Framework
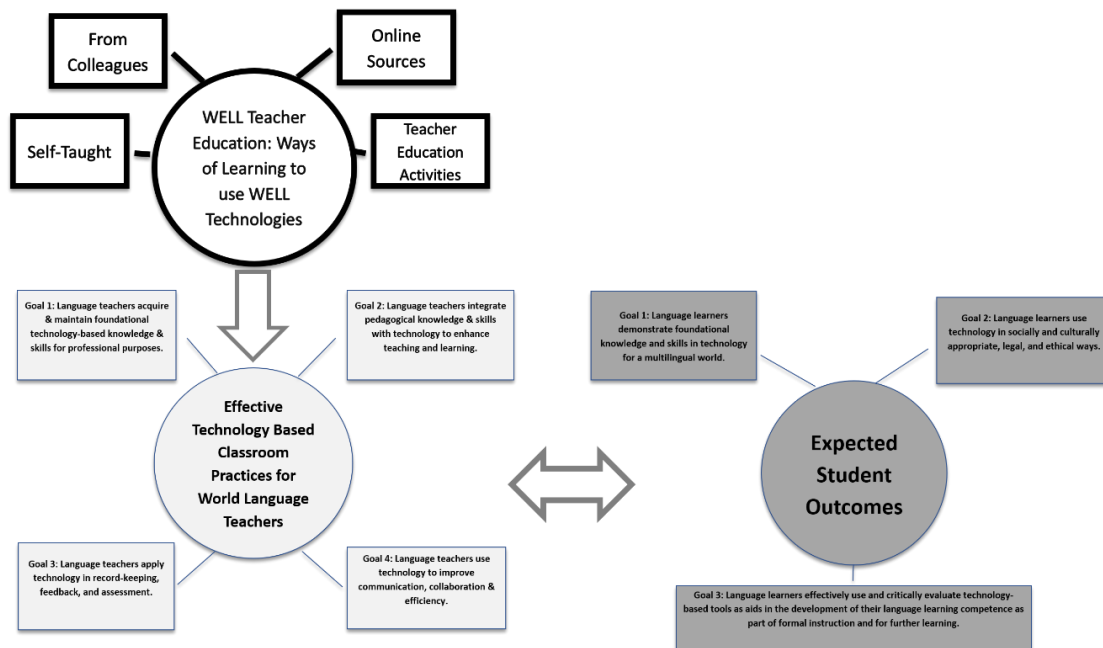
The results of this study established that there was a direct relationship between learning from colleagues and effective classroom practice. In conjunction with a social constructivist paradigm and effective teacher education practices (Lieberman & Pointer

Mace, 2008), participants who learned in a social setting were more likely use effective WELL based classroom practices. Although the hypothesis to confirm the relationship between ways of learning WELL as an overarching concept and effective classroom practice (p= .05) was narrowly rejected perhaps in part due to the wording of the survey questions, I argue that there is a relationship between the two concepts. While this study found quantitative evidence that one way of learning to use WELL technologies connects to effective classroom practices, future studies need to be conducted to establish direct links with each of the various ways of learning to enact effective classroom practice. The results of this study can act as a springboard for such research.

This study confirmed that although teacher education programs were still relevant as a way of learning to use WELL, teachers did not learn from them as much as they do from other sources (Kessler, 2007). With most teachers being self-taught and learning from colleagues, or online sources; teacher education programs should consider alternative models for WELL methods instruction (Hubbard & Levy, 2006; Torsani, 2016). For example, social media professional learning networks (PLNs) are where teachers digitally compile networks to address what tools they want to use, how they want to learn, when they want to learn, and with whom they want to learn (Graffin, 2011). Edcamp 'unconferences' are where teachers devote time by first articulating what they want to know more about and then acting as the conference presenters themselves by responding to one another's questions (Edcamp, 2018). In these models, teachers can connect with others around a selected topic at their own pace and engaging in a social constructivist way of learning. Teacher education programs could use these types of

models along with TPACK to ensure that educators are making strong connections to technology, content, and pedagogy in their practice.

The Impact of the Research Design

In this study I used a sequential design to answer the research questions. The quantitative data collected led to the collection of qualitative data. They were analyzed separately and are interpreted together in this chapter. Through the survey, some participants elected to be interviewed and/or observed. Of the 44 who volunteered, I used maximum variation sampling to purposefully select the five teachers that were interviewed, and I observed four of those five.

Self-reporting data collection, such as surveys, can produce inadvertently inaccurate responses as participants tend to offer what they perceive to be socially desired responses (Dillman et al., 2014). Therefore, conducting a sequential mixed methods design is beneficial when attempting to answer descriptive mixed methods research questions while reducing social desirability bias (Dillman et al., 2014). My questions sought to describe the ways in which teachers learned to use WELL technologies and how they used them. In tandem with the questions, this design allowed me to not only have the participants reflect on their experiences individually, but to also have them engage in an interpersonal articulation of those experiences and for me as a researcher to witness them firsthand.

This type of design allowed me as the researcher to first collect data, and then to confirm it with sequential or follow-up data; thereby adding credibility to my survey instrument and strengthening the results of the study (Creswell & Plano Clark, 2011;

Tashakkori & Teddlie, 2006). While they were overwhelmingly complementary, in one instance, there was non-confirmatory result concerning the perception of WELL teacher education activities, which is further discussed in the section attending to RQ 1b. In this study, the survey results of the interview and observation participants aligned with what I gathered from conversing with them and visiting their classes. Conversely, the interview and observation data also aligned with the results from the entire survey. In this way, the mixed methods design allowed me to further explain my findings using thick rich description (Creswell, 2013) for the measurable variables.

Addressing critiques. The rigor of the mixed methods design for this study attempted to address concerns from previous studies of sample size (Hong, 2010; Tai, 2015) and a lack of strong statistical analysis procedures (Hong, 2010). My sample size (N=113) was moderate and smaller than some studies (Hsu, 2016; Williams et al., 2014)**.** However, it was comparatively larger than other research done on this topic that had sample sizes of 8 to 25 participants (Ertmer **&** Ottenbreit-Leftwich**,** 2010; Ketsman, 2014; Sardegna & Dugartsyrenova, 2014; Tai, 2015). In the future, more studies would benefit from large sample sizes like Williams et al. (2014) (N=409) to increase generalizability**.**

To address the lack of strong statistical analysis, I conducted factor analysis for validity, Cronbach's alpha for reliability, and goodness of fit tests to determine dependence. The research design also added to the strength of the study. There were a couple of studies that also used strong analyses procedures (Baser, Kopcha, & Ozden, 2016; Williams et al., 2014), however many of them focused on descriptive analysis

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(Chao, 2015; Kessler, 2007; Sardegna & Dugartsyrenova, 2014; Tai, 2015). My study addressed concerns about the types of studies that currently make up the body of WELL teacher education research. Nonetheless, there is still a need for more research that does **not just** fill in gap**,** but that adds rich and varied perspectives to the topic.

Useful tools. In conducting this research, I learned that the TESOL (2008) standards and survey instrument that I constructed have the potential for being used in additional settings. Although TESOL (2008) standards have been used to situate the need for world language and technology integration (DelliCarpini, 2012), they have not been systematically used as a way to evaluate world language teachers' use of WELL in the classroom. In terms of a survey tool, researchers have created a self-assessment instrument using TPACK for pre-service world language teachers (Baser et al., 2016). However, there has not been a survey tool that integrates TPACK and TESOL to sharpen the focus on world languages and technology integration.

Using TESOL standards as a tool. This study also added to the body of research in which TPACK and WELL are positively integrated. TESOL (2008) technology standards offer clear guidelines for how to effectively integrate technology with world language pedagogy (Gonzalez, 2012). Inadequate teacher education has been considered a primary reason that WELL technologies have not reached their full potential (Hubbard & Levy, 2006; Kessler, 2006; Oxford & Jung, 2007). By adding TESOL standards to evaluate WELL use, I introduced a method of assessing WELL teacher education that could strengthen the practice of teacher educators. TESOL standards could be used as an instrument that teacher educators give to teachers for self-reflection and as a course

evaluation tool. The standards could be framed in such a way that ask teachers if they feel prepared to enact effective technology practices because of the teacher education activity. For example, one question could state: 'After this teacher education activity I now feel prepared to check web enhanced technologies for student safety' with responses being recorded on a Likert scale from strongly disagree to strongly agree. Like the reciprocal connection between teacher practice and student outcomes in my conceptual framework, the TESOL standards could aid both the teachers and teacher educators in improving their practices.

