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Mandarin Teachers' Experiences Using Technological Pedagogical Content Knowledge in Early Childhood Classrooms

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Abstract

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MEd., Arcadia University, 2006

B.A., Temple University, 2000

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

The focus of this research study was on the experiences and perceptions of Mandarin Chinese teachers who used technologies and innovative instructional methods to teach second language skills to young learners. The conceptual framework drew on 3 theories: (a) Vygotsky's sociocultural learning theory, (b) Schön's action theory, and (c) Mishra and Koehler's technological pedagogical content knowledge (TPACK). The research questions focused on the experiences of early childhood teachers integrating TPACK to teach Mandarin Chinese and how do early childhood teachers perceive the use of instructional methods to teach Mandarin Chinese. Purposeful sampling was used to identify 8 Mandarin Chinese language teachers who taught Mandarin Chinese to students in preschool through 3rd grade. Data were collected through semistructured interviews, a questionnaire centered on TPACK, and a reflective journal entry. The data were analyzed through thematic inductive analysis using cross-case analysis to identify codes, patterns, and emerging themes that explored the teacher's experiences. The overall findings in this study indicated that teachers experienced positive outcomes integrating technology, pedagogy, and content knowledge in the early childhood language learning classroom. The finding has the potential for social change by increasing technological and instructional resources and materials in early childhood language learning classrooms and providing on-going professional development for Mandarin Chinese language teachers in American schools.

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Dedication

To my mom, Barbara Pugh, who was taken from this life too soon. May Allah grant her one of the highest places in heaven.

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First and foremost, I must thank Allah (God) for his unconditional love. This dissertation would not have been possible without Him.

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"Education is the passport to the future, for tomorrow belongs to those who prepare for it today."

Malcolm X

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Chapter 1: Introduction to the Study

Global and cultural education exposes learners to diverse people, nations, and languages. Learners can build global and cultural competencies by interacting with diverse groups, experiencing diverse cultures and religions, and learning different languages (de Andreotti, 2014). Learners who value global and cultural awareness become global citizens who promote change and empowerment (de Andreotti, 2014; Murphy, 2014). One aspect of global and cultural awareness is second/foreign language learning. In this study, I focused on teachers' experiences integrating technology, pedagogy, and Mandarin Chinese as a second language to early childhood learners.

Second language learning is a key component of global and cultural awareness in education (Baker, 2015; de Andreotti, 2014; Murphy, 2014). Although English and Spanish are the fastest growing second language options in many American schools (Pinter, 2017), the United States is proving a need for highly developed competencies in other world languages. According to the Center for Applied Linguistics (2017), in the past few decades, there has been a decline in studying world languages in the United States. Despite this decline, languages such as Arabic and Mandarin Chinese have gained in popularity throughout American high schools and colleges (Center for Applied Linguistics, 2017; Liu & Wang, 2018). It is suggested that globalization, economic trade, and national security play a major part in this shift (U.S. Department of Education, 2008). However, American students lack second language linguistic abilities compared to their foreign counterparts (Friedman, 2015).

Recently, the United States enhanced foreign language policies and curriculums to increase the number of American students enrolled in world language courses (U.S. Department of Education, 2008). These world languages include Spanish, French, Russian, Arabic, and Chinese. However, for purposes of this study, I explored the development of Mandarin Chinese in early childhood language learning programs throughout the United States.

In 2006, the National Security Language Initiative was developed to improve foreign language skills in the United States (U.S. Department of Education, 2008). This initiative was created to spearhead programs and grants that would encourage students to study less commonly taught languages, attend summer language institutes in other countries, and to motivate American schools to invest in qualified language teachers (U.S. Department of Education, 2008). As a result, the enrollment in less commonly taught languages gradually increased (American Council on Teaching of Foreign Languages, 2011). By 2009, the number of students who were learning Mandarin Chinese as a second language in the United States was 59,800 (American Council on the Teaching of Foreign Language, 2011; Asia Society, 2010). In 2009 the US-China Strong foundation was created to increase the number of American students who wanted to learn Mandarin Chinese as a second language (Allen-Ebrahimian, 2015; Wu, 2017). By 2015, approximately 200,000 American high school and college students were taking courses in Mandarin Chinese (Allen-Ebrahimian, 2015; Wu, 2017). Moreover, by 2020, the US-China Strong foundation is predicting at least one million Preschool through 12th grade

American students will be enrolled in Mandarin Chinese courses nationwide (US-China Strong, 2015).

As Mandarin Chinese expands in U.S. schools (Asia Society, 2010; Wang, 2017; Xu, Padilla, & Silva, 2015), the current literature shows that most of the language learning opportunities in Mandarin Chinese is in high schools and colleges (Asia Society, 2016; Center for Applied Linguistics, 2017; He, 2017; Liu & Wang, 2018). Very few early childhood and elementary education programs offer languages that do not share the same alphabetic script as English, such as Chinese (Asia Society, 2012). In fact, most K–12 institutions offer common and easy to learn options such as French or Spanish. However, the U.S. Department of Education (2008) along with the National Security Language Initiative expressed the need for all American students to study and master second languages, especially critical languages like Arabic, Chinese, and Russian. These critical languages are needed to promote globalization, increase cultural awareness, and support national security (U.S. Department of Education, 2008).

According to Wu (2017), Mandarin Chinese has been identified as a critical language to our nation's economy and national security. Although Mandarin Chinese is considered one of the most difficult languages to learn, it is suggested that American schools introduce less commonly taught foreign languages at the early childhood and elementary levels to encourage long-term investments in critical second languages (Allen, Evans, Hupp, & Passman, 2015). In addition, research suggests that learning a language such as Mandarin Chinese at an early age can enhance cognitive benefits and increase academic skills (Winskel et al., 2016). For example, a literature review

conducted by O'Brien (2017) found that bilinguals outperformed their monolingual peers on memory and problem-solving tasks. Research indicated that second language learning is linked to improved verbal skills (Rodge, Melby-Lervag, & Lervag, 2016) and higher standardized test scores (Turnbull, Hart, & Lapkin, 2003). Although there have been many studies on the benefits, advantages, and challenges of foreign language learning, there has been little research on the experiences and perceptions of teachers who teach foreign languages to young children in an early childhood setting.

The purpose of this qualitative case study was to explore early childhood teachers' experiences and perceptions teaching Mandarin Chinese using technology, pedagogy, and content knowledge (TPACK). For purposes of this study, early childhood learners are between the ages of 4 and 8 years old.

Chapter 1 includes the background, the purpose, and the importance of this study. The chapter also includes succinct information on Mandarin Chinese teachers in the 21st century, early childhood language learning, and technology in early childhood environments. The goal of this qualitative case study is to develop new understandings of the experiences and perceptions of Mandarin Chinese language teachers who integrate technology and instructional pedagogy in a Mandarin Chinese language learning classroom for early childhood learners.

Background

All individuals are believed to have the ability to learn a language (Lenneberg, 1967). According to Krashen (2013), young children learn their first language effortlessly. Krashen (2013) continued by explaining that learning a first or native

language is involuntary. Through his research on second language learning, Krashen (2013) posited that there are two types of language learning methods: second language acquisition and second language learning. Second language acquisition is a "subconscious process" (Krashen, 2013, p.1) of learning a language; second language learning refers to a formal process of learning a language. This process is proven through structured learning environments such as traditional classroom settings or online language learning courses. In addition to the differences in language learning methods, children and adults may experience variances in language learning.

Researchers have suggested that children and adults have different educational experiences while learning a second language (Philip, Borowczyk, & Mackey, 2017). Children who learn a second language are known to have successful, long-term benefits as opposed to adults (Bialystok & Hakuta, 1999; Lichtman, 2016; Murphy, 2014). Many researchers found that second language learning offers positive cognitive benefits for children (Bialystok & Hakuta, 1999; Kocaman & Kocaman, 2012; Winskel et al., 2016). Therefore, it is important for children to have the opportunity to learn a second language (Murphy, 2014) to increase life-long benefits. Ananiandou and Claro (as cited in Murphy, 2014) stated that many countries have stressed the importance of foreign language learning in the primary years. Murphy (2014) asserted that second language learning encourages 21st century skills such as "global citizenry, communication skills, and intercultural sensitivity" (p. 132). As a result, some countries are lowering the starting age for second language learning to include children as young as preschool (Maad, 2016;

Murphy, 2014). Moreover, many countries are spearheading progressive second language education programs by implementing less commonly taught languages to the curriculum.

The Center for Advanced Research on Language Acquisition (2017) defined less commonly taught languages as languages that do not include languages such as English, French, Spanish, and German. Furthermore, many less commonly taught languages do not share the same alphabetic script as English. Most K–12 institutions offer common language learning options. Common options are usually French, Spanish, or German. Very few schools in the United States incorporate the less commonly taught languages such as Arabic, Chinese, and Japanese (Asia Society, 2012). However, the United States Department of Education (2008) expressed the need for American students to study and master less commonly taught languages. To aid this need, the United States government increased the education budget in 2007 to include progressive avenues for second language learning (U.S. Department of Education, 2008). The United States is trying to provide opportunities for students to increase, enhance, and improve their second language learning skills in less commonly taught languages. However, most of these opportunities were for high school and college students. Very few schools across the United States offer early childhood students the ability to learn less commonly taught languages. Lu and Lavadenz (2014) believed that the lack of language learning opportunities for young students lie in the lack of innovative instructional methods, qualified faculty, curriculum policies, and research. This study was important because it allowed me to understand the experiences and perceptions of Mandarin Chinese teachers

who integrated technology and instructional methods to teach Mandarin Chinese to early childhood learners.

Problem Statement

A growing interest in learning Mandarin Chinese as a second language exists in U.S. schools (Asia Society, 2010; Logan & Walker, 2012). Despite this interest, early childhood language teachers often face challenges accessing age-appropriate technology and innovative instructional methods for young Mandarin Chinese language learners (Godwin-Jones, 2015). It is essential to understand the experiences and perceptions of Mandarin Chinese language teachers who utilize technology and instructional methods to promote language learning in the early childhood classroom.

The purpose of this qualitative case study was to explore early childhood teachers' experiences and perceptions teaching Mandarin Chinese using technological pedagogical content knowledge (TPACK). The research questions for this study were: What are the experiences of early childhood teachers integrating TPACK to teach Mandarin Chinese and how do early childhood teachers perceive the use of instructional methods to teach Mandarin Chinese? The rationale for developing new understandings was to develop a holistic statement of these teachers' experiences and perceptions implementing highly innovative educational programs that include: (a) the integration of innovative technologies into their classrooms, (b) a unique pedagogy for language learning for early childhood learners, and (c) the goal of learning Mandarin Chinese content as a unique learning environment. I used the lens of TPACK to analyze the perceptions and experiences of these teachers. Potentially understanding these teachers'

perceptions and experiences implementing a multiple innovation instructional model may result in new understandings of how innovation happens in U.S. schools.

Innovative instructional methods and technology integration for teaching and learning has been the focus of innovative 21st century education. Innovative instruction in language learning has increased academic performance and increased student engagement (Khorasgani & Khanehgir, 2017; Serdyukov, 2017; Tirtayani, Magta, & Lestari, 2017). Extensive research on the benefits and barriers of technology integration in the classroom has been conducted (Blackwell, 2014; Chun, Kern, & Smith, 2016; Kim, Kim, Lee, Spector, & DeMeester, 2013; Nickerson & Zodhiates, 2013). Specifically, technology in early childhood classrooms have believed to be positive by researchers (Blackwell, 2014; Dunn, Gray, Moffett, & Mitchell, 2016; Keengwe & Onchwari, 2009) In addition, researchers have investigated the innovative use of technology in second language classrooms (Lu, Meng, & Tam, 2014; Serdyukov, 2017). However, there is a need to understand the experiences and perceptions of teachers integrating new technologies, non-traditional pedagogy, and critical language content in the early childhood classroom.

Mandarin Chinese Teachers in the 21st Century

The increase in popularity of Mandarin Chinese language learning in the United States has resulted in the demand for Mandarin Chinese teachers. The need for effective teachers is critical (Wu, 2017; Xu, Padilla, Silva, Steele, & Peterson, 2010). However, pre-service and in-service Mandarin Chinese teachers face many challenges in the United States (Asia Society, 2010; Liu, 2017). The challenges range from understanding second

language pedagogy to understanding diverse student cultures. Mandarin Chinese teachers are responsible for creating lessons and activities that are engaging and motivating for American students (Wu, 2017). It is essential for Mandarin Chinese teachers to expand their content knowledge, knowledge of pedagogy, and technological skills to facilitate language learning in young learners. Because Mandarin Chinese is considered a complex language system, it is important for educators to develop alternative pedagogies and integrate advance technologies to facilitate the learning of a critical language for early childhood learners (Zhan & Cheng, 2014; Lin & Collins, 2012).

Mandarin Chinese teachers need to be trained and certified to work in the United States (Asia Society, 2018). However, due to the demand of Mandarin Chinese teachers from China or Taiwan, Asia Society (2018) stated that teachers who are not certified at the time of hiring must be enrolled in a teacher preparation program. In addition to understanding content knowledge, Mandarin Chinese teachers need to understand U.S. culture, classroom management, and the diverse educational needs of American students (Wu, 2017). In 2004, the Confucius Institute in China was created to support the needs of potential Mandarin Chinese teachers in the United States and other countries. The Confucius Institute is a non-profit educational organization that promotes the teaching and learning of Mandarin Chinese worldwide (Hanban, 2014). Not only does this organization provide resources and services to Mandarin Chinese language teachers, but also to public, private, and Chinese heritage schools. The Confucius Institute recruits Mandarin Chinese teachers from China and Taiwan to teach Chinese worldwide (Wu, 2017). Mandarin Chinese teacher education and professional development programs are

still in the developmental stage (Piu, 2017). Therefore, understanding the experiences and perceptions of Mandarin Chinese teachers can offer insight into teacher needs and make improvements.

Xu et al. (2010) examined the experiences of 29 Mandarin Chinese language teachers who participated in a summer professional development program. The purpose of the summer professional development program was to provide new and veteran teachers with innovative instructional skills, Chinese as a second language pedagogy, and curriculum support. The researchers' goal was to understand the needs of Mandarin Chinese teachers in the U.S. (Xu et al., 2010). Based on the data collected, the researchers found that the summer intensive program was helpful and beneficial to the participants. The program met the needs of the Chinese teachers by providing a myriad of methods and skills. The participants experienced positive results with peer coaching. The participants had the opportunity to gain knowledge about second language pedagogy, and national foreign language standards.

In this present study, not only did teachers need to understand second language pedagogy, but also early childhood language learning. Early childhood pedagogy is different for the pedagogy of secondary and elementary school.

Early Childhood Language Learning

Researchers have asserted that exposure to second language learning produces positive outcomes for young learners (Bialystok, 2017; Bialystok & Hakuta, 1999; Kaushanskaya, Gross & Buac, 2014; Nicolay & Poncelet, 2015; Ramirez & Kuhl, 2017). One study found that exposing children to second languages can increase expressive and

receptive language skills (Kaushanaskaya et al., 2014). Researchers Nicolay and Poncelet (2015) also found that second language skills increased oral language and vocabulary skills. In addition, Bialystok (2017) found that young children enhanced cognitive development during second language learning. A rationale for researching language learning in early childhood is that early childhood learners are underrepresented in many second language studies. Another rationale for researching young learners is young children would have the time to learn a foreign language long-term to achieve positive outcomes (Bialystok, 2017). Long-term exposure is shown to increase cognitive development (Bialystok, 2017), verbal working memory (Kaushanaskaya et al., 2014), and pronunciation and fluency (Prosic-Santovac, 2016). It is evident that younger children should be exposed to languages to promote life-long learning, and to enhance receptive and expressive communication skills and cognitive abilities (Murphy, 2014; Ramirez & Kuhl, 2017).

A study conducted by Bankovic and Sollars (2017) examined how the practices of teachers in an English as a second language kindergarten class in Malta can affect second language learning. The researchers deemed that the quality of foreign language education in early childhood is important to increase receptive and expressive communication skills. However, while conducting observations, the researchers found that active play coupled with learning were not integrated in the English as a second language classroom. The researchers found that the children in this study did not have the opportunity to use English through play and meaningful interactions with the teachers and their peers (Bankovic & Sollars, 2017). The teachers used a teacher-centered approach to learning.

After their research, Bankovic and Sollars (2017) recommended that the teachers implement child-centered approaches to teaching and learning. Child-centered pedagogy increases learning and development through play and social interactions (Dewey, 1938). The researchers suggested that child-centered pedagogy will give the students the opportunity to expand their cognitive and linguistic abilities in English (Bankovic & Sollars, 2017).

Play is a critical learning tool in early childhood education. Many early childhood learners experience immersive play during instruction. It is my suggestion that immersive play during second language learning gives the learner an opportunity to use the language in interactive ways. One form of play and interaction in the early childhood classroom is the use of technology. If used properly technology plays a vital role in the learning and development of young children.

Instructional Methods and Technology in Early Childhood Environments

Young children are rapidly learning and developing in a digital age. Technology is used in many early childhood classrooms across the nation. The National Association for the Education of Young Children (NAEYC) (2012) stated that technology in early childhood classrooms supports learning and development if used properly. Instructional methods, tools, and technology are important to use in language learning classrooms. Language learning activities, instructional methods, and technology should promote the use of traditional and high-tech educational resources that stimulate visual, auditory, and kinesthetic means to encourage students to communicate orally and use newly learned vocabulary. Recent research proved that the use of instructional methods enhanced

learning in a second language classroom. For example, Snow (2017) found an instructional method that increased vocabulary development. Children acquired larger vocabularies with "responsive interactions" (p. 7) in the classroom with teachers and classmates. Responsive interaction is an instructional method that includes speaking, listening, and collaborating through discussions and interactive play (Tarrant, 2014).

A study conducted by Prosic-Santovac (2016) examined the effects of an instructional method that used popular animated videos and cartoons to promote English as a second language for preschool learners. The animated videos and films increased vocabulary skills, grammar, pronunciation, and fluency through interactive play and dialogue. The study results showed that the animated cartoons and videos were effective in developing second language skills.

After reviewing the literature about Mandarin Chinese language teachers, early childhood learners, instructional methods, and technology, I noticed empirical research was lacking in Mandarin Chinese as a second language in the early childhood education context. Most importantly with the demands of 21st century skills in technology, the research into the experiences and beliefs of Mandarin Chinese teachers who use instructional methods and technology as a literacy source was important. The current study might give educators the opportunity to understand teachers' experiences and beliefs of Mandarin Chinese teachers who implement technology and instructional methods in a Mandarin Chinese language learning classroom environment for young learners. Limited research exists on teaching and learning Mandarin Chinese as a second language in American schools.

Current literature on second language learning focused on the teaching and learning of Mandarin Chinese to high school and college level learners (Center for Applied Linguistics, 2017; He, 2017). As a result of an extensive literature review, I found no research on the experiences and perceptions of early childhood teachers who teach Mandarin Chinese. The lack of research shows that there is a need for understanding the experiences and perceptions of early childhood teachers who teach Mandarin Chinese. Other noticeable gaps revealed that there is a need for research advancements in pedagogical teaching in Chinese as a second language, as well as the use of technological resources in a Mandarin Chinese language learning classroom. Bridging the gaps might give Mandarin Chinese language educators the opportunity to increase their knowledge and understanding of technological, pedagogical, and content related issues and concerns in Mandarin Chinese as a second language for early childhood learners.

Based on my review of the literature, the experiences of Mandarin Chinese language teachers have not been studied within the context of early childhood teaching and learning and the implementation of technology. The literature demonstrated that researchers have found substantial benefits and advantages in learning a second language in the early primary years. However, there continues to be a significant gap in the literature about Mandarin Chinese teaching and learning, teacher experiences with technology, and early childhood. The findings of this study could provide insight into understanding what Mandarin Chinese language teachers experience in the classroom with the use of technology, pedagogy, and content knowledge as well as how these

experiences shape their craft as teachers. I developed the research questions to address the gap in the literature related to the experiences and perceptions of Mandarin Chinese language teachers who use technology and a variety of instructional methods to teach Mandarin Chinese to early childhood learners. The findings of this study could provide insight into understanding what Mandarin Chinese language teachers experience in the classroom with the use of technology, pedagogy, and content knowledge as well as how these experiences shape their craft as teachers.

Implications for Social Change

The purpose of this qualitative case study was to explore early childhood teachers' experiences and perceptions teaching Mandarin Chinese using TPACK. The use of technology, pedagogy, and educational resources are critical aspects of responsive educational settings in a rapidly changing society. I focused on an innovation cluster (Russell, 2015) in the educational setting. Innovation in classrooms does not occur as a single entity, such as technology integration alone. The innovation cluster is the integration of technology, such as multimedia, the pedagogy of teaching and learning in early childhood classrooms, and the content knowledge of Mandarin Chinese. In this study, I used TPACK as one of the frameworks to understand innovation in an early childhood second language setting and the experiences teachers' experience in these educational settings while integrating an innovation cluster.

Education is an agent for social change. As an agent for social change, education continues to evolve to meet the needs of learners. Not only does education promote intellectual and academic growth, but also social, emotional, and cultural growth.

Moreover, the development of a second language in American schools can produce a myriad of social change implications. Second language learners develop a flexible thought process in which they can view the world through a different lens. A flexible thought process can influence the way learners perceive the world. Second language learning can increase the opportunity for global and cultural awareness (Baker, 2015; Nugent & Catalano, 2015). Most importantly, second language learning can encourage learners to advance their 21st century competency skills to increase interpersonal and communication skills in another language as well as the possibilities for life-long learning and career opportunities.

Purpose of the Study

The purpose of this qualitative case study was to explore early childhood teachers' experiences and perceptions teaching Mandarin Chinese using TPACK. I explored the experiences and perceptions of teachers who implemented technology and various instructional methods to promote Mandarin Chinese language learning in early childhood.

Research Questions

The research questions that guided this study were:

Research Question 1 (RQ1): What are the experiences of early childhood teachers integrating TPACK to teach Mandarin Chinese?

Research Question 2 (RQ2) How do early childhood teachers perceive the use of instructional methods to teach Mandarin Chinese?

Conceptual Framework

The three conceptual frameworks that defined my understanding of the salient theories and concepts were Vygotsky's sociocultural learning theory, Schön's (1983) action theory, and the concept of technological pedagogical content knowledge (TPACK). Sociocultural learning theory provided a conceptual basis for understanding how Mandarin Chinese language teachers experience the integration of new technology and their implementation of a second language pedagogy. Schön's (1983) action theory provided a conceptual basis for understanding how reflection prior to and after a lesson modifies the teachers perception of teaching and learning Mandarin Chinese. The concept of technological pedagogical content knowledge (TPACK) provided a conceptual basis to understand teachers' responses to the integration of technologies into their early childhood classrooms.

The main theoretical framework for this qualitative case study was Vygotsky's sociocultural learning theory. Vygotsky (1978) viewed language learning as a social construct. I used sociocultural learning theory to guide this study. I combined second language learning, teacher development, and early childhood language development to understand teachers' experiences and perceptions integrating technology with subject matter and pedagogy to help students learn Mandarin Chinese in an early childhood setting. Moreover, I used sociocultural theory to understand teachers' experiences and perceptions with scaffolding, the zone of proximal development, and the development of TPACK.

Wood, Bruner, and Ross (1976) and Vygotsky (1978) asserted that the concept of scaffolding plays an integral part in learning. I firmly believe that the concept of scaffolding, which is under the umbrella of sociocultural theory, facilitates student understanding during second language learning. Yet, Eun and Lim (2009) argued that meaning and mediation, two other concepts of sociocultural theory, aid in the understanding of language learning. It is my suggestion that the use of scaffolding guides teachers and young students through the teaching and learning process of Mandarin Chinese as a second language. Scaffolding is usually connected to Vygotsky; however, Wood et al. (1976) coined the term scaffolding to understand the dynamics of the tutor and tutee relationship. The definition of scaffolding is the learners' ability to complete a task with the help of a teacher (Wood et al., 1976). Scaffolding is an intervention method that actively supports learners to increase successful outcomes. A basic definition of scaffolding by Rodgers, D'Agostino, Harmey, Kelly, and Brownfield (2016) was that scaffolding helps students complete a task or learn difficult content. During scaffolding activities and tasks, teachers act as facilitators to improve a student's ability to learn a concept and build new knowledge. In this study, the scaffolding aspect of sociocultural learning theory encouraged teachers to use innovative instructional methods and technology to maximize positive learning outcomes in Mandarin Chinese.

Schön (1983) used action theory to examine how professionals think and act within the context of their profession. Action theory is a form of reflective processing where professionals can construct meaning through their experiences. Schön (1983) described action theory as a process of learning by doing. A reflective participant learns

through the reflections of their past experiences. Kolb and Kolb (2005) added that learning focuses on "experiencing, reflecting, thinking, and acting" (p.194). In this study, I used the theoretical lens of Schön's (1983) action theory to gain a deeper understanding of the experiences of Mandarin Chinese language teachers as they reflect on their classroom experiences with technology integration and other instructional methods.

