INVESTIGATING TECHNOLOGY INTEGRATION IN UNITED STATES

TESOL TEACHER PREPARATION PROGRAMS

by

Ching-Yi Yeh

An executive position paper submitted to the Faculty of the University of Delaware in partial fulfillment of the requirements for the degree of Doctor of Education in Educational Leadership

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ACKNOWLEDGMENTS

TABLE OF CONTENTS

Appendix

LIST OF TABLES

LIST OF FIGURES

GLOSSARY

TESOL: Teaching English to Speakers of Other Languages

ELL: English Language Learners

CALL: Computer Assisted Language Learning

ISTE: International Society for Technology in Education

NCATE: The National Council for Accreditation of Teacher Education

TEAC: Teacher Education Accreditation Council

CAEP: Council for Accredited Educator Preparation

AERA: American Education Research Association

NLCB Act (2002; 2007): No Child Left Behind Act

ESSA (2010): Every Student Succeeds Act

Social Networking:

- ➢ Facebook: allows users to get online, post and share photos and comments. Also, group discussions and individual/ group chat functions are available.
- ➢ Twitter: allows users to get online and post singular photos and comments.

Mobile Technology:

- ➢ Use of portable devices: android phones/ tablets, iPads, iPhone, iPod

Web Tools (Student Engagement/ Gaming):

- ➢ Quizlet
- ➢ Kahoot

Online Office Productivity:

- ➢ Google suites – google doc, google sheets, google forms etc.

Learning Management System (LMS):

- ➢ Canvas
- ➢ Blackboard
- ➢ Moodle

ABSTRACT

Technology is beneficial to language learners when applied within well-design lessons. This study investigated the appropriateness and effectiveness of technology integration in Teaching English to Speakers of Other Languages (TESOL) teacher preparation programs across the United States. It also examined faculty use of technology in TESOL preservice teacher courses and in their practicum placements. The work was conducted in the context of graduate/undergraduate TESOL preparation programs. Data were collected from TESOL preservice teachers through a self-report survey focusing on technology, pedagogy and content. The survey included both multiple-choice and open-ended questions related to preservice teachers' views on technology integration witnessed in their coursework. In addition, TESOL faculty were also interviewed to examine their views on relevant technical skills for teaching language for TESOL preservice teachers.

Results revealed that the TESOL preservice teachers did not observe any technology integration that could be used in English as a Second Language (ESL) teaching activities and there was no support for them to think about technology integration in their own teaching during their practicum. However, they reported feeling more prepared in using technology in language teaching contexts when they witnessed their professors demonstrating technology use in university classes. TESOL faculty recommended that preservice teachers should be immersed in language lessons incorporating technology, observe how different tools can be utilized in various language lessons, and be flexible in selecting the most appropriate technology tools. Results have implication for technology integration in ESL classrooms, researchers, practitioners, and policy makers responsible with the design and implementation of

TESOL teacher training programs. Specifically, results indicate that efforts should be made to support TESOL preservice teachers to understand and value the importance of using instructional media in ESL classrooms, as well as incorporate technology with well-designed lessons.

Chapter 1

INTRODUCTION

The Teaching of English to Speakers of Other Languages (TESOL) can now be enhanced with digital media that provide learners with increased opportunities to practice the target language (Hawkins & Uzuner, 2008). Digital media ranges from DVD players, projectors, interactive whiteboards, mobile devices such as cell phones, personal digital assistant (PDAs), and audio media players, which all provide teachers with different ways to assist language teaching and learning. In order for future teachers to successfully integrate these new media into TESOL, they need to acquire a body of knowledge called technological pedagogical content knowledge (also referred to as technology, pedagogy, and content knowledge, or TPACK; Chai, Koh, & Tsai, 2010; Lee, Ng & Tan, 2008; Mishra & Koehler, 2008).

Technology is beneficial to language learners when applied within well-designed lessons (Hawkins & Uzuner, 2008). Yet, new teachers are typically not well prepared to design technology-enhanced TESOL lessons. Without attention to technology and its pedagogical value in teacher preparation programs, teaching 21st-century learners can be filled with disappointment and inefficient use of technology (Brown & Warschauer, 2006; Lee et al., 2008). Chai and colleagues (2010), in particular, pointed out the importance of strong teacher preparation programs in developing teacher knowledge for effective use of technology and the need for constant modification and evaluation of technology integration within the programs. Therefore,

TESOL teacher preparation programs hold a crucial role in helping preservice teachers gain knowledge and competence regarding technology integration in language teaching.

With sufficient knowledge of technology integration in language teaching, teachers can incorporate different tools to stimulate language learning. Technology offers a setting where information can be viewed and accessed using a varied, nonlinear interface, allowing students with different learning preferences and needs to access information otherwise unobtainable using traditional expository texts (Twyman & Tindal, 2006). Mayer (2005) and Clark and Mayer (2008) indicated that the dual coding principle, limited capacity principle, and active learning principle are the three basic psychological principles that link human memory and support learning. Myer pointed out that learners have separate learning channels when it comes to words and visuals. Learning takes place when learners are under the appropriate cognitive processes. He explained that in the science of learning, dual coding means that people have two different channels in processing visual and verbal materials. The second principle, limited capacity, refers to how each channel can process only a limited amount of information at a time. The third principle, active learning, refers to the notion that deep learning (e.g., choosing, classifying, and integrating) occurs depending on the learner's cognitive processing.

Warschauer, Zheng, and Park (2013) discussed the significant growth and benefits of digital reading for elementary English language learners (ELLs). Language learners incorporate images, sounds, and words to share and express their thoughts. In this case, TESOL teachers need to have a wide knowledge base in order to choose the most effective materials and use them to support students' learning (Zhao, 2003). Bruce (1997) pointed out that teachers should not only be seen as objects of change, but

also as active agents who can transform the teaching and learning environment via technology.

As technology advances, teachers have a greater variety of technology tools that can be integrated in their classroom (Blake, 2013; Olphen, Hofer, & Harris, 2012). Hayward and Tuzi (2003) indicated that effective use of technology can improve courses and support students to become more effective communicators. Increasingly, teachers are seeking new way to integrate technology to achieve better teaching and foster student learning (Uzuner, 2008). Language teaching and learning can now go beyond audiotapes and flashcards. With an increasing number of students using smart phones or digital tablets to communicate via social networking websites such as Facebook or Twitter in their daily lives, language teachers can seek opportunities to make wise use of these social media (Yunus, Salehi, & Chenzi, 2012). Further, Internet users now have access to plenty of free online resources to support self-learning and can become active learners (Taranto, Dalbon, & Gaetano, 2011). Chinnery (2008, 2014) recommended that TESOL teachers spend time searching for the most appropriate, relevant, and effective teaching materials that meet the learners' needs.

Traore and Keyi-Blankson (2011) suggested that technology can be used in TESOL classrooms as a positive process to support teaching and learning. Technology is expected to be integrated into language classroom rather than a separate discipline (Kern, 2006). Yet, TESOL teachers feel ill-prepared and often struggle with integrating new technologies in their classrooms (Littrell, Zagumny, & Zagumny, 2005). In fact, research shows that both elementary preservice and in-service teachers have a low level of technological knowledge (Palmer, 2004). Offering teacher educational technology

training and providing opportunities to redesign learning with technology, however, can lead to effective teaching and learning (Rienties, Brouwer, and Lygo-Baker, 2013).

Theoretical Framework

This work is situated in the theoretical framework of TPACK proposed by Mishra and Koehler (2006). According to Mishra and Koehler (2008), "The development of TPACK by teachers is critical to effective teaching with technology" (p. 3). The TPACK framework builds on Shulman's (1986) tripartite knowledge for teaching and articulates the types of knowledge needed for effective use of technology by teachers. Specifically, it encompasses three knowledge domains, namely: technological knowledge (TK), pedagogical knowledge (PK) and content knowledge (CK). To reach successful technology integration in classrooms, these three bodies of knowledge must interact and be put into practice, hence transforming into a new form of knowledge (Mishra & Koehler, 2008).

Shulman (1986) proposed a cognitive perspective to view teachers as thinkers and planners. He further described pedagogical content knowledge (PCK) as the teachers' knowledge needed to assist students in learning disciplinary content. PCK covers broad concepts of teaching, learning, curriculum, evaluation, and pedagogy. According to Shulman, PCK (see Figure 1) develops when teachers find ways to interpret the subject matter and take the learners' needs into consideration with efficient utilization of the instructional materials.
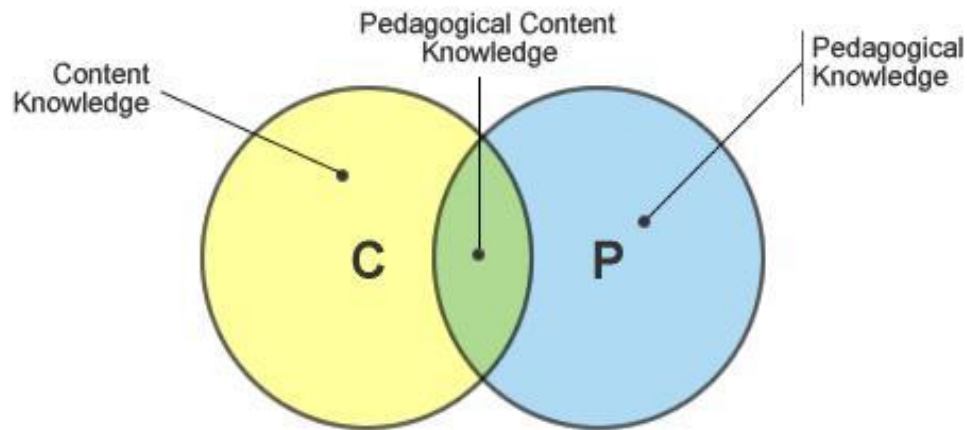
Figure 1   Pedagogical content knowledge (PCK).

Later, Mishra and Koehler (2006) added technology into the framework and described three additional constructs including, technological content knowledge (TCK), technological pedagogical knowledge (TPK), and TPACK as shown in Figure 2. TCK refers to teachers' understanding in using the most appropriate technology to deliver the content. TPK describes the understanding of how teaching and learning are influenced by technology. Finally, the authors suggested that teachers should have the basic knowledge in teaching with technology, choosing effective methods, while utilizing knowledge of disciplinary content. The effective mix and combination of all seven constructs will result in the most important intersection and a unique body of knowledge – TPACK (see Figure 2) – and reveal the ability required for effective technology integration (Mishra & Koehler, 2006).
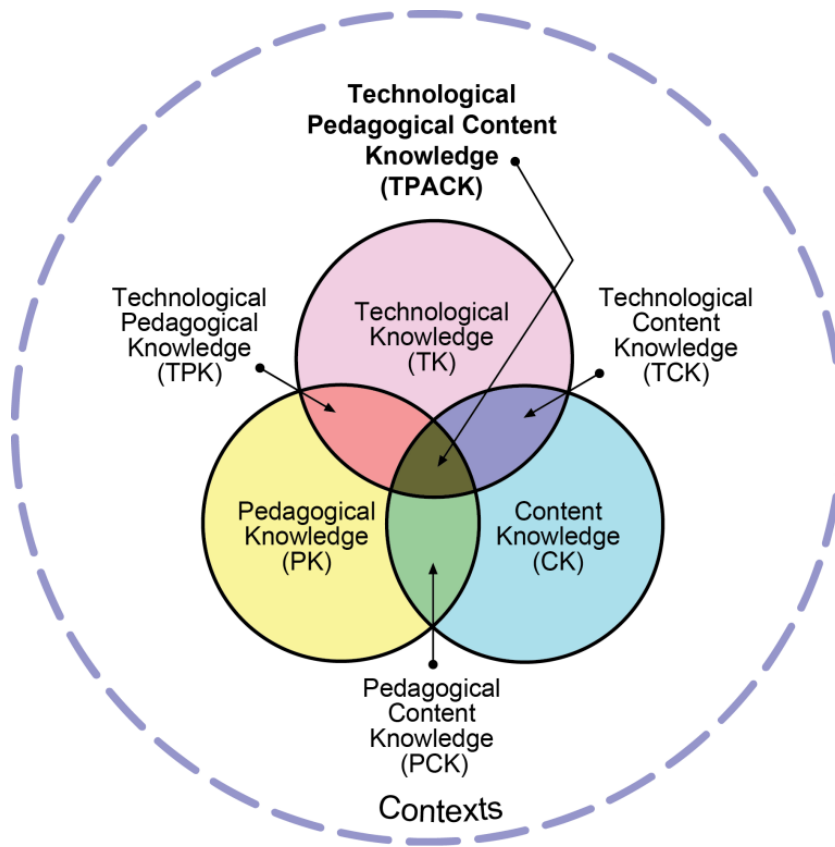
Figure 2   TPACK (Source: http://www.tpack.org/).

Literature Perspectives

Importance of Using Technology in TESOL

        The No Child Left Behind Act of 2001, later updated as the Every Student Succeeds Act (ESSA, 2015) required all students to be technologically literate as they finished middle school. This requirement largely increased attention around technology implementation in classrooms (Blankson, Keengwe, & Kyei-Blankson, 2010). ESSA entitled schools to obtain funds to improve all students' academic achievement, academic growth, and technology literacy (United States Department of Education, 2015).

6

As a result of new expectations, school administrators, teacher educators, and technology advocates are faced with questions of how and what technology teachers are utilizing in their classrooms (Fox & Henri, 2005; Goktas, Yildrim, & Yildrim, 2009; Lam, 2000). "Technology can be acknowledged to be an integral part of teaching today. Whether it be state-of-the-art computers or older VCRs, the arsenal of teaching tools is no longer limited to paper and blackboard" (Lam, 2000, p. 390). Likewise, Hayward and Tuzi (2003) noted the necessity for college students to become competent with technology, as a means of succeeding in post-secondary programs or at work. Furthermore, Yule (2006) suggested that preservice language teachers understand the importance of technology in language teaching and know how to utilize technology in order to actively engage language learners.

The fundamental goal for research in the computer assisted language learning (CALL) field is to foster technology integration in classrooms and assist language teachers with maximizing its educational uses (Hong, 2009). With the rapid advances of technology, in the past few decades, teachers in second/foreign language teaching have a wider selection of technology, from the traditional workbook drills to audio tapes to computer-based online tutors and simulators that do not require physical presence (Hubbard, 2008; Levy, 2009).

With more choices given, teachers must select the most appropriate technology that caters to the language learners' needs. As Prensky (2001) noted, teachers must communicate and teach with the language of this generation of students, which he called "digital natives," who have grown up with technology. To accomplish this goal, Yule (2006) argued that novice language teachers need a preservice education that enables them to cope with the challenges of their language teaching positions in schools

and allows them to find the support that they are likely to need when they enter the teaching field.