Using the survey as a tool. In addition to the TESOL standards as a method of teacher education evaluation, the survey validated in this study could be further validated and revised as a pre-assessment instrument to guide teacher educators when preparing for instruction**.** As the instrument has been vetted through a pilot study and a research study, further refinement would only add its validity, making it ideal to use as a precursor to teacher education activities focused on WELL technologies**.** This instrument could be used by teacher education programs, world language associations, and individual presenters to make their presentations more suited to their audience's needs.

Recommendations

As this study was primarily focused on that ways in which teachers learn how to use web enhanced language learning technologies, important implications and recommendations for teacher educators, teacher education programs, and school districts were made.

Implications for Teacher Educators

Tai (2015) presented a TPACK-in-Action model that combined best practices for professional development and integration of technological and pedagogical content knowledge. Such a model could be used as well to ensure that teacher educators are not using technology in isolation; rather they are carefully weaving it into the curriculum in pedagogically sound ways. With a social constructivist paradigm in mind, teacher educators should endeavor to encourage collaboration and curiosity in teacher education activities (Amineh & Asl, 2015). Providing opportunities for teachers to practice the integration of their TPACK can lead to effective classroom practice as defined by TESOL (2008) (Tai, 2015).

Since teachers learn to use WELL technologies through individual research, from colleagues, through teacher education activities, and through online modules I encourage teacher educators to differentiate amongst activity participants. One way to do so is to provide easy access to devices or sites that teachers can use for free or at a nominal cost. As subscriptions to web-based applications can be prohibitively expensive, teachers may not be able to access desired technologies in their classrooms, thus making the training activity useless for them. Recognizing different types of teachers who might attend a session is paramount. Teachers desire for their individuality to be recognized when they are in the room. In other words, they want to learn how to access technologies that are relevant to their content area and student level.

One suggestion for differentiation is to provide a few materials that can be modified to fit each teacher's specific needs and be modeled from a variety of

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perspectives/content areas. For example, in a world languages session, teacher educators should present materials for teachers of elementary, middle, and high school students and for teachers of different languages. They should model the use of these materials or allow teachers to work with a partner to give them an opportunity to brainstorm how the technology can be integrated into their curriculum.

Furthermore, this research study showed that teachers appreciate interactive opportunities for "playing with" the technology. They are not interested in simply listening and watching the presenter, but they want to be able to manipulate the technology while they have access to an expert. Along the same vein, teacher educators should provide one-on-one time with activity attendees if possible. Teachers mentioned in this study that they wanted time to ask questions to make sure that they are maximizing the capabilities of the technology.

Teachers also wanted access to engaging programs that allow for individualized student practice and that feature authentic materials. Since student motivation and engagement are the primary reasons that teachers use WELL in the classroom, it is imperative that the technology be interesting to the students. Furthermore, as engagement with other communities encourages students to "construct knowledge through human activity" (Kim, 2001 as cited in Amineh & Asl, 2015, p. 13), exposure to authentic resources are a necessary tool to engage students in the culture of the target language.

Additionally, teachers desired assistance with preemptively troubleshooting any issues that might arise during implementation. Giving them suggestions to overcome obstacles allows teachers to feel prepared and more likely to use WELL in the class even

in the face of uncertain device reliability. Since the study's participants noted their top barriers to WELL implementation were time and reliability, giving them an easy way to use the technology through a variety of platforms allows teachers a way to overcome certain hindrances. Teachers also appreciated having an opportunity to follow up with the presenter to determine if they were using the WELL technology successfully. If face-to-face contact could not be made, teachers were amenable to online modules.

Implications for Teacher Education Programs

According to this study, few teachers learned to use WELL from their teacher education programs. Recommendations to address this issue include the creation of a series of classes that could be taken over time. In addition to the ideas listed above, teacher education programs should create methods courses that are geared towards content areas offered in the program. As TPACK focuses on the integration of different types of knowledge, having a class that focuses on one's content is ideal in helping to develop a newly formed knowledge base. Should the creation of multiple methods courses prove too difficult, one thoughtfully formed methods course that uses TPACK and the effective characteristics as a framework could be an option. In such a course, pre-service teachers should be grouped by content area and required to collaborate to complete the course. This study found that in addition to being self-taught, teachers also learned from their colleagues which adheres to the social constructivist paradigm. The course should be offered as a series to give participants extended opportunities to engage with the technology. It can be offered for shorter time blocks over two semesters, rather than longer time blocks over one semester. This allows for follow-up to WELL

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implementation. Since teachers said they also learn from online modules, an online course that follows the same parameter highlighted above may also be an option.

Implications for School Districts

School districts can support and encourage district-wide professional learning communities (PLC) as well as dedicated time to ongoing professional development presented by teacher leaders. In accordance with the recommendations for the teacher educators, the districts should use a model based on TPACK and focused on content areas. They should also endeavor to utilize the effective characteristics identified in this study of learning to use WELL technologies.

School districts should also support teacher education opportunities through peer observation. Teachers noted that while they learned best from hands-on practice, they also appreciated technology being modeled. Being able to observe an actual class engaged in the activity will help teachers be able to "see themselves" using the specific technology. During my observations for this study, I learned about a myriad of web-based applications that I could easily implement into my own curriculum now that I know exactly how they can play out in an authentic setting. The observations could also allow teachers to think through potential obstacles that might arise and take steps to preempt them. The cohort of observing teachers could also be grouped by their PLC giving them the opportunity to not only observe one another, but also to collaborate and follow-up with WELL technology use during their PLC meetings. Finally, with the use of the school district's LMS, in-service teachers could remain in contact with one another

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virtually. This option could serve as a supplement or hybrid to regularly scheduled meetings.

Limitations

Although I attempted to reduce threats to reliability and validity, there are limitations of this mixed methods study. One limitation is the moderate sample size of N=113. While I hoped to secure at least double that amount, my sample size was estimated at 140 survey participants. This is based on the estimated population of 2000 with an 90% confidence interval and 8% margin of error. The number of survey participants was less than desired. This could be due in part to the length of the survey, as it took an average of 15 minutes to complete the survey. This excluded any extreme outliers which were assumed to be people who started and stopped intermittently during their completion of the survey. It could also be due to the method of delivery, as emailed surveys can produce low response rates.

Another limitation is the lack of variability of the participants who were interviewed and observed. From the list of participants who were willing to be observed, I used maximum variation sampling to determine a cross section of participants with varying responses to the survey questions. The purpose was to deliver a "small sample of great diversity" to produce high quality detailed descriptions and patterns across cases (Patton, 2015). The desired variability was not achieved due, in part, to non-response from teachers who had initially volunteered to be observed and the difficulties of obtaining school district permission to observe teachers. My goal was to interview and

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observe six teachers who fit the criteria, but I was only able to observe four and interview five teachers. This reduced access to the intended diversity of cases.

Finally, personal bias and limited research experience were also limitations to this study. I attempted to account for both these through rigorous methods of data collection and analysis. I sought to use sound statistical analysis and thick, rich description to allow the reader to come to their own conclusions about the data provided. However, important findings could have been inadvertently missed due to my emergent experience with data collection and analysis methods.

Implications for Future Research

The findings of this study led to implications for future research. They included additional research efforts to: (a) delve deeper into how WELL is used in the classroom; (b) determine the relationship between effective WELL classroom practices and student outcomes; and (c) determine how often WELL technologies should be used to enhance student outcomes. I discussed each of these below.

WELL Teacher Education and Its Effects on the Classroom

For this study I did not distinguish between the specific ways that WELL teacher education training is used in the classroom from the ways WELL technologies are used in the classroom in general. The scope of this study did not include an explicit link between WELL teacher education and the effects of a specific way of learning to use WELL in the classroom. Future research studies should focus on evaluating the direct effects of specific WELL teacher education activities on the classroom. By conducting a longitudinal study with a cohort of world language teachers who participate in a

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particular type of WELL teacher education activity, researchers can endeavor to find a correlation between the teacher education activity and its effects on the classroom.

Reciprocity Between Classroom Practices and Student Outcomes

Included in my conceptual framework is a reciprocal link between effective technology-based classroom practices and expected student outcomes. Ketsman (2012) noted that teacher expectations of students strongly correlated with student outcomes. As the use of effective WELL classroom practices increases, the desired student outcomes will also increase. While the existence of this reciprocal link was mentioned in my study, it was not thoroughly investigated using a student's perspective. Future research should endeavor to determine what reciprocal effect WELL classroom practices have on student outcomes. Pre- and post-assessments of students' language acquisition combined with classroom observations and student and teacher interviews could be collected as data. Such a study could be conducted at a variety of schools, controlling for the use of technology, the absence of technology, and the use of different types of technology.