Technological resources in education continue to advance learning opportunities. The implementation of technology creates a need for teachers to understand how technology can enhance teaching and learning in their specific content matter. It is critical for teachers to understand the fundamentals of their content matter to provide students with the best learning experience. Shulman (1986) described teacher effectiveness as understanding the subject matter they teach. Moreover, he believed that teachers need to go beyond the basics of their content and understand the theories and practices that make up the content. Shulman (1986) defined pedagogical content knowledge as the ability to issue ideas, concepts, and theories about the subject matter in addition to the ability to identify how students learn. Furthermore, teachers can use strategies and methods to perfect learning in the content area. Technological pedagogical content knowledge was developed due to the necessity of incorporating technology in pedagogical teaching and content knowledge.

Baran, Chuang, and Thompson (2011) defined technological pedagogical content knowledge (TPACK) as a "framework that focuses on the complex interactions between a teacher's knowledge of content, pedagogy, and technology" (p. 370). TPACK assesses teacher's knowledge of technology and how they use their knowledge to link technology

with specific subject matter (Agyei & Keengwe, 2014; Williams, Foulger, & Wetzel, 2010). Technological pedagogical content knowledge refers to the teachers' understanding of the complex relationship of technology, pedagogy, and content knowledge as it increases the effectiveness of learning and development. In this study, the use of TPACK examined how and why teachers use technology in their Mandarin Chinese classrooms as well as their beliefs of the use of technology to enhance language learning.

Nature of the Study

I employed a qualitative case study method to gather holistic, in-depth information (Tellis, 1997) about Mandarin Chinese language teacher's experiences and perceptions teaching Mandarin Chinese to early childhood learners. For this study, I used triangulation to collect data from semistructured teacher interviews, a teacher questionnaire related to technological, pedagogical, content knowledge, and a reflective journal entry. I conducted eight teacher interviews. I received six completed teacher questionnaires, and two completed reflective journals. I used Yin's six-phase research strategy to simplify the information. I analyzed the data through thematic inductive analysis. I organized the data by developing labels for each section of data in the form of codes, categories, and themes (Boyatzis, 1998).

Definitions

It was assumed that varying perspectives would potentially lead to varying definitions of key terms throughout this study. For this purpose, it is important for the

researcher to clarify and define the key terms. The key terms and their definitions concerning this study are as follows:

Constructivism: Constructing meaning through social interactions (Fosnot & Perry, 2005).

Early childhood education: Children between the ages of birth to 8 years old. For this study, early childhood education will consist of preschool to 3rd grade, students who are between the ages of 4 and 8 years old (Follari, 2015).

Experiences: Knowledge or skills gained through observation, participation or exposure to an activity or event (Merriam-Webster, 2019).

Foreign language learners: Students who are learning a second language other than their native tongue (Asia Society, 2016).

Heritage schools: Schools created by Asian immigrates to maintain and support the Cantonese or Mandarin dialect (Liu, 2010).

Less commonly taught languages (LCTL): For this study, less commonly taught languages are languages that are seldom taught in schools. These languages exclude English, French, Spanish, and German (Asia Society, 2016).

Logographic: A writing system that uses symbols or characters to represent a word or phrase (Shu, 2003).

Mandarin Chinese: Mandarin Chinese is the predominate language spoken in China and Taiwan (Asia Society, 2016).

Perceptions: The process of experiencing information through "multiple stimuli by the senses" (Lewis, 2001, p. 275).

Pinyin: Pinyin is a "phonological coding system for teaching and learning Chinese words" (Lin et al., 2010, p. 2).

Reflection-in-action: Reflective thought during an activity (Schön, 1983).

Reflection-on-action: Reflective though after an activity is completed (Schön, 1983).

Scaffolding: An instructional strategy that aids students in completing a task with assistance from the teacher or a knowledgeable peer (Vygotsky, 1978).

Second language (L2): A second language is a language a student is learning or acquiring (Krashen, 1988).

Second language learning: Second language learning is learning a language other than the student's native language in an educational setting (Krashen, 1988).

Second language acquisition: Second language acquisition refers to learning a language subconsciously, other than an educational setting (Krashen, 1988).

Sociocultural learning theory: The development of social and cultural connections that regulate human development and behavior (Lantolf, Thorne, & Poehner, 2015)

Target language: Target language "refers to any language that is the goal of learning" (Saville-Troike & Barto, 2016, p. 2).

Technological pedagogical content knowledge (TPACK): Effective teaching that includes the implementation of technology, pedagogy, and content are knowledge (Mishra & Koehler, 2006).

Assumptions

The following assumptions were made about the participants. I assumed that all the participants would be of Chinese or American-Chinese descent. I assumed the teachers would need to review the interview questions prior to the interview. During the interviews, I assumed the teachers would provide honest answers that related to their experiences and perceptions about teaching Mandarin Chinese to early childhood learners. The following assumptions were made about the language learning and teaching experience. Given that language learning and early childhood education both involve a social context. I assumed that language learners in early childhood needed many opportunities to produce oral language through social interactions and play. I assumed that teachers in American schools had access to instructional methods and technology daily.

Scope and Delimitations

Teachers who teach Mandarin Chinese to early childhood learners often face challenges accessing age-appropriate technology and innovative instructional methods for young language learners (Godwin-Jones, 2015). I chose this specific aspect because current research is necessary to understand the experiences and perceptions of Mandarin Chinese language teachers to provide effective teaching practices in the classroom. My sample included eight Mandarin Chinese language teachers. I used purposeful sampling to find potential participants who fit the inclusion criteria. This study was delimited to early childhood teachers who taught children between the ages of 4 to 8 years old. Teachers were from public and private schools that taught preschool through 3rd grade

learners. Although China has several Chinese dialects such as Cantonese, Hakka, and Mandarin, this study was delimited to Chinese language teachers who are currently teaching Mandarin Chinese in public and private schools in the United States.

Transferability refers to the outcome of the study being applicable to other contexts (Miles, Huberman, & Saldana, 2014). It is expected that the results of this study can be applicable to similar languages, especially languages that do not share the same alphabetic script as English.

Limitations

Limitations are constraints outside the researcher's control (Simon & Goes, 2013). Every research study has limitations. The limitations relevant to this study were sampling, lack of participant diversity, and the inability to perform classroom observation. Purposeful sampling was a limitation in this study. Due to the nature of the study, the participants were not random language teachers. The participants in this study were Mandarin Chinese language teachers who taught early childhood students in public and private schools throughout the United States. This limitation was difficult to avoid. There was a lack of diversity in the participant pool as most of the teachers were of Chinese descent. Due to the nature of this study, this limitation was difficult to avoid. Classroom observations are an excellent way to collect data and gain an in-depth understanding of the phenomenon. I did not have the opportunity to observe the classroom environment during Mandarin Chinese instruction.

As a result of the limitations, I collected data three ways: (a) semi structured in-depth interviews, (b) a questionnaire that assessed the teacher's experiences and

perceptions of technology, and (c) a reflective journal based on three reflective questions about a lesson conducted in the classroom. The data collection options above gathered an ample amount of data to gain insight into the classroom as well as the experiences and perceptions of teachers. Although bias can exist in all research, to reduce or eliminate research bias, I used triangulation, memoing, and reflective journaling. In addition, I explained the importance of confidentiality and I informed the participants of their ability to withdraw from the study at any time.

Significance

The enrollment of Mandarin Chinese as a second language has increased in K–12 schools throughout the United States (American Councils for International Education, 2017). Likewise, the rise of technology integration in second language classrooms has been apparent (Winskel et al., 2016). As the interest in learning Mandarin Chinese grows (Asia Society, 2010), it is important to explore the experiences and perceptions of Mandarin Chinese language teachers who integrate technology and instructional pedagogy into an early childhood language learning environment.

After a review of the literature, past research showed no indication of empirical studies that focused on the experiences and perceptions of early childhood teachers who integrated technology in Mandarin Chinese second language classrooms. Therefore, the demand to research teacher experiences and perceptions was important for 21st century foreign language development in the United States. Since Mandarin Chinese is still in its infancy as a second language for early childhood learners, (Asia Society, 2012; Bai, Lien, & Spring, 2016) Mandarin Chinese language teachers have experienced a lack of

innovative instructional materials, curriculum, and technology resources in early childhood classrooms (Asia Society, 2010; Asia Society, 2012; Lü & Lavadenz, 2014). Research into this phenomenon revealed an understanding of early childhood teachers' experiences and perceptions of integrating technology, pedagogy, and content knowledge to early childhood learners.

The significance of this study allowed early childhood language teachers to express how they experienced and perceived the use of technology in a Mandarin Chinese language learning environment. It was suggested that based on Mandarin Chinese language teacher experiences and perceptions, this study will lead to effective and appropriate uses of instructional methods, technology in an early childhood classroom. The goal of this study was to offer insight into the experiences and perceptions of Mandarin Chinese language teachers who use technology and innovative instructional pedagogy in an early childhood setting. Potentially understanding these teachers' perceptions and experiences implementing a multiple innovation instructional model may result in new understandings of how innovation happens in early childhood language learning classrooms. The findings from this study may help with the creation of appropriate technological and instructional learning resources for young language learners.

Summary

Although Mandarin Chinese is one of the less commonly taught languages in American schools, it continues to increase in popularity. Most Mandarin Chinese course curricula is developed for high schools and colleges. In recent years, a few primary and

early childhood settings have been offering Mandarin Chinese as a progressive way to incorporate global learning and cultural awareness in the curriculum for younger students. As students continue to enroll in less commonly taught languages, such as Mandarin Chinese, world language educators must gain a sense of content knowledge, instructional pedagogy, and technological knowledge. Success in second language education depends on the quality and effectiveness of the teachers. Therefore, understanding the experiences and beliefs of Mandarin Chinese teachers who integrate technology into their language learning classroom will eventually support student learning, encourage motivation, and increase student engagement.

Chapter 1 focused on the following concepts: (a) understanding Mandarin Chinese teachers, (b) second language learning in early childhood, and (c) the use of technology. Chapter 2 provided an in-depth review of literature detailing sociocultural learning theory, second language learning, and technological pedagogical content knowledge. The conceptual framework of Vygotsky's sociocultural theory, Schön's action theory, and the use of TPACK is used as a lens to understand the experiences and perceptions of Mandarin Chinese language teachers who use technology and of instructional methods to teach Mandarin Chinese to early childhood learners. Chapter 3 provided a detailed analysis of the major parts of the research methodology. Chapter 3 addressed the design of the study, the participant logic, the role of the researcher, the methods of data collection, and data analysis. Chapter 4 contained an analysis of the data and the results of the participants' experiences and perceptions teaching Mandarin Chinese using technology and instructional methods in an early childhood language

learning environment. Chapter 5 concluded this study with an interpretation of the findings as they related to the conceptual framework. Chapter 5 also included my implications for social change and recommendations for future research.

Chapter 2: Literature Review

Introduction

Early childhood language teachers often face challenges accessing age-appropriate technology and innovative instructional methods for young Mandarin Chinese language learners. The problem I addressed in this study has evolved into its current form through educational reform in early childhood, early childhood language development, and the integration of technology and other instructional methods in an early childhood education program. The purpose of this qualitative case study was to explore early childhood teachers' experiences and perceptions teaching Mandarin Chinese using TPACK.

The chapter begins with a historical synopsis of the literature in Chinese language learning in the United States. I focused on a comprehensive review of the conceptual framework and current literature related to relevant topics, such as sociocultural learning theory, reflective teaching, and TPACK. I conclude the chapter with the various technological, instructional, and multimedia methods educators use to effectively teach a second language in an early childhood setting.

History of Mandarin Chinese in the United States

Several factors lead to the first Chinese language in the United States. In the early 1800s, immigrants from China began to arrive in Hawaii and California for employment (Liu, 2010). However, immigration policies such as the Naturalization Act of 1870 enforced many restrictions on immigrants and immigration. Although the Naturalization Act of 1870 protected former African slaves and their descendants, the act excluded

Asians from obtaining citizenship (Liu, 2010). Other restrictions such as segregated education kept Asians immigrants from attending public American schools with their Caucasian counterparts. The United States government created segregated schools for Asians. However, children were not allowed to speak their native language in school or on the playground. Consequently, parents and volunteers decided to create Chinese heritage schools to ensure children maintained their native language and culture (Liu, 2010). According to Liu (2010), the first Chinese heritage school started in 1886 in San Francisco, California. Most of these schools offered language classes after school or on the weekends.

Due to the influx of Cantonese speaking Asian immigrants, the first heritage school taught the Cantonese dialect (Liu, 2010; Wen & Li, 2016). Liu (2010) explained that after World War II, the second wave of Asian immigrants from China immigrated to the United States. The second wave of Asian immigrants spoke Mandarin Chinese (Liu, 2010). The number of Mandarin Chinese speakers surpassed Cantonese-speakers in the United States (Liu, 2010). As a result, Liu (2010) claimed that Mandarin Chinese became the most widely taught dialects in Chinese heritage schools.

Today there are several Chinese heritage schools throughout the United States. Chinese heritage schools continue to support the language and cultural needs of Asian Americans. In fact, many Chinese heritage schools accept English-speaking Americans who want to learn Mandarin Chinese as a second language. As Mandarin Chinese increases in popularity as a second language, some public and private schools in the

United States have begun to offer Mandarin Chinese as a language learning choice (Wu, 2010).

Today, Mandarin Chinese as a critical language is essential to our nation's economy and security. Public and private schools that introduce critical languages are investing in language learning opportunities that will be beneficial for young learners. Most importantly these schools have initiated progressive educational reform. Educational reform supports and strengthens the American education system.

Educational Reform

Educational reform aims to change education from its current form (Teasley, 2017) to increase student achievement and success. Follari (2015) asserted that educational reform involves the improvement of student achievement and success. Slavin and Chambers (2017) added that educational reform policies give positive educational opportunities for all learners. Education reform has the potential to improve the quality of education while increasing academic support and meeting the needs of diverse learners.

Since the 1900s, the American education system has made several changes to improve education (Teasley, 2017). Many of those changes have progressed education reform into its current form. For example, education reform has transcended education to include early childhood learners, foreign language learning, and teacher education. In terms of early childhood education, recent research has indicated that early childhood education programs are making improvements to language and literacy (Slavin & Chambers, 2017), math and science (McClure et al., 2017), and second language learning (Burke, 2015; Pufahl & Rhodes, 2011; Wang & Winstead, 2016).

Reformed views have changed earlier beliefs about early childhood and second language learning. Some researchers claimed that second language learning can confuse early childhood learners (Bialystok, 2008). Bialystok (2008) found that second language learning influenced children's development by enhancing linguistic development. Bialystok (2008) also claimed that learning two writing systems enhances literacy development. Moreover, it is important to understand how second language development effects early childhood learners and their intellectual thought. Byers-Heinlein, Chen, and Xu (2014) found that children as young as 2-years-old start to understand the nature of foreign words. Therefore, by increasing oral language and vocabulary development, teachers can provide optimal learning opportunities for early childhood learners. Integrating technology and innovative instructional methods are ways to enhance second language development for early childhood learners.

Technology is a strong factor in educational reform. Technology has increasingly developed over the past 10 years (Ludgate, 2015). Technological devices have become common in the early childhood classroom. However, there has been little empirical research on the relationship between touchscreen technology and cognitive development in young learners (Bedford, 2015). Although parents, teachers, and administrators have their own ideas about the use of technology, Billington (2016) stated that technology should be used in moderation as a supplement to the early childhood curriculum. Combined with innovative pedagogy, technology can support second language learning, literacy (Everson, Chang, & Ross, 2016), and unfamiliar writing systems (Flewitt, Messer, & Kucirkova, 2015). The use of iPads has added to educational reform in terms

of mobile technology and pedagogy. Flewitt et al. (2015) stated that adding tactile technology such as iPads in the classroom increased motivation and engagement. Billington (2016) added that technology such as tablets and iPads supported positive learning outcomes in young children. On the other hand, Ludgate's (2015) study found contrasting attitudes and beliefs among teachers. Ludgate (2015) examined the ways touchscreen technology was used in early childhood centers for 2 to 4-year-old learners. The study did not generate positive results. Most of the early childhood centers believed students between 2 to 4-years-old were too young to use touchscreen technologies. Not all educators have embraced this form of educational reform. However, technology can be an effective way to support learning (Flewitt et al., 2015) if properly combined with pedagogy and content knowledge.

Literature Search Strategy

I began my search with narrow terms about Chinese as a second language in early childhood. The searches showed few articles on the topic. During one of my residencies, I decided to take an optional workshop on conducting literature searches. Based on what I learned from the residency, I changed my keywords and searched various databases including Google Scholar, EBSCO Host, ERIC, SAGE, Taylor and Francis Online, and ProQuest. As I exposed myself to the new literature my keywords started to increase. I searched a wide range of search terms and keywords including: *Chinese as a second language, Mandarin as a second language, linguistics, second language learning, foreign language learning, early childhood education, technology in language learning, technological pedagogical content knowledge (TPACK), teaching Chinese as a second*

language, game-based learning, critical period hypothesis, sociocultural theory, less commonly taught languages, action theory, and *reflective journal writing.* In addition, I searched for recent dissertations on Chinese language learning to find if my study would contribute to the gap in the literature.

The years searched ranged from 2010 – 2019. This included full, peer-reviewed journal articles, early childhood education books, educational technology books, foreign language learning books, and qualitative research books. I narrowed the searches to peer-reviewed journal articles. Later, I narrowed my searches to research articles between 2015 – 2019 to ensure that my research articles were current and relevant. As I exhausted the literature on Mandarin Chinese as a second or foreign language, I decided to search articles that studied other languages. I found an abundance of articles examining English as a second language, Spanish, and French. Many of those articles were helpful in describing the use of instructional methods and technology in a second language learning context. However, those articles did not expound on the processes of teaching and learning non-alphabetic languages. Articles that illustrated the teaching and learning of non-alphabetic languages such as Arabic, Korean, and Japanese offered immense insight into languages that did not share the same alphabetic script as English.

As I conducted my searches and read through several studies, I found that the information became redundant and repetitive. I decided that I exhausted the literature and completed the literature review. However, I continue to receive new article alerts through Google Scholar. In addition to Google Scholar alerts, I often searched the Walden library for new articles or dissertations pertaining to my topic and keywords. I found that there is

an overwhelming lack of research studies on the language development of Mandarin Chinese learners in an early childhood setting. With this study, I hope to add important aspects of the use of technology and pedagogy in second language learning with early childhood learners.

Finding a gap in the literature is the beginning of starting a research project (Muller-Bloch & Kranz, 2015). In their study, Muller-Bloch and Kranz (2015) reviewed several research studies to identify the gaps in the literature. After reviewing 40 literature review articles on diverse topics, they found that many articles had several gaps. The data analysis allowed the researchers to use the grounded theory approach to create guidelines on identifying gaps in the literature. The researchers presented four steps to finding the gap in the literature. The first step is to synthesize and find the gaps. The second step is to characterize the gaps to decide which type of research fits. The third step is to verify if the research gap truly exists by extensively linking the research gap with databases. Muller-Bloch and Kranz (2015) referred to the verification stage to confirm the research gap. The last step gives the researcher the opportunity to present the research gap during the synthesis or after the synthesis is completed. After reading this study, I reflected upon my study and how I would present the gap in the literature.

Before I completed my literature review, I had several research interests centered on linguistics, Mandarin Chinese as a second language, and early childhood education. I interconnected these concepts to conduct a qualitative research project. After completing a literature synthesis to find the gaps in my topics above, the emerging gap demonstrated

a lack of research on early childhood learners and less commonly taught languages such as Mandarin Chinese.

The basis of this study was unique. I designed it to understand the experiences and perceptions of Mandarin Chinese language teachers who taught Mandarin Chinese as a second language using TPACK to early childhood learners. The gap in the literature created three overarching themes for the conceptual framework: sociocultural learning theory, action theory, and technological pedagogical content knowledge. Based on the three frameworks, I explored the experiences and perceptions of Mandarin Chinese teachers who taught Mandarin Chinese to early childhood learners.

I conducted a comprehensive review of the conceptual framework and current literature related to relevant topics focused on sociocultural learning theory, action theory, and technological pedagogical content knowledge. I explored the methods educators used to effectively teach a second language in an early childhood setting using technology and innovative instructional pedagogy. In addition, I explored how reflective practices in action theory describe the experiences and perceptions of Mandarin Chinese language teachers as they developed their craft and moved within their zone of proximal development.

Conceptual Framework

Second language learning is a social activity that involves social interactions and collaborations (Mondahl & Razmerita, 2014) between the student and the teacher. I focused on this qualitative case study to understand the experiences and perceptions of Mandarin Chinese language teachers who used technological, pedagogical, and content

knowledge to teach Mandarin Chinese to early childhood learners. I explored the sociocultural learning theory as a constructivist-based instructional model that encouraged the associated concepts of immersive play and second language learning. In addition, the concept of TPACK was examined to grasp teacher's experiences and perceptions of technology in second language learning, as well as understanding the purposefulness of integrating technologies into early childhood language classrooms.

One of the most notable transformations in education was the shift from behaviorist ideologies to a more constructivist learning approach. Educators shifted away from Skinner's behaviorist theory, who believed a child's mind was a blank slate and did not have the ability to initiate learning. However, Piaget believed children were equipped with more than a blank slate. Through his research, Piaget found that children can construct new knowledge based on their beliefs and past experiences (Bhattacharjee, 2015; Jones & Brader-Araje, 2002). Moreover, many constructivists asserted that learning occurs when learners are actively engaged in the learning process (Bhattacharjee, 2015). For educators, the fundamental idea of constructivism enables learners with a multitude of opportunities to construct knowledge based on their experiences inside and outside of the classroom.

In a study conducted by Tang et al. (2017), the researchers surveyed 161 Finnish and Estonian teachers to measure child-centered, teacher-centered, and child-dominated practices within the classroom. From the study, 90 teachers taught 1st grade and 70 teachers taught 3rd grade. All teachers were observed in the classroom by an Early Childhood Classroom Observation Measure (ECCOM) to assess classroom practices. The

ECCOM observations were compared to the teacher's self-reported classroom behaviors. The researchers found that there was a significant relationship between teaching experience and constructivist classroom practices. Teachers with less teaching experience in both Finland and Estonia exhibited child-centered classrooms, whereas veteran or more experienced teachers demonstrated more teacher-centered behaviors.

In a similar study, Kikas, Peets, and Hodges (2014) examined 1st grade teachers and students in Estonia. The researchers used ECCOM to observe the effectiveness of teacher practices. Kikas et al. (2014) found that child-centered classrooms were effective with "highly persistent students" (p. 280); whereas, teacher-centered classrooms were more effective for students who had academic difficulties. The researchers determined that children who demonstrated poor academic abilities needed more structure than their highly achieving counterparts.

Rahardjo (2016) viewed constructivism as actively building knowledge in a student-centered environment. A constructivist classroom environment encourages independent learning. In the past, the role of the teacher in traditional educational environments was to disseminate knowledge through direct instruction; whereas, constructivism allows students to learn through collaboration, social interaction, exploration, and play. Vygotsky (2004) discussed the concept of imagination and play as coinciding with the developmental stages and experience of a child. Children can use their experiences to induce creative and imaginative play. Play is an important method of language learning for early childhood education. Early childhood education focuses on socialization, immersive play, interactive learning, as well as cognitive development.

Rahardjo (2016) asserted that play, particularly socio-dramatic play benefits cognitive development in young children. The author explained that play encourages "problem-solving skills, critical thinking, language development, and creativity" (p. 9).

Sociocultural Learning Theory

Vygotsky's (1978) constructivist framework for instruction and learning is sociocultural learning theory. Sociocultural theory focuses on the importance of social interaction and cognitive development. From a sociocultural perspective, the language learning classroom gives students the opportunity to construct knowledge (Vygotsky, 1978). The use of a sociocultural lens helped the researcher understand how social interactions, immersive play embedded in the curriculum, and the use of technological and instructional methods shaped second language learning in an early childhood setting. The sociocultural learning theory focuses on the learners' ability to learn a second language in a social and meaningful environment. Sociocultural learning gives the learner the opportunity to gain knowledge by actively constructing meaning through the interaction with peers and adults (Yang, 2012). Social interactions play a key role in the learning process, especially in second language learning; not only for the students but also for the teacher. In fact, social interactions are equally important for the cognitive development of children and adults.

According to Fahim and Haghani (2012), the key contribution of sociocultural theory is participation in social learning environments. Therefore, this study will examine language learning as a social practice (Kao, 2010) for both teachers and students. The tenets of sociocultural theory address the learner's mental and academic development

through interactions within the environment (Fahim & Haghani, 2012; Kao, 2010). In this context, teachers can use sociocultural theory to guide how they can use technology and instructional methods to facilitate student learning in a Mandarin Chinese language classroom. I used sociocultural theory to guide my understanding of teacher experiences and perceptions as it applied to TPACK.

Two fundamental components of sociocultural theory are scaffolding and the zone of proximal development. Vygotsky (1978) believed that social interactions and cultural constructs influenced language learning. Teachers introduce these social and cultural constructs to increase student learning potential. Vygotsky explained that scaffolding acted as an instructional strategy that supported learning and development. Vygotsky referred to the zone of proximal development as an instructional method that moves students from a dependent learning state to an independent learning state.