Effective Technology to Enhance Four Skills in Language Teaching and Learning

Thouësny and Bradley (2011) noted that despite the wide availability of technology in everyday life, incorporating technology in education is a challenging endeavor. Correspondently, Hoopingarner (2009) emphasized that the importance of technology in language classrooms has changed from "whether" to "how." He further asserted that language teaching and learning can be more efficient via meaningful use of technology. Yet, DelliCarpini (2012) indicated that incorporating technology into language classrooms requires technology knowledge, time, and positive beliefs from teachers. Results from her study revealed that 85% of her participants (N = 53) have access to computers at work but 49% responded that they rarely used the computer for classroom activities. This section discusses the ways in which digital content and new technologies can be used to enhance language teaching and learning.

O'Hara, Pritcher, Huang, and Pella (2013) pointed out that the use of technology also helps language learners to build up multimodal background in learning new vocabulary and content in meaningful ways. They added that the use of multiple modes of technology (e.g., text, audio, images, video, and animation) provides language learners an authentic learning experience and helps them draw connections to prior knowledge and become strategic learners. Likewise, Choi and Yi (2015) found that the use of multimodal technology can help language learners to better understand the subject matter and more fully express themselves. In order to provide such technology rich experiences and utilize the full potential of technology, teacher development in advance is needed (O'Hara et al., 2013).

Towards this end, Mouza and Lavigne (2012) identified four classes of emerging technologies (see Figure 3) that can help teachers and teacher educators fully understand current technologies and their potential use in educational settings:

1.   technologies that support learning to understand and create,

2.   technologies that support learning by collaboration,

3.   technologies that support anytime, anyplace learning,

4.   technologies that support learning by gaming.

This section discusses the ways in which these types of technologies can be used to support four skills fundamental in language teaching and learning, namely speaking, speech recognition, reading and writing.

Speaking skills. Potential uses of evolving and novelty technologies are becoming more accessible and available for teachers in this digital era (Niess, 2015). Rich online content is one such technological resource that provides language learners ample chances to practice the target language. Further, the utilization of technology and online multimedia can create a more encouraging, interacting, and engaging learning environment for ELLs (Bañados, 2006; Hwang, Shadiev, & Huang, 2011). Hwang et al. (2016) indicated that the use of web-based multimedia and animation help enhance language learners' speaking skills and promote student learning achievement. They suggested that online storytelling animation tools foster individual speaking practice opportunities with less distractions. These technologies all fall into the fourth category of Mouza and Lavigne's (2012) emerging technology classification where technology is used to support learning to understand and create.

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                          ┌─────────────────────────┐
                          │  Emerging Technologies   │
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Part I: Technologies that Support *Learning to Understand and Create*	Part II: Technologies that Support *Learning by Collaboration*	Part III: Technologies that Support *Anytime, Anyplace Learning*	Part VI: Technologies that Support *Learning by Gaming*
Dynamic Representations	Handhelds & Classroom Networks	Laptop Programs	Educational & Commercial Virtual Worlds
Dynabooks	Web 2.0: Wikis, Course Management Systems	Virtual Schools	Web 2.0: Wikis, Course Management Systems
Digital Fabrication	Social Networks	Mobile Devices	Game Development through Scratch
Visualization		Augmented Reality	

Figure 3   Emerging technologies for the classroom (Mouza & Lavigne, 2012)

Speech recognition skills (Speaking and listening). Automatic speech recognition (ASR) technology can also be used in teaching listening, speaking, and pronunciation in the target language. Kim's (2006) study indicated the powerful role of ASR technology for language learners with abundant chances to listen to sentences spoken by native English speakers. Elimat and AbuSeileek (2014) also pointed out the

useful features of ASR for language learners: individual practice, student profile/progress storage and monitoring, automatic feedback, and authentic listening materials. Similarly, in language teaching, Neri, Cucchiarini, and Strik (2003) stated that the ideal use of ASR technology in computer assisted pronunciation teaching (CAPT) is described as the following five phrases:

    1. Speech recognition

    2. Scoring with immediate feedback

    3. Error detection to raise awareness of areas needed to be focused

    4. Error diagnosis with suggestion for improvement

    5. Feedback presentation with clear grading rubrics in a meaningful way.

Reading skills. Traditionally, teachers in second language reading classes provide instruction, assistance, and intervention to enhance students' reading skills (Levine, Ferenz, & Reves, 2000). Garrett (2009) noted that teaching language reading with technology supports reading comprehension and builds up language learners' essential reading skills: skimming, scanning, inferring, predicting, and so forth. Specifically, Garrett indicated that the computer is one of the most appropriate tools to practice language skills such as reading comprehension. With technology integration, reading comprehension in websites or software provide options such as timed-reading, text enlargement, and highlighting functions to cater the needs of individual learners. In addition to reading skills, Groot (2000) stated that visual aid and organizers support language learners' retention of new vocabulary and lead to effective learning. Likewise, Gladwin (2016) indicated that the popular use of online flashcards such as Quizlet fosters memorization of new vocabulary for language learners.

Making efficient use of reading software for language learners to practice reading at home aligns with Mouza and Lavigne's (2012) emerging technology Category 3, where the technology supports learning anytime and anyplace. Garrett (2009) added that software programs now include many mini-reading lessons and activities for teachers' use in class or in integral exercises to be completed at home. She explained that the most important step is to find suitable technology integrated material for teaching reading. Finally, she pointed out the importance of teachers' understanding of the theoretical basis in computer-based reading comprehension materials and the fundamental tool selection skills in identifying the most suitable technology tools.

Writing skills. Traditionally, language learners face limitations of vocabulary and lexical structure usage when writing in the target language (Yoon, 2016). Often, they are asked to complete multiple writing drafts and engage with other peers in face-to-face situations, which can create anxiety among learners (Wu, Petit & Chen, 2015). Chen (2016) noted that computer mediated peer feedback in ESL writing classes can help reduce anxiety among language learners. Specifically, Kessler (2013) indicated that the use of Internet and online collaboration tools can offer authentic opportunities to support writing for language teachers and learners (Kessler, 2013). He explained that using resources on the Internet is beneficial to the students; teachers and students can be encouraged to use an online corpus or search engine such as Google (Sha, 2010), to bring authentic videos, writing texts, and audios into classrooms. In addition, Lu (2010, 2012), and Kessler (2013) discussed the value of online writing tools, such as the syntactic and lexical complexity analyzer (http://aihaiyang.com/synlex/), which demonstrates and draws students' attention on vocabulary usage and other important aspects of writing. The idea of using technology and Internet collaboration falls into

12

Mouza and Lavigne's (2012) emerging technology Category 2, where technology is used to support learning by collaboration.

Examples of Current Educational Technology in TESOL

While the prior section focused on emerging technologies that can support fundamental skills in language teaching and learning, this section provides examples of technologies that can support TESOL teaching and learning more broadly.

Asynchronous online environments. In asynchronous online learning environments, language learners can interact with each other and offer their ideas or reflections on their writing at their own time and pace (Kern, 2006; Murphy 2011). These asynchronous online discussions can also be recorded, and the users can resume or access them later. Nor, Hamat & Embi (2012) pointed out the benefits of using online discussion for language learners when given lesson/discussion expectations and productive feedback from the instructor. Levine, Ferenz & Reves (2000), for instance, found that through the integration of technology and an online learning environment, students performed better academically and demonstrated improved literacy skills. Likewise, Hayward and Tuzi (2003) found that the key to providing a successful language writing environment is to turn technology into an asset by using it wisely to help and encourage students to become better communicators. In Yule's (2006) study, preservice language teachers stated that the use of web tools and computers provided a freshness of language learning and promoted classroom participation. In particular, language learners got authentic opportunities to see others using the target language to communicate with each other in real life situations.

Social media. Metcalf, Layton, and Goslin (2016) pointed out that the use of social media in language classrooms can make teaching and learning more interactive

and dynamic. They found that existing online social media such as Facebook and user-generated videos added new interest to students' presentations. With the help of online social media and mobile applications such as Fakebook, PechaKucha, and Chautauqua, students' language learning production became more lively. Moreover, they noted that students' language skills were enhanced through the completion of multimodal assignments.

Web 2.0 tools. Other than speaking and listening skills, students also gain more opportunities to practice reading skills with the use of technology in TESOL reading and writing classes, such as online wiki spaces/communities (Wiseman & Belknap, 2013). Wiseman & Belknap (2013) further noted that the efficient use of wikis helps promote collaboration and communication in language learning. In addition, Boulos, Maramba, and Wheeler (2006) noted that the use of wiki spaces allows language learners to actively engage in reading, exchanging, and presenting opinions at their own pace. Likewise, Warschauer's (1996) found benefits such as learner engagement and a shift to student-centered class with positive learning outcomes in technology integrated second language (L2) writing classes. When used efficiently by experienced teachers, use of Web 2.0 tools fosters learning and develops learners' collaborative and creative thinking skills (Nelson, Christopher & Mims, 2009). Similarly, Sullivan and Pratt's study (1996) found that learners tend to get more peer feedback and increase their writing skills in computer-mediated writing class.

Teachers, however, are often intimidated by the idea of technology integration in the 21st century language classroom (Lee, Ng & Tan, 2014). Technology use in classrooms is often viewed as a requirement forced externally (Ahmed & Nasser, 2015; Kessler, 2010). In order to reach successful technology integration in language

classrooms, teachers need to be equipped with adequate skills to combine traditional pedagogies and current technology tools (Leighton & ICT in Education, 2012). Kessler (2013) pointed out that the development of technology has changed the landscape of language teaching resources significantly in the past decade. Therefore, teacher education programs play a crucial role in preparing preservice teachers for the necessary knowledge and the use of technology before they graduate (Lei, 2009; Mouza, 2016).

Teacher Preparation in Technology

"Institutions responsible for preservice and in-service professional development for educators should focus explicitly on ensuring all educators are capable of selecting, evaluating, and using appropriate technologies and resources to create experiences that advance student engagement and learning. They also should pay special care to make certain that educators understand the privacy and security concerns associated with technology. This goal cannot be achieved without incorporating technology-based learning into the programs themselves" (United States Department of Education, OET, 2016, p. 25).

This excerpt from the 2016 National Education Technology Plan (NETP) has prompted teacher education programs to prepare and equip their teacher candidates with necessary classroom technology competence before they exit the teacher education programs. The authors of the NETP pointed out that during their preparation programs, preservice teachers should have the opportunity to witness and have proper models of successful classroom technology integration. In addition, they should know how to select and use the most appropriate technology in their future teaching field. Foulger, Graziano, Slykhuis, Schmidt-Crawford, and Trust (2016) said that all teacher educators and teacher education programs in US should take full responsibility for preparing the

preservice teachers and teaching them how to use technology effectively. They also recommended modifying and developing curriculum in courses to teach and model technology integration for the preservice teachers.

In an update of the National Educational Technology Plan in January 2017, the author(s) indicated four guiding principles for teacher preparation programs:

1. Focus on the active use of technology to enable learning and teaching through creation, production, and problem-solving.

2. Build sustainable, program-wide systems of professional learning and teaching.

3. Ensure preservice teachers' experiences with educational technology are program-deep and program-wide, rather than one-off courses separate from their methods courses.

4. Align efforts with research-based standards, frameworks, and credentials recognized across the field.

Technology Preparation for TESOL Preservice Teachers

The fundamental goal for research in the CALL field is to foster technology integration in classrooms and assist language teachers with maximizing its educational uses (Hong, 2009). As technology has advanced rapidly in the past few decades, teachers in second/foreign language teaching have a wider selection of technology from the traditional workbook drills, audio tapes, face-to-face practice to computer-based online tutors and simulators without being required to be in the same place (Hubbard & Levy, 2008; 2011).

Kessler (2010) indicated that some of the TESOL programs have made changes to incorporate technology, but the training did not show a dramatic change in

technology integration in language classrooms. Hoopingarner (2009) suggested that educational programs should provide ongoing technology training for preservice teachers in order to accommodate the fast-changing pace of technology development. When it comes to developing and incorporating technology in activities for TESOL classrooms, teachers should provide positive experiences and consider how to better support learners' needs (Petrie & Avery, 2011). Specifically, empirical studies found that preservice teachers' lack familiarity with more advanced technologies such as Web 2.0 technologies (e.g., Lei, 2009). As a result, Lei pointed out the need for teacher education programs to prepare preservice teachers to make an effective connection and transition between teaching and learning.

Hampel and Stickler (2005) stated that the context of online teaching in particular, requires a different set of skills with new teaching approaches, especially for language teaching and learning. For example, language teaching in online voice-conferencing lessons becomes more arduous without non-verbal cues. They further suggested a set of computer skills for preservice language teachers to build up their competency before they graduate from their training programs. Yule (2006) added the necessity to include planning and preparation time for language teachers before integrating technology (that is, web-based learning tasks) into language classrooms.

Similarly, Hubbard (2008) argues that teacher training programs play important roles in providing successful experiences for language teachers, and the tools/technology they select directly affect language learners' exposures and usages in language classrooms. The successful use of technology in classroom takes place only when preservice teachers see modeling of technology use in the general preparation and

obtain opportunities to learn pedagogy and use technology in educational settings (Banister & Vannatta Reinhart, 2014).

Modeling and promoting the digital citizenship and responsibilities

Traditionally, education is guided by teachers, also viewed as specialists and conveyors of information, whereas students are deemed to be passive receivers in the learning environment (Pai & Borba, 2012). Tapscott (2010) pointed out that this rigid teaching and learning model can no longer facilitate learners in this digital interactive period. In TESOL teacher preparation programs, Banister and Vannatta Reinhart (2014) suggested that preservice teachers should have the opportunities to witness and practice technology skills aligned with standards provided by the International Society for Technology in Education (ISTE). They emphasized the need to strengthen skills in using technology in educational settings for preservice teachers while they go through their preparation programs. They also noted that preservice teachers must gain a sense of digital citizenship and have the chance to interact responsibly with others in the professional social networking environment. Kessler (2013) also reported the importance of information utilization and, more importantly, the construct of exchange of information in the technology teaching culture.

TESOL Technology Standard for Language Teachers

The TESOL Technology Standard for language teachers was introduced in June 2011 and was built upon the National Educational Technology Standards (NETS) developed by ISTE with a focus on English language teaching. The four major goals of the TESOL Technology Standard for Language Teachers suggest that language teachers should

1.   maintain basic knowledge and skills in technology for professional uses,

2. integrate pedagogical knowledge with technology,

3. apply technology in assessment and feedback, and

4. improve communication in a more collaborative and efficient manner through technology.

Each goal contains several indicators identifying essential and crucial points for language teachers, such as the need to have basic knowledge and skills to use technology in both preparing teaching materials and offering assignments via online resources. The TESOL Technology Standard also suggests that language teachers should adapt a variety of digital resources and can expand a conventional activity using technology tools. Language teachers are the role models in using technology in their teaching and should demonstrate a technology-integrated teaching style instead of making it an add-on.