WELL Screen Time

A final question that emerged from this study was how often WELL should be used in the classroom to maximize student outcomes. I did not find research concerning how frequently teachers use WELL in the classroom. Also, Alice mentioned that she was unsure if her efforts to use technology daily were leading to student mastery. Like the potential research study on reciprocity, a future study could be related to the time needed for WELL use in the classroom for students to master world language content. This study could replicate the one described above, but the controls would focus on the amount of

time that technology is used in the classroom and the types of technology used. The results of this potential study could inform educators about appropriate screen times for educational use.

Conclusion

The social constructivist paradigm, TPACK, and TESOL standards provide educators with a framework for sound educational practice. The three of them together allow educators the opportunity to integrate technological, pedagogical, and content knowledge with best practices for teaching language acquisition with technology from the point of view that knowledge is constructed through human interaction. In line with the basic assumption that language cannot be taught in isolation and that collaboration and communication are the reasons that languages exist, this framework offers a suitable complement for the integration of world languages and technology. Understanding the ways in which teachers learn to use WELL technologies, their access to teacher education activities, the characteristics of effective teacher education, the ways in which their training is applied, the reasons why they use WELL technologies, the types of technologies that they use, and the frequency with which they use them are important. By understanding what it takes to ensure world language teachers can effectively teach students using technology, we are setting up a framework for student success and achievement built on a foundation of purposeful collaboration, knowledge integration, and 21st century habits of mind.

This study provided several implications for how teacher educators should conduct training activities, how teacher education programs can support pre-service

teachers, and how school districts can support in-service teachers. The study revealed that although teachers learned to use WELL technologies in a variety of ways, they were using effective practices to integrate what they had learned into the curriculum; however, they would still like increased access to more effective teacher education activities that can help them continue to be knowledgeable practitioners. Implications from this study can guide teacher educators towards making teacher education activities for WELL technologies more relevant for teachers, thereby increasing effective web enhanced language learning technology use in the classroom.

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APPENDIX A

RESEARCH CROSSWALK

Research Questions	Survey Constructs & Rationale	Item Rationale	Survey Questions	Interview Questions	Observation Questions	Analysis Procedures	Data Sources
	Demographics Acquisition	**Ensuring Target Population**	1			Quan: Likert Scale, Descriptive	Quan: Survey
		Prevention of Response Duplication		2		Statistics, Field Coding for Open	
		Demographics	31-35	3-4		Responses,	Qual:
1. In what ways do K-12 world language teachers learn to use WELL technologies in the classroom?	**Ways of Learning WELL**-addresses the varied ways that WELL is learned	**Ways of Learning WELL**		5	(1)	Cross Tabulation	Interview, Observation
1a. What access do teachers have to WELL training?	**Teacher Education Participation**-addresses the extent to which teachers participate in any type of training for WELL	**TPACK & Teacher Ed Participation**		6	(2), elaborate	Qual: Theme Development and Content Analysis	
				7			
	Effective Classroom Practices—According to the Conceptual Framework/TESOL standards, effective classroom practices are Goal 1, Goal 2, Goal 3, Goal 4 (TESOL, 2008).	**TPACK & Teacher Ed Participation & Effective Practice**					
		TPACK & Teacher Ed Participation		8			

	TPACK—theoretical framework for the study. Research shows that it can be used as a model for PD and that teachers should have more training in content specific tech integration (Mishra & Koehler, 2006; Koh, Chai & Lim, 2016; Matherson, Wilson, & Wright, 2014; Ndongfack, 2015)			
1b. What are the characteristics of effective WELL teacher training from a teacher's perspective?	**Perception of WELL Teacher Education**—Teachers' want more & better training in WELL. Research notes this as one of the factors that influence WELL implementation (Buabeng-Andoh, 2012; Arnold & Ducate, 2015).	**Perceptions of WELL Tchr Ed & Effective Practice**	9	
		Perceptions of WELL Tchr Ed	10	(3) elaborate
		Perceptions of WELL Tchr Ed	11	
		TPACK & Characteristics & Perceptions of WELL Tchr Ed	12	
	Characteristics of Teacher Education-research lists that effective training is ongoing, of significant duration, offers support, engaging, utilizes modeling, and content specific. Noting the characteristics of	**Characteristics**	13	(5) elaborate
		Characteristics	14	

Research Question	Theme	Codes			Observation Question
	training of the participants can give additional insight into types of training that are effective (Darling-Hammond et al., 2009; Gulamhussein, 2013)				
2. In what ways do teachers apply WELL in the classroom?	**Ways Teacher Education Applied &Technology Use**-Addresses the various ways and for what purposes technology is used in a World Language Classroom.	**Ways Teacher Ed Is Applied & Tech Use TPACK & Effective Practice**	17	(6)	
2a. Why do teachers use WELL in the classroom?	**Student outcomes/ motivation**—Social constructivism & student motivation align with the reasons for using WELL and student outcomes are one of the main reasons why WELL is used (Arnold, 2007; Ketsman, 2012; Ketsman, 2014; Moore, 2006; Spodark, 2005). According to the Conceptual Framework/ TESOL standards, desired student outcomes are Goal 1., Goal 2., Goal 3. (TESOL, 2008).	**Perception of Tech & Ways Teacher Ed Is Applied & Tech Use**	16		
		Student Outcomes & Perception of Tech	18		
		Student Outcomes & Perception of Tech	19		
		Student Outcomes & Ways Teacher Ed Is Applied & Tech Use & Perception of Tech & Effective Practice	20	(7)	How is the teacher using/ engaging technology for the students? Is there ease of use? What is the observer's perceived comfort level?

Perception of Technology—Research lists advantages of using WELL (Egbert et al., 2002; Kessler, 2007; Ketsman, 2012; Moore, 2012). Teachers' perceptions are important because they directly affect their use of WELL (Buabeng-Andoh, 2012).	**Perception of Tech & Barriers**	21	
	Perception of Tech & Barriers & Ways Teacher Ed Is Applied & Tech Use	22	
	Barriers	24	(11)

Effective Practices—**Barriers to use**—lack of time, resources, support, & motivation are some reasons that negatively affect use of WELL. Inquiring into teachers' barriers as well as positive reasons for use will allow for a deeper analysis RQ2 (Chizmar & Williams, 2001; Burnett, 1998; Butler & Sellbom, 2002; Egbert et al., 2002; Ketsman, 2014; Moore, 2006). According to Egbert et al. (2002), the overall purpose of web-based language instruction (WELL) is to enhance teaching effectiveness and

	student achievement. <u>Positive reasons for using WELL</u> (Egbert et al., 2002; Ketsman, 2012; Lee, 2000; Warschauer & Healey, 1998)				
2b. What **types of WELL technologies** are being used by world language teachers?	**Types of WELL Technologies used— refers to what software, hardware, and web technologies are used to teach languages.**	**Types of Well & Effective Practice**	23	(8) (9)	What specific tools did the teacher use during class? (software/ hardware)
		Access	25		
		Access & Types of Well	26		
	Access to Technology & Logistics-teachers' access to technology directly influences their use of technology. Research notes this as one of the factors that influence WELL implementation (Buabeng-Andoh, 2012)	**Access**	27		
		Access & Barriers & Types of Well	28		
	Barriers to use—				