The zone of proximal development is defined as what a student can accomplish independently compared to what the student can accomplish with help from a teacher or more skilled peer (Lantolf et al., 2015). Teachers use the zone of proximal development to encourage and motivate students to learn in an "independent and voluntary manner" (Veraksa, Shiyan, Shiyan, Pramling, & Pramling-Samuelson, 2016, p. 222). In this study, I used the theoretical framework to investigate how sociocultural theory was used to effectively guide teachers through the teaching and learning process of Mandarin Chinese as a second language in early childhood. The zone of proximal development is used to encourage the student to perform tasks independently, whereas scaffolding is used to encourage teachers to use instructional pedagogy to strengthen constructive learning

outcomes. In the following sections I provided a detailed synthesis of the zone of proximal development and scaffolding.

Scaffolding is defined as an instructional strategy (Nemati & Arabmofrad, 2014). It is the ability to solve a problem or complete a task with support from a more experienced individual. Teachers use scaffolding as a method to withdraw support as the student gains confidence and competence (Nemati & Arabmofrad, 2014). The concept of scaffolding is the ability to effectively move the student to the next task.

There are many forms of educational scaffolding. In this study, I discuseds the importance of linguistic scaffolding and emotional scaffolding. I strongly believe linguistic and emotional scaffolding are key components of sociocultural learning in a foreign language, especially for young children. Philip, Borowczyk, and Mackey (2017) asserted that children learning an unfamiliar language need teacher and peer support. In second language learning, scaffolding encourages positive development and growth. Therefore, scaffolding in second language learning for children is vital for language development and growth. Children need an environment where they can flourish through positive interactions, play, and observations.

Researchers have examined linguistic scaffolding (Lucero, 2014) and emotional scaffolding (Park, 2014), as important concepts in early childhood development. Linguistic scaffolding suggests that language teachers need to support students as they learn complex language learning tasks. As described by Lucero (2014), linguistic scaffolding is the support teachers provide to their students to increase or improve language development. Munoz (2014) discussed the importance of promoting and

supporting linguistic diversity. Munoz (2014) explained that in most classroom settings, teachers and students have a limited time for foreign language interaction. Most students do not have the opportunity to extend their learning outside of the classroom. Therefore, the quality of instruction must take priority.

A student's emotional need is also important in education. Students need emotional support as they learn a second language (Krashen, 1988), especially if the target language is challenging such as Mandarin Chinese. Park (2014) asserted that teachers need to "create positive emotional experiences" (p. 20) to increase learning potential in the language classroom. Emotional scaffolding improves engagement, motivation, and confidence (Park, 2014). Park (2014) conducted a case study that examined emotional scaffolding in early childhood education. The author found that the importance of emotional scaffolding is understanding young student behavior as well as understanding early childhood development to create instructional activities that will promote language learning while supporting the emotional stability of children in the classroom.

The zone of proximal development (ZPD), coined by Vygotsky (1978), is defined as the "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (p. 86). Nemati and Arabmofrad (2014) defined the zone of proximal development as the range between what a student can achieve alone and what a student can achieve with assistance. Wass and Golding (2014) asserted that the ZPD is an effective teaching tool in the

learning process. Nemati and Arabmofrad (2014) explained that the role of ZPD is to facilitate a student's potential while helping the student complete a task on their own. As the student moves toward their potential development, the student gains the ability and confidence to complete the task. The teacher can withdraw support (scaffolding) as the student gains independence and confidence the teacher will move the student's zone of proximal development to decide if the student can move to the next task (Nemati & Arabmofrad, 2014).

It is important for educators to support teaching and learning with scaffolding as well as moving students within their zone of proximal development. Effective support in the second language classroom can ease problems with the complexities of language learning and development. Both scaffolding and the zone of proximal development can act as positive facilitators in the teaching and learning process. The use of support systems is the result of teachers taking action within their classroom to combat problems.

Reflection on Action Theory

Reflection is a way of thinking and acting to encourage progress in one's practice or profession (Meierdirk, 2016). Schön (1983) explained that there are two types of reflection that produce action: *reflection-in-action* and *reflection-on-action*. Reflection-in-action occurs during an activity, while reflection-on-action occurs after an activity is completed (Schön, 1983). Both reflection-in-action and reflection-on-action include an evaluation of the activity, an evaluation of ones' actions, an evaluation of changes, and an evaluation of effective decision making. Originally, Schön's (1983) action theory did not focus on teachers; however, it is suggested that reflective thought can increase teacher

development and teacher learning (Shandomo, 2010). Schön (1983) believed reflective thought involved effective planning, collaboration, and decision making based on what works and what does not work within the learning process (Jaeger, 2013). Reflected experiences are an integral part of teacher growth and development (Dervent, 2015; Kelly, 2006; Shandomo, 2010). Kelly (2006) defined teacher development as a growth process that moves teachers from a novice to an expert. Similarly, Mena-Marcos, Miguel, and Tillema (2009) stated that teacher reflection is a cyclical process that involves "knowledge and action" (p. 195).

Reflection-in-action and reflection-on-action allow teachers to move from novice to expert based on their reflective experiences. From a sociocultural perspective, reflective experiences can assist teachers in the learning process as they move within their zone of proximal development (Evans, 2002; Kelly, 2006). In this study, teacher interviews, reflective journals, and a TPACK questionnaire were used to give Mandarin Chinese language teachers the opportunity to reflect on their knowledge and experiences of technology, pedagogy, and Mandarin Chinese content. The use of Schön's (1983) action theory helped the researcher understand teacher reflection on their experiences and perceptions as it related to TPACK.

An example of reflection in practice is Dervent's (2015) qualitative action research study. In his study, he examined the reflective journals of ten preservice physical education teachers who were enrolled in a teacher education program in Istanbul, Turkey. During this 10-week study, reflective journals were required as one of the data collection sources. Researcher questions guided the reflective journals each week. Dervent (2015)

found that reflective journaling increased reflective thinking. Dervent (2015) noted that reflective thinking improved through teacher practice during the 10-week study. The researcher found that many participants learned from their experiences within the classroom.

In another study, Göker (2016) found that teacher education programs in Turkey did not provide preservice teachers with the opportunities to think critically. Göker (2016) set out to examine the impact of teacher reflective journals as a catalyst to critical thinking to increase teacher development and leadership skills. The author examined the journal responses of 16 student teachers who were encouraged to write reflective journals on their teaching experiences and practices to determine the areas of teaching that needed improvement. The themes in Göker's (2016) data analysis found that most teachers reflected on "teaching techniques, classroom management, and managing disciplinary problems" (p.66). Göker (2016) noted that the reflective journaling acted as a metacognitive process by helping the student teachers understand their own learning and teaching process and how that process can be improved through reflection, evaluation, and practice.

Similar to Göker (2016), Bashan and Holsblat (2017) found that the use of reflective journal writing gave Israeli student teachers an opportunity to write about their experiences, thoughts, and perceptions about teaching. By examining the student teacher's writing in reflective journals, Bashan and Holsblat (2017) observed a positive change in teacher development over the course of the teacher education program. The literature on reflective journaling presented themes of exploration, thought, and

experiences. In this study, the use of reflective journaling will validate Mandarin Chinese language teacher experiences and perceptions as teachers write about their teaching and learning process after an activity or lesson.

Technology Pedagogical Content Knowledge (TPACK)

Technology, problem-solving, and communication skills are critical for students to advance in a globalized society (Williams et al., 2010). Teaching requires an understanding of pedagogy and content (Koehler & Mishra, 2009). In other words, teachers must have a full understanding of how to effectively present material to students as well as demonstrate full knowledge of the content area. In addition to pedagogy and content knowledge, technology is a valuable tool in the classroom (Gill & Dalgarno, 2017; Kim et al., 2013). Teachers are integrating technology into their lessons to increase 21st century skills. As teachers integrate technology into their classroom, pedagogical and content knowledge become extremely important. In this study, the integration of technology, the knowledge of early childhood pedagogy, and the knowledge of Chinese language proved to be important in understanding the teachers' experiences and perceptions in the classroom regarding TPACK.

Often, 21st century teaching competencies require specialized knowledge in linking content, pedagogy, and technology together to produce optimal learning opportunities. Although the use of technology in the classroom is an important learning tool (Gill & Dalgarno, 2017; Kim, et al., 2013), there are challenges linking technology with pedagogy and content (Koehler & Mishra, 2009). One overarching challenge researchers have found is that some teachers are not prepared to integrate technology into

the curriculum (Kim et al., 2013). Teachers do not experience valuable professional development and training in technology integration, which adds to their insufficiency (Koehler & Mishra, 2009). Teachers need ample support in technology integration. Koehler and Mishra (2009) pointed out that teachers have diverse needs when it comes to technology integration. A one-size-fits-all approach will not provide teachers with advancements in the complex world of educational technology. Moreover, a teacher's beliefs about technology integration can influence their practice (Aydin-Gunbater, Boz, & Yerdelen-Damar, 2017; Koh, Chai, & Tay, 2014) and hinder learning. Aydin-Gunbater et al. (2017) posited that self-efficacy beliefs could influence a teacher's ability to successfully integrate technology into the curriculum. Technology, problem-solving, and communication skills are critical for students to advance in this 21st century globalized society (Williams et al., 2010). Teaching requires a knowledge base of the subject matter as well as an understanding of pedagogy (Koehler & Mishra, 2009).

Regarding language learning, technology can serve as a useful tool to increase oral language and vocabulary instruction. However, the need to understand the role of integrating technology with content area knowledge is vital in student learning and achievement. As children have more access to digital technology in and outside the home, teachers need to learn how to incorporate technology into their lessons. This study was an examination of how teachers effectively integrate technology into a Mandarin Chinese language learning class by interlinking technology, early childhood pedagogy, and Chinese language content knowledge. Thus, technology has a strong influence on the intricacies of second language education.

Mishra and Koehler (2006) understood the influence technology had on teaching and learning. The researchers developed technological pedagogical content knowledge by adding the "technological" component to the pedagogical and content knowledge components. Technological pedagogical content knowledge (TPACK) is a framework built upon Shulman's (1986) pedagogy content knowledge (PCK) model. Shulman (1986) defined PCK as the knowledge of strategies and best practices to enhance education. TPACK was created by Koehler and Mishra (2009) to illustrate how technology, pedagogy, and content knowledge can be implemented in the classroom to facilitate teaching and learning. The following diagram illustrates the interconnectedness of the TPACK components to teacher's knowledge.

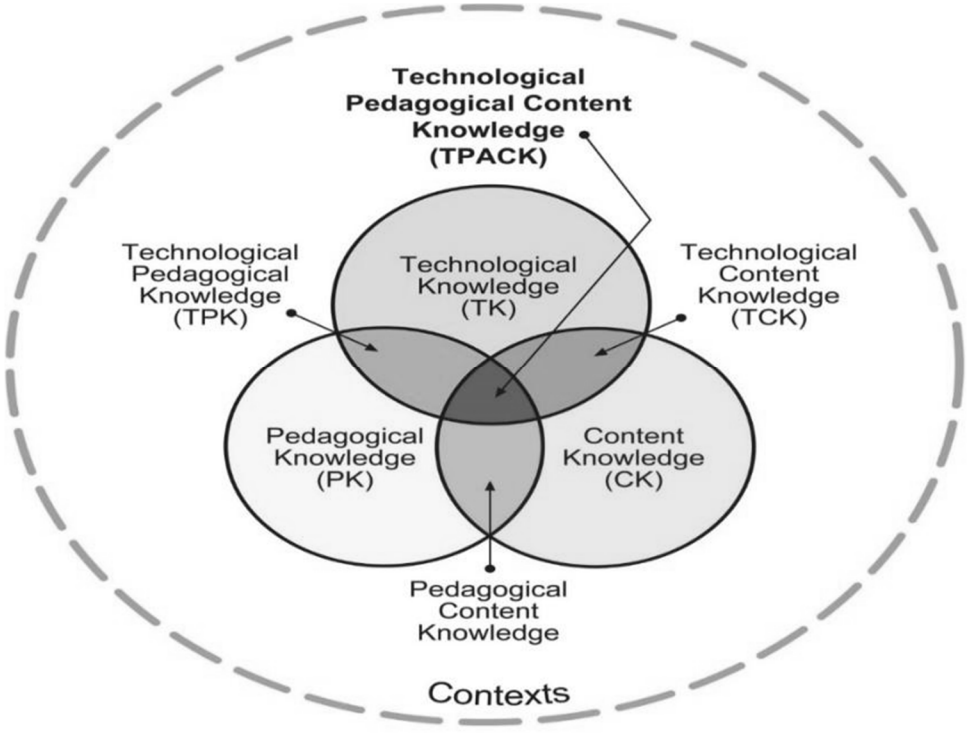

Figure 1: TPACK Model

Based on the above diagram, technological knowledge (TK), content knowledge (CK), pedagogical knowledge (PK) are three core components of TPACK (Koehler & Mishra, 2009).

1. Technological knowledge (TK) refers to the knowledge of using technology in the classroom (Soong and Tan, 2010). The knowledge of various technology ranges from paper and pencil to advanced digital resources.
2. Content knowledge (CK) refers to teachers' knowledge about the subject matter. Koehler and Mishra (2009) asserted that a teacher's knowledge of content is critical to teaching and learning. Teachers need to have a deeper knowledge base in their discipline. For example, teachers who teach science need to be knowledgeable about scientific ideas, concepts, and theories (Shulman, 1987) to demonstrate their mastery of the content.
3. Pedagogical knowledge (PK) refers to the best practices of teaching and learning. It encompasses the processes, strategies, and practices of teaching and learning (Koehler & Mishra, 2009) to enhance all features of the teacher's craft. Pedagogical knowledge is also connected to skills such as classroom management, lesson planning, and assessment development (Koehler & Mishra, 2009).

As technology became embedded in the education field, PCK initiated technological content knowledge (TCK) and technological pedagogical knowledge. Both TCK and TPK focused on the use of technology in content as well as in pedagogy (Soong & Tan, 2010). Soong and Tan (2010) referred to TPACK as a useful tool in developing

effective teachers who can successfully integrate technology, content, and pedagogy to enhance learning. TPACK centers around an educator's knowledge of content and technology, and how technology effectively enhances the learning process. Second language learning and development in United States schools continues to grow. Across the nation, some children as young as four years old are learning the fundamentals of a new language due to the progressive nature of the school. However, it is not enough to simply teach a second language to children, but teachers need to learn how to teach effectively so children can be engaged, motivated, and encouraged to learn a new language.

Chuang and Ho (2011) derived the following definitions to describe the seven components of TPACK.

Table 1

Definitions of TPACK

Models	Descriptions
Technological Knowledge: TK	Knowledge of technologies that range from paper and pen to digital technology.
Content Knowledge: CK	Knowledge of specific content that teachers are required to know and master to teach effectively.
Pedagogical Knowledge: PK	Knowledge on the best practices of teaching to enhance the learning process
Pedagogical Content Knowledge: PCK	Knowledge of combining effective teaching practices with content knowledge. Shulman (1987) describes this component as an educators' guide to developing better teaching skills.
Technological Content Knowledge: TCK	Knowledge of how educators integrate technology into the content.

Technological Pedagogical Knowledge: TPK	Knowledge of useful technological resources that are used to enhance teaching and learning practices.
Technological Pedagogical Content Knowledge: TPACK	The combination of technology, pedagogy, and content knowledge. Understanding the complex interplay of technologies, best practices, and content knowledge of various subjects (Mishra & Koehler, 2006)

Literature Review Related to Key Concepts

Introduction

Key concepts guided this study to understand language learning in an early childhood context. The key concepts include (a) early childhood language learning including, (b) Mandarin Chinese language learning, (c) innovative instructional methods, (d) technology, and (e) TPACK. The first concept, early childhood language learning, examined the cognitive functions children acquire as they engage in second language learning. The second concept, Chinese language learning, guided educators in understanding the uniqueness of learning a language that does not share the same alphabetic script as English. The third concept, instructional methods, explored the multitude of instructional methods that second language teachers use in a classroom. Instructional methods help teachers effectively instruct students as well as to encourage students to learn. The fourth concept, technology, explored various uses of technology in a language learning environment. The final concept, TPACK, examined teachers' beliefs, perceptions, and expectations about the use of technology, pedagogy, and content

knowledge in a Mandarin Chinese classroom. TPACK also examined the understanding of how these three concepts work together to transform teaching and learning.

Early Childhood Language Learning

Language learning is more than a form of communication; it engages the brain and has a strong effect on cognitive abilities (Ramirez & Kuhl, 2017). Cognitive development is a key factor for problem-solving, critical thinking, and reasoning (Deak, 2014). It is suggested that there are cognitive advantages to second language learning. Researchers believe that language learning effectively shapes the brain and cognitive systems (Barac, Bialystok, Castro, & Sanchez, 2014; Bialystok, 2017; Ramirez & Kuhl, 2017) to prepare students for best language learning. Peal and Lambert (as cited in Barac et al., 2014) stated that children demonstrated positive outcomes and enhanced cognitive and mental abilities during language learning. It appears that there is a correlation between language processing and cognitive development. Recent studies have identified the potential increase in cognitive functions due to second language learning. Researchers have found that there are several benefits to early second language learning (Kaushanskaya, Gross, & Buac, 2014; Kocaman & Kocaman, 2012; Tarone, 2015; Walk, Matsuo, & Giovanni, 2015). Younger children who learned a second language experienced higher levels of language skill, cognitive development (Asia Society, 2012; Bialystok, 2017; Kocamon & Kocamon, 2012), and working memory (Kaushanskaya et al., 2014; Marini, Eliseeva, & Fabbro, 2019; Nicolay & Poncelet, 2015).

Kaushanskaya et al., (2014) conducted an empirical study to examine the cognitive effects of bilingualism. The researchers focused on early childhood learner's

ability to task shift, use verbal memory, and memorize vocabulary in a dual immersion setting. The researchers studied 38 children between the ages of 5 and 7 years old. The researchers separated the 38 students into two groups of 19. The control group consisted of 19 children. The treatment group consisted of 19 children. All 38 students were native English speakers. The students in the treatment group were enrolled in a dual immersion Spanish school, whereas the students from the control group were not in a dual immersion Spanish school. The students took several cognitive assessments that evaluated task-shifting, vocabulary, working memory, and short-term memory.

The researchers found that both groups performed similarly on task-shifting and verbal short-term memory. However, the children in the treatment group showed a substantial increase in tasks that demonstrated verbal working memory and vocabulary development. Based on their study, Kaushanskaya et al. (2014) found that exposure to a second language can increase a learner's ability to improve executive skills such as verbal working memory and vocabulary development.

Second language learning can be an asset to student success. Second language learning promotes communication, intrapersonal connections, and student success. In their longitudinal study, Nicolay and Poncelet (2015) set out to examine 101 preschoolers in an English immersion school and a traditional French-speaking school in Belgium. Fifty students attended the traditional French-speaking school; whereas, 51 students attended the English immersion school. In the 3-year study, several skills assessed the student's executive tasks, verbal/nonverbal, and vocabulary skills. This longitudinal study found that the bilingual immersion group outperformed their monolingual peers in

attentional and executive skills. The researchers attributed the increase in attentional and executive functioning to second language learning. Nicolay and Poncelet (2015) explained that the dual language immersion students demonstrated more attention and focus as opposed to their monolingual peers. The researchers continued to assert that while the children switched from one language to another this activity appeared to increase cognitive flexibility and auditory skills.

Likewise, Snyder (2016) found that young bilingual learners outperformed monolingual learners in cognitive tests. Long-term exposure to second language learning increased cognitive development in many functions. Snyder (2016) suggested early childhood learners who learned a second language not only increased their expressive and receptive language skills but also enhanced cognitive development. However, to increase language skills in any second language, it is important to develop oral language and vocabulary development. Oral language and vocabulary development play a key role in the ability to communicate in the target language.

Krashen's Theory of Second Language Learning

Understanding Krashen's (1988) second language learning theory is a noteworthy key concept for this study. Krashen's (1988) understanding of second language learning focuses on the natural approach to language learning. Krashen (1988) explained that the natural approach is a subconscious way of learning a language. Krashen (1988) compared the natural approach to second language learning to a child learning their native language. This learning approach disregards grammar instruction and rules; stating that grammar and rules are learned after a child has gained receptive and expressive speech.

Krashen (1988) described five hypotheses connected to second language acquisition: (a) acquisition-learning distinction, (b) the natural order hypothesis, (c) the monitor hypothesis, (d) input hypothesis, and (e) the affective filter. The acquisition-learning distinction describes two methods of learning a language: acquisition or learning. Acquisition refers to learning a language naturally. Krashen (1988) described language acquisition as a subconscious or implicit way of learning a language. According to Zafar (2009), language acquisition is like Chomsky's LAD theory, supporting that children have an innate ability to learn their native language. On the other hand, Krashen's (1988) description of language learning is described as formal learning. Formal language learning is explicit. Formal learning is a conscious way of learning a language, which is taught in classroom settings.

The second hypothesis, natural order, describes how children learn the structures of a language. The natural order hypothesis explains that there is an order in acquiring grammatical rules and language structures (Krashen, 1988). The author stated that there are certain grammatical structures that are learned early and there are others that are acquired later in life. However, Zafar (2009) asserted that natural order can be controversial. Zafar (2009) explained that Krashen's (1988) natural order only described the grammatical structures of the English language.

The monitor hypothesis determines if learned grammatical structures are used correctly. The monitor hypothesis acts as an editor (Lightbown & Spada, 2006) in the language learning process. However, Krashen (1982) explained that three conditions need to be present during the monitor process: (a) time, (b) correctness, and (c) rules.

Language learners need enough time to produce correct language and grammar. It is important for language learners to know how to express themselves using correct language and grammar.

The input hypothesis refers to comprehension. Individuals learn languages when they understand messages (Krashen, 1982). In describing the input hypothesis, Lightbown and Spada (2006) stated that effective language learning in the input stage occurs when a language that is already known is coupled with a language that is not known to increase knowledge of grammatical rules, pronunciation, and language structures.

The affective filter refers to a learners' emotional well-being. The affective filter refers to the relationship between emotional factors and language learning (Krashen, 1982). The affective filter can either hinder or advance language learning. Teachers need to meet the emotional needs of learners. Learners who show anxiety and nervousness will not develop a new or second language. Learners should learn a second language in a less stressful environment to demonstrate progress.

Krashen's (1982) theory of second language learning was used to explain adult language acquisition. However, in this study, it will be used to explain how children learn languages in a natural way in an early childhood setting. According to Krashen (1982), children learn their first language subconsciously. Children do not realize they are acquiring a language. Whereas, formal language learning involves a conscious or implicit effort to learn a language. Implicit language learning is done in formal classroom settings. However, early childhood learners do not understand the notion of implicit

language learning. Based on their age and developmental level, early childhood learners would excel in a natural approach classroom environment. Krashen (1982) explained that although language learning involves grammar, rules, and a formal knowledge base of a language, children can learn a second language in early childhood without the knowledge of grammar and rules.

Mandarin Chinese Language Learning

Chinese continues to be one of the world's fastest growing languages spoken by people around the world. Simons and Fennig (2017) ranked Chinese as the number one language spoken by people around the world. Although Chinese is spoken by billions of people and appears to be gaining interests in the United States, many learners may find it difficult to learn because it does not share the same alphabetic script as English. According to linguistics, Mandarin Chinese is known for one of the most difficult languages to learn for native English speakers (Lin & Collins, 2012; Zhan & Cheng, 2014).

Although Mandarin Chinese as a second language has been in the United States for over 100 years (Herring, 2008), American college and university students had the opportunity to learn the language. Today, Mandarin Chinese is slowly gaining popularity in United States K – 12 schools (Billak, 2013; Walk et al., 2015). Yao (2009) added that more K – 12 schools are offering Mandarin Chinese to their students as curriculum standards in world languages start to take shape in the language learning classroom. However, learning Mandarin Chinese as a second language can be a challenging task for

many learners. Current researchers have asserted that Mandarin Chinese is one of the most difficult languages to learn (Lin & Collins, 2012; Ye, 2013; Zhan & Cheng, 2014).

To add to its complexity, Mandarin Chinese is a logographic, character-based language system that consists of complex strokes that create a small square configuration. There are more than 80,000 Mandarin Chinese characters (Lin & Collins, 2012). The difficulties in Mandarin Chinese lie in character recognition (Heng & Ling, 2015; Teng, Guey, & Laraie, 2016; Xu, Chang, & Perfetti, 2014), the Mandarin Chinese writing system (Xu et al., 2014) and the Mandarin Chinese vocal tones (Lan, Kan, Sung, & Chung, 2016). In fact, Lin and Collins (2012) added that native English speakers may require 2400 hours of instruction to learn Mandarin Chinese. A learner needs several hours of Mandarin Chinese instruction to master Mandarin Chinese character recognition to be proficient. In fact, a Mandarin Chinese language learner would need to learn at least 8,000 Chinese characters to read a newspaper or article (Lin & Collins, 2012). However, Hanyu Pinyin, an alphabetic system for Chinese language learners, created an easier method to learn the language (Everson, Chang, & Ross, 2016).