Purpose of the Study

With the increasing need for technology integration in classrooms, little attention has been given to how TESOL teacher preparation programs equip preservice teachers to utilize technology in their future classrooms (Kessler, 2006). Furthermore, only limited information regarding technology preparation or addressing the TESOL Technology Standards is found in the curriculum of the US TESOL teacher preparation programs. After examining the program websites of 65 US TESOL programs, it was noted that fewer than 10 programs explicitly listed technology-related courses or addressed the TESOL technology standards in their curriculum. Therefore, the purpose of this work is to examine the status quo of technology integration among US TESOL teacher preparation programs.

Key Questions

The following research questions will be addressed by this study:

1. How do TESOL preservice teachers self-assess their TPACK knowledge during their teacher education program? What educational uses of technology are TESOL preservice teachers demonstrating during their teacher education program?

2. What technology tools do TESOL faculty members use in their courses? How are they using them?

3. According to TESOL faculty, what technology-related skills should TESOL preservice teachers obtain during their teacher education program?

4. What recommendations can be made to strengthen the preparation of TESOL preservice teachers in the use of technology?

Chapter 2

METHODOLOGY

The purpose of this Executive Position Paper (EPP) was to investigate key approaches to successful technology integration in TESOL teacher preparation programs in the United States. Preservice teacher and instructor surveys and interviews were distributed to solicit their views on technology integration in language teaching and learning. Specifically, a modified version of the *Survey of Preservice Teachers' Knowledge of Teaching and Technology* that was developed and validated by Schmidt, Baran, Thompson, Koehler, Mishra & Shin (2009). It was used to better understand TESOL preservice teachers' knowledge self-assessment. The survey is widely used for assessing preservice teachers' TPACK development around the world (e.g., Chai et al., 2010; Graham et al., 2009; Schmidt et al., 2009; Shinas, Karchmer-Klein, Mouza, Yilmaz-Ozden, & Glutting, 2015). The survey was distributed to TESOL teacher preparation programs across the United States. This chapter discusses the development of the survey, context of the study, data collection procedures, and the limitation of the study.

Context of This Study

TESOL Teacher Preparation Program

Data were collected from preservice teachers enrolled in TESOL programs across the United States. The survey email was sent to program directors or course instructors for distribution. Data were collected from current TESOL students or students who graduated within the past 3 years in undergraduate and graduate degree

21

programs at several institutions. Non-degree programs were eliminated (See Table 1 for

an overview of data collection).

Table 1   Data Collection Matrix

Question	Data Source	Data Analysis	How Information Was Used
1. How do TESOL preservice teachers self-assess their TPACK knowledge during their teacher education program? What educational uses of technology are TESOL preservice teachers demonstrating during their teacher education program?	TESOL preservice teachers survey response using a National Survey (Schmidt et al., 2009)	Surveys were used to collect this data.	This data demonstrates the comfort level of TESOL preservice teachers with respect to technology as well as ways in which preservice TESOL teachers utilize technology during their teacher preparation program.
2. What technology do TESOL faculty use in their courses? How are they using it?	• TESOL instructors • Online survey distributed to TESOL instructors across the country	Surveys were distributed to TESOL instructors to ask about their technology-related background and ways which they use technology in their courses. Data were then being analyzed using descriptive statistics	Knowing the instructors' technology background helped determine how comfortable they are in incorporating technology in teaching TESOL preservice teachers. Demonstrates ways in which TESOL instructors currently

		and qualitative methods. Interviews with TESOL instructors to identify skills were required for TESOL preservice teachers	use technology in their courses. Interviews demonstrated the skills required for TESOL preservice teachers in regard to technology according to the views of TESOL instructors.
3. According to TESOL faculty, what technology-related skills should TESOL preservice teachers obtain during their teacher education program?	• TESOL instructors • Interviews		
4. What recommendations can be made to strengthen the preparation of TESOL preservice teachers in the use of technology?	• Literature • TESOL instructors survey responses • TESOL preservice teachers survey response	Surveys were analyzed using descriptive statistics and qualitative methods for open-ended questions.	Survey responses and literature review were analyzed to inform the study recommendations.

Most of the participating TESOL programs offer courses in four major categories including language acquisition (e.g., first and second language acquisition, multilingualism, and learner identity), language structure and use (e.g., phonology, grammar and syntax, and discourse analysis), social context (e.g., sociocultural theory and language policy), and instructional approaches (e.g., communicative language teaching, task-based language learning, learner centered teaching, and technology-enhanced language instruction). All programs require their students to complete student field teaching in either a K-12 setting or a higher education setting. Some programs offer a certification track and a non-certification track.

The language acquisition and language structure courses offered in the program help develop preservice teachers' content knowledge. The social context and instructional approaches courses offer preservice teachers an overview of their future

classrooms. Throughout the programs, TESOL preservice teachers gain professional content knowledge and practice creating teaching materials for language learners. Also, the TESOL preservice teachers need to turn in field notes and teaching demonstration videos. Some faculty members incorporate technology enhancements in the method course while some programs offer separate technology in language teaching courses as electives or as a requirement. During the student teaching in the field, all TESOL teacher preparation programs require their preservice teachers to observe classes with ELLs for 4-6 weeks during their last semester in the program; however, technology enhancements in different classroom settings varies.

Selection of Programs

Selection of programs was conducted in two phases. Phase 1 included five universities offering technology courses in their TESOL teacher preparation programs. These programs offered technology courses as an individual requirement or elective for TESOL preservice teachers. Phase 2 included an additional 13 schools (see Figure 4).
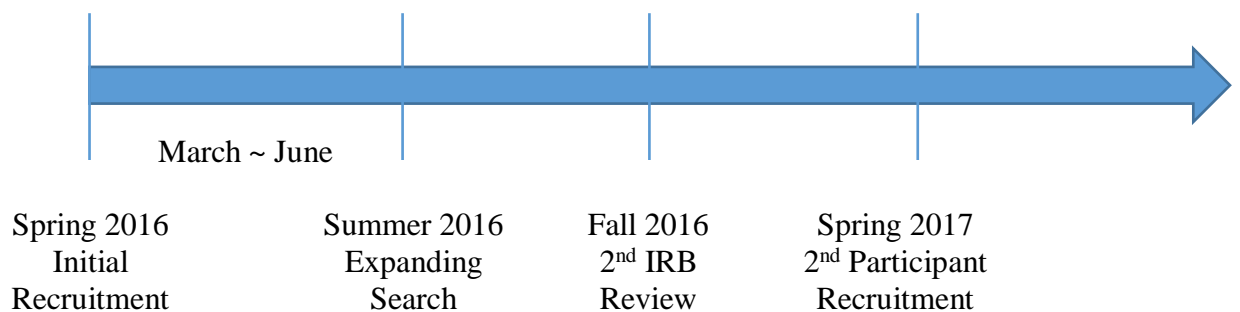

March ~ June

Spring 2016	Summer 2016	Fall 2016	Spring 2017
Initial	Expanding	2nd IRB	2nd Participant
Recruitment	Search	Review	Recruitment

Figure 4   Recruitment timeline.

Phase 1 Program Selection

The participants of this study were TESOL graduates within the prior 3 years, current TESOL preservice teachers (graduate students), and their faculty/instructors across the United States. The TESOL teacher preparations programs were selected based on suggestions made by the TESOL CALL interest group listserv members, online active faculty and instructors in American Educational Research Association (AERA), and International Society for Technology in Education (ISTE) technology interest groups. In particular, nominations were solicited through the TESOL CALL listserv for technology-rich TESOL programs – that is, programs that are known for their efforts to address the TESOL Technology Standard.

A review of active faculty or instructors of TESOL teacher preparation programs in online TESOL CALL, AERA, and ISTE technology interest groups was conducted. The goal was to find participating programs that offer individual technology courses addressing the TESOL Technology Standards and examine how their preservice teachers self-assess their TPACK knowledge. The targeted participants would have already taken technology in language teaching related courses. After the initial review of programs and obtaining an Institutional Review Board approval at the University of Delaware, a study recruitment/invitation email (see Appendix A) was sent to responding TESOL faculty as well as to the convenience sampling programs.

All program course descriptions address the use of technology in language teaching and learning educational settings. The review of the TESOL technology course description was intended to answer Research Question 1. Out of the five chosen TESOL teacher preparation programs, only the University of Maryland Baltimore County (UMBC)'s technology course addressed technology standards in their course description. For the rest of the chosen programs, other than computer skills and the use

of audio in language learning, none of the technology course descriptions addressed TESOL Technology Standards or described detailed technical skills for TESOL preservice teachers. Indiana University of Pennsylvania, University of Wisconsin at Madison, and University of Southern California offered technology-related courses with course descriptions entailing the use of multimedia in language classrooms. All of the courses from the programs are offered face-to-face except for the course EDUC 596 Technology Enhanced Language Learning Design and Instruction at the University of Southern California. Research Questions 2 and 3 were further answered with the faculty's interview results.

<center>Selection of Programs – Phase 2</center>

After the preliminary recruitment in spring 2016, the response rate was too low (23 respondents) for analysis. Hence, a second round of program selection began in summer 2016 after receiving University of Delaware IRB approval for expanding the search and recruiting more study participants (Appendix E). In addition to suggested TESOL programs from the TESOL CALL listserv, National Council for Accreditation of Teacher Education (NCATE) accredited TESOL teacher preparation programs were included in the selection for program review. A list of accredited and nationally recognized TESOL teacher preparation programs were gathered from NCATE (www.ncate.org), which was combined with Teacher Education Accreditation Council (TEAC) in July 2013 into a new accrediting organization, Council for the Accreditation of Educator Preparation (CAEP).

According to CAEP (http://www.caepnet.org), there are 55 graduate-level accredited TESOL teacher preparation degree programs across the United States (updated November 2017). TESOL programs that offer endorsement certificates were

excluded from the study. Most of the accredited TESOL graduate level programs are located in the northeastern region (25), followed by the southern region (16), midwestern region (9), and only 5 in the western region of the United States (see Table 2). Other than the listserv-suggested TESOL programs and CAEP-accredited TESOL programs, non-accredited program participants were also invited as convenience samples.

From the convenience sampling programs, a survey was sent to preservice teachers, and separate interviews were conducted with faculty from the University of Southern California, University of Delaware, University of Hawaii at Manoa, and Duquesne University. With the search result on CAEP, it appeared that most of the accredited TESOL programs were located in the northeastern and southern regions. Therefore, recruitment emails were sent to regional TESOL groups and professors in fall 2016.

Table 2   CAEP Accredited Graduate Level TESOL Teacher Preparation Programs

State	Number of Accredited Graduate Level TESOL Programs	United States Region	Total Numbers in Each Region
Arizona	2	West	5
Colorado	2	West	
Utah	1	West	
Illinois	2	Midwest	9
Indiana	1	Midwest	
Michigan	1	Midwest	
Minnesota	1	Midwest	
Missouri	1	Midwest	
North Dakota	1	Midwest	
Ohio	2	Midwest	
New Jersey	1	Northeast	25

New York	18	Northeast	
Connecticut	1	Northeast	
Massachusetts	3	Northeast	
Pennsylvania	1	Northeast	
Rhode Island	1	Northeast	
Oklahoma	1	South	16
South Carolina	1	South	
Texas	1	South	
Virginia	2	South	
District of Columbia	3	South	
Delaware	2	South	
Florida	1	South	
Georgia	1	South	
Maryland	4	South	

Total- 55 Accredited Graduate Level TESOL Programs across the United States

The preservice teacher TPACK survey on Qualtrics was sent to the selected TESOL program faculty who were currently teaching or had taught technology-related courses for distribution. At the end of the data collection process in spring 2017, TESOL preservice teacher responses were collected from a total of 13 TESOL teacher preparation programs (Table 3). Most of these TESOL programs offered Master's degree level courses for preservice teachers on campus. Out of the 13 TESOL programs, five of them did not offer any technology-related courses, either as required or elective courses.

Data Collection Instruments

Data were collected from both TESOL teacher preparation program faculty and the preservice teachers. The faculty members were invited for an interview or were given options to fill out online survey through Qualtrics. The questions were designed

and given to help understand the use of TESOL CALL standards in their curriculum and the actual use of instructional technology in their courses. The TESOL preservice teachers were invited to participate in the TPACK self-report survey, including questions soliciting their perception of technology integration beliefs.

Survey and Interview Protocol Development

The Survey of Preservice Teachers' Knowledge of Teaching and Technology was modified to better fit the study of TESOL preservice teachers. The original survey is a valid and reliable survey instrument built around the TPACK framework. It is designed for content area teachers, not specifically for TESOL preservice teachers; therefore, items regarding content knowledge (math, science, and language arts) were removed (Table 4).

Table 3   Selected TESOL Programs and Related Technology Courses Offer

Institution	Education Technology Course in TESOL Program
1. American University Washington, DC	MA & BA TESL-654/TESL-454: Technology for Language Teaching and Learning
2. Duquesne University Pittsburgh, PA	MA GILT 511 Technology and Education GILT 513 Instructional Application of Technology
3. Indiana University of Pennsylvania	PhD ENGL 808 Technology and Literacy
4. Kent State University	MA ENG 51002 Computers for Second Language Teaching (3)
5. Seattle Pacific University	MA TESL 6300: Technology in Language Teaching
6. University of Alabama	MA Technology related courses not offered
7. University of Central Florida	MA

		TSL 5380 Computers and Technology for ESOL (3 credit hours)
8.	University of Delaware	MA Technology related courses not offered
9.	University of Hawaii at Manoa	MA Technology related courses not offered
10.	University of Maryland Baltimore County	MA EDUC 689 Educational Technology for ESOL Teachers (elective)
11.	University of Pennsylvania	MA Technology related courses not offered
12.	University of Southern California	MA EDUC 596	(3 units) Technology Enhanced Language Learning Design and Instruction
13.	Winona State University	MA Technology related courses not offered

Table 4   Description and Sample of Modified and Deleted Items of the TPACK Survey

	Domain	Number of Item(s)	Sample Item
1.	TK	6	I know how to solve my own technical problems.
2.	CK	1	I have sufficient knowledge about second language learning.
3.	PK	7	I know how to access student performance in a classroom.
4.	PCK	1	I can select effective teaching approaches to guide student thinking and learning in a second language.
5.	TCK	1	I know about technologies that I can use for understanding and doing second language learning.
6.	TPK	9	I can choose technologies that enhance the teaching approaches for an English as a second language lesson.
7.	TPACK	4	I can teach English as a second language lessons that appropriately combine reading in second language, technologies and teaching approaches.

8. Models of
   TPACK
   (Faculty,   3   My TESOL preparation professors appropriately
   PreK-6   model combining content, technologies and teaching
   Teachers)   approaches in their teaching.

The survey asks about participants' demographic data and requires TESOL

preservice teachers to self-report their knowledge of TPACK in different domains (TK,

CK, PK, PCK, TCK, TPK, TPACK, Models of TPACK, Time for Models of TPACK).

A total of 35 items was included in the survey. A 5-point Likert scale response format

was used for all Likert scale items in the survey in this study, with responses ranging

from *strongly disagree* to *strongly agree*. The survey started with domains asking about

the preservice teachers' knowledge in TK, CK, and PK. The items were modified to

"second language learning" in content area constructs CK, PCK, TPK, and TPACK.