RATIONALE FOR SELECTION OF INTERVIEW AND OBSERVATION PARTICIPANTS

Q#	Survey Items	Frequency Determination	Rationale
3	What grade level(s) do you teach? • K-5th (4)—15.9% • 6-8th (5)—28.3% • 9-12th (6)—67.3% • Please list any combination of grade levels taught not listed here: _____ (7)—6.2%	Questions with 3 or fewer options were sorted by percentages.	-To account for a potential variety in types of technology used to teach different developmental levels and infrastructure (Buabeng-Andoh, 2012).
4	What language(s) do you currently teach? • American Sign Language (4)—0% • Arabic (5)—1.8% • Chinese (Mandarin) (6)—1.8% • English as a Second Language (7)—4.4% • French (8)13% • German (9).9% • Italian (10)—0% • Japanese (11) --.9% • Latin (12)—1.8% • Russian (13)—0% • Spanish (14)—69.9% • Other (Please Specify): (15) 3.5% Cherokee, Spanish & ESL, Spanish Heritage, ESL (2) •	To determine low, medium and high frequencies, I Visually Binned on SPSS with 2 cut points placed at equal percentiles based on scanned cases using the frequency percentages. Low Cutpoint:1.8 Medium Cut point: 3.5	-To account for a potential variety in types of technology used to teach different languages.
5	How have you learned to use WELL technology? *Select all that apply:* • Self-taught (1) 81.4% • Teacher education program (2) 30% • From colleagues (3) 58% • From IT or technology staff (4) 48% • From online sources (5) 51% • Attended teacher training workshops (6) 57.5% • Other (Please Specify): (7)12.4%	For questions that utilize a 'select all that apply' option, the goal for observation/interview is to connect with individuals who are representative of each method. I first determined the number of different methods used by each participant (range between 1 and 6- 'other' was omitted for the purposes of interview/observation selection). I then visually	-Research Question #1

| | | Binned the total count of each method on SPSS with 2 cut points placed at equal percentiles based on scanned cases using the frequency percentages. Low Cutpoint:2 Medium Cut point: ends at 4 | |

| 6 | Within the past twelve months, did you have access to any teacher training opportunities that addressed WELL technology?
• Yes, and I had sufficient opportunities (1) 32.7%
• Yes, but I wish there had been more opportunities (2) 32.7%
• No, and I wish there had been opportunities (3) 23.9%
• No, but I am uninterested in teacher training on WELL technology (4) 8%
• Unsure (5) 2.7% | To determine low, medium and high frequencies, I Visually Binned on SPSS with 2 cut points placed at equal percentiles based on scanned cases using the frequency percentages. Low Cutpoint:8 Medium Cut point: 23.9 (removed 1 of the repeating numbers32.7 because it was eliminating a high category) | - Research Question #1a |

| 17 | Please think back over the ways in which you use your WELL teacher training in the classroom and rate the following statements.

Item is a matrix with the following response options:
Never (1)
Rarely (2)
Sometimes (3)
Often (4)
Always (5)
• I train students to perform basic functions on digital device (editing, organizing, files, accessing applications, etc.)
• I train students to exercise appropriate caution when using online sources (concerning social media safety, computer viruses, etc.)
• I train students to understand that communication norms differ across cultures communities and contexts
• I train students to use WELL appropriately to achieve their learning objectives
• I evaluate WELL technologies for | I took the average Likert scale score for each of the 15 listed ways in which WELL teacher training is used in the classroom for each respondent. I then used Visible Binning to categorize respondents' usage of researched based effective practices at varying degrees of frequency. Visually Binned on SPSS with 2 cut points placed at equal percentiles based on scanned cases using the frequency percentages. Low Cutpoint:3.53 Medium Cut point: 4.188 | -Research Question #2 |

student internet safety
- I evaluate WELL technologies for curricula goals
- I prepare and maintain technology environments to meet specific teaching/learning goals.
- I choose WELL technologies that align with student needs and abilities
- I identify more than one approach to meet an objective (i.e. when technology is not working)
- I maintain research-based knowledge about up-to-date WELL technology use in the classroom
- I use WELL technologies for student assessment
- I use WELL technologies for record keeping
- I use WELL technologies for student feedback
- I use WELL technologies for communication with students
- I use WELL technologies in innovative, up-to-date ways
- Other (Please Specify): _____

20 For what purpose is the WELL technology used in your world language course? (Select all that apply)
- For student individualized practice and differentiation of instruction (1)—83.2%
- For student assessment (2)—70.8%
- To facilitate student collaboration in socially and culturally appropriate, legal, and ethical ways (3)—61.1%
- To improve student communication (4)—40.7%
- To improve student technological skills (5)—48.7%
- To increase student motivation (6)—83.2%
- To provide student access to authentic sources (7)—73.5%
- To provide immediate feedback to students (8)—57.5%
- To provide access to task-based and content-rich learning activities (9)—58.4%

For questions that utilize a 'select all that apply' option, the goal for observation/interview is to connect with individuals who are representative of each method. I first determined the number of different methods used by each participant (range between 1 and 9- 'other' was omitted for the purposes of interview/observation selection). I then Visually Binned the total count of each method on SPSS with 2 cut points placed at equal percentiles based on scanned cases using the frequency percentages. Low Cutpoint:5 Medium Cut point: ends at 8

-Research Question #2a

	• Other (please specify) (10) 8.8%		
21	I would like to use WELL technology in my classroom more often. • Strongly disagree (1)—8% • Somewhat disagree (2)—2.7% • Neither agree nor disagree (3)—12.4% • Somewhat agree (4)—36.3% • Strongly agree (5)—40.7%	All Likert scale were divided into negative, neutral, and positive categories	-To account for teacher perception of the use of WELL in the classroom. Also relates to Research Questions 2a and 2c. Teachers' perceptions are important to note as they directly affect their use of WELL implementation (Buabeng-Andoh, 2012).
22	I feel prepared to incorporate WELL technology in the classroom to support student learning. • Strongly disagree (1)10.6% • Somewhat disagree (2)8% • Neither agree nor disagree (3)8% • Somewhat agree (4)41.6% • Strongly agree (5)31.9%	All Likert scale were divided into negative, neutral, and positive categories.	-To account for teacher perception of the use of WELL in the classroom. Also relates to Research Question 2a. Teachers' perceptions are important to note as they directly affect their use of WELL implementation (Buabeng-Andoh, 2012).
24	What barriers prevent you from using WELL in the classroom? (Select all that apply) • Lack of time (1) 38.9% • Lack of support (2) 14.2% • Lack of motivation (3) 3.5% • Lack of training (4) 31% • Lack of device reliability (5)36.3% • Other (Please Specify): (6) 20.4% • I do not have any perceived barriers that prevent me from using WELL. (7) 22.1% • Lack of Support from the school administration (8) 4.4%	For questions that utilize a 'select all that apply' option, the goal for observation/interview is to connect with individuals who are representative of each method. I first determined the number of different methods used by each participant (range between 1 and 5- 'other' was omitted for the purposes of interview/observation selection). I then visually Binned the total count of each method on SPSS with 2 cut points placed at equal percentiles based on scanned cases using the frequency percentages. Low Cutpoint:1 Medium Cut point: ends at 2 (high=1, mid=2, low=3, 4, 5).	-To account for different barriers as presented by across school types, grade levels, access and languages. Lack of time, resources, support, & motivation are some reasons that negatively affect use of WELL. Inquiring into teachers' barriers as well as positive reasons for use will allow for a deeper analysis RQ2 (Burnett, 1998; Egbert et al., 2002; Ketsman, 2014; Moore, 2006).
25	Do your students have access to individual technology devices at your primary place of employment? • Yes 86.7% • No 12.4%	Questions with 3 or fewer options were sorted by percentages.	--To account for different levels of access across school types, grade levels, and languages. Teachers' access to technology directly influences their use of technology. Research notes this as one of

		the factors that influence WELL implementation (Buabeng-Andoh, 2012).
27 Do you, as a teacher, have access to individual technology devices at your primary place of employment? • Yes 100% • No	Questions with 3 or fewer options were sorted by percentages.	-To account for different levels of access across school types, grade levels, and languages. Teachers' access to technology directly influences their use of technology. Research notes this as one of the factors that influence WELL implementation (Buabeng-Andoh, 2012).
29 In a typical five-day school week, how often do you utilize WELL technology in your classroom? • Never (11) .9% • Rarely, less than 20% of the school week (12) 10.6% • Occasionally, about 21-40% of the school week (13) 13.3% • Sometimes, about 41-60% of the school week (14) 16.8% • Most of the time, about 61-80% of the school week (15) 26.5% • Usually, about 81-90% of the school week (16) 19.5% • Always (17) 12.4%	To determine low, medium and high frequencies I divided the WELL technology use by infrequent, moderate, and high usage categories.	-Research Question #2c
34 For how long have you been employed full or part-time world languages teacher? • Less than five years (1) 11.5% • Five to ten years (2) 19.5% • More than ten years (3) 69%	Questions with 3 or fewer options were sorted by percentages.	-To account for different levels of engagement with technology across teaching experience (Buabeng-Andoh, 2012).
35 At what type of school do you currently work? • Public, non-charter (1) 71.7% • Public, charter (2) 13.3% • Private, non-religiously affiliated (3) 7.1% • Private, religiously affiliated (4)5.3% • Other (Please Specify): (5) 2.7% (2 online)	To determine low, medium and high frequencies, I Visually Binned on SPSS with 2 cut points placed at equal percentiles based on scanned cases using the frequency percentages. Low Cutpoint:5.3 Medium Cut point: 13.3	-To account for different levels of engagement with technology across school infrastructures (Buabeng-Andoh, 2012).