Pinyin is a phonetic sound system using alphabetic letters (Lu, 2017). Pinyin focuses on pronunciations such as rimes, tones, and sound blends (Lu, 2017). It is the connection between Mandarin Chinese sounds and words. Created by the Chinese government in 1958, Pinyin helped promote Mandarin Chinese (A little dynasty, 2017; Zhou, 1958). Since its start, the use of pinyin has impacted the language development and literacy skills of young native Chinese speakers in China, Taiwan, and Singapore (Lu, 2017). To promote Chinese language learning United States schools have used pinyin to

increase language and literacy development of second language learners. According to Lu (2017), the use of pinyin improves oral and vocabulary development in Mandarin Chinese. There are several instructional methods to learn and master Pinyin. Understanding which is best for early childhood learners is an important aspect of this study. All aspects of teaching and learning should be considered when assessing the most proper instructional method for teaching younger children. Teachers must consider grade level and their goals.

Instructional Methods

For this study, instructional methods in language learning have been examined to understand the experiences and perceptions of Mandarin Chinese language teachers who use a variety of instructional methods to teach Mandarin Chinese to early childhood learners. Second language teaching and learning may be difficult tasks for teachers and students. In English language learning classes, many teachers use hands-on manipulatives, such as storybooks (Albaladejo, Coyle, & de Larios, 2018; van Druten-Frietman, Strating, Denessen, & Verhoeven, 2016), interactive games (Christie & Roskos, 2017; Pan, 2017), songs (Coyle & Gomez-Gracia, 2014), and technology to promote literacy in English. McNally, Guha, Norooz, Rhodes, and Findlater (2014) investigated how interactive mobile devices improved vocabulary skills in German. Technology-based flashcards examined by Tirtayani, Magta, and Lestari (2017) studied how the flashcards promoted vocabulary in English for Kindergarten students. The use of songs (Albaladejo et al., 2018), physical movement (Edge, Cheng, & Whitney, 2013; McNally et al., 2014), books, and games (Plass, Homer, & Kinzer, 2015) in a language

learning classroom are great ways to introduce vocabulary and oral language to second language learners.

Auditory methods help students learn languages through activities that promote listening skills. In Taiwan, Chou (2014) studied the use of songs, games, and stories to increase vocabulary development in English among native Chinese speakers. In her study, Chou (2014) found that songs, games, and stories had a positive impact on vocabulary development. Teachers were able to increase the student's English vocabulary development using auditory methods. Leśniewska and Pichette (2016) also studied the impact of songs and stories among younger children during language learning. In their study, Leśniewska and Pichette (2016) found that the age of the learner determined if they would benefit from songs or stories. The study found that younger students preferred songs, whereas older students preferred stories. By understanding that younger students may enjoy songs as opposed to stories, Mandarin Chinese teachers can create engaging and motivating activities for younger learners that include Chinese songs, rhymes, and rhythm.

Although young children enjoy the rhythmic and melodic sound of songs. A recent study conducted by Albaladejo et al., (2018) found that children increased their vocabulary skills in a second language by listening to stories. In their study, 17 children between 2 and 3-years-old were given one pre-test and two post-tests to determine if a story, song or the combination of both were effective in vocabulary development and retention. The first post-test was given immediately after the children listened to a story, a song, and a combination of a story and song. Another post-test was administered three

weeks after the activities. After the post-tests, the researchers found a significant increase in vocabulary development after the children heard the story. The story and song combination also showed an increase in vocabulary development, but not as much as interacting with the story. The researchers determined that stories were comprehensible, motivational, and engaging to young learners due to the characters and series of events (Albaladejo et al., 2018), which gave the teachers the opportunity to introduce new vocabulary at a pace that facilitated comprehension. In addition to auditory learning, many learners progress well with kinesthetic methods such as movement.

Movement can act as an instructional method that allows students to learn through kinesthetics. Total physical response is an instructional method used by some educators. Total physical response (TPR) is a language teaching method developed by James Asher (Al Harrasi, 2014). TPR combines language learning with whole body movements to increase a student's ability to learn and retain information (Asher, as cited in Al Harrasi, 2014). Vocabulary skills in young children can increase with the use of commands, gestures, and movements (Albaladejo et al., 2018; Edge et al., 2013). Interestingly, Al Harrasi (2014) loosely associated TPR with trace theory. He stated that knowledge of a language is connected to physical gestures and movements. Another aspect of TPR is the affective filter of a learner. Krashen (1982) described affective filter as a learners' emotional state while learning a second language. The use of TPR claims to lower the affective filter of language learners (Al Harrasi, 2014). For that reason, the use of TPR suggests that language learners need to experience a relaxed environment without stress or anxiety to enhance language development.

In his study, Al Harrasi (2014) explained that although Arabic is the native language of Oman, English has become the official language for business, government, and higher education. As a result, learning English at an early age is important for students in Oman. In his study, Al Harrasi (2014) examined several aspects of the English language curriculum for young learners. Al Harrasi (2014) collected data by examining the curriculum, observing classrooms, and interviewing faculty. As an observer, Al Harrasi noticed that teachers employed TPR as an instructional method. Al Harrasi (2014) expressed that teachers taught lessons through various activities using songs, stories, and movement. In his observations, teachers bellowed commands and students followed. Al Harrasi (2014) found that TPR was beneficial to the development of vocabulary in a second language. In a similar study conducted by Fahrurrozi (2017), a group a 3rd graders in Indonesia increased vocabulary skills in English as well with the use of TPR.

Despite TPR's advantages in language learning, there were some drawbacks to the instructional method in Al Harrasi's (2014) study. Consequently, the demands of the curriculum did not leave room for teacher modifications, deletions, or additions (Al Harrasi, 2014). Teachers were required to follow the curriculum without adding their own creativity, supplemental tools, or activities. However, Al Harrisi (2014) stated that teachers often used Arabic to leverage a students' understanding of English. Also, the lack of qualified teachers in the TPR method was a problem in the classroom. Not only did the teachers lack proper training in TPR, but they also lacked effective classroom management (Al Harrasi, 2014). According to Al Harrasi (2014), the lack of classroom

management attributed to an undesirable classroom environment. In this study, Al Harrasi (2014) only interviewed the supervisor of the English department. He did not interview the teachers to grasp their perspective. It is my suggestion that by interviewing the teachers Al Harrasi (2014) would have been able to understand the teacher beliefs and attitudes about TPR.

Al Harrasi (2014) found that TPR was an effective language learning method for young English language learners in his study. Yet, Al Harrasi (2014) recommended that teachers need to receive proper training in TPR. He also requested that teachers should have the opportunity to supplement TPR methods with their own creative teaching activities. Unfortunately for this study, Al Harrasi (2014) did not interview the teachers to obtain their point of view. By interviewing the teachers, he would have been able to compare classroom observations to teacher perceptions and attitudes about TPR.

In contrast, Khorasgani and Khanehgir (2017) conducted a study with 34 English language learners to compare two instructional methods used to teach a second language. The methods used were TPR and the Keyword Method. The students who participated in the study were in primary school between the ages of 6 to 7 years old. Khorasgani and Khanehgir (2017) explained that the KWM instructional method applied mnemonics to teach vocabulary skills in a target language. KWM associates a word with a picture or phrase to connect the two languages. The procedure consisted of pairing 30 English nouns to a picture. The researchers placed the students in three separate groups. One group learned 10 words through TPR, another group learned 10 words through KWM, and the last group learned 10 words with only a picture meaning. Based on a pretest and

posttest, the children in the KWM group retained more English vocabulary as well as the definitions of the words as opposed to the TPR and picture groups. In their study, Khorasgani and Khanehgir (2017) found that the Keyword Method (KWM) was more effective than TPR.

The existing research proved that the total physical response method can be a beneficial and effective instructional method to support language learning. As young children take part in second language learning, movement and physical activity can play a significant role in student's success in language development. During movement activities, children tend to increase social interactions, interpersonal communication, and play with classmates. Teachers can initiate play to help students learn. Play is an important aspect of child development and learning.

Vygotsky (2004) discussed the concept of imagination and play as coinciding with the developmental stages and experiences of a child. Children can use their experiences to produce creative, interactive, and imaginative play. Play is an equally important method of language learning for early childhood education. The core focus of early childhood pedagogy is providing opportunities for play-based learning. Play is an important concept in child development. Play can employ various mediums such as games, technology, and multimedia. In this context, play will be examined through technology and multimedia.

Young children are using diverse types of technology to engage in play and learning. For young children, teachers need to integrate technology with play-based learning experiences (Edwards, 2016). Edwards (2016) believed web-mapping was an

excellent method of engaging young students in play. Web-mapping aligns play-based learning with technology. In her study, Edwards (2016) introduced the concept of web-mapping to promote play-based learning. She studied the influence of web-mapping on teacher curriculum practices. The use of web-mapping is an excellent practice of child-centered learning. Teachers can extend learning opportunities by implementing technology, digital media, and popular culture to connect students to positive and engaging learning experiences. Edwards (2016) believed that student-centered learning allowed children's interest to permeate the curriculum.

In a quantitative study, Alpar (2013) studied the effects of play on elementary students in a foreign language classroom. The aim of his study was to determine if play increased vocabulary and other cognitive-based learning skills. There were two groups: a control group and an experimental group. Sixteen participants between 10-11 years of age took part in the study. The students were in two groups: a traditional group or play-based group. There were eight students in each group. For the control group, traditional-based instruction used "books, notebooks, and a blackboard" (Alpar, 2013, p. 1250). The experimental group used interactive play and game-based learning. The researcher asserted that each class received the same lessons; however, based on the control and experimental groups, the method of instruction was different. The researcher conducted a total of 240 hours of lessons in 3 weeks. The students were given quizzes at the end of each week to determine whether knowledge of the second language was retained. The data from both classes were collected and analyzed. Alpar (2013) found that language development in the target language increased when play-based instruction was utilized.

However, there was a slight increase in vocabulary knowledge amongst the students in the traditional class. Nonetheless, the game-based group demonstrated a significant increase in test scores compared to the other two groups.

Alpar (2013) concluded that game-based play contributed to language learning. In addition, this study revealed that students were less stressed about learning a new language during play-based and game-based learning. Alpar also discovered that student motivation increased along with the improvement of test scores. Second language teachers who introduce play-based instruction through games and activities increase the level of motivation and engagement in young students. One way to introduce play-based instruction is to integrate technology into the learner-centered classroom. Students will have the opportunity to interact with the teacher, classmates, as well as with the technology in order to increase positive student outcomes in language learning.

Technology

The implementation of technology-supported instruction has helped learners enhance second language skills. Technology can be a powerful resource tool in an educational setting, especially in learning oral language and vocabulary instruction. Researchers have found that the integration of technology in a language learning classroom offers many opportunities for growth and development. In fact, Ahmad (2016) and Lu et al., (2014) found in their studies that the use of technology outweighed the benefits of traditional based learning in a language learning classroom. Technology enhances language learning outcomes (Lu et al., 2014). Liu and Olmanson (2016) found that technology supported native English speakers Chinese character acquisition.

Although teachers play a key role in using technology to enhance learning in the classroom (Hsu, Tsai, Chang, & Liang, 2017). Nikolopoulou and Gialamas (2015) found that the participants in their study had difficulty implementing technology in their classrooms. The participants noted several barriers such as lack of funding, lack of resources, and lack of support.

However, implementing technology in a second language learning environment can offer several benefits in improving second language development. Various technology tools may support academic and social development in children by enhancing social interaction and communication with peers (Hsin, Li, & Tsai, 2014). The implementation of technology is shaping the way young children learn second languages. Research has shown that implementing technology into a second language classroom can increase motivation and engagement (Asia Society, 2012; Butler, 2015), improve receptive and expressive language and writing skills, and introduce students to native speech (Pemba, Mann, Sarkar, & Azartash, 2016).

Coyle and Gomez-Gracia (2014) conducted research to determine second language vocabulary learning with the use of songs in a preschool setting. Children between the ages of 5 and 6 took part in the study. They listened to audio recorded songs to reinforce vocabulary development. The author performed a pre- and post-test to assess vocabulary development. Based on the results of 25 participants, the researchers found that there was a significant increase in receptive language learning rather than expressive language. The researchers believed that a combination of language, music, and actions help students retain vocabulary in the second language. On the other hand, the

researchers found that the student's expressive language did not increase a great deal. The researchers suggest that teachers increase oral development to enhance speaking skills in the target language. This study demonstrated how songs can increase motivation and maintain attention to new words.

Mavilidi, Okely, Chandler, Cliff, and Paas (2015) conducted a study to examine the use of body movements and gestures to increase vocabulary. The authors studied 125 preschool children, between the ages of 4 and 5 years old who used body movements and gestures to enact words to enhance vocabulary in second language learning. Children who took part in physical exercise while learning vocabulary in a foreign language scored higher on a free-recall test than children who did not perform exercises. Integration of physical activities to enhance language learning has positive effects on children in this study.

Cviko, McKenney, and Voogt (2014) and Zhan and Cheng (2014) provided information on how technology can enhance second language learning in Chinese. Technology can aid second language development by providing more time and exposure to the target language (Meyer, 2013). Lu et al. (2014), also found that educators had more time to focus on students in need by implementing technology during instruction. In their study, McPake and Stephen (2016) explored Gaelic language learning in a preschool setting to implement new instructional strategies for second language learning. To encourage language learning in a less commonly taught language like Gaelic, the authors designed an application that allowed students and their parents to upload and sequence pictures to tell a story. Learners had the ability to learn new vocabulary as well as hear

native speech. The use of technology in this setting found that young students were excited to practice the language with or without an adult. Thus, enhancing their motivation and engagement.

Game-based learning is an innovative learning tool that promotes learning. Hsu et al., (2017) can be used to enhance learning and support instruction. The researchers found that elementary school teachers were more likely to use game-based learning. They had higher levels of confidence and motivation in game-based learning as an instructional tool. Rawendy, Ying, Arifin, and Rosalin (2017) asserted that game-based learning increases motivation. It encourages students to actively participate in the activity/task. Chinese character learning to increase vocabulary can decrease motivation for younger children (Rawendy et al., 2017).

Play is a form of learning (Vygotsky, 1978). In fact, Alpar (2013) encouraged teachers to use play to engage students, especially younger students. Computer games can be an effective learning tool (Butler, 2015). Butler (2015) explained that computer gaming in education enhanced motivation and engagement and made complex information easier to understand. Play is an important part of learning for children. Butler (2015) viewed computer gaming in education as "organized play" (p. 92). In addition, technology and game-based learning can promote language learning because it is self-directed learning (Meyer, 2013). This study will be an examination of the connection between sociocultural theory and technology in Chinese as a second language classroom for early childhood students.

Dunn, Gray, Moffett, and Mitchell (2016) explored the impact of technology on the development of literacy and numeracy based on the beliefs of children. The authors collected data from observations, children's focus groups, and individual conversations with children during iPad use. The researchers found that the children who took part in this study linked the concept of play to games. Students used tablets to access literacy and numeracy-based games.

Game-based language learning is considered vital in second language learning, especially in early childhood education (Meyer, 2013). Ryder and Machajewski (2017) conducted a study examining a German gamification app for second language learners. The authors explained that gamification is a "use of game mechanics in a non-game context to engage users" (p.2). Based on their study, the authors found that gaming apps increased attention and motivation in their participants.

Sandanayake (2016) introduced new and innovative approaches to virtual learning to enhance technology-based learning. Virtual learning environments are interactive and collaborative. The author asserted that group learning appears to be more effective than individual learning. Future trends in virtual learning will be to enhance learning through interactive, collaborative, multimedia technologies.

Technology has increased a great deal in the education field. Technology has infiltrated the education field. Teachers and students are using technology in every aspect of education, from math classes to physical education. As technology is implemented into classrooms, it is important that teachers are comfortable and confident in the use of technology. The concept of TPACK is understanding what learners need to know and

how that knowledge will be disseminated using technology. As technology evolves, the use of TPACK is widely important in education.

Technology Pedagogical Content Knowledge (TPACK)

The role of technology in education continues to evolve. The importance of technology in education can be demonstrated in the way teachers use technology in the classroom. An educator's beliefs about technology can enhance or hinder teaching and learning (Harris & Hofer, 2017; Kim et al., 2013). In a study conducted by Aydin-Gunbater, Boz, and Yerdelen-Damar (2017), the researchers examined pre-service teachers' self-efficacy, confidence, and capabilities of technology integration. The quantitative study surveyed 665 pre-service teachers who enrolled in a 4-year science education program. The participants were recruited through convenience sampling. In fact, all the pre-service teachers were at the end of the 4-year program. The data was collected through a "TPACK self-efficacy scale" (p. 924). The analysis of the data found that the pre-service teachers did not see a direct impact of TK, PK, and CK on the TPACK diagram.

In a study conducted by Lefebvre, Samson, Gareau, and Brouillette (2016), the researchers examined the technological knowledge of elementary and high school teachers who use an interactive whiteboard (IWB) during instruction. The researchers used a self-reporting questionnaire to assess the teacher's TPACK knowledge. The researchers found that all 30 teachers, regardless of grade level, who completed the questionnaire reported higher levels of TPK and TK when using an IWB for teaching. In fact, the teachers rarely referred to PK or CK as a key factor in teaching with an IWB.

However, in another survey conducted by Cheng (2017), to assess teachers TPACK knowledge in second language learning posed some differences in the two studies. Cheng (2017) surveyed 172 teachers who taught the language of Hakka in Taiwan. Cheng (2017) set out to understand Hakka language teachers' beliefs of TPACK.

Although many of the teachers self-reported a high confidence level in their overall knowledge of TPACK, that was not the case in six individual TPACK components of CK, PK, TK, PCK, TPK, and TCK. Cheng (2017) found that teachers who had more language teaching experience had an overall high confidence level in CK, PK, PCK as opposed to teachers who had less teaching experience. Interestingly, Cheng (2017) found that female teachers had more confidence in PK than male teachers. However, male teachers had a higher confidence level in CK, TK, and TPK than their female counterparts. Despite Cheng's (2017) findings, a study performed by Koh, Chai, and Tsai (2014) found that there were no relationships between a teacher's experience and their confidence in TPACK components. Although teacher beliefs of technology vary from a teacher's experience, their gender, or their knowledge, it is critical for teachers to gain a deeper understanding of how to effectively use technology in the classroom in order to promote learning.

Summary and Conclusions

An extensive literature search was conducted from 2013 to 2018 for this literature review. All of the literature was related to second or foreign language pedagogy, Mandarin Chinese instruction, early childhood pedagogy, and the integration of technology in a second language teaching and learning setting. I found very few

Mandarin Chinese as a second language research studies to support the second language development of young children in the United States. Articles relating to teacher self-efficacy were also used to provide an understanding into the experiences and perceptions of teachers who use technology in the classroom. I found there was a gap in the literature regarding the experiences and perceptions of teachers who teach Mandarin Chinese to early childhood learners using technology and innovative instructional pedagogy.

The teaching of second language learning is vital to the development of 21st century language skills and competencies. In fact, the teaching of languages that do not share the same alphabetic script as English has grown in popularity. As the United States pushes second language educational reforms on secondary and higher education, there is little progression in early childhood. Early childhood is a critical learning period. Early childhood learners experience a rapid growth of language and cognitive skills (Winskel et al., 2016). A rich linguistic environment with effective instructional materials and technology can aid in the teaching and learning of a new language in early childhood education.

In this study, I focused on theories and concepts that surround second language learning, early childhood pedagogy, technology, and instructional methods. I described the most effective instructional practices in second language learning for early childhood educators who teach Mandarin Chinese as a second language. As a small-sample qualitative case study, the findings from this study cannot be generalized to a larger population of Mandarin Chinese language teachers. The findings can aid Mandarin Chinese language teachers, school administrators, and Mandarin Chinese language

curriculum developers in effectively promoting innovative instructional materials and implementing effective technology into Chinese language curricula for early childhood learners.

Chapter 3 shows an in-depth study design that explains the study's methodology and rationale. This qualitative case study was used to understand the experiences and perceptions of teachers who teach Mandarin Chinese to early childhood learners using technology and innovative instructional pedagogy. Chapter 3 also addresses the researcher's role, participant's demographics, the setting, sampling, data collection, data analysis, limitations, and ethical considerations.

Chapter 3: Research Method

Introduction

The purpose of this qualitative case study was to explore early childhood teachers' experiences and perceptions teaching Mandarin Chinese using TPACK. The research questions that guided this study were:

Research Question 1 (RQ1): What are the experiences of early childhood teachers integrating TPACK to teach Mandarin Chinese?

Research Question 2 (RQ2) How do early childhood teachers perceive the use of instructional methods to teach Mandarin Chinese?

Innovative instructional methods and technology resources are essential for second language teaching and learning. Instructional methods in second language learning are used by educators to provide support to learners, enhance language development, and to effectively promote pedagogical knowledge. Technology used in second language learning can promote communication, global and cultural awareness, and student engagement. I explored Mandarin Chinese language teacher's use of instructional methods and technology in a Mandarin Chinese as a second language classroom. Most of the research conducted in the past has focused on high school and college language learners. Hence, this study is unique because it concentrated on teachers who taught early childhood learners between the ages of 4 – 8 years old.

In this study, I conducted a qualitative single-case study. According to Nath (2005), case study research has gained in popularity throughout the years. This qualitative case study approach explored and described the experiences of Mandarin Chinese

language teachers who use technology and instructional methods as resources for early childhood language learners.

Chapter 3 is organized into several sections. The first section includes a detailed description of the research design, the rationale, and the research approach. The second section includes a chronological detail of participant recruitment, data collection procedures, data analysis. The last section explores issues of credibility, transferability, dependability, confirmability, and ethical procedures and concerns.

Research Design and Rationale

The following research questions guided this study:

RQ1: What are the experiences of early childhood teachers integrating TPACK to teach Mandarin Chinese?

RQ2: How do early childhood teachers perceive the use of instructional methods to teach Mandarin Chinese?

The central concept of this study was to understand the experiences and perceptions of early childhood teachers who taught Mandarin Chinese using technology and innovative instructional methods. The participants' experiences and perceptions were essential in understanding how Mandarin Chinese language teachers experienced and perceived the integration of technology and instructional methods as innovative instructional resources in an early childhood language learning classroom. Therefore, I used a case study to gain an in-depth understanding of the teachers' experiences and perceptions about the topic.

Qualitative research designs are used to gain a deeper understanding of the experiences people encounter with the phenomenon (Yin, 2009). A qualitative research design was the best fit for this research design. First, qualitative studies explain or describe a phenomenon. Second, qualitative research asks "how" and "why" questions. Third, qualitative research uses textual data. Textual data gives the researcher the opportunity to understand an individual's feelings, belief systems, and beliefs through interviews and focus groups. In contrast, a quantitative study is used to gain numerical data. The data collected from quantitative data can be measured through surveys, assessments, and other statistical data (Babbie, 2010). Based on the characteristics of a quantitative research design, this design was not suitable for this type of study.

In the past 3 decades, the use of case study research has gained significant interest in the education field (Nath, 2005). A case study is an analysis of a single-case or multiple case to provide an understanding of the phenomenon (Stake, 1995; Yin, 2014). Researchers have described advantages of conducting case study designs. Hyett, Kenny, and Dickson-Swift (2014) viewed case study approaches as more diverse and flexible than other approaches. A case study design is suitable when a researcher strives to explore, describe, interpret, and explain a phenomenon (Zucker, 2009). In addition, a case study relies on multiple sources of data. A case study approach offers diverse data collection methods. A case study gives the researcher the opportunity to triangulate data with interviews, observations, document analysis, and questionnaires (Harrison, Birks, Franklin, & Mills, 2017). In this case study, I collected data from semistructured interviews, an online TPACK questionnaire, and a reflective journal entry. For this study,

gathering multiple sources of data allowed me to gain an in-depth understanding of the experiences and perceptions of Mandarin Chinese teachers who integrate technology and instructional methods to promote the learning of Mandarin Chinese in an early childhood classroom.

There are several methods of qualitative research. One method of a qualitative research design is a phenomenological approach. A phenomenological approach focuses on the lived experiences of the participants (Creswell, 2013; Patton, 2002). However, Creswell (2013) explained that the analysis of a phenomenological study reduces individuality and describes a commonality between the participants. Moustakas (1994) explained that a phenomenological approach is a collection of data that illuminates "how" and "why" the participants experience a phenomenon as a group. I rejected a phenomenological approach because the purpose of my study is not to gain an understanding of the participant's experiences as a group, but as individual experiences and perceptions. My goal was to explore each case to gain a sense of how each teacher experiences the integration of technology and instructional methods to promote learning in their early childhood language learning classrooms.

I also reviewed another qualitative method, a narrative research design. However, I decided to reject a narrative research design based on the nature of my study. A narrative research design allows the researcher to recreate stories based on the lives and experiences of individual participants through discussions, dialogue, journals, biographies, and other chronological events (Creswell, 2013; Moen, 2006). Because of the data collection sources, a narrative study will produce a chronological story of the

participant's experiences. Creswell (2013) stated that a narrative research study is used to capture detailed stories or life experiences. I rejected the narrative research design based on its uniqueness of recreating stories through life experiences to design a chronological series of events in a participant's life. I was not looking to recreate stories as chronological events in a Mandarin Chinese language teacher's life.