At the end of the survey, three open-ended questions (see Table 5) invited

participants to provide input and share their experiences on TESOL program

preparation for technology integration in the language classroom.

Table 5   Open-Ended Questions in Preservice Teacher Self-Report Survey

Q.16	Describe a specific episode where an instructional technology professor or instructor effectively demonstrated or modeled combining content, technologies and teaching approaches in a classroom lesson. Please include in your description what content was being taught, what technology was used, and what teaching approach(es) was implemented.
Q.17	Describe a specific episode where one of your practicum cooperating teachers effectively demonstrated or modeled combining content, technologies and teaching approaches in a classroom lesson. Please include in your description what content was being taught, what technology was used, and what teaching approach(es) was implemented. If you have not observed a teacher modeling this, please indicate that you have not.
Q.18	In what ways, if any, did your teacher preparation program prepared you to implement technology with English as a second language lessons?

The first open-ended question (No. 16) was intended to answer Research Question 2 regarding what technology TESOL faculty use in their classroom and how. The responses from the preservice teachers aimed at helping identify the technology witnessed and used by their professors in their TESOL teacher preparation programs. The second open-ended question (No. 17) is related to Research Question 3 regarding which technology-related skills TESOL preservice teachers should obtain during their teacher preparation program. The use of technology in TESOL classrooms helps with understanding the skills needed for TESOL teachers in the field. The last open-ended question (No. 18) was asked to answer Research Question 1 regarding how TESOL preservice teachers self-assess their TPACK knowledge during their teacher education program, as well as what educational uses of technology TESOL preservice teachers demonstrated during their teacher education program.

In the original recruitment email sent to the faculty, the TESOL faculty members were invited to participate in an interview with questions soliciting their views on the necessary technical skills for TESOL preservice teachers and how technology and TESOL technology standards are integrated into their courses in TESOL teacher preparation programs (see Appendix B, Faculty Recruitment Email). In addition, they were asked to distribute the TPACK preservice teacher survey to the TESOL preservice teachers in their programs. Most of the responding faculty addressed the TESOL CALL standards or other similar technology-related standards (e.g., ISTE Standards, formerly known as the National Educational Technology Standards [NETS]) in teaching their courses. Moreover, they were asked to share their experiences of challenges with technology integration and provide recommendations for TESOL preservice teacher

training programs regarding the use of technology in second language teaching and learning. The faculty interview protocol is shown in Figure 5.

Technology has changed many aspects of our lives. In this study, I would appreciate your views on how you use or would like to use technology for effective teaching and learning. The study has already been approved by the University of Delaware's IRB office. I will do my best to keep your personal information confidential. All information collected by the survey will be stored in a password-protected database. To maintain confidentiality, no personally identifying information will be collected or reported. There are no immediate risks or benefits for you as a participant in the study.

1. In your view, what types of technology skills should TESOL preservice teachers acquire during their teacher preparation program?

2. How are TESOL technology standards addressed in the curriculum of your program? (Probe: Is there a specific course that addresses the TESOL technology standards? Or are they infused across courses?)

3. What, if any, technologies do you use in your own teaching? Can you give specific examples of how these technologies are integrated in your course?

4. What, if any, technologies do your students use in your course? Can you describe an example of how students use technology in your own course?

5. How much technology related professional development do you receive every semester/year? (Describe any technology related professional development you've received during your teaching career provided by your employer/colleague. Describe any technology related professional development you obtain by yourself).

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6. What challenges do you face in your efforts to integrate technology in your own course?

7. What recommendations can you offer for strengthening the technology preparation of TESOL preservice teachers in your program?

Figure 5   Interview Protocol Used for TESOL Faculty

Data Collection

At first, the study recruitment email was sent only to TESOL teacher preparation programs that offer individual technology-related courses in their TESOL teacher preparation program. In spring 2016, the initial recruitment email invited TESOL faculty to participate in an interview and asked them to distribute emails to the TESOL preservice teachers at their programs; specifically, the ones who had already taken technology-related courses either as an elective or requirement. The survey was opened for 15 weeks, from February 2016 to the end of June 2016. A second reminder email was sent in mid-May 2016. However, the response rate was too low; only 32 participants from five different programs responded.

Preservice Teacher Data Collection

The TPACK survey was sent through Qualtrics, an online data collecting system to the TESOL faculty for distribution among the preservice teachers in TESOL teacher preparation programs across United States. For data collection, the TPACK survey was adapted and distributed through Qualtrics to collect views from TESOL preservice teachers. The survey asked preservice teachers to self-report their knowledge regarding teaching with technology and their knowledge of pedagogy. See Appendix C and D for the TPACK preservice teacher survey.

Initially, 10 TESOL programs were selected after analyzing their curricula. Subsequently, the surveys were sent to faculty and preservice teachers of those programs to solicit their input. After both surveys were sent, they remained open for 4 months, and then the data were collected in spring 2016. A follow-up reminder email was sent periodically depending on the responses. Follow-up interviews were conducted with the instructors depending on their willingness and availability. However, due to the low response rate, a second round of data collection started in spring 2017, after expanding the program search to TESOL CALL interest groups and active language teaching faculties with publications in various journals.

TESOL Faculty/Instructor Data Collection

While gathering TESOL teacher preparation program information, program curricula were reviewed to examine if any technology related courses were offered in the programs. Purposive sampling techniques were used to find the most productive and appropriate participants in response to the following research questions –

Q1. What technology-related skills should TESOL preservice teachers obtain during their teacher education programs?

Q2. What technology do TESOL faculty use in their courses? How are they using it?

At first, programs that offered no technology-related courses were removed. Then, faculty in the teacher preparation programs that offer technology courses were invited to participate in the study with options of phone interviews or simply replying to the faculty survey through Qualtrics. The faculty members were invited to share their experience, knowledge, and input on the use of technology and preparation for preservice teachers in TESOL. More than three instructors from each program were

contacted for appropriate selection of faculty participants who have been teaching or had taught technology related courses in their TESOL teacher preparation programs. The faculty survey questions solicited their experience and views on technology integration along with their input on necessary skills for TESOL preservice teachers. Out of 30 initial and follow-up emails, a few faculty responded that the technology-related courses have not been offered in a while and five of them were too busy to engage in any study, so the programs were all removed from the study. As a result, a total of six faculty responses were collected; four faculty completed the Qualtrics survey, and two Skype interviews were conducted.

After completing the survey or interviews, faculty helped distribute the survey to preservice teachers currently enrolled in the TESOL preparation programs or graduated within the prior 5 years. These included all preservice teachers who had taken or not yet taken any technology courses in the program. To include more participants for the study, a preservice teacher survey was also sent to TESOL colleagues of faculty at the University of Delaware, one of the convenient samples in the study.

Data Analysis

Likert-Scale TPACK Data from TESOL Preservice Teachers

At the end of data collection, a total of 79 responses were collected from TESOL preservice teachers through Qualtrics. Five respondents were excluded due to missing answers from some questions. Out of the remaining 75 respondents, 10 were male and 65 were female. Technology courses were offered or taken either as an elective or a required course for 44 respondents. A total of 31 respondents did not take

or did not have the opportunity to take technology-related courses during their TESOL preservice teacher preparation program.

TESOL Faculty Instructor Data

Email recruitment was sent to more than thirty faculty at multiple institutions in summer 2016 and spring 2017. After 4 months of recruiting time, a total of six faculty members responded and participated in this study. Four faculty replied through a Qualtrics survey. Two interviews were conducted through Skype individually on a semi-structured format. The faculty responded to the seven questions from the interview protocol with further explanation. Mostly, the Skype interviews revealed the faculty members' experiences and their views of teaching and using educational technology in TESOL teacher preparation programs. The interview recordings were transcribed and other online data was downloaded from Qualtrics. The Qualtrics qualitative responses were analyzed using the qualitative analysis system – Dedoose. Data from faculty responses was inputted into Dedoose to find common themes and patterns of insights on relevant and necessary technology for TESOL preservice teachers in responses.

The faculty interview questions reflected the research questions driving this work. Specifically, the faculty members were invited to share their insights on what technology-related skills they believe TESOL preservice teachers should learn before they graduate. In addition, they were asked how they address the TESOL technology standards and the ways they integrate technology in their courses. For the preservice teacher survey, they were asked to reflect on the ways they witness technology being used in their courses.

This study utilized a mixed methods design that included both qualitative and quantitative data. The Explanatory Framework was employed for data analysis – guided

by the research questions; this framework was used to examine technology preparation in TESOL programs. Studies using this framework tend to have important variables individually without manipulation (Johnson & Christensen, 2008). The faculty data were analyzed using qualitative inductive approaches and descriptive analysis to look for similarities and differences in each TESOL teacher preparation program. This approach is also ideal for studies using research questions to solicit answers with limited time and resources (Johnson & Christensen, 2008). In addition, narrative analysis was used to transcribe and present the faculty members' experiences based on similar contexts – technology for TESOL preservice teachers.

Limitations of the Study

One key limitation of the study is that the survey is a self-report instrument, thus making it difficult to eliminate participants' personal biases. In addition, the small sample size (N = 75) and the number of participants from each TESOL teacher preparation program varied since participation was not a course requirement and the preservice teachers completed the survey on their own time.

Chapter 3

RESULTS

Educational Technology Course

The educational technology course offered in some participating TESOL programs has various course titles (e.g., Educational Technology for ESOL Teachers, Technology for Language Teaching and Learning and Technology Enhanced Language Learning Design and Instruction). Further, the courses offer different views on adapting and using current technology in language classrooms. Generally, however, the educational technology courses for TESOL preservice teachers center on wikis, online learning/course management systems (LMS/ CMS), Internet-based resources and software, technology evaluation reports, and e-portfolios. As a result, the TESOL preservice teachers enrolled in one of those courses, should have had fairly similar course experiences with educational technology.

Key Question 1: Preservice Teachers' Self-Assessment of TPACK

The collected data were divided into two groups based on whether a technology course was offered in the participants' TESOL teacher preparation program. In this study, 37 participants were enrolled in TESOL programs that offered an individual educational technology course for second language teaching. The remaining 38 participants were enrolled in a program that did not offer an individual educational technology course either as a required or elective. The analyzed responses, however, showed no significant difference between the two groups. Specifically, results from an independent t-test demonstrated no significant difference ($p < .05$) among the TPACK domains in the study between participants enrolled in a program that offered an

individual educational technology course and those enrolled in a program that did not

offer such a course (see Table 6).

A close examination of data indicated that participants not enrolled in a

technology course exhibited slightly higher scores in knowledge of technology (TK),

but lower scores in the use of technology for language teaching (PK, TPK, TPACK and

Models of TPACK) (See Table 6). Overall, however, there was no statistical

significance in participants' scores. There was only one item in CK, PCK, and TCK

domains; therefore, the three domains were not analyzed statically and not included in

the following tables.

Table 6   Mean and Standard Deviations on TPACK Domains

Domain	Mean	Std. Deviation	Mean Difference	P Value
TK	3.50 (Tech course not offered, N=37)	0.79	- 0.34	0,054
	3.84 (Tech course offered, N=38)	0.76		
PK	4.20 (Tech course not offered)	0.56	0.15	0.331
	4.05 (Tech course offered)	0.77		
TPK	3.71 (Tech course not offered)	0.81	0.10	0.568
	3.61 (Tech course offered)	0.64		
TPACK	3.76 (Tech course not offered)	0.91	0.09	0.651

	3.67 (Tech course offered)	0.71		
Models of TPACK	3.29 (Tech course not offered)	0.95	0.08	0.719
	3.21 (Tech course offered)	0.93		

N=75

Open-Ended Question from Preservice Teachers' Self-Assessment of TPACK Knowledge

In response to Research Question 1, Question 7 of the survey asked the following question:

Describe a specific episode where one of your practicum cooperating teachers effectively demonstrated or modeled combining content, technologies and teaching approaches in a classroom lesson. Please include in your description what content was being taught, what technology was used, and what teaching approach(es) were implemented. If you have not observed a teacher modeling this, please indicate that you have not.

In this question, 35 responses were collected out of 74 respondents. Specifically, preservice teachers were asked to report the TESOL teachers' use of technology in their practicum course in the TESOL teacher preparation program. Most respondents noted that PowerPoint Presentation was used the most, followed by the use of document camera projectors. Five of the respondents mentioned that there was no technology use observed in their TESOL practicum classroom. The tools used in TESOL practicum classrooms are shown in Table 7.

Table 7   Use of Educational Technology in TESOL Practicum

Emergent Theme(s)	Technology Tool(s)	Number of Times Mentioned
Basic Presentation Tools/ In-class Hardware	Computer/ Listening Lab	1
	Projector	4
	Whiteboard & Marker	1
	Power Point	5
	Video	3
	TED Talk	1
	Youtube	2
Part VI: Technologies that Support Learning by Gaming	Quizlet	2
	Kahoot	3
	WebQuest	1
	Online Games	1
	Padlet	1
Part II: Technologies that Support Learning by Collaboration (CMS/ LMS)	Edmodo	1
	Blackboard	1
Part I: Technologies that Support Learning to Understand and Create	Google Doc	1
Part II: Technologies that Support Learning by Collaboration	Facebook	1
No Technology Observed		5

Question 18 of the survey asked the following question: "In what ways, if any, did your teacher preparation program prepare you to implement technology with English as a second language lessons?" A total of 45 responses were collected out of 74 respondents. Other than the tools mentioned in the previous two questions, two respondents discussed the benefits of learning technology for ESL classroom, from learning about multi-literacy to a multimodal approach (see Table 8). A total of 19 respondents pointed out that they felt inadequately trained for technology integration in ESL classrooms.

Table 8	Preserve Teachers' Responses Regarding Their Perception of Technology Integration in TESOL Programs
Student feedback 1	Through exposure to the literature focusing on various aspects including the development of technology use in language teaching/learning, principles of pedagogy of multiliteracies and multimodality, technological tool evaluation theory and guidelines, technology-based language teaching concepts such as affordances, situated practice, overt instruction, critical framing, etc. The program also offered hands-on practice of technology tool/application evaluation, online teaching practice with lesson design and implementation, online discussion facilitation, etc.
Student feedback 2	Look at what current technology tools exist and teach multi-literacies and use multimodal approaches.

Key Question 2: The Technology TESOL Faculty Use in Their Courses

Question 16 of the survey requested the following:

Describe a specific episode where an instructional technology professor or instructor effectively demonstrated or modeled combining content, technologies, and teaching approaches in a classroom lesson. Please include in your description what content was being taught, what technology was used, and what teaching approach(es) were implemented.

In this question, 46 responses were collected out of 74 respondents. Most respondents noted that PowerPoint Presentation was used the most, followed by videos, and then online websites. The tools used in courses and their purposes are shown in Table 9.