INTERVIEW PROTOCOL

1. Reiterate the purpose of the interview. **The purpose of this interview is to get a teacher's perspective concerning the use of web-enhanced language learning technology in the world language classroom. This interview will take about 20-30 minutes.**
2. Address confidentiality & the format of the interview (including permission to record) **I would like your permission to video record this interview so that I can transcribe our session. This video will be kept in a secure folder on my laptop and will not be shared with anyone. Your responses to these interview questions will be strictly confidential in that your responses will in no way be connected to your name. I will use a pseudonym when transcribing our conversation.**
3. Inform the participant that I will send a copy of the transcribed interview. **If you'd like I will send you a copy of the transcribed interview to make sure that you find the transcription to be accurate.**
4. Ask the participant if there are any clarifying questions **Do you have any clarifying questions before we begin? Please feel free to email me if you come up with any additional questions.**

	Research Questions	Interview Questions
1. In what ways do K-12 world language teachers learn to use WELL technologies in the classroom?	a. What access do teachers have to WELL training? b. What are the characteristics of effective WELL teacher training from a teacher's perspective?	1. How have you learned to use WELL technology? 2. In the last twelve months, how many teacher training activities have you attended related to WELL technology use in the classroom? a. Tell me about them. 3. How would you rate the average usefulness (relevant to your instruction) of the training you received for WELL technology and why? 4. How would you rate the average quality (delivery of material presented) of the training you received for WELL technology? 5. After participating in a WELL teacher training activity, what characteristics of the teacher training make you most likely to incorporate what you learned into your own practice as an educator?

		a. How often do you feel they are present?
		6. In what ways do you use your WELL teacher training in the classroom?
		7. For what purpose is the WELL technology used in your world language course?
2. In what ways do teachers apply WELL in the classroom?	b. What types of WELL technologies are being used by world language teachers?	8. What types of WELL technology do you use in your world language course?
		9. Why do you use those specified WELL technologies?
	c. How often are WELL technologies being used in the classroom?	10. How often, on average, do you use WELL technology in the classroom?
		11. What barriers prevent you from using WELL in the classroom?

Contact Summary
Participant:
Date: (date of transcription)
1. What main issues or themes struck me in this contact?
2. Summary of the information I obtained (or failed to obtain) on each of the target questions that I have for this contact.
   a. Ways of learning WELL:
   b. Training Participation
   c. Perception of Teacher Training
   d. Characteristics of Training
   e. Ways training is applied
   f. Technology Use
   g. Perception of Technology
   h. Effective Classroom Practices
   i. Barriers to use
   j. Types of WELL technologies used
   k. Access to Technology & Logistics
   l. Frequency of Use
   m. Other things that came up
3. Anything else that struck me as salient, interesting, illuminating, or important in this contact?
4. What new or remaining questions do I have in considering the next contact?

Interview Analysis Codes

Conceptual Framework (TESOL Goals)	Theoretical Framework TPACK	Themes	RQs
Teacher Goal 1: Language teachers acquire & maintain foundational knowledge & skills for professional purposes.	Pedagogical Knowledge (PK) Technological Knowledge (TK) Technological Pedagogical Content Knowledge (TPACK)	**Ways of Learning Instructional Technology** **Effective Classroom Practices** **Teacher Education Participation** **Perception of WELL Teacher Education** **Characteristics of WELL Teacher Education**	1 1a 1b
Teacher Goal 2: Language teachers integrate pedagogical knowledge & skills with technology to enhance teaching and learning. Teacher Goal 3: Language teachers apply technology in record-keeping, feedback, and assessment. Teacher Goal 4: Language teachers use technology to improve communication, collaboration & efficiency.	Technological Pedagogical Knowledge (TPK) (TK) (TPACK)	**Ways WELL teacher education is applied and Technology Use** **Effective Classroom Practices**	2

Teacher Goal 2	(TPK)	**Perception of Technology**	2a
Teacher Goal 3			
Teacher Goal 4	(TPACK)	**Effective Classroom Practices**	
Student Goal 1: Language learners demonstrate foundational knowledge and skills in technology for a multilingual world.		**Student outcomes/motivation**	
Student Goal 2: Language learners used technology in socially and culturally appropriate, legal, and ethical ways.			
Student Goal 3: Language learners effectively use and critically evaluate technology-based tools as aids in the development of their language learning competence as part of formal instruction and for further learning.			
Teacher Goal 3	(TPK)	**Access to Technology & Logistics**	2b
Teacher Goal 4			
Student Goal 1	(TPACK)	**Barriers to use**	
Student Goal 2		**Student outcomes/motivation**	
Student Goal 3			
Teacher Goal 3	(TK)	**Barriers to use**	2c
Teacher Goal 4	(TPACK)	**Frequency of Use**	

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Interviewee: Ayesha Monique Coleman Swinton [AS]
Interviewee: Pseudonym Mam
 Date and Time: March 27, 2018 7:26pm EST Duration: 17:32 minutes
Interview with SM on March 27, 2018. This interview was conducted on the telephone and recorded using Google Voice and Audacity Audio Recorder.

AS: All right here we go once again. So, the purpose of this interview is to get a teacher's perspective concerning the use of web enhance language learning technology in the world language classroom. The interview will take about 15 to 20 minutes and you already gave me permission to record this call and if you need me to I'd be happy to send you a copy of the transcribed interview to make sure that you find everything to be accurate.
MALINA: Okay sounds good.
AS: Do you have any clarifying questions before we begin?
AS: Okay, if you come up with any questions after, feel free contact me and let me know and I'll be happy to answer them. Okay, so the first question is how have you learned to use WELL technologies. Okay how?
MALINA: I didn't get all of that question.
AS: Okay, how have you learned to use WELL technology?
MALINA: How have I use technology in the classroom?
AS: No, how have you learned to use it?
MALINA: How have I learned to use it, is that a question? Okay, well I guess some of it has been just learning on my own, but I have taken several courses that our district offers and especially with the learning platform that they are beginning to use in our district I have spent three summers on almost a week-long course to learn how to use it efficiently and effectively.
AS: Okay, which learning platform is it?
MALINA: Canvas. I've done a little bit on Google classroom, but I prefer Canvas and that's what the district is moving towards.
AS: Thank you. In the last 12 months how many (unintelligible) activities have you attended? So, will you tell about, that use of WELL in the classroom, will you tell me about the last couple of summers you said you had the Canvas courses?
MALINA: In the last how long? Year, twelve months? In the last year how many sessions have I attended to learn how to use canvas?
AS: In particular any WELL technology, any world language technology.
MALINA: Okay in the last year I've taken one course and I would say with maybe eight hours.
AS: And can you tell me about that course?

MALINA: Yes, it was yes. It was again, it was the use of canvas specifically with the world languages using things like audio for the students to be able to listen to different articles, newscasts, and radio broadcasts and then answering and recording their own responses.

AS: Oh okay, how did you find that session?

MALINA: How did I find those sessions?

AS: Yeah, did you like it, did you enjoy it? What did you think about it?

MALINA: Yes, I enjoyed it a lot because it's something applicable and it's something that I was able to plan my own lessons as I was doing the course, so it didn't feel like it was a waste of time. And again, it was applicable because sometimes the trainings are very good for other content areas but not necessarily for world languages, but in this case, I feel like every minute I spent in it was useful.

AS: Wonderful, and how would you rate overall the average usefulness of the training you receive the world technology but not just this particular training but in general how do you? What do think about training for world languages and technology?

MALINA: I mean if I would say the scale of one to ten for world languages specifically I would give it a six. It's not very often that that specific course is offered and actually this training was not specifically for world languages but the way it was set up, the training, each teacher was able to do their own work. But for world languages it tends to be very generalized and it's only for like one website. For example, if we're using a textbook with Vista Higher Learning the training is generally geared towards that particular book, but since we don't use only that book in class it's very limited to what we can do and if they don't buy access for each one of the students then it's a little bit of a waste of time because I'm learning what the kids could do if they had a license. But since the district didn't buy the license then it's not very helpful. So, I would say what we have been offered about technology for world languages specifically, I would rate it you know again maybe a five or six.

AS: Okay and in general, how would you rate the average quality of the training that you received in regards to the delivery of materials? So, what did you think about the presenter in particular?

MALINA: It was well presented, it was engaging it was useful, for me because I was familiar with the books and with the website. If somebody is brand-new and has not been exposed to it previously I think it goes a little bit too fast and I say that because some of my co-workers felt a little lost. But for me it was good, it was engaging, and it went through each one of the steps of what we could do with that technology, so it was helpful.