The purpose of this qualitative case study was to explore early childhood teachers' experiences and perceptions teaching Mandarin Chinese using TPACK. For this reason, I decided that a qualitative case study is a proper fit for my study. For this study, a single case study design was conducted. The single case was the teaching of Mandarin Chinese in an early childhood setting. A single case study allowed me to explore the experiences and perceptions of Mandarin Chinese teachers who use technology and instructional methods to promote language learning in an early childhood setting.

Role of the Researcher

As a former early childhood educator, I taught young children for 15 years. I have always been a strong advocate for second language learning in early childhood education. I have personally experienced the relationship between second language learning and early childhood learners. In 2011, my daughter started learning Mandarin Chinese at 5 years old. I also served as a volunteer for a Mandarin Chinese weekend language school in our state. This study was not within my work environment, nor did I recruit or use participants affiliated with the Mandarin Chinese school where I am a parent/volunteer. There were no conflict of interest or power relationship issues in this

study. In addition, I did not have any personal or professional relationships with the participants in this study. The participants were informed that they can withdraw at any time during the research study if they felt there was an ethical concern.

The role of the researcher in qualitative research is important. The researcher is the main instrument in a qualitative research study (Tufford & Newman, 2012; Xu & Storr, 2012). As the researcher, I was aware of the possibility of intentional and unintentional biases (Fusch & Ness, 2015). I set aside my biases, expectations, and prior experiences as an early childhood educator by maintaining objectivity. To reduce bias, I maintained a reflective journal during my research. The reflective journal recorded my thoughts, ideas, and perceptions of the research process. I also took part in memoing (Tufford & Newman, 2012) to maintain objectivity. Memoing is an important part of interview data (Miles et al., 2014). Memoing allowed me to write analytical notes about my thoughts and feelings as a researcher during the research process. As a researcher, I remained actively involved in this study until its completion.

Methodology

For this study, I conducted a qualitative case study to gain an in-depth understanding of the experiences and perceptions of Mandarin Chinese language teachers who use technology and instructional methods to teach Mandarin Chinese in an early childhood classroom. Yin's (2009) six-phase research strategy guided the research design. Yin's six-phase research model includes: (a) planning to conduct the case study, (b) designing the case study, (c) preparing to collect case study evidence, (d) collecting the case study evidence, (e) analyzing the case study evidence and developing the

conclusions, and (f) reporting case study results or findings used to provide a logical model to ensure consistency throughout both the data collection and analysis procedures.

The first phase of Yin's (2009) research model was creating a plan. However, before planning a case study, the researcher needs to identify the rationale for applying the design to their study. According to Yin (2009), there are three criteria for identifying the appropriateness of the case study design. The three criteria are: (a) the researcher seeks to answer a how or why research question; (b) there are no requirements to control behavioral events; and (c) the study focuses on a contemporary event (Yin, 2009). Once all three criteria are met, the researcher can justify the use of a case study. This research design met all three criteria.

The second phase involves the researcher designing the case study. Organization is critical for a well-designed research study. A well-designed plan ensures that the results of the study address the research questions (Yin, 2009), and all pertinent information about the study is aligned. The researcher must ensure the alignment of the research questions, research designs, and methodology. The third phase is the preparation phase. The researcher prepares to collect case study evidence. Yin (2009) identified five components for the preparation phase. The components are as follows: (a) practice investigation skills, (b) train for specific case study, (c) develop a case study protocol, (d) conduct a pilot case/field test, and lastly (e) gain approval for human subjects' protection.

The fourth phase was collecting the case study evidence. Yin (1981) explained that case study data were retrieved from several different data collection methods, such as observations, interviews, field notes, documents, and records. The data in this study were collected from multiple cases to gain multiple perspectives of the experiences and perceptions of Mandarin Chinese language teachers who used TPACK in early childhood settings.

Yin (2009) identified three principles of data collection. The first principle asserted that multiple sources of evidence must be used. The second principle required the researcher to create a case study database. The third principle supported a chain of evidence. I used three sources of data. The following sources helped to answer the research questions and presented optimal triangulation: (a) teacher interviews, (b) a TPACK questionnaire, and (c) a reflective journal entry.

Phase five and six of Yin's (2009) case study design consisted of analyzing the case study evidence and reporting the case study. A cross-case analysis technique is used to organize and analyze the data after collection. According to Yin (2009), a cross-case analysis allowed each case study to be treated as a separate study. The cases were equivalent to multiple experiments that make the findings from the case study more compelling (Yin, 2009). A single case study heightened the study by giving a deeper understanding of how the teachers experienced and perceived the use of instructional methods and technology to promote learning. As a result, my qualitative case study design provided a rich, in-depth understanding of the use of instructional methods and technology as effective learning tools in a Mandarin Chinese classroom.

Participant Selection Logic

For this study, the target population was early childhood teachers who taught Mandarin Chinese in public or private U.S. schools. The participant selection logic of this study was significant because it supported and justified the reason for using a purposeful sample.

According to Palinkas et al. (2015) purposeful sampling was used to explain predetermined criterion of the study. Purposeful sampling allowed the researcher to identify and select participants who are experienced with the phenomenon (Creswell & Plano-Clark, 2011). In this study, I created a set of participant criteria that supported the overall research goals of this study. The participants in this study were Mandarin Chinese language teachers who used technology and instructional methods to teach Chinese as a second language to early childhood learners. In this case, the phenomenon was to understand their experiences and perceptions using technology and instructional methods in an early childhood classroom. Chinese language teachers who fit the inclusion criteria were qualified to address the goals of this study. As a result, my rationale for using purposeful sampling was justified. In addition, I created inclusion criteria to acknowledge who can participate in the study as well as exclusion criteria to determine who cannot participate in the study.

This study had three inclusion criteria for potential participants: English proficiency, in-service teaching, and early childhood experience. The participants in this qualitative case study were Mandarin Chinese language teachers who were proficient in English. The participants were proficient in English, which made it easier to maintain a

phone or Skype interview session. The participants had at least 1 or more years of in-service teaching experience. I sought to understand the experiences and perceptions of Mandarin Chinese language teachers who were currently or formerly teaching in their field. Pre-service teachers were not used for this study. A pre-service teacher does not have the experiences and perceptions to answer the interview questions.

The participants had experience teaching young children between the ages of 4 and 8 years old. I focused on teachers who taught early childhood learners. In addition, the interview questions focused on the teacher's experiences and perceptions with technology and other instructional methods within an early childhood setting. The participants used some form of instructional method or technology in their Mandarin Chinese language classroom. The basis of this study was to understand the experiences and perceptions of Mandarin Chinese language teachers who used technology or instructional methods as instructional tools in their classroom.

There were three exclusion criteria. Exclusion criteria excluded individuals who could not speak or understand English on a proficient level. Individuals who did not teach Mandarin Chinese as a second language to children between 4 – 8 years old. Individuals who were pre-service teachers or taught Mandarin Chinese less than 1 year. Individuals who did not integrate some form of instructional methods or technology in their lessons were excluded as well.

I conducted a purposeful sample. Purposeful sampling requires that participants have a predetermined criterion (Guest, Bunce, & Johnson, 2006). Participants were recruited through school websites nationwide, as well as the professional social media

site, LinkedIn. First, through a Google search, the researcher located public, private, and Chinese immersion schools that offered Chinese to early childhood learners. Once I found specific elementary schools that offered Mandarin Chinese, I reviewed each school's website to locate the Mandarin Chinese language teacher and his or her email address. Once the researcher found a teacher who taught Mandarin Chinese to early childhood learners, the researcher sent the teacher a recruitment flyer and a consent form. The LinkedIn search consisted of locating professional teachers in the professional database. I used the LinkedIn search engine to locate teachers who taught Mandarin Chinese in the United States and reviewed each Mandarin Chinese teacher's profile to determine if he or she taught at an elementary school. Based on the teacher's description of his or her workplace, I emailed the teacher with a recruitment flyer and consent form.

The recruitment flyer requested that potential participants contact the researcher by phone or email. Upon contact, I asked a series of criterion questions. The questions were as follows:

1. Do you teach early childhood students between 4 and 8 years of age?
2. How long have you been teaching Mandarin Chinese to early childhood learners?
3. Do you use technology and instructional methods as educational tools/resources in the classroom?

Participants who did not meet the three criteria were thanked for their time and consideration. Participants who met the three criteria were asked to join the study. The

invitation to participate in the study included a detailed synopsis of the research study and an informed consent to protect participants' privacy and confidentiality. The researcher recruited eight participants for this qualitative study.

In qualitative research a qualitative sample size is smaller than a quantitative sample. However, qualitative research requires a more labor-intensive research process. A participant pool of eight participants is enough to uncover in depth and detailed information about the study and address the research questions. Data saturation can determine the qualitative sample size. Mason (2010) asserted that a large sample size can over saturate the data and become repetitive. Therefore, for this study, a sample size of eight produced in-depth and detailed information that addressed the research questions.

Instrumentation

As a case study research methodology, it is critical that the researcher obtain extensive knowledge about the case. The researcher obtained data from semistructured teacher interviews, reflective journals, and responses to a TPACK questionnaire. As a result, the researcher had a multi-faceted data set that responded to the research questions for this study.

Interview Protocol

To obtain teacher perspectives, the researcher conducted interviews to gain an understanding of Mandarin Chinese language teacher experiences and perceptions of using technology and instructional methods in an early childhood learning classroom. Yin (2014) described interviews as essential sources of qualitative case study research. The study indicated that interviews provided inquiries into teacher's

experiences and perceptions of instructional methods and technology in a Mandarin Chinese language learning class to promote second language learning in young learners. Semi-structured interview questions were open-ended, and they produced a fluid conversation between the researcher and participant. Each interview session was audio recorded for interview follow-ups or clarifications. All participants were asked the same questions. However, some participants were inductively probed more than others based on their responses to certain interview questions.

All interviews were audio tape recorded on two devices to ensure validity. Phone interviews were conducted on a cellular phone in a private area with no distractions. Each phone interview was conducted with the loudspeaker. The cellular phone was equipped with a recording device app that recorded the phone call. The phone interview was also audio recorded on a laptop. During a Skype interview, I used a computer application, as well as a laptop voice recorder that recorded the interview. All recording devices were used for transcription purposes. I conducted all eight transcriptions. The interview transcript was sent to the participants through email. I requested that the participants review their responses for accuracy and clarity. I used a confidential master list to ensure that each participant received his or her transcript of the interview. Each participant had an assigned interview code number P1 through P8, as well as pseudonyms. The codes and pseudonyms were also connected to their reflective journal responses. The pseudonyms were not connected to the TPACK questionnaire because the questionnaire was anonymous.

Interview Questions

Semi-structured interviews are flexible, giving the researcher opportunities to probe the interviewees for in-depth, detailed information. In this study, semistructured interviews were conducted as a main data collection source. Semi-structured interviews allowed the researcher to establish a rapport with the participant. I offered to give a copy of the interview questions to the participants, so the participants had a chance to review the questions since English was not their native language. None of the eight participants asked to review the interview questions beforehand.

To establish content validity in the interview questions, the interview questions were vetted by two Mandarin Chinese language teachers. The teachers were not part of the study; however, their feedback assisted the researcher in producing clear and understandable interview questions. Based on the comments and suggestions from the expert reviewers, the researcher modified and deleted questions. The interview questions were as follows:

1. Explain your role as a Mandarin Chinese language teacher in an early childhood classroom?
2. Describe how you use technology (i.e. SmartBoard, iPads, tablets, laptops, etc) in your lessons for early childhood learners?
3. Reflect on your experiences with technology in the classroom, what positive experiences have you had integrating technology in your classroom? What difficulties have you experienced with the integration technology?

4. How do you perceive the integration of technology as a second language learning tool in early childhood?
5. Reflect on your experiences with TPACK, how have your experiences with TPACK influenced your instruction within the classroom?
6. Overall, do you think technology acts as a positive learning tool in the early childhood classroom? Why?
7. What instructional methods (i.e. songs, movement, TPR, games, etc.) do you employ in the classroom for early childhood learners?
8. How do these instructional methods enhance Mandarin Chinese in an early childhood classroom?
9. Reflect on your experiences with instructional methods, what positive experiences do you have using these instructional methods in your classroom?
10. What difficulties have you experienced with the integration of instructional methods?
11. What other experiences and perceptions with technology integration and instructional methods would you like to discuss as it pertains to the teaching of Mandarin Chinese in an early childhood classroom?

Interview questions 2, 3, 5, 6, 10, and 11 are relevant to the research question: What are the experiences of early childhood teachers integrating TPACK to teach Mandarin Chinese? Interview questions 7, 8, 9, and 11 are relevant to the research question: How do early childhood teachers perceive the use of instructional methods to teach Mandarin Chinese?

Reflective Journal Entry

In this study, participants were provided with one reflective journal entry. A reflective journal is a written record of experiences or events (Majid, 2016). The journal entry allowed the researcher to gain an insight into the experiences and perceptions of the teachers during their lessons. The reflective journal served as evidence of what the teacher's experienced and perceived in an actual lesson using technology or an instructional method. The reflective journal supported the teacher's use and understanding of TPACK.

For this study, I provided each teacher with a reflective journal entry template to record experiences and perceptions of a lesson that involved the use of technology or an instructional method. Each journal entry will ask four questions about the teacher's experiences and perceptions of the lesson, the technology, and the instructional method. The questions were as follows:

1. Briefly describe the lesson.
2. Reflect on a lesson you completed with the use of technology or an instructional method, what were your experiences using technology or an instructional method during this lesson for early childhood learners?
3. Reflect on a lesson you completed with the use of technology or an instructional method, how did you perceive the lesson regarding your use of technology or instructional methods for early childhood learners?
4. What other experiences did you have about this lesson that you would like to share? The reflective journal entry was connected to both research questions,

as they asked about the teacher's experiences and perceptions using technology in an early childhood language learning classroom.

The teachers were requested to email the completed reflective journal to the researcher. The researcher allowed 10 days for the reflective journal to be completed and emailed. The reflective journals were given the same master code number and pseudonym as their interview. Each journal entry was kept in a computer file folder for management and easy retrieval. The journal entries were uploaded to Dedoose, a data management tool.

The purpose of the reflective journal was to understand the experiences of these teachers as they implemented a specific unit in their Mandarin Chinese classroom using technology and instructional methods. This data collection source was responsive to the research questions, what are the experiences of early childhood teachers integrating technological pedagogical content knowledge (TPACK) to teach Mandarin Chinese? And, how do early childhood teachers perceive the use of instructional methods to teach Mandarin Chinese?

Technology Analysis

In this study, a questionnaire was requested of the participants to complete as a third data collection source. This questionnaire was a self-assessment of the teacher's experiences and perceptions integrating technology and pedagogical practices using Mandarin Chinese content in an early childhood classroom. The questionnaire was modified to reflect pertinent information regarding this study. The questionnaire allowed me to gain insight into the experiences and perceptions of Mandarin Chinese language

teachers who used technology and instructional methods to promote the learning of Mandarin Chinese in an early childhood classroom. The questionnaire was designed to help answer the research questions: What are the experiences of early childhood teachers TPACK to teach Mandarin Chinese and How do early childhood teachers perceive the use of instructional methods to teach Mandarin Chinese?

Schmidt et al. (2009) developed the "Survey of Preservice Teachers' Knowledge of Teaching and Technology". The survey was designed to "measure preservice teachers' self-assessment of their TPACK knowledge" (Schmidt et al., p. 123). The participants of the original study were preservice teachers at Iowa State University who were enrolled in a teacher preparation program during their practicum and student teaching assignments. Content validity was established through an evaluation of the TPACK questionnaire. To increase content validity, experts read the questionnaire and provided comments and suggestions to validate the use of the questionnaire.

I obtained permission from Dr. Denise Schmidt at Iowa State University to use a questionnaire titled, "Survey of Preservice Teachers' Knowledge of Teaching and Technology". Although the original design of the survey encapsulated all content and technological knowledge for P-12 teachers, this study modified the questionnaire to reflect teacher content, technological knowledge, and instructional methods of Mandarin Chinese in an early childhood classroom. After the modifications of this questionnaire, I posted the questionnaire in Qualtrics for the participants. The link to the questionnaire was emailed to the participants. Participants were asked to complete the questionnaire within 3 days of receiving the initial email. Participants who did not complete the

questionnaire within the 3-day time frame received another email reminding them to complete the questionnaire. Six out of eight participants completed the questionnaire. The TPACK questionnaire was anonymous.

Summary

The purpose of this qualitative case study was to explore early childhood teachers' experiences and perceptions teaching Mandarin Chinese using technological, pedagogical, and content knowledge (TPACK). This study used Yin's (2009) qualitative case study strategy to gather and analyze data. The methodology section was essential as it outlined the participant selection logic, instrumentation, recruitment procedures, data analysis, and ethical procedures. The participant selection logic of this study was significant because it supported and justified the reason for using a purposeful sample. I used semistructured interviews, a TPACK questionnaire, and a reflective journal entry to understand the experiences and perceptions of Mandarin Chinese language teachers who used instructional methods and technology to teach Mandarin Chinese in early childhood classrooms. The following section outlines the researchers plan for recruitment, participation, and data collection.

Procedures for Recruitment, Participation, and Data Collections

To conduct a well-designed research study, there are several procedures researchers must follow for participant recruitment, data collection, and data analysis. There are several sources of case study data collection: documents, archival records, interviews, observations, and physical artifacts (Yin, 2014). Multidimensional data for this qualitative case study was collected in the form of:

1. A single phone or Skype interview
2. An online TPACK questionnaire and
3. A reflective journal written in response to a lesson in the participants' classrooms.

Interviews allow participants to express their beliefs, attitudes, and thoughts. Yin (2014) explained that interviews allow the participants and researcher to engage in a guided conversation. For this study, seven interviews were conducted on a cellular phone and one interview was conducted on Skype. The interview times ranged from 33 minutes to 1.5 hours. Each interview was audio recorded and transcribed by me. A transcription of each interview was given to each participant for clarification. One participant contacted the researcher by email to clarify information on the transcript.

Each participant was asked answer questions for a reflective journal about a lesson in the classroom. The purpose of this process was to understand how these teachers experienced the integration of technology into their classrooms in the process of teaching Mandarin Chinese.

Each participant was asked to complete an online questionnaire. The questionnaire was modified based on the original TPACK questionnaire. The questionnaire was designed through Qualtrics. The questionnaire was also quantitatively analyzed by Qualtrics. I used the textual analysis to gain an understanding of the participants' beliefs and use of technology in a Mandarin Chinese classroom. The questionnaire was uploaded to Dedoose.

Data Collection

The purpose of this qualitative case study was to explore early childhood teachers' experiences and perceptions teaching Mandarin Chinese using technology, pedagogy, and content knowledge (TPACK). The information listed below reflected the steps the researcher took to obtain data from semistructured interviews, a TPACK questionnaire, and reflective journal entries.

1. Upon IRB approval, I emailed a recruitment flyer to Mandarin Chinese language teachers identified on their school's website as teaching early childhood learners. The email briefly explained the purpose of the study and specific criteria. The email requested that potential participants contact me through email or phone to participate in the study.
2. Prospective participants who contact me by telephone or email were asked, how long have you taught Mandarin Chinese in an early childhood program? If they have not taught for a year, the researcher will thank the participant for their interest. The researcher was seeking participants who taught for one or more years as a Mandarin Chinese language teacher in early childhood.
3. Prospective participants who met the above criteria, were invited to participate in an interview.
4. Interviews were conducted on the phone or on Skype. This depended on the participants comfortability and convenience.
5. I contacted the participants to request times for an online VOIP or phone interview.

6. I collected data by conducting a single semistructured interview with participants on the phone or through Skype or Zoom for approximately 30-45 minutes.
7. I used a call recorder and a built-in computer recorder for all phone and Skype interviews.
8. Phone interviews were audiotaped using Voice Recorder on my login protected phone.
9. A Skype interview was conducted on the researcher's personal Skype account.
10. I only recorded the audio from the interviews.
11. I saved the audio file in a login protected home computer.
12. After the interview was completed, I emailed each participant topic questions for their reflective journal. I requested that each participant email their responses within 2 weeks.
13. After the interview was completed, the researcher sent the Qualtrics URL for the TPACK questionnaire.
14. After the questionnaires, interviews and journals were completed, I informed the participants through email that the study ended. The researcher sent a "Thank You" email for their participation. The email asked if the participants had any remaining questions or concerns.
15. I addressed a small issue about one of the participant's transcript.
16. I requested a mailing address for a VISA gift card. Two participants provided their address to receive a $20.00 VISA gift card for their participation.

Data Analysis Plan

The use of multiple sources for data collection will require different approaches to data analysis. For this study, the research data was collected and categorized in three ways to provide an understanding of how teachers' experience teaching Mandarin Chinese as a second language to early childhood learners using instructional methods and TPACK. In order to respond to the research two questions, I analyzed the interview questions, the TPACK questionnaire, and the reflective journal entry to identify codes, patterns, and themes across the data.

Data Analysis Procedures

To analyze the interview data, I used thematic inductive coding to understand the themes and patterns that result from coding all the data set. Listed below are five phases of thematic inductive analysis (Nowell, Norris, White, & Moules, 2017).

Phase 1:

1. Familiarization: During this phase, I collected the data. I will become familiar with the data through "prolonged engagement" (p. 4). I listened to recorded interviews several times to understand the data. Then, I transcribed the data and read the data for accuracy. I printed out a hard copy of the interview and journals.
2. Member-Checking: I sent the transcribed interview to each participant for their review. They emailed me any comments they have after reviewing the interview.

3. Audit trails were established to document the development of the analysis (Carcary, 2009) by my reflective journaling, memoing and the responses to member-checking.

Phase 2:

4. Generating Codes: During this phase, I created coding and labels of relevant data. If there is a response that is not relevant to the study, I did not code this text and remove it from my consideration.
5. During this phase, a database was created using Dedoose. Dedoose is a data management software that organizes, manages, and codes the data. I uploaded all data into Dedoose. I selected a paragraph as a unit of meaning and identify coding structures, categories or phases that define that unit of meaning.
6. I completed this initial coding for all participants' interviews and reflective journals.
7. Next, I combined the coding structures under patterns for each participant as axial coding.
8. I reviewed each participant's response to the TPACK online questionnaire. I created a table that links the participant's response to the sections of the TPACK questions.

Phase 3:

9. Search for themes: During this phase I memoed about developing themes and patterns. I identified the patterns for each participant and combine the patterns into major themes across all participants. I reviewed the tables from

the analysis of the TPACK questionnaire for each participant and analyze these results as they relate to my major cross-case themes.

Phase 4:

10. Reviewing the themes: During this phase, I analyzed the themes I created and developed my analysis for the themes including supporting text from the participants' response and I created a table of the codes, patterns and themes. In Dedoose I created coding tables that combine similar patterns across cases into major themes from my initial and axial coding of the interviews and the reflective journals.
11. I related these final themes with the results from the TPACK questionnaire table.

Phase 5:

12. I wrote the report.

Interview Data

Interview data is an important data source that can provide an abundance of relevant information (Yin, 2014). Information from an interview can either confirm or contradict the researcher's assumptions. Yin (2014) explained that in the beginning of a research study there is no way of knowing if the participants will contradict or confirm the phenomenon. Though contradictions or discrepant cases in the data demonstrate a difference in the main body of evidence (Yin, 2014), to understand experiences and perception I did not remove data unless it was not related to the participant's experiences

or perceptions of teaching and learning in their classroom. I used the following steps for interview data:

1. I used memoing during each interview. Memoing allowed me to take notes and reflect after the interview.
2. After each interview, I listened to the recording once without transcribing to familiarize myself with the data and to check for accuracy.
3. Then, I listened to the recording again to transcribe the interview.
4. Each transcribed interview was sent to the participant to check for accuracy.
5. After the participants checked the transcript, one participant emailed me her clarification to the number of students she had in the classroom. I uploaded each transcribed interview and my notes into Dedoose, a data management system.
6. I identified units of meaning as a paragraph.
7. I selected a paragraph and created a code that was linked to this paragraph.
8. After initial coding was completed for each interview, I combined the codes into categories as part of focus coding process.
9. After all interviews were analyzed for initial and axial coding, I conducted a cross-interview analysis to identify themes as axial coding. I coded the information to investigate emerging themes and patterns in the data.
10. Then, I created a visual aid that displayed a table or matrix with patterns and themes (Yin, 2014).
11. Lastly, I created individual reports for each case study.

12. After all data was analyzed in Dedoose, I requested that the website be delete

Reflective Journal Entry

Documentation data for this study was a reflective journal template for participants. The documentation data consisted of two reflective journal entries of two separate lessons completed in the classroom. The journal was used in conjunction with other sources for the "corroboration and augmentation of evidence" (Yin, 2014, p. 107). The following steps were used to collect journal data:

1. The participants received a reflective journal template in their email after they have completed their interview.
2. The participants were requested to email me one reflective journal entries of a Mandarin Chinese language learning lesson.
3. After I collected each journal entry, I uploaded and analyzed them in Dedoose.
4. I reviewed all the journals and defined initial codes for the instructional activity, the purpose of the instructional activity and the integration of technology in response to the research questions.
5. I developed an axial pattern for each journal by combining codes based on the experiences described by the teachers.
6. I reviewed all summary patterns for the participants' journal, and I created themes that were evident among all the journals.
7. I linked this analysis to the themes resulting from the thematic inductive analysis of the interviews.