Key Questions 3 and 4: Technology-Related Skills for TESOL preservice teachers

The faculty members from different TESOL teacher preparation programs mentioned several technological skills for TESOL preservice teachers (Table 10). They recommended that the preservice teachers should know how to use the following

multimedia for language teaching including web tools (wikis, digital story-telling, recording, website creators, course management systems, and social media), hardware (computers, tablets, and cameras), and software (voice recognition and recording stations in each listening lab). Most professors reported that they embedded the TESOL technology standards in their courses. Although there was no explicit mention of the technology standards being presented to the preservice teachers, the faculty used it as a reference when planning TESOL method courses.

Table 9   Faculty Use of Educational Technology in TESOL Teacher Preparation Programs

Emergent Theme(s)	Technology Tool(s)	Number of Times Mentioned
Basic Presentation Tools/ In-class Hardware	Power Point Slides	12
	Video	8
	Computer	1
	Smartboard	4
	Websites	7
	Prezi	1
	Jeopardy	1
	EdPuzzle	1
	Padlet	1
Part VI: Technologies that Support Learning by Gaming	Youtube	1
	Blog	1
	Digital Age	1
	Word Cloud	1
	Socrative	1
	Kahoot	1
	Plickers	1
	TeachLive	1
Part II: Technologies that Support Learning by Collaboration	(Web 2.0: CMS) Blackboard	4
	Twitter	1

Part III: Technologies that Support Anytime, Anyplace Learning	Multi-apps on tablets	2
Part I: Technologies that Support Learning to Understand and Create	Adobe Captivate	1
	Voice Recording	1
	Google Sheet, Doc, Form	4
Online Storage	Wiki	1
	Dropbox	1

Table 10   Educational Technology Tools Faculty Member Demonstrated in Courses

1. Numerous web tools such as Google Forms, Padlet, Haiku Deck, etc
   Web teaching platform/Learning management system (the course is completely online)
   Students work with various technology tools to create artifacts to be displayed in a digital portfolio
2. PowerPoint, LMS platform provided by 2U, texting, chat bar, break-out rooms, design of multimedia lesson plans, design of PechaKucha presentation, email, phone conversations for one-on-one conferences
3. I use Adobe Connect to teach classes online synchronously. I also post materials for the students using asynchronous means (e.g. online forums, embedded videos, course walls where both instructors and students could communicate, voice threads, etc.).
4. I use Canvas in a hybrid program, PowerPoint, Padlet, Prezi, etc.

Faculty members reported that in addition to technology skills, a language teacher's perception toward technology integration is also vital. They recommended that TESOL teacher preparation programs ensure that preservice teachers have exposure to various technologies in language teaching settings. In addition, the program director and curriculum designers should have the mindset of embracing and utilizing technology in TESOL teacher preparation courses and language classes. Other than teachers' values and curriculum design, one faculty mentioned the usefulness and effectiveness of professional learning communities (PLCs). She recommended that preservice language teachers should join professional groups to learn and keep up with

the current trend in teaching with various tools. See Table 11 for a list of suggested

skills for TESOL preservice teachers.

Table 11   Suggested Technology Integration Skills for TESOL Preservice Teachers

Emerging Theme: Values in Technology Integration	
Explanation	The most important aspect is to model good ways of using technology for preservice TESOL teachers, so they will understand and have the right mindset in choosing the most appropriate tools for their future students.
Quote (s)	"What is the real role for it, how can it be utilized in a way it's different from other types of technology, what does it offer? Not just a drill machine, that whole value is important." "Both how to be users and creates of technology-based content."
Emerging Theme: Promote Creativity, Flexibility, and Critical Thinking Skills	
Explanation	The faculty suggested that TESOL preservice teachers should try to think about what will benefit their students the most and how to design classes to help students improve. Also, preservice teachers should always be creative and adaptive when selecting from the existing tool.
Quote (s)	"Thinking okay, what is the end need of the student and the situation and how my technology help or not. But if it's going to help, what is available that may or may not be created for language teachers. so that's another mindset."" The skills should be the things that they can, those ideas are there, whether they can change them and adapt them depending on their situation so they can feel themselves, the power of learning with technology."
Emerging Theme: Trouble Shooting Skills	
Explanation	Faculty pointed out that TESOL teachers should always be prepared for teaching and test the tools in advance. In addition to class preparation, they also need to have a second plan ready in case things fall apart.
Quote (s)	"It's really important to not just keep up with technology itself but also how do you manage, you know if you go to a computer lab and stuff isn't working or whatever, doesn't just shut you down as a teacher but that you have some plans."
Emerging Theme: Technology skills in (not limited to)	

Explanation	TESOL preservice teachers should have technology skills in using tools such as website creator, online presentation tools, online blogs, e-portfolio, video camera, the SMARTBoard, laptops, computers, cellphones, apps, WebQuests, coding, synchronous and asynchronous online platform and curriculum development, instructional technology, corpus, social networking tools, office productivity suites.
Quote (s)	"They should be able to use some multi-media and that will depend on the teacher what kind of multi-media they want to use."

Chapter 4

DISCUSSION

According to the American Council on the Teaching of Foreign Languages (ACTFL, 2012), language educators can use technology to support language instruction, practice, and assessment. Exposure to technology greatly benefits preservice teachers and offers them more venues to convey knowledge and obtain successful language teaching (Zhang & Deroo, 2017). Preservice teachers are like students in the classroom – they expect to witness what is modeled for them and are expected to transfer the skills and knowledge into their future classrooms (Tondeur et al., 2011). Further, scaffolding with feedback and responses can also help preservice teachers build and develop the use of CALL Hubbard (2008).

Zhang and Deroo (2017) identified three approaches to technology integration in language teacher preparation programs – (a) delivering technology-related instruction through a TECHNOLOGY course, (b) through LANGUAGE-TEACHING METHODS courses, and (c) through a succession of technology-related coursework across the program. They further discussed important themes in preparing language teachers to integrate technology, which include: (a) bridging theory and practice, (b) situating learning in authentic scenarios, (c) developing positive attitude towards technology, and (d) collaborating with in-service teachers and peers.

The suggested approaches of technology integration provided by Zhang and Deroo (2017) align with the data collected from the faculty interviewed in this study. The faculty members noted that it is crucial for preservice teachers to have exposure to

technology integration during the preparation program. They recommended that preservice teachers should be immersed in language lessons incorporated with technology and see how different tools can be utilized in various language lessons. In addition, they noted that they need to be creative and flexible in choosing the best tools when designing language classes. However, the last theme discussed by Zhang and Deroo indicated that collaboration with in-service teachers and peers, which was not observed by all of the preservice teachers participating in the study. Nearly 15% of the respondents (N = 35) reported not seeing any technology integration in their practicum classrooms. This result also contradicted the literature indicating the importance of the teacher educator and mentor teachers in modeling technology integration in language classrooms (Rokenes & Krumsvik, 2016). The TESOL preservice teachers in this study did not have the opportunity to observe how relevant technology could be used in ESL teaching activities and there was no support for them to think about technology integration in their own teaching. This result also opposes Arnold and Ducate's (2015) notion that both preservice and in-service teachers should collaborate and develop efficient ways to become reflective practitioners.

Koehler and Mishra (2009) indicated that teachers' professional knowledge with technology integration should be reconsidered in teacher preparation programs. The TPACK framework offers a body of knowledge needed for successful teaching with technology. The components should be promoted as one in order to maintain quality and efficient teaching. In this study, the results of TESOL preservice teachers with technology courses offered led to lower TK (M = 3.50) compared to no technology courses offered (M = 3.84). Yet, the means in TPACK were more highly reported by preservice teachers who completed a technology course. Regardless of their differences

in TK, PK, TPK, and TPACK, the Models of TPACK showed nearly no difference (M = 3.29 and M = 3.21; SD = 0.95 and SD = 0.93). Although teaching content and pedagogy were delivered in the courses, the preservice teachers tended to benefit more from the use of educational technology as demonstrated by faculty or practicum teachers.

Recommendations

For TESOL Program Faculty

First, as recommended by the faculty in this study, preservice teachers should have multiple technological skills with a flexible mindset. In addition to hardware technology – computers, cameras, cell phones, and smartboards – TESOL preservice teachers should learn how to utilize some online tools and corpus, even including coding in their lessons. During the interview, the faculty mentioned some of the most commonly used online tools such as Kahoot, G Suite, Quizlet, Padlet, and Prezi (see Table 12). These online tools fall into the student engagement and collaboration areas, and they can be used to encourage student participation and promote cooperative learning. Kahoot, Prezi, and Quizlet are commonly used in K-12 settings, whereas G Suite and Padlet are more suitable for higher education settings. These recommended tools have been widely used, and there is already a large database of free or paid lesson templates created by other users and teachers.

Second, in order to successfully prepare TESOL preservice teachers, the TESOL curriculum and TESOL faculty should also be updated constantly. The faculty and preservice teachers should feel comfortable in using new technology and embrace the hidden obstacles. The following tools are recommended by TESOL preservice teachers

and faculty. The selected tools have user friendly interface, large shared database, and

offer free accounts for teachers and students. The created learning templates can be

shared within an individual student, a team, or a class through a shareable link.

Table 12   Recommended Tools for TESOL Preservice Teachers

	User Friendly	Free Accounts	Online Database	Limitation
Kahoot	v	v	v	Requires all players to log in (with a given code for different lessons/ study sets) at the same time to participate.
Quizlet	v	v	v	Students need their own account to keep the records of their learning (vocabulary study challenge minute count).
Prezi	v	v	v	Requires all students to sign up for a free account before viewing or creating any Prezi presentation slides.
G Suite	v	v		Requires all students to sign up for a free account before viewing or creating any Prezi presentation slides.
Padlet	v	v		No video functions.

Moreover, there should be connection and showcasing of existing tools and how

they can be used in different settings for varied learners. TESOL teachers in K-12 will

be teaching and supporting students in interdisciplinary subjects, so they should have an

opportunity to witness the use of instructional media in math, science, social studies,

and so forth. Furthermore, the ability to search for the most suitable multimodal

resources with constant reflection and community support needs to take place in

TESOL field practica.

Third, moving from traditional practicum courses to online classrooms can also

be considered for the future TESOL profession. The use of virtual reality for ESL

classes and the encouragement in trying newly evolving technology can greatly affect preservice teachers' mindset and facilitate reflection on their teaching practice.

Course Activity Tool – Kahoot

To use Kahoot https://create.kahoot.it/ in ESL classrooms (Figure 6), teachers can search and use the wide database created and shared by other users. The information on the website is all free, and the user-friendly interface allows novice and experienced teachers to find the most suitable topics for their students. This can be used for teaching reading and writing classes with a focus on grammar, reading comprehension, sentence structure exercises, and so forth. This web tool promotes student collaboration and engages students with its gaming features.
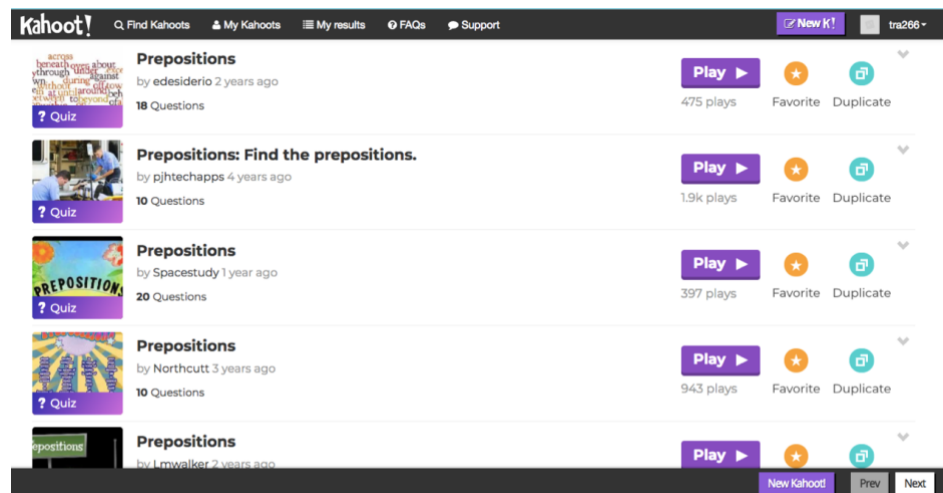
Figure 6   Screenshot of Kahoot.

Course Activity Tool – Quizlet

Similar to Kahoot, to use Quizlet (Figure 7; https://quizlet.com/) in ESL classrooms, teachers can use the wide database created and shared by other users. The

information on the website is all free, and the user-friendly interface allows novice and experienced teachers to find the most suitable topics for their students. Students can be invited to collaborate and create their own study sets. This web tool is ideal for learning new vocabulary, and it allows students to memorize the terms through gaming. Students are encouraged to use the Match function to memorize the definition of the key words with a bonus game Gravity function for spelling. A free review test option is included and can be created easily for teachers. In addition, this can be used for teaching all four language skills classes. This web tool promotes anytime, anywhere individual study review or group collaboration learning (a new feature added in 2017 with a minimum of six participants).
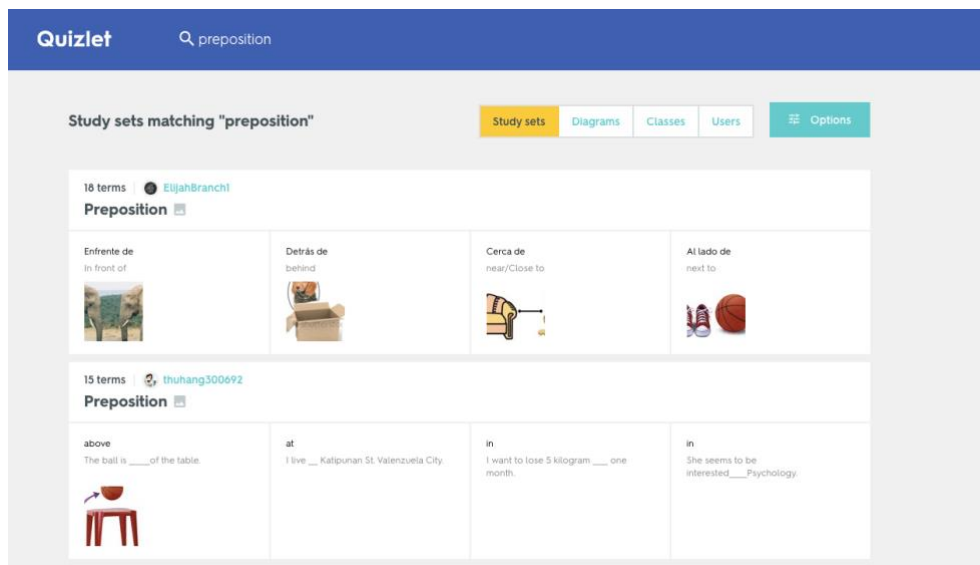
Figure 7   Quizlet screenshot.