AS: Okay and so after participating in this particular training or any activity training for WELL world technology, world languages and technology; What characteristics of the teacher training make you most likely to incorporate what you learned into your own practices? So, what makes you actually bring it back to the classroom?

MALINA: Applicability and having the resources in the classroom. If I know that I can use it with my students and they will have the technology, you know the Chromebook or laptop or self whatever, you know if I know that they're going to be able to access it, that's the most helpful thing. Now when I know that they have access then, it excites me

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that I can guide them to use technology in an educational way. We tend to think that students, I work with teenagers, so we tend to think that they know everything about technology and it's interesting to see that they really don't know how to use it for educational purposes, sometimes unless we teach them. So, when I get back from those trainings it's very exciting for me to be able to teach them something in relation to technology and again as long as I know that I have access to the tools that they need.

AS: Okay, in general how often do you find that to be true in your training, that it's applicable in that the students, your students, will actually have access to it.

MALINA: How often is it applicable, you mean in general trainings or specifically with technology?

AS: Specifically, with world languages and technology training

MALINA: I think that it's applicable most of the time. Especially the way the world is going now that technology is a big part of our schools and of student's lives, it's definitely applicable.

AS: Okay, in what ways do you use that training in your classroom? So, have you learned anything in the training that that you've been able to utilize in your classroom, issues like any specifics that you can remember?

MALINA: I've used a lot of the things that I've learned starting with using less paper and one a lot more assignments online. In my classroom itself, getting students' immediate responses. Also, being able to differentiate, because I can assign students different work depending on their skills and ability and interest. So indefinitely I think that everything that I've learned I've been able to apply. Not everything all at once, but over time little by little I go and implement a little bit more as I can. The testing is now done, mostly nonhomework, I try to do mostly online. And you know it doesn't substitute the personal relationship, but it does enhance and add to it.

AS: Okay and so you already told me. The next question is why do you, what purpose does WELL technology your classroom and you told me for homework, for tests.

MALINA: Yeah, assessments and I use it a lot also for feedback where they can tell me how much and producing. I can measure a little bit better where they need help when they show me what they can do with the language through technology. I use it, yeah for assessment and for everyday feedback. They also have many different ways to reach me and to ask me questions. So, like you said, a lot for like homework and interaction and also, it's been really neat how they can; the students have been able to work with other students that are not in their own classroom

AS: And what types of technology do you use in your course world language?

MALINA: I'm sorry I didn't get that.

AS: I'm sorry, what types of world language technology do you use in your course?

MALINA: What device?

AS: What types like, what software or website application.

MALINA: Yeah so, we use, I use Google classrooms some and that's mostly for differentiation because I give them different assignments. We use Canvas and in Canvas you know we can do the assessments. We can do reading, we can do writing, we can do speaking, listening. I use the textbook that the district has purchased only access for the

teacher not for the students, but I can access the audios and the videos and then they can respond to it. So, they can't interact with the book, but I show them you know the questions or whatever and then generally I create something for them where they can respond even if they don't have direct access to the to the same material. And I try to use some authentic material like newscasts or radio broadcasting, things that they can listen to or feel that are from the country of the target language.

AS: And why do you like those in particular?

MALINA: Why do I like?

AS: Why do you use those specific technologies?

MALINA: Because I have found that its friendly, user friendly. The students get comfortable with it and they can do pretty much everything I need them to do with the language. They can produce writing and speaking. They can either and they can also you know do it individually and also interact. It doesn't help with conversation obviously they have to do that in person, but even presentational. I like those technologies because I think that they enhance the learning experience for them and again they feel comfortable. They can navigate easily, they can find their way around, and it's very similar to a lot of the apps that they have on their phones. And they can learn very quickly how to do different things with that on average.

AS: How often would you say you use tech in your classroom?

MALINA: How often do I use technology? I mean I use technology in my classroom every day and I would say 50% of the time in my class there's some sort of technology. If not, directly my students using it, but again I can, might show to the video or I might present something from a projector that has the source being the book online or some like that. But I would say about 50% of the time at least every day has something to do with technology.

AS: Great, my last question is what barriers prevent you from using technology in the classroom?

MALINA: We don't have access to chrome books every single day, so you know accessibility. Our internet is not a hundred percent reliable. So, there are days when just you don't have access to Internet or it just doesn't work very well. And also, our building is very old, we've had days when the power goes off, so we have absolutely no technology. And with cell phones I mean I try that but honestly, I am pro technology, but again cell phones because they are a big distraction. So, I find that what students start using cellphones to access the different sites or apps. They get immediately sidetracked into texting or using their own apps and games and then pretty soon they're not engaged in the class anymore. So yeah, I mean if the access to technology, access to Internet, and reliability I would say to further hindrances.

AS: Okay, that was wonderful thank you so much for your time.

MALINA: Sure.

APPENDIX E

OBSERVATION PROTOCOL

Classroom Layout

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Research Questions	Focusing Questions
2. In what ways do teachers apply WELL in the classroom?	1. How is the teacher using/engaging technology for the students? Is there ease of use? What is the observer's perceived comfort level?
2a. Why do teachers use WELL in the classroom?	2. How are the students engaged in the technology? Is there ease of use? What is the comfort level?
2b. What types of WELL technologies are being used by world language teachers?	3. What specific tools did the teacher/student use during class? (software/hardware)
2c. How often are WELL technologies being used in the classroom?	4. How long were the students engaged with technology?
	5. How long was the teacher engaged with technology?
Additional Focusing Questions	1. Where are the objects located?
	2. What are all the places activities occur?
	3. Where do the actors place themselves?
	4. What are all the ways activities incorporate objects?
	5. Where do I watch and why?
	6. Whom do I watch? Why?
	7. What do I watch? Why?

Other things to consider while observing (Spradley, 1980)
1. Space
2. Actor(s)
3. Activity
4. Object
5. Act
6. Event
7. Time
8. Goals
9. Feelings

Observation Date/Time	Preliminary Codes	Theoretical/Analytical Notes/Memos

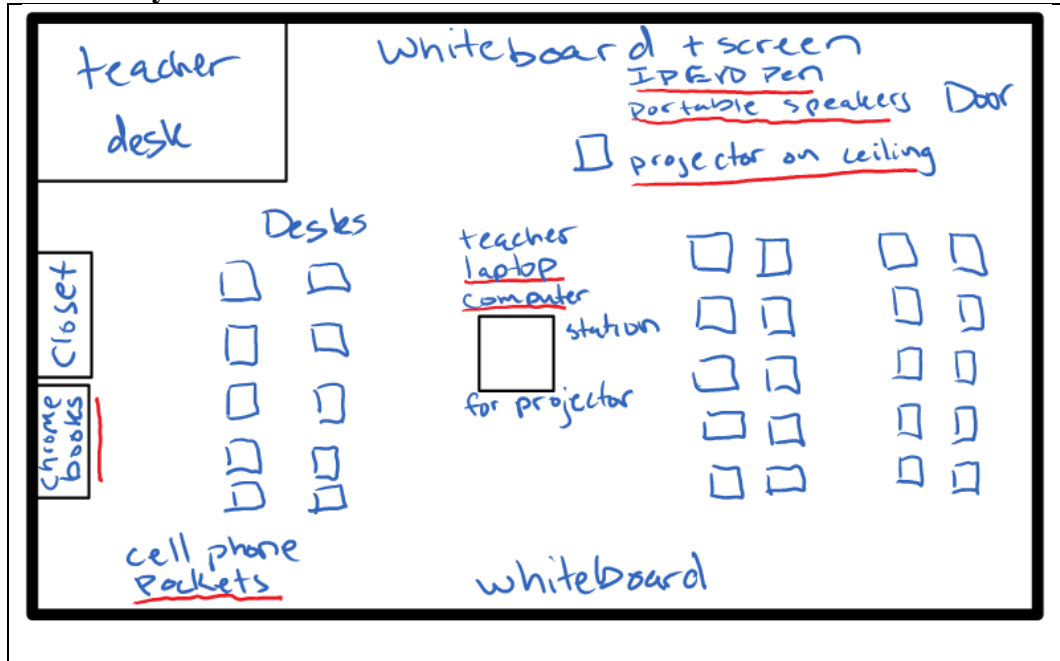Observation Analysis Codes (See Interview Analysis Codes Appendix C)

COMPLETED CLASSROOM OBSERVATION

Class: Spanish Level 2
Teacher: Alba
Date: April 4, 2018 12:05p-
Public High School in Western NC
Students received consent forms via online class webpage

Classroom Layout

Research Questions	Focusing Questions
2. In what ways do teachers apply WELL teacher training in the classroom?	1. How is the teacher using/engaging with technology? Is there ease of use? What is the observer's perceived comfort level? Do I notice the following teacher behaviors during the observation? **Teacher seems very comfortable with technology; students seemed well trained to interact with projector/document camera/video and their own notebooks. Used tech to complete worksheet about reflexive verbs, show video/authentic materials, play sound** • The teacher trains students to perform basic functions on

digital device (editing, organizing, files, accessing applications, etc.)