TPACK Questionnaire Data

The TPACK online questionnaire was posted in Qualtrics. The questionnaire was emailed to each participant. After the participants responded to the questionnaire, I downloaded all the data as a Word document from the online site to my login protected computer. I uploaded the Word documents into Dedoose for coding. I coded these documents based on the TPACK conceptual model identified in Figure 1. The TPACK questionnaire will provide information relevant to the teachers' experiences and perceptions of TPACK and teaching Mandarin Chinese to early childhood learners. Example questions were as follows: I feel confident using technology in my lessons. I believe my methods and strategies will increase students' learning in Chinese as a second language. I have various ways and strategies of developing my understanding of Chinese as a second language. I used content analysis to identify patterns in the responses of each participant to the TPACK model and relate these to the themes emerging from my analysis of the interviews and reflective rubric (Hsieh & Shannon, 2005; Schmidt et al., 2009). This supported the research questions. The following steps outlined how I analyzed the questionnaire.

1. Six participants completed a 5-scale Likert item online questionnaire that asked questions about their experiences and perceptions about TPACK and Mandarin Chinese as a second language.
2. A Qualtrics report was generated.
3. The report was categorized by the seven TPACK domains and each question was linked to a 5-scale Likert item.

4. I used content analysis to interpret the results by comparing and contrasting the responses of the participants.
5. I created coding tables in Word to combine similar patterns across cases into major themes from my initial and axial coding of the interviews and the reflective journals.
6. I related these final themes with the research questions.
7. I wrote my report on my analysis.

Issues of Trustworthiness

Qualitative research is understanding a phenomenon from the perspectives of the participants (Trochim, 2006). Qualitative research involves credibility, transferability, dependability, and confirmability (Trochim, 2006). The researcher must ensure trustworthiness and credibility by maintaining the credibility and dependability of the research, the study's ability to be transferable to other context, and the confirmability of the study's results.

Credibility

Credibility in qualitative research is important for maintaining internal validity. Although, Trochim (2006) explained that the study's participants can only judge credibility, in this study the researcher addressed credibility by using triangulation. Triangulation included interviews, questionnaires, and document reviews. I conducted interviews until I had reached data saturation. The interviews were recorded and transcribed by the researcher to provide credible audit trails. The participants had the opportunity to review their responses to ensure I provided a true account of their

thoughts and perspectives. This was part of member checking. I used reflexivity by keeping and maintaining a reflective journal through the research process.

Transferability

Transferability refers to the external validity of the study in order to make generalizations of the study's results (Trochim, 2006). To increase transferability by provided a thorough analysis of the study. The analysis acted as a thick description of the study and provided an in-depth analysis of the research context. I also ensured that there was a variation in participant selection by ensuring that the participants were diverse.

Dependability

Dependability in qualitative research involves consistency (Trochim, 2006). For my study, to establish dependability I conducted audit trails. I ensured that the interviews were recorded and transcribed. I ensured dependability by providing triangulation with interviews, a questionnaire, and document analysis. The interviews were conducted to gain insight on the participant's experiences, perceptions, and attitudes about teaching Mandarin Chinese as a second language for early childhood learners. I gathered data about the use of technology and innovative instructional tools through a questionnaire in Qualtrics. I also gathered data by reviewing reflective journal entries by the teachers.

Confirmability

Confirmability implicates how the results of the study are confirmed (Trochim, 2006). Confirmability can refer to the integrity of the researcher and the study (Shenton,

2004). For my study, I enhanced confirmability by using triangulation to reduce researcher bias. Shenton (2004) asserted that the researcher must ensure that bias does not permeate the study. The use of audit trails increased the study's ability to be duplicated. Data audits examined the study's data collection and data analysis procedures (Trochim, 2006). Confirmability also refers to the study's limitations and its potential effects. For that purpose, I wrote and maintained a reflective journal.

Ethical Procedures

To ensure ethical procedures were met and maintained throughout the study, I requested approval from each school before I recruit teachers for the study. I ensured that the participants understand the nature of the study and its intended purpose. I obtained signed consent forms. The participants were informed of all procedures of data collection, as well as confidentiality involved in data collection and storage. Participants were given transcripts to review their answers for errors as a form of member-checking. The audio file of the interviews was stored in my login protected home computer during analysis. The audio file was deleted from my phone after it is saved in my home computer.

For confidentiality, I created a master list of participants' names linked to their pseudo name. I kept this master list separate from other data and locked in a file cabinet until it was destroyed. I used the pseudonym, P1, P2, P3, etc. throughout the study. During and after the completion of the data collection, all hard copies of data materials were stored in a locked file cabinet, which was only accessible to me. All data research was saved on a locked computer. A USB drive used to collect data was also stored in a locked safe for 5 years and then destroyed with a hammer.

For this study, I used Dedoose, a data management software to organize, manage, and maintain the data. Yin (2014) suggested the use of a database system to increase the quality of the research study as well as improve reliability. The following steps were used to manage the data.

1. The online questionnaires were posted in Qualtrics. Online results from Qualtrics were downloaded to a login protected home computer.
2. After all participants have responded to the questionnaire, I requested Qualtrics to delete the questionnaire from their website.
3. To organize and manage my research data, I used a data management tool called Dedoose.
4. I organized the data by developing labels for each section of data in the form of codes, words, and phrases (Boyatzis, 1998).
5. Data gathered from interviews, technology, and artifacts were imported on the data management software.
6. All data were saved on a USB flash drive for backup purposes.
7. The USB flash drive was placed in a locked safe for 5 years.
8. After 5 years it will be destroyed with a hammer.
9. All interviews, notes, and audio recordings were on a locked computer.
10. Hard Copies were placed in a locked file cabinet for 5 years. After the 5-year term, the hard copies will be destroyed.

Summary

The purpose of this qualitative case study was to understand early childhood teachers' experiences and perceptions teaching Mandarin Chinese using technology, pedagogy, and content knowledge (TPACK). Chapter three presented a qualitative single-case study research design that will be used in this study. Chapter three provided a comprehensive and detailed description of all the data procedures involved in this study. I interviewed Mandarin Chinese language teachers who currently teach or have taught early childhood learners in formal classroom settings. In addition to the interviews, the teachers received a questionnaire about their experiences, attitudes, and knowledge of technology, pedagogy, and Mandarin Chinese content. I requested that the teachers complete two reflective journal entries after completing a lesson. Data was collected and analyzed to find themes and patterns. The results of the participant interviews, document reviews, and the TPACK questionnaire are presented in Chapter 4.

Chapter 4: Results

Introduction

The purpose of this qualitative case study was to explore early childhood teachers' experiences and perceptions teaching Mandarin Chinese using TPACK. I used a case study design to gain an in-depth insight into the language teacher's experiences and perceptions of teaching Mandarin Chinese to young learners while implementing technology and instructional pedagogy. Based on my review of the literature, the experiences of Mandarin Chinese language teachers have not been studied within the context of early childhood teaching and learning with the implementation of technology and instructional pedogogy. The literature demonstrated that researchers have found substantial benefits and advantages in learning a second language in the early childhood years. However, there continues to be a significant gap in the literature regarding Mandarin Chinese teaching and learning, teacher experiences with technology, and early childhood language learning.

Two research questions guided my understanding of how Mandarin Chinese teachers experience and perceive the use of technology and instructional pedagogy in an early childhood classroom. The two research questions were: What are the experiences of early childhood teachers integrating TPACK to teach Mandarin Chinese and how do early childhood teachers perceive the use of instructional methods to teach Mandarin Chinese?

I collected data from semistructured interviews, a TPACK questionnaire, and a reflective journal entry. I analyzed the data and made connections to the research questions and conceptual framework.

This chapter includes the results of a qualitative case study analysis of the experiences and perceptions of eight Mandarin Chinese teachers who used technology and instructional pedagogy to teach Mandarin Chinese to early childhood learners. In this chapter, I will present the setting, participant's demographics, data collection and data analysis, the results, and evidence of trustworthiness. I have included a review of the finding that address the research questions.

Setting

Eight Mandarin Chinese language teachers participated in my study. The teachers resided in various cities throughout the United States. I interviewed seven Mandarin Chinese language teachers on the phone and one teacher on Skype. There were no distractions during the interviews. The interviews last from 33 mins to 1.5 hours. Each interview was audio recorded on two devices: a cell phone recorder app and a laptop audio recorder. After each interview the participants were encouraged to take part in a TPACK questionnaire to better understand their feelings, experiences, and perceptions of technology, pedagogy, and content knowledge. In addition to the TPACK questionnaire the teachers were requested to respond to four reflective journal questions based on a lesson plan completed in the classroom.

Demographics

Eight teachers consented to participate this study. Each participant was at least 18 years of age and a Mandarin Chinese language teacher. Seven of the participants were Chinese-American and one participant was White-American. Of the eight participants seven were female and one was male. Each participant taught Mandarin Chinese in the United States for one or more years. In this study, the demographics were limited to gender, state, current teaching grade, and number of years teaching in the United States. Table 2 displays the participants' profiles, followed by a summary of each participant.

Table 2

Participant's Demographics

Participant code	Gender	State	Grade	Years teaching
P1	Female	California	3st grade	3 years
P2	Female	Utah	1st grade	2 years
P3	Female	Washington D. C.	1st– 6th grade	10 years
P4	Female	Utah	3rd grade	7 years
P5	Male	Hawaii	K – 5th grade	5 years
P6	Female	Oregon	Kindergarten	11 years
P7	Female	New York	Preschool	6 years
P8	Female	Utah	1st grade	5 years

Summary of Participants

P1 was originally from Taiwan. She was a 3rd grade teacher at a dual language immersion school in California. She taught for 9 years in her native land of Taiwan. She taught in the United States for 3 years. She taught all the core subjects such as math,

science, and social studies in Chinese. She had a coteacher who taught the students English in the core classes. Both teachers used their prep time to collaborate and design lesson plans for their students. The lesson plans were designed to speak and understand core subjects in both English and Mandarin Chinese.

P2 was originally from China. She was teaching 1st grade in Utah. She taught in the United States for 2 years. As a new teacher, she found discipline and student engagement a problem in her class. By collaborating with other teachers and attending professional development training, she created and maintained effective discipline techniques and strategies to keep young students engaged and motivated in the target language.

P3 was originally from Taiwan. She was teaching at a Montessori school in Washington, D. C. She taught for 10 years in the same school. Not only did she teach early childhood, but she also taught 4th through 6th grade. She explained that Montessori school had a different grading system than regular public and private schools. For example, students from age 2.5 years to 5 years old were in the same class. In addition to Mandarin Chinese, her school also offered Spanish as a second language. Parents had to choose between Spanish and Mandarin Chinese as their language of choice for their child.

P4 was originally from China. She taught and resided in Utah. She taught 3rd grade at a dual immersion school. She taught all the core subjects such as math, science, and social studies in Mandarin Chinese. P4 had a co-teacher who taught the students the

core subjects in English. She spoke Mandarin Chinese in all her lessons. She taught in the United States for 7 years.

P5 was an American male teacher. He learned Mandarin Chinese in college. After living in mainland Chinese for a year he moved to Hawaii. P5 taught Kindergarten through 12th grade at a school in Honolulu, Hawaii. He taught 22 different classes 3 days a week. He taught Chinese in a private school for 5 years. He also worked part-time as an International Family Liaison for Mandarin Chinese speakers.

P6 was originally from China. She taught and resided in Portland, Oregon. She taught kindergarten students at a dual immersion school. P6 taught her students basic core subjects in Mandarin Chinese. She collaborated and cotaught with her partner teacher. She taught in both private and public schools for 11 years.

P7 was originally from China. She taught and resided in New York City. She taught Mandarin Chinese to preschool children between 3 years and 4 years. She taught in the United States for 6 years. At the time of her interview, she a graduate student specializing in teaching Mandarin Chinese as a second language.

P8 was originally from Northern China. She taught and resided in Utah. She taught 1st grade at a dual immersion school. P8 taught most of her core classes in Mandarin Chinese. Her co-teacher taught the core subjects in English. She taught for 5 years in both Hong Kong and the United States.

Data Collection

The data collection process began after the Walden University IRB approved my study. The study gained IRB approval on July 17, 2018. Walden University's approval

number for this study is **07-17-18-0148516** and it expired on **July 16th, 2019.** After IRB approval, I identified public and private schools throughout the United States that offered Mandarin Chinese as a second language to early childhood learners. As an additional recruitment source, I used the social media website, LinkedIn. I used the LinkedIn search engine to locate teachers who taught Mandarin Chinese to early childhood learners. I emailed a recruitment flyer and consent form to 122 teachers at their school. I sent a recruitment flyer and consent form to 46 teachers to their LinkedIn accounts. I expected all the participants to read the consent form. I requested a reply email stating "I consent" if they wanted to participate in the study. The participants were also told that the study was voluntary, and they could withdraw from the study at any point. I contacted all participants who sent a reply email stating "I consent".

Before conducting each interview, I thanked the participants for participating in my study. I reviewed the background of the study by providing each participant with the purpose of the study, the procedures involved in the study, the risks and benefits, confidentiality, and the compensation, I reminded the participants that the interview would be recorded and they can stop the interview at any time. I also informed the participants that I would provide a typed transcript of the interview for their review.

I collected data from eight participants during a 4-month period. Data collection for this study consisted of three data sources: (a) teacher interviews, (b) TPACK questionnaires, and (c) a reflective journal entry. All eight Mandarin Chinese language teachers participated in the interviews. Seven of the eight teachers were interviewed by phone and one teacher was interviewed through Skype. Six Mandarin Chinese language

teachers completed the TPACK questionnaire. Two Mandarin Chinese language teachers completed and returned the reflective journal entry.

All of the participants lived in a different state. I was flexible and accommodating during the interview process. As I scheduled and conducted the interviews, I had to consider the time zone differences to ensure I was not impeding on the participant's time or work schedule. During the phone interviews, I used two recording devices: a cell phone recorder app and a computer voice recorder. I conducted each interview in a private office space in my home. The interviews lasted between 33 minutes and 1.5 hours. None of the participants stopped the interview procedure. All of the participants were interviewed once. All of the participants gave clear and detailed answers. Therefore, there was no need to conduct a second or follow-up interview. I transcribed all of the interviews verbatim. Transcribed interviews were emailed to each participant.

There was one variation in data collection from the plan presented in Chapter 3. I changed the number of reflective journals from two to one. I understand that teachers are busy, and they may not have time to reflect on two journal entries for this study. A low response to the reflective journals was considered an unusual circumstance. I received two reflective journal responses from two participants. One teacher contacted me to explain that she completed the reflective journal but did not attach the journal entry to the email that she sent me.When I informed her of the mistake, she returned an email stating that she did not save the document. I decided not to ask the teacher to complete another reflective journal.

Recruitment

The recruitment procedure consisted of obtaining teacher emails from online public-school directories and open school websites. The websites contained teacher names and emails. Some websites even included a picture of the teacher. The initial email consisted of a brief message about my search for Mandarin Chinese participants, with an attached recruitment flyer and a consent form outlining the purpose and procedures of the study. I sent 122 email messages to potential participants. Mandarin Chinese language teachers were also found on the LinkedIn website through my personal account. I sent 46 messages to potential participants on their LinkedIn account. The participants were instructed to reply to the emails if they were interested in participating in the study. I followed up with an email message to confirm I received their notice of consent. My email also asked each willing participant to schedule a time and date when they are available to discuss the study in detail and to schedule an interview based on the required criteria.

I interviewed eight Mandarin Chinese language teachers who taught Mandarin Chinese in an early childhood setting (Appendix A). Six participants were recruited by email or LinkedIn. Two participants were recruited by a participant from the study. The participant sent me an email with the names and email addresses of two teachers who taught in Utah. I sent an email to those teachers with a brief explanation of the study, the purpose of the study, and the study procedures. Attached to the email was a recruitment flyer and a consent form. The two teachers consented to the study. All eight participants met my criteria of (a) one or more years as a Mandarin Chinese teacher in early

childhood, (b) an in-service language teacher in early childhood (preschool through 3rd grade) and (c) integrated technology and instructional methods in the classroom.

Teacher Interviews

Eight Mandarin Chinese language teachers participated in my study. The teachers resided in various cities throughout the United States. I interviewed seven Mandarin Chinese language teachers on the phone and one teacher on Skype. Each interview took place in a private office space in my home. There were no distractions during the interviews. The interviews last from 33 minutes to 1.5 hours. Each interview was audio recorded on two devices: a cell phone recorder app and a laptop audio recorder. All participants agreed to an audio recorded interview. My interviews consisted of a semistructured interview protocol with eleven questions. Each participant was assigned a code. For example, I used P1 through P8, to identify the participants. The letter "P" was used to indicate the participant and a number was used to indicate the order of the participant's interview.

After each interview, I transcribed the interviews. Each participant received their transcribed interview for member checking and accuracy. One participant contacted me to clarify the number of students in her class. The transcript read 16; however, the student had 60. The completed transcripts were uploaded into Dedoose, a data management tool for researchers. The interviews were coded and analyzed in Dedoose. After each interview the participants were encouraged to complete a TPACK questionnaire to better understand their feelings, experiences, and perceptions of technology, pedagogy, and content knowledge. Six teachers completed and returned the survey.

TPACK Questionnaire

After the interview, the participants were sent an email with the TPACK questionnaire link. The link automatically directed the participant to the questionnaire. The questionnaire comprised of five demographic questions and 34 Likert scale questions. Six of the eight participants completed the survey. The questionnaire was compiled into a detailed report in Qualtrics. The report was uploaded into Dedoose for an in-depth analysis. The report was also printed as a hard copy report for easier access.

Reflective Journal Entry

After each interview, a reflective journal entry document was emailed to the participant. The participant was instructed to reflect on a lesson that used technology or another instructional method to teach Mandarin Chinese to young learners. The three questions were included in the reflective journal entry: (a) Briefly describe a lesson you integrated technology or an instructional method in your early childhood classroom. Please include in your description what content you taught, what technology you used, and what teaching approach(es) you implemented. (b) Reflect on the above lesson. What were your experiences using technology or an instructional method during this lesson for early childhood learners? (c) Reflect on the above lesson. How did you perceive the lesson regarding your use of technology or instructional methods for early childhood learners?

Participants were instructed to return the document to the researcher as an attachment. Upon receiving the returned reflective journal document, I reviewed the document for accuracy. The answers to the returned reflective journals were clear and

concise. I did not have to contact the participants for clarification. When the two participants returned the document, their first and last name was typed on the top of document. I removed the names of the participants and matched the reflective journal to the interview transcript. I replaced their name with an identifier such as P1 through P8. The reflective journals were uploaded into Dedoose. They were coded and analyzed.

Data Analysis

For this dissertation, I used thematic inductive analysis (Nowell et al., 2017). I collected multiple sources of data to ensure a well-organized and complete analysis. The following steps were used to move from coded units to larger categories and themes.

Interview Analysis

I collected the interview data from eight participants. I became familiar with the data through "prolonged engagement" (Nowell et al., 2017, p. 4). I listened to recorded interviews once without transcribing to understand the data. Then, I listened to the interview a second time to transcribe the data. After I completed each transcription, I read the transcribed data for accuracy. I printed out a hard copy of the interview transcript. I collected two completed reflective journals from two participants. I read each question and answer to understand the data presented. I sent the transcribed interview to each participant for their review. I gave each participant one week to review the data and email me with any clarifications or concerns. One participant emailed me with corrections to the transcript. Audit trails were established to document the development of the analysis (Carcary, 2009) by my reflective journaling, memoing, and responses to member-checking.

Journal Analysis

For this study, a reflective journal was developed to gain an in-depth understanding of teacher's experiences and perceptions using technology and instructional pedagogy in an early childhood language learning classroom. For the reflective journal writing, I requested that teachers reflect and share their experiences and perceptions on a Mandarin Chinese language lesson that implemented technology or an instructional method for early childhood language learners. The teachers were asked to respond to the following three questions: (a) Briefly describe a lesson you integrated technology or an instructional method in your early childhood classroom. Please include in your description what content you taught, what technology you used, and what teaching approach(es) you implemented. (b) Reflect on the above lesson. What were your experiences using technology or an instructional method during this lesson for early childhood learners? (c) Reflect on the above lesson. How did you perceive the lesson regarding your use of technology or instructional methods for early childhood learners?

The teachers received a reflective journal template in their email after they completed their interview. Once the teacher completed the reflective journal, they were requested to return the completed journal to my email address. Two of the eight participants returned the completed journal entry. After I collected each journal entry, I uploaded and analyzed them in Dedoose. I reviewed all the journals and defined initial codes for the instructional activity, the purpose of the instructional activity and the integration of technology in response to the research questions. I developed an axial pattern for each journal by combining codes based on the experiences described by the

teachers. I reviewed all the patterns for the teachers' journals, and I created themes that were evident among all the journals. I linked this analysis to the themes resulting from the thematic inductive analysis of the interviews.

TPACK Questionnaire Analysis

For this study, a TPACK questionnaire was developed in Qualtrics to gain an understanding of the teachers' experiences integrating technology, pedagogy, and content knowledge in an early childhood language learning classroom. The questionnaire included five demographic questions and 34 Likert-scale items. The Likert-scale consisted of five ratings: *strongly disagree, disagree, neither agree or disagree, agree*, and *strongly agree*. The questionnaire was divided into seven domains: (a) Technological Knowledge (TK), (b) Content Knowledge (CK), (c) Pedagogical Knowledge (PK), (d) Pedagogical Content Knowledge (PCK), (e) Technological Content Knowledge (TCK), (f) Technological Pedagogical Knowledge (TPK), and (g) Technological Pedagogical Content Knowledge (TPACK). A detailed outline of these subdivisions was presented in Chapter 2. Six participants completed the online questionnaire which asked questions about their experiences and perceptions about TPACK and Mandarin Chinese as a second language.

To analyze the TPACK questionnaire, I downloaded a combined report of six completed questionnaires from Qualtrics (Appendix B). The Qualtrics report provided quantitative information that I interpreted into a qualitative understanding of the teacher's experiences and perceptions through content analysis. I created the following descriptive codes for each domain: Technological Knowledge: *technology*, Content Knowledge:

Mandarin Chinese content, Pedagogical Knowledge: *instructional practices*, Pedagogical Content Knowledge: *instructional practices and content*, Technological Content Knowledge: *integration of technology and content*, Technological Pedagogical Knowledge: *technology and instructional practices*, and Technological Pedagogical Content Knowledge: *integration of technology, instruction, content*. I uploaded the data into Dedoose. Using the Qualtrics charts and graphs, I looked for patterns in the data. I linked the patterns in the TPACK questionnaire to the coding and patterns found in the interviews.

Data Structuring in Dedoose

I created a database in Dedoose. Dedoose is a data management software that organizes and manages the data to allow the researcher to code data, observe patterns, and create themes. I uploaded the interviews, reflective journals into Dedoose. The TPACK questionnaire was created into a PDF file and uploaded to Dedoose. Each interview transcript and reflective journal response was read line by line. I selected a phrase or paragraph as a unit of meaning. I identified initial codes and parent codes. I created codes and labels of relevant data. Next, I combined the coding structures under patterns and categories for each participant as axial coding. Then, I reviewed each response to the TPACK online questionnaire. The responses to the TPACK questionnaire were anonymous. I identified initial and axial codes from the questionnaire responses. I created memos in Dedoose about developing themes and patterns.

I identified initial codes and identified patterns for each participant and combined the patterns into major themes across all participants. I reviewed the charts and graphs

from the analysis of the TPACK questionnaire for all the participant and analyzed these results as they related to the interviews responses and the research questions. In Dedoose, I created coding tables that combine similar patterns across cases into major themes from my initial and axial coding of the interviews and the reflective journals. I analyzed the themes I created and developed my analysis for the themes including supporting text from the participants' response. I related these final themes to the results from the TPACK questionnaire table.

Through the process of inductive analysis, I coded the interview transcripts, reflective journals, and TPACK questionnaire. I read each interview transcript line by line and coded the data. I found initial codes from the interviews and reflective journals. I analyzed the initial codes to look for related words and patterns. When I identified related patterns, I clustered the codes to create categories. The categories, themes, and codes were linked to the research question. Codes that related to technology were clustered together. Then these codes were grouped into three categories: support, resource tools, and challenges. The remaining codes were condensed and placed in the categories that were related.

Research Question 1

Description of Initial Codes

The first question asked, "What are the experiences of early childhood teachers integrating technological pedagogical content knowledge (TPACK) to teach Mandarin Chinese?" Through the process of inductive analysis, I coded the interview transcripts, reflective journals, and TPACK questionnaire. I read each interview transcript line by

line and coded the data. I found initial codes from the interviews and reflective journals. I analyzed the initial codes to look for related words and patterns. When I identified related patterns, I clustered the codes to create categories and themes. The categories, themes, and codes were linked to each research question. For the first research question, codes that related to the teacher's experiences and perceptions using technology were clustered together. For the second research question, codes that were related to the teacher's experiences and perceptions using instructional pedagogy were clustered together. After I distinguished which codes related to each research question, I analyzed the codes again for similarities and patterns.