Course Activity Tool – Prezi

Presentation skill is essential for all students including ELLs, with Prezi (Figure 8; https://prezi.com/), teachers can help students draft their thoughts and present their ideas using this online tool. Students can be encouraged to collaborate and make their own online slideshow. This web tool is great for students who are more interested in doing presentations with creativity. It emphasizes concept mapping and provides good training for being concise. In ESL classrooms, ELLs in sixth grade and above can work as a team or individually to show their ideas and sentences with Prezi.
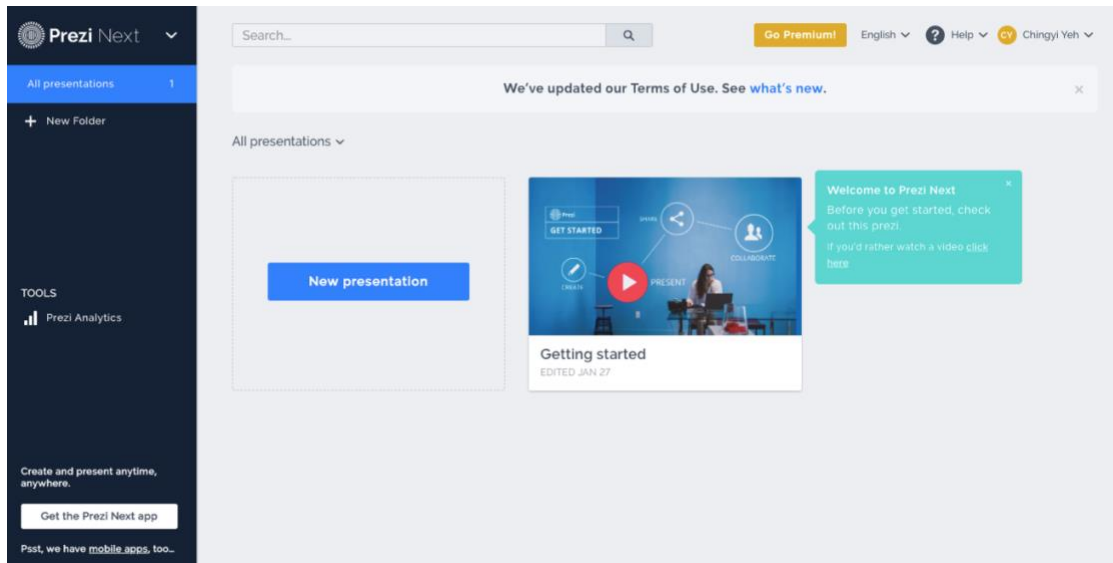
Figure 8   Screenshot of Prezi.

Online Presentation/ Collaboration Tool – G Suite

Google (Figure 9; https://gsuite.google.com/) offers multiple ways to create, maintain, and store documents online. With this web tool, ELLs can be invited to create writing or speaking assignments at their own pace and then share with others. The free

online storage space allows the students to access their files anytime, anywhere if there is internet connection. The students can manage their work and contribute at the same time. This tool can be used in all four language skill classes.
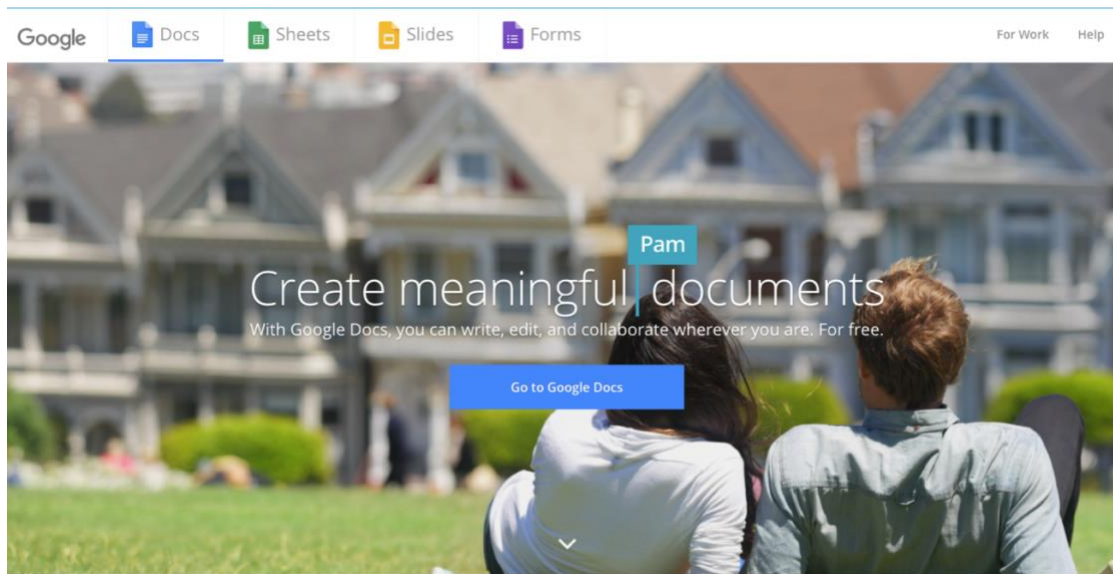

Figure 9   Screenshot of Google Docs.

<div align="center">Course Activity Tool – Padlet</div>

Padlet (Figure 10; https://padlet.com/) allows ELLs to present writing pieces online. Teachers can create topics for students to contribute their ideas. They can use words, phrases, pictures, or audio responses. Students have options in choosing the avatar and changing the background colors or fonts. Teachers can share the page easily with a shareable link or have students scan unique QR codes for each topic. This tool is great for turning traditional reading and writing, grammar classes into lively interactive sessions.
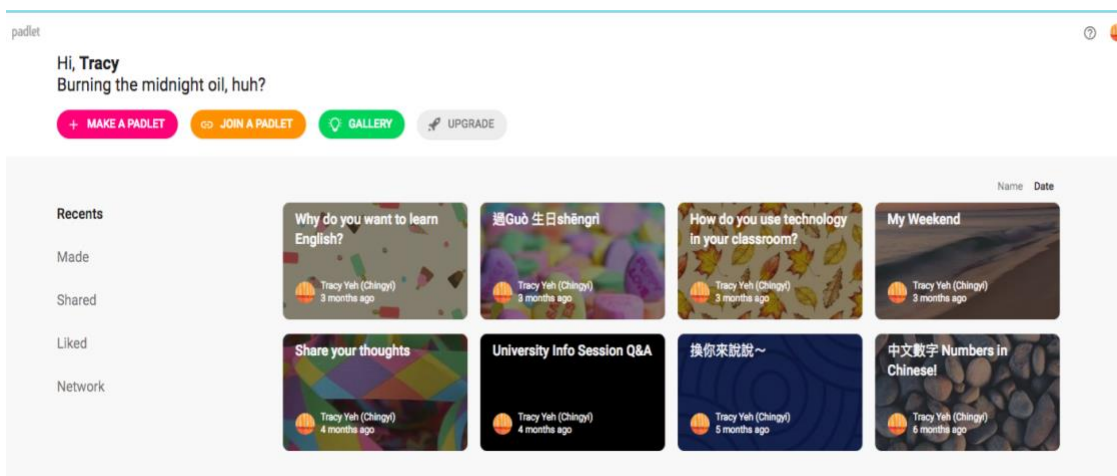
Figure 10   Screenshot of Padlet.

Conclusion

Examining technology integration in TESOL teacher preparation programs is crucial in order to better prepare preservice TESOL teachers in using technology in language teaching. This study investigated technology integration and preparation of 13 TESOL teacher preparation programs in the United States. The TESOL preservice teachers and their course instructors were invited to participate in the study. The TPACK survey was employed to solicit the preservice teachers' perceptions on technology integration in their TESOL teacher preparation programs. The results showed that the use of technology is observed occasionally in their programs, and most of the preservice teachers have not witnessed any use of technology with their practicum teachers. In order to have effective technology integration, the faculty participants recommended that preservice teachers should have a flexible mindset in making pedagogical changes towards technology and various contents. More efforts should also be made by TESOL program and curriculum designers to help preservice language teachers understand the possible obstacles and enrich their technology

56

integration experiences. In addition, preservice teachers should be encouraged to join a

TESOL technology professional community for continuous professional learning.

REFERENCES

ACTFL (2012). Statement on the Role of Technology in Language Learning. (2017, May 20). Retrieved from https://www.actfl.org/news/position-statements/statement-the-role-technology-language-learning

Ahmed, K., & Nasser, O. (2015). Incorporating iPad technology: Creating more effective language classrooms. *TESOL Journal*, *6*(4), 751-765.

Arnold, N., & Ducate, L. (2015). Contextualized views of practices and competencies in CALL teacher education research. *Language Learning and Technology*.

Banados, E. (2006). A blended-learning pedagogical model for teaching and learning EFL successfully through an online interactive multimedia environment. *CALICO journal*, 533-550.

Banister, S., & Vannatta Reinhart, R. (2012). Assessing NETS• T performance in teacher candidates: Exploring the Wayfind teacher assessment. *Journal of Digital Learning in Teacher Education*, *29*(2), 59-65.

Blake, R. J. (2013). Brave new digital classroom: Technology and foreign language learning. Georgetown University Press.

Blankson, J., Keengwe, J., & Kyei-Blankson, L. (2010). Teachers and technology: Enhancing technology competencies for preservice teachers. *International Journal of* Information *and Communication Technology Education (IJICTE)*, *6*(1), 45-54.

Boulos, M. N. K., Maramba, I., & Wheeler, S. (2006). Wikis, blogs and podcasts: a new generation of Web-based tools for virtual collaborative clinical practice and education. *BMC medical education*, *6*(1), 41.

Brown, D., & Warschauer, M. (2006). From the university to the elementary classroom: Students' experiences in learning to integrate technology in instruction. *Journal of Technology and Teacher Education*, *14*(3), 599.

Bruce, B. C. (1997). Critical issues literacy technologies: What stance should we take?. *Journal of literacy Research*, *29*(2), 289-309.

Chen, T. (2016). Technology-supported peer feedback in ESL/EFL writing classes: a research synthesis. *Computer Assisted Language Learning*, *29*(2), 365-397.

Ching Sing Chai, Joyce Hwee Ling Koh, & Chin-Chung Tsai. (2010). Facilitating Preservice Teachers' Development of Technological, Pedagogical, and Content Knowledge (TPACK). *Journal of Educational Technology & Society, 13*(4), 63-73. Retrieved from http://www.jstor.org/stable/jeductechsoci.13.4.63

Chinnery, G. M. (2008). Biting the hand that feeds me: The case for e-language learning and teaching. *CALICO Journal*, *25*(3), 471-481.

Chinnery, G. M. (2014). Call Me... Maybe: A Framework for Integrating the Internet into ELT. In *English Teaching Forum* (Vol. 52, No. 1, pp. 2-13). US Department of State. Bureau of Educational and Cultural Affairs, Office of English Language Programs, SA-5, 2200 C Street NW 4th Floor, Washington, DC 20037.

Clark, R. C., & Mayer, R. E. (2008). Learning by viewing versus learning by doing: Evidence-based guidelines for principled learning environments. *Performance Improvement*, *47*(9), 5-13.

Dal Pai, D., & Borba, G. S. (2012). The role of digital technologies for the innovation of the learning experience in the university classroom. *Strategic Design Research Journal*, *5*(2), 59.

DelliCarpini, M. (2012). Building Computer Technology Skills in TESOL Teacher Education. *Language Learning & Technology*, *16*(2), 14-23.

Elimat, A. K., & AbuSeileek, A. F. (2014). Automatic Speech Recognition Technology as an Effective Means for Teaching Pronunciation. *JALT CALL Journal*, *10*(1), 21-47.

Foulger, T. S., Graziano, K. J., Slykhuis, D., & Schmidt-Crawford, D. (2016). Invited commentary: The time is now! Creating technology competencies for teacher educators. *Journal of Technology and Teacher Education*, *24*(3), 249-256.

Fox, R., & Henri, J. (2005). Understanding teacher mindsets: IT and change in Hong Kong schools. *Journal of Educational Technology & Society*, *8*(2).

Garrett, N. (2009). Computer‐assisted language learning trends and issues revisited: Integrating innovation. The *modern language journal*, *93*(s1), 719-740.

Gladwin, R. (2016). The Top 20 Free Online ESOL Resource Websites. *Internet TESL Journal (http://iteslj. org/)*, *4*, 7.

Goktas, Y., Yildirim, S., & Yildirim, Z. (2009). Main barriers and possible enablers of ICTs integration into pre-service teacher education programs. *Journal of Educational Technology & Society*, *12*(1), 193.

Graham, R. C., Burgoyne, N., Cantrell, P., Smith, L., St Clair, L., & Harris, R. (2009). Measuring the TPACK confidence of inservice science teachers. *TechTrends*, *53*(5), 70-79.

Groot, P. J. (2000). Computer assisted second language vocabulary acquisition.

Hampel, R., & Stickler, U. (2005). New skills for new classrooms: Training tutors to teach languages online. *Computer Assisted Language Learning*, *18*(4), 311-326.

Hayward, N. M., & Tuzi, F. (2003). Confessions of a technophobe and a technophile: The changing perspective of technology in ESL. *TESOL Journal*, *12*(1), 3-8.

HAWKINS, M., & UZUNER, S. (2008). Language, literacy, and technology. *TESOL Quarterly*, *42*(2), 339-343.

Hong, K. H. (2010). CALL teacher education as an impetus for L2 teachers in integrating technology. *ReCALL*, *22*(1), 53-69.

Hoopingarner, D. (2009). Best practices in technology and language teaching. *Language and Linguistics Compass*, *3*(1), 222-235.

Hubbard, P. (2008). CALL and the future of language teacher education. *Calico Journal*, *25*(2), 175-188.

Hwang, W. Y., Shadiev, R., & Huang, S. M. (2011). A study of a multimedia web annotation system and its effect on the EFL writing and speaking performance of junior high school students. *ReCALL*, *23*(2), 160-180.

Hwang, W. Y., Shadiev, R., Hsu, J. L., Huang, Y. M., Hsu, G. L., & Lin, Y. C. (2016). Effects of storytelling to facilitate EFL speaking using Web-based multimedia system. *Computer Assisted Language Learning*, *29*(2), 215-241.

Johnson, B., & Christensen, L. (2008). *Educational research: Quantitative, qualitative, and mixed approaches*. Sage.

Kern, R. (2006). Perspectives on technology in learning and teaching languages. *TESOL Quarterly*, *40*(1), 183-210.

Kessler, G. (2013). Teaching ESL/EFL in a World of Social Media, Mash-Ups, and Hyper-Collaboration. *TESOL Journal*, *4*(4), 615-632.

Kessler, G. (2010). When They Talk About CALL: Discourse in a Required CALL Class?. *Calico Journal*, *27*(2), 376-392.

Kessler, G. (2006). Assessing CALL teacher training: What are we doing and what could we do better. *Teacher education in CALL*, 23-42.

Kim, J., Baik, S. S., Ryu, S. H., Sohn, Y., Park, S., Park, B. G., ... & Kim, K. S. (2015). Observation of tunable band gap and anisotropic Dirac semimetal state in black phosphorus. *Science*, *349*(6249), 723-726.

Kim, I. S. (2006). Automatic speech recognition: Reliability and pedagogical implications for teaching pronunciation. *Journal of Educational Technology & Society*, *9*(1).