Students went right to website and knew how to log on

- The teacher trains students to exercise appropriate caution when using online sources (concerning social media safety, computer viruses, etc.)
- The teacher trains students to understand that communication norms differ across cultures communities and contexts

   Made a note of communication differences between Argentina and central America in terms of using the verb irse.

- The teacher trains students to use WELL appropriately to achieve their learning objectives-to **Use different Lexiles from Newsela on their Chromebook**
- The teacher evaluates WELL technologies for student internet safety
- The teacher evaluates WELL technologies for curricula goals

   Panama video, Newsela, Quizlet

- The teacher prepares and maintains technology environments to meet specific teaching/learning goals.

   Panama video, Newsela, Quizlet

- The teacher chooses WELL technologies that align with student needs and abilities

   Newsela (different levels)

   Students engage with the video, Quizlet for group and video vocab practice

- The teacher identifies more than one approach to meet an objective (Teacher i.e. when technology is not working)

   The video sound stopped working, but she kept moving through it and the sound came from the computer

- The teacher maintains research-based knowledge about up-to-date WELL technology use in the classroom
- Newsela
- The teacher uses WELL technologies for student assessment.

   Newsela, kids had option to do quiz

- The teacher uses WELL technologies for record keeping
- The teacher uses WELL technologies for student feedback
- The teacher uses WELL technologies for communication with students.

	(Posted student video consent form on class web page) has a blog website posted on her board • The teacher uses WELL technologies in innovative, up-to-date ways **Newsela, Quizlet.live** Stayed for a brief second class • **Student presented a pptx about her brother, used projector pen, to advance slides on projector screen.** • **Second class has 30 students** • **Teacher went to see if the speaker was recharged in order to play the mola video** • **Lights off for video, on for paper** • **One student at the end of class said it's good that we can use the computers because we can get on our cell phones and do whatever, but on the laptop the teacher knows what we are doing, and we have to stay focused.**
2a. Why do teachers use WELL in the classroom?	2. For what purposes was WELL used in the classroom? (Teacher. assessment, feedback, communication, etc.) **Video to show how to make a mola from the Guna Yala in Panama, spoke about how yesterday she showed a video about the Panama Canal to show the students about their culture.**
2b. What types of WELL technologies are being used by world language teachers?	3. What specific tools where used during class? (software/hardware) • **Laptop** • **Projector** • **Screen** • **Wireless Speakers ran out of batteries** • **Digital Pen to interact with projector screen** • **Students use notebooks** • **Some students on digital watches, but to my knowledge, not for school work** • **Used a piece of paper to have students distinguish between saber /conocer…they walked across the room** • **Did 1,2,3,4, 5 sentences** • **Used worksheet to talk about reflexive verbs, one student asked for permission to text mom,** • **Students' notebooks have verb charts, worksheets, etch** • **Used document camera to do worksheet with students (camera was a little fuzzy)**

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		• Used whiteboards to conjugate reflexive verbs, students stood up to write in conjugations
		• Has a plastic shoe storage device to hold students' cell phones
		• Students listened to teacher review, then got up to translate the conjugated verbs
		• Students take out lined paper, walk around the room and write sentences with pictures posted around the room.
		• Students were instructed to go get a Chromebook, log in and go to Newsela.
		• Sra. had assigned a story using Newsela and students could choose their own Lexile level. Students were allowed to choose the level.
		• Students have to respond to reading comprehension questions
		• Some students complained that their item would not load, Sra. said, 'sometimes that happens' and kept moving through the reading.
		• Advised one student to just use google sign in to read
		• Some students already completed the quiz available on the website
		• Reminded students that they can read at a lower Lexile. Some students not engaged (but was the case for written activities as well
		• Reviewed questions
		• On Quizlet.live the students can play a vocabulary game with other members of the class. Teacher moved quickly to websites and projected/modeled the entire time…
		• Quizlet game at the end of class, students are familiar with the game and moved around to work with other members of the class. The logged on and put in the class code quickly, one student lagged behind
		• Teacher walked around while students played game.
		• Students returned computers and packed up, got phones, etc.

2c. How often are WELL technologies being used in the classroom?	4. For what length of time was technology used in the classroom? • **Video 7 minutes "la mujer y la mola", then went back to use whiteboard** • **Returned to the computer to change to another video (2 minute)** • **Document camera (5 minutes?)—check video** • **-Newsela— (8 minutes?)** • **Quizlet: 1:23p-1:27p** • **Gave winning team ring pops** • **One set of Chromebooks for WL hall stored in her room** • **30 in cart, keep 3 always in room.** • **Uses them the most, got last year** • **Homework online, has a class blog did study Spanish for hmwk** • **Quizlet learn** • **Quizlet matching game**
Additional Focusing Questions	1. Where are the objects located? **Screen in front, projector on ceiling, laptop in middle of room on desk next to document camera** 2. What are all the places activities occur? **Middle of the room, front of the room** 3. Where do the actors place themselves? **Teacher walking around, whiteboard, walls, middle of the room,** **17 students seated (9 boys) (8 girls)** 4. What are all the ways activities incorporate objects? 5. Where do I watch and why? **I watch the teacher mostly, but look at the student materials/interaction with tech** 6. Whom do I watch? Why? **Teacher, I want to focus on her use of tech, I also look at how students interact** 7. What do I watch? Why? **All around the room to watch for instances of tech use/materials**

SURVEY QUESTIONS

Q#	Survey Items
1	In the past 12 months have you taught a World Language to K-12th grade students in North Carolina? • Yes (1) • No (2) **If no, skip to end of survey.**
2	Please enter your work email address. This identifier will only be used to prevent duplication of survey results. All survey results will remain anonymous and participants will not be contacted without consent.
3	What grade level(s) do you teach? • K-5th (1) • 6-8th (2) • 9-12th (3) • Please list any combination of grade levels taught not listed here: (4)
4	What language(s) do you currently teach? • American Sign Language (1) • Arabic (2) • Chinese (Mandarin) (3) • English as a Second Language (4) • French (5) • German (6) • Italian (7) • Japanese (8) • Latin (9) • Russian (10) • Spanish (11) • Other (Please Specify): (12)
5	How have you learned to use WELL technology? *Select all that apply:* ● Self-taught (1) ● Teacher education program (2) ● From colleagues (3) ● From IT or technology staff (4) ● From online sources (5) ● Attended teacher training workshops (6) ● Other (Please Specify): (7) _____

6   Within the past twelve months, did you have access to any teacher training opportunities that addressed WELL technology?
- Yes, and I had sufficient opportunities (1)
- Yes, but I wish there had been more opportunities (2)
- No, but I am uninterested in teacher training on WELL technology (3)
- No, and I wish there had been opportunities (4)
- Unsure (5)

If "No" Is Selected, Then Skip to "I have attended professional development

7   In the last twelve months, how many teacher training activities have you attended that included WELL technology use in the classroom as one of the topics? None (1)
- 1-2 (2)
- 3-4 (3)
- 5 or more (4)

8   I have attended professional development which were focused on WELL technology in the classroom at some point over the course of my career?
- Yes (1)
- No (2)

If 'No' Is Selected, Then Skip to "How do you think WELL technology use

9   Attending teacher training activities that address WELL technology in the classroom has made me more likely to integrate WELL technology into my classroom.
- Strongly disagree (1)
- Somewhat disagree (2)
- Neither agree nor disagree (3)
- Somewhat agree (4)
- Strongly agree (5)

10   How would you rate the overall usefulness (relevant to your instruction) of the training you received for WELL technology?
- Not at all useful (1)
- Slightly useful (2)
- Moderately useful (3)
- Very useful (4)
- Extremely useful (5)

How would you rate the average quality (delivery of material presented) of the training you received for WELL technology?
- Terrible (1)
- Poor (2)
- Average (3)
- Good (4)
- Excellent (5)