Description of Categories

I clustered the codes to create categories and themes. I reviewed the codes and patterns for topics that were related. Codes that were related to the use of technology became one category and codes that related to the difficulties with technology use in the classroom became one category. Codes that related to classroom procedures, rules, and management became a category. Codes that were related to movement became a category. Codes that described the difficulties with technology became one category. Codes that were related to instructional pedagogy became a category.

Categories to Themes

After I had my categories from combining the initial codes for all participants, I created a theme that addressed the categories and related these themes to a specific research question. I reviewed the related codes and categories to see the overarching themes. The themes for research question one were supporting language learning through

technology, technology as a resource tool, challenges of technology. The themes for research question two were: movement enhances language learning, innovative language learning activities, early childhood language learning pedagogy, and managing student behavior to promote learning.

In Table 3 are the coding structures that emerged from the analysis of the interviews, the TPACK questionnaire, and the reflective journal as they related to the two research questions, "What are the experiences of early childhood teachers integrating TPACK to teach Mandarin Chinese? And "How do early childhood teachers perceive the use of instructional methods to teach Mandarin Chinese?"

Table 3.

Codes, Categories, and Themes

Initial codes	**Categories**	**Themes**
videos	technology resources	supporting language learning through technology
google drive		
iPads		
chromebooks		
visual support		
engaging		
voice recording		
pace		
gen files		
Elmo projectors		
e stroke		
power point		
white board		
positive reinforcement	establishing a routine	classroom management/managing student behavior to promote learning
class size		
parents		

incentives		
Class Dojo		
limited technology	difficulties in the classroom	challenges of technology
classroom management		
student behavior		
class size		
drama	activities in the classroom	movement enhances language learning
role playing		
sensory		
TPR		
calligraphy	instructional	innovative activities
teacher-made games		
character recognition		
writing instruction		
child-centered	child-based activities	early childhood language learning pedagogy
attention span		
learning through play		
learning through songs		
fun		
games		

Research Question 2

The coding structure that emerged from my analysis of the interviews, the TPACK questionnaire, and the reflective journal related to the research question, "How do early childhood teachers perceive the use of instructional methods to teach Mandarin Chinese?" My initial codes were drama, role playing, sensory, TPR, calligraphy, teacher-made games, character reconition, writing instruction, child-centered, attention span, learning through play, learning through songs, and fun. These codes were grouped in categories and themes. My combined categories were activities in the classroom, instruction, and child-based. My themes from the second research question were related

to the codes and categories. The themes were movement enhances language learning, innovative langauge learning activities, and early childhood pedagogy (Table 3).

Analysis of TPACK

For this study, I opened a Qualtrics account to create an online questionnaire. The TPACK questionnaire was a modified version which was originally developed by Schmidt et al. in 2009. The TPACK questionnaire consisted of five demographic questions and 34 Likert-scale questions. The questions used a Likert-scale of *strongly agree, agree, neither agree or disagree, disagree, and strongly disagree*. A link to the questionnaire was sent via email to each participant after the interview. I gave each participant two weeks to complete the questionnaire.

The TPACK questionnaire was completed by six of the eight participants. After the questionnaires were completed, I downloaded a Qualtrics report. The TPACK responses were put into a chart and color-coded based on the participant's responses to the Likert items. The chart was analyzed for patterns and trends based on the participant's responses. I created the following descriptive codes for each domain: Technological Knowledge: *technology*, Content Knowledge: *Mandarin Chinese content*, Pedagogical Knowledge: *instructional practices*, Pedagogical Content Knowledge: *instructional practices and content*, Technological Content Knowledge: *integration of technology and content*, Technological Pedagogical Knowledge: *technology and instructional practices*, and Technological Pedagogical Content Knowledge: *integration of technology, instruction, content*. I uploaded the data into Dedoose. Using the Qualtrics charts and

graphs, I looked for patterns in the data. I linked the patterns in the TPACK questionnaire to the coding and patterns found in the interviews.

The first domain, technology knowledge, referred to using and operating technology. The statements from this domain encouraged teachers to reflect on their experiences and perceptions of technology integration. There were five Likert-scale statements in this domain. None of the teachers chose "*strongly agree*" to describe the five questions. Fifty-seven percent of the teachers "*agreed*" with each statement. Thirty-seven percent of the teachers "*neither agreed nor disagreed*" with the statements. Six percent of the teachers "*disagreed*" with the statement.

The second domain, content knowledge, referred to the teacher's knowledge of Mandarin Chinese. The statements were developed to understand how the teachers perceived their knowledge of Mandarin Chinese and how they perceived the use of various methods to teach Mandarin Chinese. There were five Likert-scale statements in this domain. Eighty percent of the teachers "*strongly agreed*" with the statements, while 20% of the teachers "*agreed*" with the statements.

The third domain, pedagogical knowledge, referred to the teacher's experiences and perceptions of adapting their teaching style and their teaching approaches to assist students in a second language classroom. This domain also explored the teacher's experiences with assessment and classroom management. There were six Likert-scale statements in this domain. Fifty-four percent of the teachers "*strongly agreed*" with the statements, while 45% of the teachers "*agreed*" with the statement. One teacher did not

answer the statement, "I know how to use various teaching approaches in a second language classroom."

The fourth domain, pedagogical content knowledge, combined pedagogy and content knowledge to understand the teacher's experiences and perceptions of effective and meaningful teaching within a Mandarin Chinese classroom. Pedagogical content knowledge explores the relationship between what the teacher knows and what the teacher can accomplish in the classroom based on content instruction. There were two Likert-scale statements in this domain. Fifty percent of the teachers "*strongly agreed*" with the statements and 50% of the teachers "*agreed*" with the statements.

The fifth domain, technological content knowledge, referred to the integration of technology within the content area. This domain explored the teacher's experiences and perceptions using technological resources that enhance the learning of Mandarin Chinese in an early childhood classroom. There were four Likert-scale statements for this domain. Twelve percent of the teachers "*strongly agreed*" with the statements, while 66% of the teachers "*agreed*" with the statements. Thirty-three percent of the teachers "*neither agreed nor disagreed*" with the statements. Eight percent of the teachers "*disagreed*" with the statement and 4% of the teachers "*strongly disagreed*" with the statement.

The sixth domain, technological pedagogical knowledge, referred to the combination of technology skills and pedagogy. This domain explores the experiences and perceptions of teachers who integrate technology to enhance their teaching style and teaching approaches in the classroom. There were six Likert-scale statements in this domain. Sixteen percent of the teachers "*strongly agreed*" with the statements. Seventy-

two percent of the teachers "*agreed*" with the statement, while 11% of the teachers "*neither agreed nor disagreed*" with the statements.

The seventh domain, technological pedagogical content knowledge, combined three forms of knowledge in the classroom: (a) technology, (b) pedagogy, and (c) content. This domain explored the teacher's experiences and perceptions with the integration and transaction of technology, pedagogy, and content knowledge within an early childhood classroom. There were three Likert-scale statements in this domain. Twenty-eight percent of the teachers responded with "*strongly agree*", while 44% of the teachers responded with "*agree*". Twenty-eight percent of the teachers "*neither agreed nor disagreed*" with the statements.

Evidence of Trustworthiness

In qualitative research the issue with trustworthiness involves maintain credibility and dependability, ensuring the transferability of the study, and ensuring the confirmability of the results. In this section, I described how credibility, dependability, transferability and confirmability were established and maintained throughout the study.

Credibility

This qualitative case study used triangulation to increase credibility. Triangulation included interviews, questionnaires, and a reflective journal entry. I conducted eight interviews. The interviews were recorded and transcribed by the researcher to provide credible audit trails. I reached data saturation after the 6th interview. I did not create new codes. I emailed the transcripts to each participant. The participants had the opportunity to review their responses to the interview questions to

ensure I provided a true account of their thoughts and perspectives. I also used reflexivity by keeping and maintaining a reflective journal throughout the research process.

Transferability

For my study, I increased transferability by providing a thorough analysis of the study. I used Dedoose, data management tool for qualitative research. The transcripts were uploaded in Dedoose to assist with coding, pattern development, and the creation of themes. I tried to ensure that there was a variation in participant selection by recruiting diverse participants. However, due to the nature of my study, this was very difficult. Many Mandarin Chinese language teachers in early childhood were Asian and female.

Dependability

I conducted audit trails to ensure dependability. I ensured that the interviews are audio recorded and transcribed. I increased dependability by using triangulation with data collection sources such as interviews, a questionnaire, and a reflective journal entry. The interviews were conducted to gain insight on the participant's experiences, perceptions, and attitudes about using technology and other instructional methods to teach Mandarin Chinese as a second language in an early childhood setting. I also gathered data about the participant's use of technology as an instructional tool through a TPACK questionnaire in Qualtrics. I also gathered data from the teachers by collecting reflective journal entries about classroom language lessons.

Confirmability

As a former early childhood teacher, I had to ensure that my pedagogical teaching bias did not permeate the study. Therefore, to enhance confirmability, I used triangulation. Triangulation can reduce researcher bias (Shenton, 2004). I used audit trail to increase the study's ability to be duplicated. Data audits were used to examine the study's data collection and data analysis procedures (Trochim, 2006). I was mindful of the study's limitations and potential effects. Therefore, I wrote and maintained a reflective journal of my activities pertaining to the study as well as memoing my thoughts and feelings during the research process.

Results

The purpose of this qualitative case study was to explore early childhood teachers' experiences and perceptions teaching Mandarin Chinese using technology, pedagogy, and content knowledge (TPACK). As discussed in the literature review, there is a gap in the research pertaining to Mandarin Chinese as a second language for early childhood learners. Even more so, understanding the experiences and perceptions of Mandarin Chinese teachers who teach Mandarin Chinese to young learners is lacking. The research suggests that understanding the experiences and perceptions of Mandarin Chinese language teachers can support curriculum development, teacher training, and second language pedagogy.

The following research questions were developed to address the gap in the literature related to the experiences and perceptions of Mandarin Chinese language

teachers who use technology and a variety of instructional methods to teach Mandarin Chinese as a second language to early childhood learners.

RQ 1) What are the experiences of early childhood teachers integrating TPACK to teach Mandarin Chinese?

RQ 2) How do early childhood teachers perceive the use of instructional methods to teach Mandarin Chinese?

The results of this study were organized by these two research questions. The first question focused on the experiences Mandarin Chinese language teachers had while integrating technology and pedagogy into an early childhood language learning classroom. The second question focused on the perceptions Mandarin Chinese teachers had on the integration of instructional methods that supported language learning in the early childhood classroom. To address these questions data was collected from semistructured interviews, reflective journals, and a TPACK questionnaire.

Research Question 1

The first question was, "What are the experiences of early childhood teachers integrating TPACK to teach Mandarin Chinese?" The following themes emerged from the data for research question *Supporting language learning through technology, technology as a resource tool, challenges of technology*.

Theme 1: Supporting Language Learning through Technology

All teachers who participated in this study use technology to support language learning in their classroom. Many teachers agreed that technology was useful and beneficial in supporting language learning. Many teachers reported that they use

different forms of technology every day such as iPads, projectors, smartboards, and videos.

P1 mentioned that technology motivated her students. She stated, “technology helps a lot in learning, I mean nowadays kids need a lot of incentives.” P6 had a similar idea about technology supporting language learning by stating that technology is engaging. Although P6 taught Kindergarten, she has pointed out some difficulties with technology and early childhood learners. She also stated that technology was “more attractive to young learners.” For her 1st grade Mandarin Chinese dual immersion class, P2 stated that technology was important in supporting language learning. She introduced games, videos, and writing activities while using technology in the classroom. Like P2, P4 introduces technology through videos, games and songs. P4 reported, “I use YouTube a lot for videos and Chinese songs.” She continued by stating, “We use Chromebook for the whole 3rd grade. So, I can only use once a week.”

When asked about technology supporting language learning in early childhood, P3, who teaches Mandarin Chinese to students between preschool and 6th grade in a Montessori school had a different perspective. P3 does not use technology in her classroom with very young children. P3 explained, “It is a Montessori school, we really hold a really different thought about technology according to Maria Montessori, she believes that if we use less technology, especially with the younger early childhood, it is best.” Although P3 does not incorporate technology in her classroom with her students between preschool to 2nd grade, she begins to introduce technology to her 3rd grade students.

The TPACK questionnaire provided information about the use of technology to support language learning. The section, Technological Content Knowledge (TCK) involves the use of technology to enhance learning in the content area. One participant strongly agreed that they have experience using technologies that can be used for teaching children to speak Mandarin Chinese and used for teaching Mandarin Chinese literacy. Technological Pedagogical Knowledge focuses on the use of technology to effectively use teaching strategies. One participant stated that he or she strongly agreed that they can choose technology that: (a) enhances the teaching approaches for a lesson, (b) enhances student learning during a lesson, (c) combines content, technologies, and teaching approaches, and (d) enhance the content for a lesson. Only four participants stated that they agree with the statements.

Theme 2: Technology as a Resource Tool

All the teachers mentioned using technology as a resource tool in their early childhood classroom. In her reflective journal P2 mentioned, "I use videos, whiteboards, games, music, dance, iPad, clay and painting to teach Chinese." P4 stated, "I use YouTube a lot. We also use the Chromebook for Mandarin Matches online." When asked to explain the Mandarin Matches software, P4 stated,

> Most of the schools don't have the account for each kid. But our school district, every kid has an account. They can log into the website to read books and practice and do language games on this website…they can practice at home and the kids love to do it and they can improve a lot. That's why I encourage my kids to do the Mandarin Matches at home online.

Although P5 mentioned that technology was limited in his school, he stated that he liked using the projector most of the time. He stated, "I used a projector and a CD player. I liked having both of those technologies even though they were not the most sophisticated."

Like P5, P3 limits technology for her young learners. P3 teaches at a Montessori school. She mentioned that she used iPads for the 3rd grade students. She stated, "I installed some apps. For example, a puppet show app. It records your voice and there is a Chinese cartoon puppet will start moving while you record your line or your sentences." P3 also uses the computer for Chinese character writing with her 3rd grade students. She stated, "I show them how to type pinyin…how to type Chinese characters with pinyin and I show them how to change the language setting on the computer."

When asked about technology as a resource tool, P6 stated, "I use the computer, iPad, the projector, and also we just started to use Chromebook in my class." She continued by stating,

> We use the iPad for reading…listening to the story or reading the story…but using the iPads, it is more picture and things are moving along like you are watching a movie. It is more attractive for young learners, I think.

P1 mentioned, "We basically use Elmo and projectors. I have a laptop and screen, I also use MAC book for small group.

The TPACK questionnaire provided information about teachers experiences with incorporating technology, pedagogy, and content knowledge. Technological Pedagogical Content Knowledge (TPACK) focuses on the combination of technology, pedagogy, and

content knowledge. Three key points were presented to the participants: (a) I can teach lessons that combine Mandarin Chinese, technology, and teaching approaches; (b) I can teach lessons that combine oral language, technology, and teaching approaches for young children; (c) I can teach lessons that combine vocabulary skills, technology, and teaching approaches. Two participants "*strongly agreed*", one participant "*agreed*", and two participants "*neither agreed or disagreed*" with the statement, (a) I can teach lessons that combine Mandarin Chinese, technology, and teaching approaches. Two participants "*strongly agreed*", two participants "*agreed*", and one participant "*neither agreed or disagreed*" with the statement; (b) I can teach lessons that combine oral language, technology, and teaching approaches for young children. One participant "*strongly agreed*", two participants "*agreed*", and two participants "*neither agreed or disagreed*" with the statement; (c) I can teach lessons that combine vocabulary skills, technology, and teaching approaches.

Theme 3: Challenges of Technology

All the teachers mentioned some challenges they experienced using technology for language learning in their classroom. Some teachers mentioned that they experienced limited technology at their school. For example, P5 stated that he had to use an older personal computer, a projector, and a laptop in his classroom. P5 frequently used the projector to project information onto the whiteboard. The computer and laptop were used infrequently because he did not have regular access to Mandarin Chinese software. He also complained that Wi-Fi at the school did not always work properly. P5 stated, "I had no access to majorly elaborate online software projects." He also mentioned that the

projector was better because he was able to save paper. Another challenge he experienced was making photocopies for all his students at the school. P5 was the only Mandarin Chinese teacher at his school. He taught 520 students from Kindergarten to 12th grade. Each class met with him once a week for Mandarin Chinese class. Since he had many students each week, he stated that his photocopy budget was limited. He stated, "It was better to use the projector to save paper because I was limited on the number of copies I could make."

Another teacher mentioned her challenges with technology when giving homework. P1 believes technology at home can help support language learning if parents do not speak the target language. Most of her weekly homework involved students practicing their listening and speaking skills by recording their voice on a voice recorder and saving it to a file and sending it to the teacher by email. P1 stated, "it is like a thousand of mails to check . . . it takes a lot of time to file those recordings." When asked if her young students have a hard time recording their voices, she replied, "Yes, because parents have to help them to upload the audio recordings. Sometimes parents do not know how to do it so I cannot review the homework."

P4 mentioned her challenges with technology during standardized assessments. P4 is a Mandarin Chinese language teacher at a dual immersion school. Her 3rd grade students are assessed in Mandarin Chinese each year through the AAPPL (ACTFL Assessment of Performance toward Proficiency in Language) test. She had difficulties administering the test to her students in the school's computer lab. she said, "Last year I had some computer technology problems I cannot fix so the district came to help. I didn't

understand how to do it cause some kids could not record their voice." She continued by stating, "I don't think I am very good at handling the computer or other technology so other teachers will come to help."

Although many teachers have mentioned technology is a beneficial tool in the classroom, P2 informed me that she must limit technology due to her student's behavior. P2 reported that her students love watching language videos. However, P2 said, "I cannot play a lot of videos because I think kids like videos too much, if I always play videos it makes them crazy." P2 collaborates with other teachers to assist her with strategies to alleviate the minor behavior issues during technology use.

P7 appears to enjoy using technology in her preschool class. She stated that she has a routine that involves Mandarin Chinese videos to introduce vocabulary, songs, and movement. However, P7 reported that some of her parents do not like the use of technology for young children. P7 said, "parents make it difficult…they say that the screen is not good for kids younger than six." She continued to state, "It's just a few minutes…I hope the parents can be open-minded."

P3 stated that her technology challenges involve limited space. She explained, "I do not have a classroom…our space is very limited. So instead of the students coming to a Chinese classroom, I go to their classroom, and teach in their classroom." P6's challenge is her class size. P6 said,

> I think my challenge is I think it's because the class size, I have 26 kids. It is challenging, you know less people, I need more teachers to be helping them. Each kid gets more attention. That will be helpful.

The TPACK questionnaire provided several questions related to technology and the teacher's experiences and perceptions of technology in the classroom. Most teachers agreed that their experience with technological content knowledge was proficient. However, one participant stated that he or she does not have experience using technologies for teaching early childhood learners. Two participants stated that they are not confident in providing technological resources that are developmentally appropriate for early childhood learners.

Research Question 2

The second research question was, "How do early childhood teachers perceive the use of instructional methods to teach Mandarin Chinese?" The following themes emerged from the data for research question two: *Movement enhances language learning, innovative language learning activities, early childhood language learning pedagogy, and managing student behavior to enhance learning.*

Theme 1: Movement Enhances Language Learning

In an early childhood language learning context, the teachers agreed that movement enhances language learning in the target language. P3 explained the importance of movement in language learning,

> My first language, my mother language is Chinese, but my second language, I went abroad to study, is French. At the time my French level was very bad when lived with this host family. So, I really experienced how important body language is when you are learning a foreign language. So I use it for my students and also before I started working in the school I helped babysit and I learned some idea of

> baby language and I realized how important it is when you speak a language and you add the gesture or some word or simple gesture that helps the younger learner to understand or to relate the sound to…if we are talking about children under 6, they can remember the first time and the second time when I do the same gesture. . . it is very powerful and the body movements.

P5 also incorporated dance and movement in his classroom. He stated, "song and movement was great when they were getting antsy we would get up and do a song like head, shoulders, knees, and toes. I did a lot of reviewing the words and specific vocabulary." P8 mentioned,

> We use songs, body movement like TPR-total physical response. So, kids can be mobilized when they are learning the language. For example, when I teach writing a character, I would ask them to use their finger to write in the air.

When asked how these methods enhanced learning, P8 responded, "I think it helps kids learn the language from using different senses like visual, audio, and physical movement, it helps them to remember better and sometimes understand better." P8 teaches Kindergarten and enjoys using forms of movement in her class. She believes movement helps with comprehension. When asked about movement enhancing language learning, P6 said, "I really think so. I definitely do because that helps them understand more instead of using language sometimes your body expresses the meaning of the word." P2 also incorporates movement in her 1st grade dual immersion class. P2 said, "we dance, we follow Chinese songs, we practice dancing, we can practice our movement like up, down, left, right, front, back."

Theme 2: Innovative Language Learning Activities

P1 teaches 3rd grade students at a dual immersion school. She enjoys introducing fun and innovative activities to promote learning. She uses Elmo projectors, videos, music, and recording devices in her classroom. She introduced Quizlet to her students as a language learning activity. P1 stated,

> We have quizlet. I introduced it and some students they don't know about quizlet and I show them what you can do and how they can play . . . I gave my students a list and one student made a quizlet for all the students. They like to play around and that is very interesting in learning. They say wow this is so fun.

P1 also mentioned that she teaches her students idioms. P1 stated,

> I teach Chinese idioms. I look on YouTube to see if there any interesting video about idioms or pictures to show them. So, idioms are little bit abstract, especially Chinese idioms so sometimes it is very hard for them to grasp the meaning at first but whenever I show them pictures or videos, they memorize in their mind clearly, that is very helpful. So, I teach character building, character education, and idioms to talk about their behavior, like being empathy and like being respectful.

P2 also introduces creative and innovative games in her classroom. P2 stated, "We play Jenga. Jenga it is the blocks, and they should say some sentences and they pick up the block and do it." P8 uses innovative techniques to teach Chinese character writing. Her activities are engaging and fun. P8 stated, "whenever we are learning a new character…we are writing with our finger in the air, writing with their heads or with their

butts and then they write on the whiteboard . . . we also write with a paintbrush." P4 stated, "I also teach my kids about Calligraphy. I will show the kids how to do it and the kids will follow and do it."

Theme 3: Early Childhood Language Learning Pedagogy

Many of the teachers mentioned that the children in an early childhood learning environment are not expected to understand and memorize the target language. Second language learning is a gradual process. The main aspect in second language learning pedagogy in early childhood is exposing the child to the language, making second language learning fun and engaging. Teachers explained how they promoted language learning in their early childhood classroom. P7 teaches preschool students and stated, "their attention span is 5 to 10 minutes." She continued, "I would rather younger age groups learn everyday stuff like how to ask direction, ask about the weather, request food, request clothes, like pick up daily verbs, starting with the most common verb they would use every day." P2 employs the use of games to get her first graders to understand the target language. P2 said, "I use games a lot cause children they remember language…they will learn more. P2 also stated,

> I like music. So, I play the guitar. I teach my students lots of songs like color songs and animal songs. It helps them memorize some sentences and some words because they are so young. If you teach them some songs, they can sing, and they can memorize which words they are using. It is helpful.

Instructional methods that are student-centered and age-appropriate can assist with the language learning process. P8 stated,

> Using different senses like visual, audio, and physical movement, it helps them to remember better and sometimes understand better. For example, when I am speaking a new word, I usually do action and incorporate that word and whenever I do that action, they relate it to the meaning of that word.

P8 continued by stating,

> I do all four skills whenever I introduce a new word. First, of course we focus on the listening and speaking, then they learn how to read it in Chinese characters, and then the final step they have to know how to write it.

P5 discussed some of the activities in his classroom. P5 said, "the younger ones are more oral and less written work . . . a lot of repetition. I do not do a lot of grammar. I focus on the vocabulary." P5 also mentioned the challenges of his Mandarin Chinese program. P5 said,

> When you are only seeing the students once a week it is an exposure program, not making significant advances, but the positive side is when and if those children study Chinese in the future they will have a real advantage.

P3 also mentioned early childhood language learning as an exposure program. P3 stated,

> Our school has two language teachers and we started this it is called exposure once a week to the younger age from 2 ½ to 5 years old. I read Chinese books and we sing and play games in Chinese.

The TPACK questionnaire provided additional information about pedagogical knowledge. Pedagogical knowledge focuses on the skill of teaching second language

learners. There were six key statements: (a) I have experience assessing student performance in a second language classroom, (b) I can adapt my teaching based upon what students understand or do not understand, (c) I can adapt my teaching style to different learners, (d) I can assess student learning in several ways, (e) I know how to use various teaching approaches in a second language classroom, (f) I know how to organize and maintain classroom management. Three participants stated that they "*strongly agreed*" that they have experience assessing student performance in a second language classroom. Two participants stated that they "*agreed*" with the statement above. Four participants "*strongly agreed*" that they can adapt their teaching based upon what students understand or do not understand. Whereas, one participant stated that they "*agreed*" with the statement. Four participants stated that they "*strongly agreed*" with the statement I can adapt their teaching style to different learners. One participant stated that they "*agreed*" with the statement. Three participants stated that they "*strongly agreed*" with the statement I know how to use various teaching approaches in a second language classroom. One participant "*agreed*" with the statement. One participant did not answer this statement.