Koehler, M. J., & Mishra, P. (2008). Introducing TPCK. AACTE Committee on Innovation and Technology (Ed.), The handbook of technological pedagogical content knowledge (TPCK) for educators (pp. 3-29). *Mah—wah, N]: Lawrence Erlbaum Associates*.

Lam, Y. (2000). Technophilia vs. technophobia: A preliminary look at why second-language teachers do or do not use technology in their classrooms. *Canadian Modern Language Review*, *56*(3), 389-420.

Lee, M. H., & Tsai, C. C. (2010). Exploring teachers' perceived self-efficacy and technological pedagogical content knowledge with respect to educational use of the World Wide Web. *Instructional Science*, *38*(1), 1-21.

Lei, J. (2009). Digital natives as preservice teachers: What technology preparation is needed?. *Journal of* Computing *in Teacher Education*, *25*(3), 87-97.

Levy, M. (2009). Technologies in use for second language learning. *The Modern Language Journal*, *93*(s1), 769-782.

Levine, A., Ferenz, O., & Reves, T. (2000). EFL academic reading and modern technology: How can we turn our students into independent critical readers. *TESL-EJ*, *4*(4), 1-9.

Littrell, A. B., Zagumny, M. J., & Zagumny, L. L. (2005). Contextual and psychological predictors of instructional technology use in rural classrooms. *Educational Research Quarterly*, *29*(2), 37.

Lu, X. (2010). Automatic analysis of syntactic complexity in second language writing. International *journal of corpus linguistics*, *15*(4), 474-496.

Mayer, R. E. (Ed.). (2005). *The Cambridge handbook of multimedia learning*. Cambridge university press.

Mayer, R. E. (2008). Applying the science of learning: Evidence-based principles for the design of multimedia instruction. *American psychologist*, *63*(8), 760.

Metcalf, A., Layton, M. V., & Goslin, T. L. (2016). Three Ways to Improve Student Presentations. *TESOL Journal*, *7*(2), 421-428.

Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers college record*, *108*(6), 1017.

Mishra, P., & Koehler, M. J. (2008, March). Introducing technological pedagogical content knowledge. In *annual meeting of the American Educational Research Association* (pp. 1-16).

Mouza, C., & Lavigne, N. (Eds.). (2012). *Emerging technologies for the classroom: A learning sciences perspective*. Springer Science & Business Media.

Mouza, C. (2016). Developing and assessing TPACK among pre-service teachers. *Handbook of technological pedagogical content knowledge (TPACK) for educators*, *169*.

Murphy, E., Rodríguez-Manzanares, M. A., & Barbour, M. (2011). Asynchronous and synchronous online teaching: Perspectives of Canadian high school distance education teachers. *British Journal of Educational Technology*, *42*(4), 583-591.

Nelson, J., Christopher, A., & Mims, C. (2009). Transformation of teaching and learning. TechTrends, *53*(5), 81.

Neri, A., Cucchiarini, C., & Strik, W. (2003, August). Automatic speech recognition for second language learning: how and why it actually works. In *Proc. ICPhS* (pp. 1157-1160).

Niess, M. L. (2015). Transforming teachers' knowledge: Learning trajectories for advancing teacher education for teaching with technology. In *Technological pedagogical content knowledge* (pp. 19-37). Springer, Boston, MA.

Nor, N. F. M., Hamat, A., & Embi, M. A. (2012). Patterns of discourse in online interaction: Seeking evidence of the collaborative learning process. *Computer Assisted Language Learning*, *25*(3), 237-256.

O'Hara, S., Pritchard, R., Huang, C., & Pella, S. (2013). The teaching using technology studio: Innovative professional development to meet the needs of English learners. *TESOL Journal*, *4*(2), 274-294.

Petrie, G. M., & Avery, L. (2011). Identifying Our Approaches to Language Learning Technologies: Improving Professional Development. In *English Teaching Forum* (Vol. 49, No. 3, pp. 10-19). US Department of State. Bureau of Educational and Cultural Affairs, Office of English Language Programs, SA-5, 2200 C Street NW 4th Floor, Washington, DC 20037.

Prensky, M. (2001). Digital natives, digital immigrants part 1. *On the horizon*, *9*(5), 1-6.

Rienties, B., Brouwer, N., & Lygo-Baker, S. (2013). The effects of online professional development on higher education teachers' beliefs and intentions towards learning facilitation and technology. *Teaching and teacher education*, *29*, 122-131.

Røkenes, F. M., & Krumsvik, R. J. (2016). Prepared to teach ESL with ICT? A study of digital competence in Norwegian teacher education. *Computers & Education*, *97*, 1-20.

Schmidt, D. A., Baran, E., Thompson, A. D., Mishra, P., Koehler, M. J., & Shin, T. S. (2009). Technological pedagogical content knowledge (TPACK) the development and validation of an assessment instrument for preservice teachers. *Journal of Research on Technology in Education*, *42*(2), 123-149.

Sha, G. (2010). Using Google as a super corpus to drive written language learning: a comparison with the British National Corpus. *Computer Assisted Language Learning*, *23*(5), 377-393.

Shinas, V. H., Karchmer-Klein, R., Mouza, C., Yilmaz-Ozden, S., & J. Glutting, J. (2015). Analyzing preservice teachers' Technological Pedagogical Content Knowledge development in the context of a multidimensional teacher preparation program. *Journal of Digital Learning in Teacher Education*, *31*(2), 47-55.

Shulman, L. S. (1986). Those who understand: Knowledge growth in teaching. *Educational researcher*, *15*(2), 4-14.

Sullivan, N., & Pratt, E. (1996). A comparative study of two ESL writing environments: A computer-assisted classroom and a traditional oral classroom. *System*, *24*(4), 491-501.

Tapscott, D. (2010). Grown Up Digital. How the Net Generation Is Changing Your World. International *Journal of Market Research*, *52*(1), 139.

Taranto, G., Dalbon, M., & Gaetano, J. (2011). Academic social networking brings Web 2.0 technologies to the middle grades. *Middle School Journal*, *42*(5), 12-19.

Thouësny, S., & Bradley, L. (2011). Introduction on views of emergent researchers in L2 teaching and learning with technology. *Second language teaching and learning with technology: views of emergent researchers*, 1-8.

Tondeur, J., van Braak, J., Sang, G., Voogt, J., Fisser, P., & Ottenbreit-Leftwich, A. (2012). Preparing pre-service teachers to integrate technology in education: A synthesis of qualitative evidence. *Computers & Education*, *59*(1), 134-144.

Traore, M., & Kyei-Blankson, L. (2011). Using Literature and Multiple Technologies in ESL Instruction. *Journal of Language Teaching & Research*, *2*(3).

Twyman, T., & Tindal, G. (2006). Using a computer-adapted, conceptually based history text to increase comprehension and problem-solving skills of students with disabilities. *Journal of Special Education Technology*, *21*(2), 5-16.

Van Olphen, M., Harris, J., & Hofer, M. J. (2012). Grounded Technology Integration: ESOL Teaching Strategies.

Warschauer, M., Zheng, B., & Park, Y. (2013). New ways of connecting reading and writing. *TESOL Quarterly*, *47*(4), 825-830.

Warschauer, M. (1996). Motivational aspects of using computers for writing and communication. *Telecollaboration in foreign language learning*, 29-46.

Wiseman, C. S., & Belknap, J. P. (2013). Wikis: A knowledge platform for collaborative learning in esl reading. *Tesol Journal*, *4*(2), 360-369.

Wu, W. C. V., Petit, E., & Chen, C. H. (2015). EFL writing revision with blind expert and peer review using a CMC open forum. *Computer Assisted Language Learning*, *28*(1), 58-80.

Yoon, C. (2016). Individual differences in online reference resource consultation: Case studies of Korean ESL graduate writers. *Journal of Second Language Writing*, *32*, 67-80.

Yule, D. (2006). Quality technology in the language classroom: The views of graduating teachers. *Babel*, *41*(1), 20.

Yunus, M. M., Salehi, H., & Chenzi, C. (2012). Integrating social networking tools into ESL writing classroom: Strengths and weaknesses. *English Language Teaching*, *5*(8), 42.

Zhang, Y., & Deroo, M. (2016). Technology Instruction in Language Teacher Education Programs. Preparing *Foreign Language Teachers for Next-Generation Education*, 1.

Zhao, Y. (Ed.). (2003). *What should teachers know about technology: Perspectives and practices*. IAP.

Appendix A

PHASE 1 & PHASE 2 SELECTED PROGRAMS WITH RELATED-TECHNOLOGY COURSES OFFERED

Phase 1		
Institution	**Technology-Related Course in TESOL Program(s)**	**Course Description/ Goals**
Indiana University of Pennsylvania	Degree Offered: PhD Format: Face-to-Face Course Title: ENGL 808 Technology and Literacy 3 Credits. Course Title: ENGL 644 ESOL Teaching Methodology, Materials, and Instructional Technology 3 Credits.	This course surveys current theory and practice in teaching English to non-native speakers. It includes traditional and innovative approaches for integrating instructional technology and multimedia, designing of classroom materials for specific purposes, and preparing procedures for teaching all language skills at various educational levels. This is meant to heighten awareness of unequal social hierarchies that may be embedded in approaches, materials and media used in the classroom. Prerequisite: None
Ohio University	Degree Offered: MA, Linguistics (CALL Module) Format: Face-to-Face Course Title: EDUC 689 Educational Technology for ESOL Teachers (elective)	• LING 4510/5510 Computers in Language Teaching I (Intro to CALL) • LING 4520/5520 Computers in Language Teaching III (CALL Research) • LING 4150/5150 Distributed Learning Courseware I (Audio & Video in CALL) • LING 4160/5160 Distributed Learning Courseware II (Addressing individual language skills)
University of Wisconsin - Madison	Degree Offered: MS with Secondary Teaching and ESL Certification Format: Face-to-Face Course Title: 709 Digital Media & Technology in Schools 1 Credit	Introduction for secondary educators to the role of digital media technologies in their classrooms. The course will cover major topics in digital media in teaching and students will be expected to design several instructional units that incorporate technology meaningfully into their classrooms.

	Degree Offered: MA Format: Face-to-Face Course Title: EDUC 689 Educational Technology for ESOL Teachers (elective)	This course focuses on developing our skills in employing technology to enhance teaching and learning of English as a second or foreign language. The course surveys best practices in designing, implementing, and assessing technology-enhanced learning experiences to engage students and improve learning outcomes. The course will emphasize the NETS*T standards as written by the International Society of Technology in Education: Facilitate and Inspire Student Learning and Creativity; Design and Develop Digital-Age Learning Experiences and Assessments; Model Digital-Age Work and Learning; Promote and Model Digital Citizenship and Responsibility; and Engage in Professional Growth and Leadership. Participants will collaborate on a variety of educational technology projects, including the development of an e-Portfolio, the completion comprehensive website and software analyses, the development of technology-rich thematic units, and the creation of a digital project as the capstone for the course.
University of Maryland Baltimore County		
University of Southern California	Degree Offered: MA Format: Online EDUC 596 Technology Enhanced Language Learning Design and Instruction 3 Credits	The online teaching space, particularly in the area of language teaching, is growing in scale and legitimacy, and some students may wish to work in this area. Through this experience, students may build on their previous teaching experience and on what they have learned in the MAT – TESOL program to establish the skills for online English language instruction and instructional design. The course instructor and students will collaboratively design and lead a series of discussion groups and a nine-week English workshop for their online field placement with a partner class of English language learners in the United States or abroad.

Phase 2		
Institution	**Technology-Related Course in TESOL Program(s)**	Course Description/ Goals
American University	Degree Offered: MA & BA TESL-654/TESL-454: Technology for Language Teaching and Learning	An introduction to the use of technology for foreign/second language teaching in a variety of educational contexts. Includes exploration of new media technologies, such as wikis, online course management systems (CMS), and digital stories, as well as the use of Internet-based resources and software in both high-and low-tech teaching environments. Relate current SLA theories to teaching through technology • Define and critically examine digital/new media literacy and multiliteracies • Explain how a pedagogy of multiliteracies can impact teaching with technology • Identify and critically analyze software, websites, and other technologies for a variety of teaching contexts • Evaluate the usefulness of software, websites, and other technologies • Explain the digital divide, its relevance for ESL/EFL students, and how to teach in high- and low-technology contexts • Create and implement lesson plans following a pedagogy of multiliteracies and utilizing a variety of technologies to develop student accuracy, fluency, and cross-cultural awareness in the L2 classroom.
Duquesne University	Degree Offered: MA GILT 511 Technology and Education GILT 513 Instructional Application of Technology	GILT 511 Examines the pedagogy of teaching digitally, the use of technology as a teaching strategy for the classroom, and the impact of school-related legislation and leadership roles available in instructional technology. Lecture, Online. GILT 513 Participants will prepare technology-based instructional lessons in K-12 subjects (Math, Science, English and Social Studies). They will integrate their understanding of instructional design and delivery with basic learning theories. Lecture, Online.

		Presents an overview of the interrelationship between literacy and technology. Demonstrates approaches to teaching English using computer technology.
Indiana University of Pennsylvania	Degree Offered: PhD ENGL 808 Technology and Literacy ENGL 644 ESOL Teaching Methodology, Materials, and Instructional Technology 3 CR.	This course surveys current theory and practice in teaching English to non-native speakers. It includes traditional and innovative approaches for integrating instructional technology and multimedia, designing of classroom materials for specific purposes, and preparing procedures for teaching all language skills at various educational levels. This is meant to heighten awareness of unequal social hierarchies that may be embedded in approaches, materials and media used in the classroom. Prerequisite: None
Kent State University	Degree Offered: MA ENG 51002 Computers for Second Language Teaching (3)	Designed for teachers of language and culture, this course explores the availability of technology, its implementation in the classroom and its integration with second language skills.
Seattle Pacific University	Degree Offered: MA TESL 6300: Technology in Language Teaching	Develops an understanding of how to effectively integrate technology such as audio, video, computer software, the Internet and e-mail into the communicative language classroom
University of Alabama	Not offered	N/A
University of Central Florida	Degree Offered: MA TSL 5380 Computers and Technology for ESOL (3 credit hours)	Emphasizes research in computer assisted language learning, as well as design and evaluation of software and websites for learning English as a second language.
University of Delaware	Not offered	N/A

University of Hawaii, Manoa MA Program	Degree Offered: MA	Theoretical and practical applications of using electronic and social media in second language teaching. Pre: 303 or graduate standing.
	SLS 418 Instructional media	The objectives of this course are to familiarize students with developments in the use of audio visual and especially electronic media (internet and other on-line applications) for second language teaching and the potential of different instructional technology for second language learning.
University of Maryland Baltimore County	Degree Offered: EDUC 689	This course focuses on developing our skills in employing technology to enhance teaching and learning of English as a second or foreign language. The course surveys best practices in designing, implementing, and assessing technology-enhanced learning experiences to engage students and improve learning outcomes. The course will emphasize the NETS*T standards as written by the International Society of Technology in Education: Facilitate and Inspire Student Learning and Creativity; Design and Develop Digital-Age Learning Experiences and Assessments; Model Digital-Age Work and Learning; Promote and Model Digital Citizenship and Responsibility; and Engage in Professional Growth and Leadership. Participants will collaborate on a variety of educational technology projects, including the development of an e-Portfolio, the completion comprehensive website and software analyses, the development of technology-rich thematic units, and the creation of a digital project as the capstone for the course.
	Educational Technology for ESOL Teachers (elective)	
University of Pennsylvania	Degree Offered: MA	N/A

University of Southern California	EDUC 596 | (3 units) Technology Enhanced Language Learning Design and Instruction	Collaboratively design and deliver synchronous and asynchronous online language learning opportunities. Become versatile with adapting content, technical aspects of video-conferencing and interactional dynamics.
Winona State University	Degree Offered: MA	N/A

Appendix B

FACULTY RECRUITMENT EMAIL

Dear Professors and Instructors,

My name is Ching-yi Yeh (Tracy) and I am a graduate student at the University of Delaware. I am working on my thesis investigating ways in which technology is integrated in TESOL teacher preparation programs. I am writing to invite you to participate in the study and I would appreciate your views on how you use or would like to use technology for effective teaching and learning. Also, I would appreciate your views on technology integration into the teacher education program of your university. If you have time, we can schedule a skype conversation. Alternatively, I can send you the questions electronically and you can respond at your earliest convenience.