11   Please explain how the WELL technology training you received could be improved. (free response)

12   Please think back over the WELL teacher training activities you attended and rate the following statements.
Item is a matrix with the following response options:
Never (2) Sometimes (3) About half the time (4) Most of the time (5) Always
- The presenter(s) related the learning material directly to my classroom practice (a)
- The presenter(s) introduced technology that was new to me (b)
- The presenter(s) modeled WELL technology use (c)
- The presentation was of adequate length to learn how to use a new technology as an instructional tool (d)
- The technology training related to specific content areas (e)
- The technology training related to specific grade-levels (f)
- Opportunities were offered to work in small groups which were focused on either grade-level and/or content commonalities (g)
- I was able to utilize/experiment with the technology being presented during the teacher training (h)
- The presenter(s) discussed challenges of classroom technology use (i)
- The presenter(s) discussed challenges of personal technology use (j)
- The presenter(s) discussed solutions for challenges to classroom technology use (k)
- The presenter(s) discussed solutions for challenges to personal technology use (l)
- I attended with colleagues from my school (m)
- After attending, I discussed what I learned with colleagues from my school (n)

13   After participating in a WELL teacher training activity, what characteristics of the teacher training make you most likely to incorporate what you learned into your own practice as an educator? *(Select all that apply)*
- Multi-series training (1)
- Short in duration (2)
- Consisting primarily of interactive learning opportunities (3)

- Consisting primarily of presentations (4)
- Discussing cutting edge ideas or practices (5)
- Presenting solutions to obstacles I may face with implementation (6)
- Presenting solutions to obstacles students may face with WELL technology use (7)
- Limited to professionals from my school (8)
- Limited to professionals from my content area (9)
- Limited to professionals from my grade level (10)
- Other, please specify: (11) _____

14 Of those characteristics listed above, on average, how often do you feel they are present in the WELL teacher training activities in which you participate?
- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- Always (5)

16 Prior to attending professional development activities discussing WELL technology, how often, on average, did you use WELL technology in the classroom?
- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- Always (5)

17 Please think back over the ways in which you use your WELL teacher training in the classroom and rate the following statements.
Item is a matrix with the following response options: Never (1) Rarely (2) Sometimes (3) Often (4) Always (5)
- I train students to perform basic functions on digital device (editing, organizing, files, accessing applications, etc.)
- I train students to exercise appropriate caution when using online sources (concerning social media safety, computer viruses, etc.)
- I train students to understand that communication norms differ across cultures communities and contexts
- I train students to use WELL appropriately to achieve their learning objectives
- I evaluate WELL technologies for student internet safety
- I evaluate WELL technologies for curricula goals

- I prepare and maintain technology environments to meet specific teaching/learning goals.
- I choose WELL technologies that align with student needs and abilities
- I identify more than one approach to meet an objective (i.e. when technology is not working)
- I maintain research-based knowledge about up-to-date WELL technology use in the classroom
- I use WELL technologies for student assessment
- I use WELL technologies for record keeping
- I use WELL technologies for student feedback
- I use WELL technologies for communication with students
- I use WELL technologies in innovative, up-to-date ways
- Other (Please Specify): _____

18   How do you think WELL technology use in your course affects student language acquisition?
- Negatively affects student outcomes (1)
- Somewhat negatively affects student outcomes (2)
- Does not affect student outcomes at all (3)
- Somewhat positively affects student outcomes (4)
- Positively affects student outcomes (5)

19   Please explain your rating for the question above. (open response)

20   For what purpose is the WELL technology used in your world language course? (Select all that apply)
- For student individualized practice and differentiation of instruction (1)
- For student assessment (2)
- To facilitate student collaboration in socially and culturally appropriate, legal, and ethical ways (3)
- To improve student communication (4)
- To improve student technological skills (5)
- To increase student motivation (6)
- To provide student access to authentic sources (7)
- To provide immediate feedback to students (8)
- To provide access to task-based and content-rich learning activities (9)
- Other (please specify) (10)

21   I would like to use WELL technology in my classroom more often.
- Strongly disagree (1)
- Somewhat disagree (2)

- Neither agree nor disagree (3)
- Somewhat agree (4)
- Strongly agree (5)

22   I feel prepared to incorporate WELL technology in the classroom to support student learning.
- Strongly disagree (1)
- Somewhat disagree (2)
- Neither agree nor disagree (3)
- Somewhat agree (4)
- Strongly agree (5)

23   What types of WELL technology do you use in your world language course? (Select all that apply)
- An online flashcard site (such as Quizlet, Study Blue) (1)
- Online Assessment Sites (such as Quia) (2)
- Language learning practice sites (Duolingo, Conjuguemos.com, Studyspanish.com, Spanishlistening.org) (3)
- Audio/Video Sites (such as YouTube, Skype) (4)
- Other (please list) (5)

24   What barriers prevent you from using WELL in the classroom? (Select all that apply)
- Lack of time (1)
- Lack of support (2)
- Lack of motivation (3)
- Lack of training (4)
- Lack of device reliability (5)
- Other (Please Specify): (6) _____
- I do not have any perceived barriers that prevent me from using WELL. (7)

25   Do your students have access to individual technology devices at your primary place of employment?
- Yes
- No

If "No" is selected skip to "Do you as a teacher…."

26   What devices do your <u>students</u> have access to at your primary place of employment? (Select all that apply)

This is a Matrix that includes "Place of Access: Home and School, School Only, Unsure or Not Applicable" and "Frequency of Access: 1-2 times weekly, 3-4 times weekly, weekday/school day (Monday-Friday), seven days per week, unsure or not applicable"
- Computer (Laptop, Desktop, Mac, Chromebook, etc.) (1)
- Smartphone (2)

- Tablet (I-Pad, etc.) (3)
- Wireless Internet Access (4)
- Wired Internet Access (5)
- Headphones (6)
- Other (Please Specify): (7) _____

27   Do you, as a <u>teacher</u>, have access to individual technology devices at your primary place of employment?
- Yes
- No

28   What devices and internet access do you, as a <u>teacher</u> have access to at your primary place of employment? (Select all that apply)
This is a Matrix that includes "Place of Access: Home and School, School Only, Unsure or Not Applicable" and "Frequency of Access: 1-2 times weekly, 3-4 times weekly, weekday/school day (Monday-Friday), seven days per week, unsure or not applicable"
- Computer (Laptop, Desktop, Mac, Chromebook, etc.) (1)
- Smartphone (2)
- Tablet (I-Pad, etc.) (3)
- Smart Board (4)
- Wireless Internet Access (5)
- Wired Internet Access (6)
- Headphones (7)
- Projector (8)
- Classroom Audio Speakers (9)
- Other (Please Specify): (10) _____

29   In a typical five-day school week, how often do you utilize WELL technology in your classroom?
- Never (1)
- Rarely, less than 20% of the school week (2)
- Occasionally, about 21-40% of the school week (3)
- Sometimes, about 41-60% of the school week (4)
- Most of the time, about 61-80% of the school week (5)
- Usually, about 81-90% of the school week (6)
- Always (7)

30   Thinking back over the last five-day school week, what was the average number of different activities that used WELL technology?
- 1-3 (1)
- 4-6 (2)
- 7-9 (3)
- 10 or more (4)

31   With what gender do you most identify?
- Male (1)
- Female (2)

- Other (3)
- Decline to respond (4)

32   What is your highest level of education?
- Bachelor's degree (1)
- Post-baccalaureate/teacher certification (2)
- Some Master's degree coursework (3)
- Master's degree (4)
- Some doctoral coursework (5)
- Doctoral degree (6)
- Decline to respond (7)

33   What is your age?
- 20-29 (1)
- 30-39 (2)
- 40-49 (3)
- 50-59 (4)
- 60-69 (5)
- 70-79 or older (6)
- Decline to respond (7)

34   For how long have you been employed as a full or part-time world languages teacher?
- Less than five years (1)
- Five to ten years (2)
- More than ten years (3)

35   At what type of school do you currently work?
- Public, non-charter (1)
- Public, charter (2)
- Private, non-religiously affiliated (3)
- Private, religiously affiliated (4)
- Other (Please Specify): (5)

36	Are you willing to participate in a 20-30-minute interview and/or a 30-45-minute classroom observation about classroom technology use?

- Yes, I am willing to participate in an interview only (please enter your preferred email address so that I may set up an appointment with you).
- I am willing to participate in an observation only (please enter your preferred email address and the county where you school is located)
- I am willing to participate in an interview and observation (please enter your preferred email address and the county where you school is located)
- No, thank you.