In addition to your perspectives, I would like to administer a survey to preservice TESOL teachers at your institution in order to solicit their perspectives on the integration of technology in their program. All TESOL teacher education students enrolled in the sections of (course title/ number) are invited to take part in this study and complete the survey. The survey will be filled out online through Qualtrics survey program, which is employed by the University of Delaware. This survey should take at most 15 minutes to complete. Participation involves allowing me to analyze the survey results. No other data will be collected. I would greatly appreciate it if you can distribute the survey link to your students (link).

Your participation in this study is completely voluntary, and there is no consequence for not participating. As part of your voluntary participation you can skip questions you do not feel comfortable responding. You also may withdraw from the

study at any time without penalty, at which point any information collected from you for the study will be destroyed and not included in the study.

The study has already been approved by the University of Delaware's IRB office. I will do my best to keep your personal information confidential. All information collected by the survey will be stored in a password-protected database. After analyzing all of the collected information, we anticipate writing summaries and making presentations for scholarly and lay audiences about what was learned. To maintain confidentiality, no personally identifying information will be collected or reported. There are no immediate risks or benefits for you as a participant in the study. However, I believe the results of the study will be helpful in providing a better view of effective technology integration in TESOL teacher preparation programs in the United States.

If you have any questions, please contact Tracy Yeh (Ching-yi) at chingyiy@udel.edu or 323-401-3359 or my advisor, Dr. Mouza at mouza@udel.edu or 302-831-3108. If you have any concerns or questions about your rights as a study participant, please contact Chair, Human Subjects Institutional Review Board, 210 Hullihen Hall, University of Delaware, Newark, DE 19716-1551 or 302-831-2137.

Sincerely,

Chingyi (Tracy) Yeh, Principal Investigator

By clicking on the Next button, you agree to participate in this study. Before you do so, please make sure to print or save a copy of this page for your records.

Appendix C

PRESERVICE TEACHER CONSENT FORM

Survey for Technology Integration in TESOL Preservice Teacher Training Programs

Dear Students,

My name is Ching-yi Yeh (Tracy) and I am a graduate student at the University of Delaware. I am working on my thesis investigating ways in which technology is integrated in TESOL teacher preparation programs. I am writing to invite you to participate in the study and I would appreciate your views on how you use or would like to use technology for effective teaching and learning with regards to technology integration related trainings you received at your teacher education program.

All TESOL teacher education students enrolled in courses related to technology in language teaching are invited to take part in this study and complete the survey. The survey will be filled out online through Qualtrics survey program, which is employed by the University of Delaware. This survey should take at most 15 minutes to complete. Your participation will be part of a study that involves 150 TESOL preservice teachers. Participation involves allowing me to analyze the survey results. No other data will be collected.

Your participation in this study is completely voluntary, and there is no consequence for not participating. As part of your voluntary participation you can skip questions you do not feel comfortable responding. You also may withdraw from the study at any time without penalty, at which point any information collected from you for the study will be destroyed and not included in the study.

The study has already been approved by the University of Delaware's IRB office. I will do my best to keep your personal information confidential. All information

collected by the survey will be stored in a password-protected database. After analyzing all of the collected information, we anticipate writing summaries and making presentations for scholarly and lay audiences about what was learned. To maintain confidentiality, no personally identifying information will be collected or reported. There are no immediate risks or benefits for you as a participant in the study. However, I believe the results of the study will be helpful in providing a better view of effective technology integration in TESOL teacher preparation programs in the United States.

If you have any questions, please contact Tracy Yeh (Ching-yi) at chingyiy@udel.edu or 323-401-3359 or my advisor, Dr. Mouza at mouza@udel.edu or 302-831-3108. If you have any concerns or questions about your rights as a study participant, please contact Chair, Human Subjects Institutional Review Board, 210 Hullihen Hall, University of Delaware, Newark, DE 19716-1551 or 302-831-2137.

Sincerely,

Chingyi (Tracy) Yeh, Principal Investigator

By clicking on the Next button, you agree to participate in this study. Before you do so, please make sure to print or save a copy of this page for your records.

PRESERVICE TEACHER SURVEY

Q1 Thank you for taking time to complete this questionnaire. Please answer each question to the best of your knowledge. Your thoughtfulness and candid responses will be greatly appreciated. Your individual name or identification number will not at any time be associated with your responses. Your responses will be kept completely confidential and will not influence your course grade.

Q2 Your e-mail address

_____

Q23 1. Which TESOL teacher preparation graduate/ undergraduate program do you attend now? (or attended)

_____

Q3 2. Gender

◯ Male (1)

◯ Female (2)

Q4 3. Age range

    ○ 18-22 (1)

    ○ 23-26 (2)

    ○ 27-32 (3)

    ○ 32+ (4)

Q5 4. Year in Program

    ○ First Year (1)

    ○ Second Year (2)

    ○ Graduated, year _____ (3)

    _____

    ○ Third Year (4)

    ○ Fourth Year (5)

Q6 5. Are you currently enrolled or have you completed a practicum experience in a PreK-12 classroom?

○ Yes (1)

○ No (2)

Q7 6. What semester and year (e.g. Spring/ Fall 2016) do you plan to take the technology related course offered by your program? If you are currently enrolled in or have already taken one of these technology related courses please list semester and year completed.

○ Fall 2016 (1)

○ Spring 2017 (2)

○ Summer 2017 (3)

○ Completed, please list semester and year completed. (5)

_____

○ Technology related courses wasn't offered in the program. (6)

Q8
Technology is a broad concept that can mean a lot of different things. For the purpose of this questionnaire, technology is referring to digital technology/technologies. That is, the digital tools we use such as computers, laptops, tablets, handhelds, interactive whiteboards, software programs, etc. Please answer all of the questions and if you are

uncertain of or neutral about your response you may always select "Neither Agree or Disagree"

Q9 **7. TK (Technological Knowledge)**

	Strongly Disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
a. I know how to solve my own technical problems. (1)	○	○	○	○	○
b. I can learn technology easily. (2)	○	○	○	○	○
c. I keep up with important new technologies. (3)	○	○	○	○	○
d. I frequently play around the technology. (4)	○	○	○	○	○
e. I know about a lot of different technologies. (5)	○	○	○	○	○
f. I have the technical skills I need to use technology. (6)	○	○	○	○	○

Q10 **8. CK (Content Knowledge)**
 Second Language Acquisition

	Strongly Disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
a. I have sufficient knowledge about second language learning (1)	○	○	○	○	○
b. I have various ways and strategies of developing my understanding of second language learning (2)	○	○	○	○	○

Q11 **9. PK (Pedagogical Knowledge)**

	Strongly Disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
a. I know how to assess student performance in a classroom. (1)	○	○	○	○	○
b. I can adapt my teaching based-upon what students currently understand or do not understand. (2)	○	○	○	○	○
c. I can adapt my teaching style to different learners. (3)	○	○	○	○	○
d. I can assess student learning in multiple ways. (4)	○	○	○	○	○
e. I can use a wide range of teaching approaches in a classroom setting. (5)	○	○	○	○	○
f. I am familiar with common student understandings and misconceptions. (6)	○	○	○	○	○
g. I know how to organize and maintain classroom management. (7)	○	○	○	○	○

Q12 **10. PCK (Pedagogical Content Knowledge)**

	Strongly Disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
a. I can select effective teaching approaches to guide student thinking and learning in a second language. (1)	○	○	○	○	○

Q13 **11. TCK (Technological Content Knowledge)**

	Strongly Disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
a. I know about technologies that I can use for understanding and doing second language learning. (1)	○	○	○	○	○

Q14 **12. TPK (Technological Pedagogical Knowledge)**

	Strongly Disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
a. I can choose technologies that enhance the teaching approaches for a English as a second language lesson. (1)	○	○	○	○	○
b. I can choose technologies that enhance students' learning for English as a second language lesson. (2)	○	○	○	○	○
c. My teacher preparation program has caused me to think more deeply about how technology could influence the teaching approaches I use in my classroom. (3)	○	○	○	○	○
d. I am thinking critically about how to use technology in my classroom. (4)	○	○	○	○	○

e. I can adapt the use of the technologies I know about to different teaching activity (5)	○	○	○	○	○
f. I can select technologies to use in my classroom that enhance what I teach, how I teach and what students learn. (6)	○	○	○	○	○
g. I can use strategies that combine content, technologies and teaching approaches that I learned about in my teacher preparation program. (7)	○	○	○	○	○
h. I can provide leadership in helping others to coordinate the use of content, technologies and teaching approaches at my school and/or district. (8)	○	○	○	○	○
i. I can choose technologies that enhance the content for an English as a second language lesson. (9)	○	○	○	○	○

Q15 13. TPACK (Technology Pedagogy and Content Knowledge)

	Strongly Disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
a. I can teach English as a second language lessons that appropriately combine reading in second language, technologies and teaching approaches. (1)	○	○	○	○	○
b. I can teach English as a second language lessons that appropriately combine writing in second language, technologies and teaching approaches. (2)	○	○	○	○	○
c. I can teach English as a second language lessons that appropriately combine speaking in second language, technologies and teaching approaches. (3)	○	○	○	○	○

| d. I can teach English as a second language lessons that appropriately combine listening in second language, technologies and teaching approaches. (4) | ○ | ○ | ○ | ○ | ○ |

Q16 14. Models of TPACK (Faculty, PreK-6 teachers)

	Strongly Disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
a. My TESOL preparation professors appropriately model combining content, technologies and teaching approaches in their teaching. (1)	○	○	○	○	○
b. My instructional technology professors appropriately model combining content, technologies and teaching approaches in their teaching. (2)	○	○	○	○	○
c. My practicum teachers appropriately model combining content, technologies and teaching approaches in their teaching. (3)	○	○	○	○	○

Q17 15. Models of TPACK

	25% or less (1)	26% - 50% (2)	51% - 75% (3)	76%-100% (4)
a. In general, approximately what percentage of your TESOL preparation professors have provided an effective model of combining content, technologies and teaching approaches in their teaching? (1)	○	○	○	○
b. In general, approximately what percentage of your instructional technology professors have provided an effective model of combining content, technologies and teaching approaches in their teaching? (2)	○	○	○	○

c. In general, approximately what percentage of the practicum teachers have provided an effective model of combining content, technologies and teaching approaches in their teaching? (3)	○	○	○	○

Q18
Please complete this section by writing your responses in the boxes.

Q19 16. Describe a specific episode where a instructional technology professor or instructor effectively demonstrated or modeled combining content, technologies and teaching approaches in a classroom lesson. Please include in your description what content was being taught, what technology was used, and what teaching approach(es) was implemented.

_____

_____

_____

_____

_____

Q21 17. Describe a specific episode where one of your practicum cooperating teachers effectively demonstrated or modeled combining content, technologies and teaching approaches in a classroom lesson. Please include in your description what content was being taught, what technology was used, and what teaching approach(es) was implemented. If you have not observed a teacher modeling this, please indicate that you have not.

_____

_____

_____

_____

_____

Q22 18. In what ways, if any, did your teacher preparation program prepared you to implement technology with English as a second language lessons?

_____

_____

_____

_____

_____

Q25 19. Will you be willing to participate in a follow-up interview?

○ Yes, please enter your email (1)

_____

○ No (2)

Q26 Please enter your email to join the lottery to win a $20 gift card.

_____

Q23
Thank You!

Appendix E

UNIVERSITY OF DELAWARE IRB APPROVAL_EXEMPT LETTER 1

RESEARCH OFFICE
210 Hullihen Hall
University of Delaware
Newark, Delaware 19716-1551
Ph: 302/831-2136
Fax: 302/831-2828

DATE: March 31, 2016

TO: Chingyi Yeh

FROM: University of Delaware IRB

STUDY TITLE: [871808-1] EPP (TESOL T Prep Program Tech Integration)

SUBMISSION TYPE: New Project

ACTION: DETERMINATION OF EXEMPT STATUS

DECISION DATE: March 31, 2016

REVIEW CATEGORY: Exemption category # (2)

Thank you for your submission of New Project materials for this research study. The University of Delaware IRB has determined this project is EXEMPT FROM IRB REVIEW according to federal regulations.

We will put a copy of this correspondence on file in our office. Please remember to notify us if you make any substantial changes to the project.

If you have any questions, please contact Nicole Farnese-McFarlane at (302) 831-1119 or nicolefm@udel.edu. Please include your study title and reference number in all correspondence with this office.

Appendix F

UNIVERSITY OF DELAWARE IRB APPROVAL_EXEMPT LETTER 2

RESEARCH OFFICE
210 Hullihen Hall
University of Delaware
Newark, Delaware 19716-1551
Ph: 302/831-2136
Fax: 302/831-2828

DATE: November 17, 2016

TO: Chingyi Yeh

FROM: University of Delaware IRB

STUDY TITLE: [871808-2] EPP (TESOL T Prep Program Tech Integration)

IRB REFERENCE #:

SUBMISSION TYPE: Amendment/Modification

ACTION: DETERMINATION OF EXEMPT STATUS

DECISION DATE: November 17, 2016

REVIEW CATEGORY: Exemption category # (2)

Thank you for your submission of Amendment/Modification materials for this research study. The University of Delaware IRB has determined this project is EXEMPT FROM IRB REVIEW according to federal regulations.

We will put a copy of this correspondence on file in our office. Please remember to notify us if you make any substantial changes to the project.

If you have any questions, please contact Nicole Farnese-McFarlane at (302) 831-1119 or nicolefm@udel.edu. Please include your study title and reference number in all correspondence with this office.