Theme 4: Managing Student Behavior to Promote Language Learning

Classroom management helps to control students as well as help them learn. Managing student behavior to enhance learning is important for effective learning in early childhood. Teachers mentioned many strategies for classroom management, such as establishing routines, the use of engaging materials, and the use of classroom management technology tools in the classroom. P7 teaches Mandarin Chinese to

preschool children for 30 minutes each day. P7 mentioned that her students had a short attention span. P7 stated, “teaching a routine becomes very important.”

P8 stated, “we use Class Dojo to manage our classroom.” Class Dojo is a classroom management tool that allows teachers to manage student behavior. Class Dojo has a point system for good behavior. Teachers can add points or delete points based on the student’s behavior. Teachers can also share the tool with parents.

P4 stated, “I think this year sometimes they would just frustrate me because you know some days, they are really crazy, and they don’t really listen to teachers, they like to talk.” P4 mentioned that her class’ behavior prompt her to talk to other teachers to inquire about classroom management tools to manage behavior. After P4 collaborated with other teachers she stated,

> I give them 1 to 2 minutes to calm down, if they cannot be quiet, I will write one mark on the board, I use black pen to write on my board. If they have three points, they cannot have recess. They will be quiet very fast because they don’t want to lose their recess time.

P4 uses additional methods, such as an award system to control behavior in her classroom. P4 said, “They can get award tickets.” P4 explained that based on the number of awards collected during the week, the students receive incentives. For example, “they can use the teachers chair to sit . . . they can have lunch with the teacher.”

The instructional methods used, but not limited to were, interactive activities, movement, songs, role playing, and games. This finding revealed that all the teachers used several instructional methods to promote engagement and learning in their

classroom. P6, who teaches Kindergarten reflected on the instructional methods she used in the class and noted how she enjoys using different types of activities to help her students understand the language. It was P2's comment about her use of the game Jenga in her 1st grade classroom that sparked my interest in asking other teachers about innovative games and activities they introduce in the classroom.

P8 mentioned that she incorporates a lot of movement in her 1st grade class. She created games such as air writing, where students are encouraged to use their fingers and feet to recreate Chinese characters during writing lessons. In her 3rd grade class P1 has included instructional methods in writing as well; however, she is introducing the 5 paragraph essay to her students. When I asked if writing an essay of that magnitude was too difficult for her students, P1 responded, "It is not easy to be honest because it's their second language but if you give them this high expectation then of course they will try to reach your expectation." P4 also teaches 3rd grade.

P4 has incorporated instructional methods to teach Chinese culture to her students. She has used movement, songs, dance, and role playing to teach cultural and historical aspects of Chinese New Year. It is evident from the teacher's experiences that their implementation of game-based learning increased listening, speaking, and writing skills within the early childhood classroom. Research by Coyle and Gomez-Gracia (2014), Leśniewska and Pichette (2016), and Pan (2017) found that young children are motivated and engaged by the teacher's use of interactive games, songs, and stories when learning a second language.

The results of this study show the positive impact of implementing technology in an early childhood classroom. The teachers of this study expressed their desire to have Mandarin Chinese language learning technology and instructional methods that were representative of early childhood learners. One participant mentioned that there are more resources for teachers who teach Spanish to young learners than there are for teachers who teach Mandarin Chinese to young learners. It is implicated that an increase in resources to enhance language learning in Mandarin Chinese would be beneficial for teachers and students. Teachers found that instructional resources played a significant part in motivating and engaging young students into learning Mandarin Chinese as a second language. This would put Mandarin Chinese language teachers, administrators, and second language learning curriculum developers at an extreme advantage in providing best practices for young children in United States schools.

Summary

The purpose of this qualitative case study was to explore early childhood teachers' experiences and perceptions teaching Mandarin Chinese using TPACK. The research questions for this study are: What are the experiences of early childhood teachers integrating TPACK to teach Mandarin Chinese and how do early childhood teachers perceive the use of instructional methods to teach Mandarin Chinese? My objective was to identify and understand the experiences and perceptions teachers had while teaching Mandarin Chinese to early childhood learners.

Based on the first research question three themes emerged from the data: (a) supporting language learning through technology, (b) technology as a resource tool, (c)

challenges of technology. The themes related to the participants experiences incorporating technology in their classroom for early childhood language learners, the use of technology as a resource tool, and the challenges participants experienced with technology.

Four themes emerged from the second research question: (a) movement enhances language learning, (b) innovative language learning activities, (c) early childhood language learning pedagogy, and (d) managing student behavior to enhance learning. The aim of my study was to understand the experiences and perceptions of the participants who taught Mandarin Chinese to early childhood learners while using technological, pedagogical, content knowledge to promote second language learning.

In Chapter 5, I present the purpose of this research study and the interpretations of the findings. This information was compared to the literature review in Chapter 2. I discussed my experiences with this study's limitations. I explored recommendations for future research and provided implications for positive social change.

Chapter 5: Discussion, Conclusion, and Recommendations

Introduction

The purpose of this qualitative case study was to explore early childhood teachers' experiences and perceptions teaching Mandarin Chinese using TPACK. I based this study on the following research questions: What are the experiences of early childhood teachers integrating TPACK to teach Mandarin Chinese and How do early childhood teachers perceive the use of instructional methods to teach Mandarin Chinese? The population of this study was limited to Mandarin Chinese language teachers who use technology and innovative instructional methods to teach Mandarin Chinese to early childhood learners in preschool through 3rd grade. The use of a qualitative case study research design allowed me to gain an in-depth understanding of Mandarin Chinese language teacher's experiences and perceptions using technology and instructional methods to teach young children. A case study research approach was used to develop flexible and diverse sources of data collection.

During my literature review, I did not find empirical studies that specifically focused on early childhood learners learning Mandarin Chinese as a second language nor did I find studies that explored Mandarin Chinese language teachers' experiences and perceptions teaching early childhood learners. This qualitative case study has contributed to the existing literature on teaching and learning Mandarin Chinese as a second language by exploring teacher experiences and perceptions as they integrate technology, pedagogy, and content knowledge into an early childhood language learning environment.

The findings of this study were a result of eight semistructured interviews, a TPACK questionnaire, and a reflective journal entry. The data collected produced initial codes, which were developed into patterns and categories. The categories produced seven themes. Each theme was related to how teachers experienced and perceived the integration of technology, pedagogy, content knowledge, as well as age-appropriate instructional methods in a Mandarin Chinese language learning classroom for early childhood learners. The themes were connected to the conceptual framework presented in Chapter 2.

In this chapter, I will provide an interpretation of the findings by connecting the finding to the literature review and conceptual framework. I will explain the limitations and recommendations of the study. I will present implications for practice and provide a conclusion to the study.

Interpretation of the Findings

The results from this study presented the experiences and perceptions of teachers who used TPACK and innovative instruction in constructivist ways to promote learning in Mandarin Chinese for early childhood learners. The findings from this study extended the knowledge of how teachers experience and perceive the integration of technology and innovative instructional methods in a Mandarin Chinese language classroom for early childhood learners.

From this study, several themes emerged about how Mandarin Chinese language teachers conceptualized and implemented technology, pedagogy, and Mandarin Chinese content in their classroom. In the following subsections, I will provide an interpretation

of the findings related to the literature from Chapter 2. In addition, I will provide an analysis of the findings as they related to the conceptual framework, which included: (a) Vygotsky's (1978) sociocultural learning theory, (b) Schön's (1983) action theory, and (c) Koehler & Mishra's (2009) TPACK. As a result of this study, Bandura's (1997) theory of self-efficacy emerged to provide additional support to understand and identify teacher self-efficacy, technology acceptance, and teacher confidence while integrating TPACK.

Supporting language learning through technology

Teachers play a vital role integrating technology at the early childhood level (Lu et al., 2014). All teachers who participated in this study used technology to support language learning in their classroom. In this study the teachers used several types of technology to engage learners. Many teachers stated that they used Whiteboard, Elmo projectors, iPads, and Chromebooks in their classroom. The use of technology increased student engagement and motivation. Many teachers agreed that technology was useful and beneficial in supporting language learning because it increased student engagement and motivation, which increased the student's willingness to learn. For example, P1 mentioned that technology motivated her students. P6 stated that technology was more attractive to her students than books, papers, and pencils. The participants in Carver's (2016) study affirmed the notion that technology promoted engagement and increased motivation. Flewitt et al. (2015) found that their participants had positive attitudes toward technology use in the classroom. Their research confirmed that technology use increased engagement and motivation. Billington's (2016) study also confirmed that integrating

technology created positive outcomes for young learners. In a study conducted by Byker (2014), technology integration was considered a positive resource tool and offered many advantages to teaching and learning a second language.

Previous researchers discussed how the integration of technology supported language learning (Billington, 2016; Byker, 2014; Flewitt et al., 2015). Participants in this study used technology to incorporate interactive and engaging activities in their lessons. P2 stated that she incorporated technology using games, videos, and writing apps to engage her students. Billington (2016) found that students learned from technology if the teacher provided engaging activities and opportunities to interact with other students while using the technology. Second language learning is enhanced through the use of technology.

Challenges of technology

Preparing teachers for technology integration in an early childhood education setting can be challenging. An increase in technology presence in education has presented advantages and challenges in teaching and learning (Byker, 2014). I found several challenges of integrating technology in an early childhood second language learning classroom. Seven teachers stated they felt confident integrating technology in the classroom. However, one teacher stated she was not confident using technology and she had very little experience using technology to implement Mandarin Chinese learning resources.

One challenge I found in this study was the lack of technology in the curriculum. P3 explained that she limited technology use in her classroom due to the Montessori

curriculum, which restricts technology use with very young children in preschool through 3rd grade. She explained that play-based pedagogy was age-appropriate for young children as opposed to technology-based learning (Aldhafeeri, Palaiologou, & Folorunsho, 2016). P3's experiences and perspectives about technology were confirmed by Aldhafeeri, Palaiologou, and Folorunsho (2016), who found that Kindergarten teachers in Kuwaiti schools believed play-based pedagogy was more beneficial to young children than technology-based instruction. In Ludgate's (2015) study, preschool teachers believed that preschool children were too young for technology. However, this sentiment was not consistent with the other participants who welcomed the use of technology in their early childhood classroom.

Another challenge of technology was limited access. P5 stated that the lack of technology access limited his ability to teach effectively. P5 stated that his main technology resource tool was a projector. By limited the use of technology in the classroom, students and teachers do not have access to meaningful online resources. Nikolopoulou and Gialamas (2015) found that the lack of funding, technology, and support were many barriers teachers faced in their classroom. Teachers should have ample access to technology to facilitate student learning.

Other challenges of integrating technology in education were the lack of knowledge and teacher confidence. The lack of knowledge and confidence can hinder technology integration in the classroom. Teachers in this study who were not proficient or confident in technology had difficulties using technology in their classroom. P4 described her challenges using technology in the classroom. She discussed the lack of confidence in

providing resources for young children in a Mandarin Chinese language classroom. In addition, P4 gave a detailed account of a problem she encountered while using technology during a standardize test for her students. A study conducted by Scherer, Siddiq, and Tondeur (2019) supported the findings in this study. Their study linked the integration of technology to teacher acceptance, teacher attitudes, and teacher knowledge.

Self-efficacy. New information emerged from this study about self-efficacy and the integration of technology. It is necessary to explore teacher beliefs as it impacts their technology use. Bandura (1997) defined self-efficacy as "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (p. 3). In this study, seven teachers noted that their confidence in technology integration was strong. One teacher admitted that she did not have confidence in her technical skills, and it reflected in her ability to use technology in the classroom. Teachers who demonstrated a high level of TPACK in their questionnaire, had an increase in self-efficacy. This finding was evident in Nikolopoulou and Gialamas's (2015) study about teacher's perceptions of integrating computers in early childhood education.

Alharbi and Drew (2018) stated that there was a connection between self-efficacy and the development of TPACK, teacher education, and professional development. Therefore, teacher's self-efficacy beliefs about technology and their experiences using technology are significant in this study. Teachers who experienced effortless ways to implement new technology perceived technology as beneficial in their classroom (Nikolopoulou & Gialamas, 2015). Teachers need to believe that the technology they are implementing is meaningful and it will promote positive learning experiences. This was

consistent with the findings in a study conducted by Rahimi and Weisi (2018), who stated that teachers who reflected on their practice before and after a lesson experienced positive self-efficacy. Alharbi and Drew (2018) affirmed that technology skills and self-efficacy was linked to teacher confidence. The researchers believed that the teacher's ability to use technology-enhanced instructional activities to promote learning can hinder or support the learning process for both the teacher and the learner. In their study, Blackwell, Lauriella, and Wartella (2016) found that positive attitudes toward the value of technology increased the teacher's use of different types of digital technologies.

As researchers can attest, there is a relationship between self-efficacy and teacher knowledge (Byker, 2014; Nikolopoulou & Gialamas, 2015). It is evident that an increase in teacher knowledge would in turn increase self-efficacy. Research demonstrates that higher levels of support for teachers in TPACK develops self-confidence, self-efficacy in integrating technology (Byker, 2014).

Innovative pedagogy to enhance language learning

Young language learners can effectively learn a second language by participating in engaging and fun activities with teachers and fellow students. There are multiple studies that discuss teacher's experiences with innovative instructional pedagogy to enhance second language learning (Bankovic & Sollars, 2017; Chou, 2014; Khorasgani & Khanehgir, 2017; Leśniewska & Pichette, 2016; Prosic-Santovac, 2016; Tirtayani, Magta, & Lestari, 2017). The results of this study addressed teacher's experiences and perceptions integrating innovative instructional pedagogy that aligned with the literature. Participants in this study indicated that they used innovative instructional methods daily

to teach Mandarin Chinese. The participants expressed the importance of introducing age-appropriate, fun, and engaging activities in their lesson plans to promote second language learning in an early childhood setting.

The participants discussed that many of their instructional activities were teacher-created and involved songs, movement, stories, and games. For example, P8 stated that she used movement along with visual and audio cues to promote learning. This was reflective of the previous research on integrating certain instructional methods in a second language learning classroom for young learners. Chou (2014), as well as Leśniewska and Pichette (2016) discussed how the teachers used songs, stories, and games to increase vocabulary development for young second language learners. The participants in my study recognized the value and importance of integrating instructional activities such as songs, stories, movement, and games to effectively teach Mandarin Chinese to early childhood learners. For example, P2 used the game Jenga to promote oral language skills in Mandarin Chinese. During this game, students who created meaningful sentences in Mandarin were able to use a block to build a tower.

Another concept related to the integration of instructional methods and activities was the student's age. The participants in this study varied on how they incorporated songs and stories for different age groups. Many participants in this study used more songs with younger early childhood learners and stories with older noticed a difference in the children's ability to learn and retain new vocabulary through songs and stories. The result of my study confirmed Albaladejo et al.'s (2018) study in which teachers were able to increase student vocabulary development by reading aloud stories. The read alouds

gave students the opportunity to understand and process the words. Although songs engage children in fun, rhythmic activities, songs also involve memorization and word recall. Interacting with songs did not require a deeper understanding of vocabulary. As a result, the use of stories enhanced literacy, vocabulary development, and comprehension. Stories in second language learning expand listening and comprehension skills, which is consistent with the input hypothesis.

Young language learners can effectively learn a second language by participating in engaging and fun activities with teachers and fellow students. There is extensive research on music and songs facilitating second language development in the early childhood classroom. Participants who used movement such as TPR and gestures in their classroom experienced an enhancement of their lessons. P3 informed me that she spoke three different languages: Mandarin Chinese, French, and English. P3's awareness of her own challenges learning a second language was evident in her discussions about the complexities of second language learning and her experiences in the classroom. Her awareness demonstrated that language learning involved more than the regurgitation of new words, but the combination of words and movement increased language development and vocabulary retention (Al Harrasi, 2014), as well as the value of gestures to promote second language development (Mavilidi et al., 2015; Rowe, Silverman, & Mullan, 2013). This corroborates Fahrurrozi's (2017) findings who noted that teachers who combined movement with new vocabulary increased vocabulary skills for second language learners.

Interpretation in Context of the Conceptual Framework

The findings of this qualitative case study aligned with the conceptual framework. The conceptual theories that guided my study were (a) Vygotsky's (1978) sociocultural learning theory, (b) Schön's (1983) action theory, and (c) Koehler & Mishra's (2009) TPACK. These theories were used to understand teacher experiences and perceptions as they related to the use of technology, pedagogy, content knowledge, and instructional methods. For this study, two research questions explored the participant's experiences and perceptions integrating technology, pedagogy, and content knowledge while teaching Mandarin Chinese in an early childhood learning environment. The interviews, reflective journals, and TPACK questionnaire served as a catalyst for codes, patterns, and themes to emerge from the data. Overall, the results of this study demonstrated that teachers viewed the use of technology and instructional methods as effective instructional tools in a Mandarin Chinese language learning environment. The results from the data assisted in the understanding of teacher experiences and perceptions implementing technology and instructional methods to promote language learning.

Technological Content Knowledge

The first research question, "What are the experiences of early childhood teachers integrating technological pedagogical content knowledge (TPACK) to teach Mandarin Chinese" explored the teacher's experiences with technology, pedagogy, and content knowledge. The themes from question one were: Supporting language learning through technology, technology as a resource tool, and challenges of technology. These themes were related to the concept of technological content knowledge (Koehler & Mishra, 2009). The findings from the interviews revealed that integrating technology had a

positive impact in a Mandarin Chinese language learning environment for young learners. Technological resources such as iPads, projectors, laptops, and smartboards were used by the teachers to engage students in songs, videos, movement, and games. The teachers in this study combined technology, pedagogy, and content in their classroom to created student-centered language learning environments that focused on socialization, interactive learning, and cognitive development skills (Rahardjo, 2016). However, based on the responses to the questionnaire, it was evident that the teacher's technological knowledge was average. The teachers required more technological resources for both early childhood learners and Mandarin Chinese instruction to encourage students to learn the target language. Effective technological resources are essential in a language learning classroom to increase engagement, motivation, and learning (Isler & Yildirim, 2018).

Another key finding is teacher's negative experiences with technology. Although many teachers expressed the positive impact of technology, a few teachers had negative experiences with outdated technology, a lack of innovative technology materials, and technology that did not work. P5's experiences with technology was striking to me. He had limited technology and no access to good online software projects. He expressed that his school had very little money and the Chinese language program was not the school's top priority. This deficit created a difficult teaching experience; however, he created innovative resources through instructional materials to promote learning. According to Koehler and Mishra (2009), negative experience with technology can reduce the effectiveness of the teaching. This research is supported by Ahmad (2016) who found that the use of technology outweighed the benefits of traditional based learning in a

language learning classroom. In addition, Lu, Meng, and Tam (2014) found that technology enhances language learning outcomes.

In P3's case, her school followed the Montessori curriculum. She explained that technology was nonexistent in the preschool and kindergarten classes. She continued to explain that the Montessori curriculum focused on the cognitive and physical development of young learners. In her school the Mandarin Chinese language program was deemed an exposure program for young learners. Students were introduced to basic Mandarin Chinese through interactive instructional materials. Although P3 was able to introduce technology to her 3rd grade learners, the technology resources were limited to laptops and word documents. P7 enjoyed introducing Mandarin Chinese videos to her preschool class; however, she experienced problems with parents who did not want their child(ren) exposed to computer screens. The parents were concerned that too much screen time will be a detriment to the child's brain functioning.

Pedagogical Content Knowledge

The key findings for the second research question, how do early childhood teachers perceive the use of instructional methods to teach Mandarin Chinese". The themes for research question 2 were: The following themes emerged from the data for research question two: *Movement enhances language learning, innovative language learning activities, early childhood language learning pedagogy, and managing student behavior to enhance learning.* The themes focused on the teacher's experiences and perceptions using instructional methods to teach Mandarin Chinese in an early childhood environment. Results from this study, found that the teachers supported learning through

an interactive social environment (Vygotsky, 1978). These findings are related to Vygotsky's (1978) sociocultural learning theory by promoting social interactions between teachers and students, and students and their peers. As the literature review demonstrates, sociocultural learning theory produced social contexts of language learning.

This was evident in P3's experiences with her students outside of the classroom. P3 mentioned that her students practiced speaking Mandarin Chinese during lunch breaks and recess. Social interaction was also noticed in P4's classroom. Her 3rd grade class spends a lot of time learning Mandarin Chinese vocabulary. P4 mentioned how repetition can be boring and it is important to, "make it fun." Her class participated in vocabulary games as a social activity to increase language learning. It was mentioned by Mondahl and Razmerita (2014) that social interactions increased student language learning abilities. The teachers noticed that the introduction of multi-media games and social activity promote cognitive development in Mandarin Chinese for young learners.

Teacher Beliefs and Innovation

The teachers in this study had the opportunity to reflect on their experiences and perceptions related to TPACK. Drawing on Schön's (1983) action theory, teachers reflected on their teaching practice and how this reflection improved the way they thought and acted on pedagogical knowledge and knowledge of content. Schön (1983) described reflection-in- action as an activity that encouraged the professional to think, understand, and problem solve after completing a task. This study revealed that most of the teachers reflected on their classroom management skills. This reflection is a self-

examination of how the teachers experienced behavior problems and difficulties in the classroom that prevented them from teaching Mandarin Chinese.

One noted difficulty in the classroom was cultural dissonance. Most of the teachers in this study were of Asian descent. The teachers expressed how they had to address cultural differences in their teaching practices and interactions with children. For example, a teacher explained that a young child was crying on the playground. She did not embrace or cuddle the child to stop crying. After reflecting on the incident, the teacher stated that she should have embraced the child while saying, "everything will be ok". In her study, Samuels (2018) discussed teacher's ability to facilitate culturally responsive teaching. It is evident by the teacher's exchange with the young child, that culturally responsive teaching does not only occur in the classroom, but in all facets of teacher and child interactions. The teachers in this study realized that they needed to modify their teaching style to accommodate young learners.

Collaboration

Teacher experiences in classroom management led them to collaborate with experienced teachers to revamp their practices within the classroom. The main tenet of Schön's (1983) theory is to reflect on your practices to apply new knowledge to improve professional practice. In this study, Schön's action theory indicated that reflected experiences can impact teacher growth and development (Dervent, 2015). Russell (2008) stated reflection is needed to support teacher implementation and change. Teachers in this study who worked in dual immersion schools discussed their positive experiences

collaborating with their co-teacher. Collaboration increased their understanding of second language pedagogy.

Limitations of the Study

The teachers in this study were selected based on three criteria: The participants will be Mandarin Chinese language teachers. The participants will have at least one or more years of in-service teaching experience. The participants must have experience teaching young children between the ages of preschool through 3rd grade. Therefore, teachers who taught elementary school from 4th grade through eighth grade, teachers who taught high school, and college professors in higher education were excluded from this study if they did not teach or have recently taught Mandarin Chinese to early childhood learners. Based on the criteria, one limitation was a small sample size. This study was conducted with eight participants. The participants were not represented of all Mandarin Chinese language teachers in all levels. Thus, this study was limited to the experiences and perceptions of the eight participants. This study could not be generalized to a larger population of Mandarin Chinese language teachers.

Another limitation of the study was diversity. Seven of the eight teachers were female and of Chinese or Taiwanese origin. One teacher in this study was a White American male. Although race and ethnicity were not a criterion in this study, the inclusion of a diverse gender and race population was very limited. However, the inclusion of a diverse teacher population would be beneficial and useful in understanding the experiences and perceptions of male and female Mandarin Chinese teachers and well as Mandarin Chinese teachers who are not native of China or Taiwan.

Recommendations

The purpose of this qualitative case study was to explore early childhood teachers' experiences and perceptions teaching Mandarin Chinese using technology, pedagogy, and content knowledge (TPACK). Based on my extensive literature review, research into Mandarin Chinese as a second language is limited. Even more so, research about Mandarin Chinese as a second language in early childhood education is extremely limited. It is apparent that further research on teaching and learning Mandarin Chinese as second language in early childhood education is needed.

The recommendations for further research stemmed from the strengths and limitations of this study. Although the study included teachers from various U.S. cities in North America, it was limited to the experiences and perceptions of the eight participants who consented to participate in this study. Further research with a larger and diverse population of Mandarin Chinese language teachers would be helpful in providing a greater insight into teacher experiences related to the use of technology and instructional methods in an early childhood language learning classroom.

Another recommendation for further research would be to conduct a longitudinal mixed-methods research study. A longitudinal study relating to Mandarin Chinese language learning in a dual immersion school that includes quantitative and qualitative data to assess student growth and performance using benchmark assessments, classroom observations, and teacher and student interviews would be a great opportunity to examine the impact and influence of learning Mandarin Chinese over a long period of time.

Implications

As our global society increases with immigration, international security, and foreign economic advancements, there is a strong demand for second language learning skills. Research has demonstrated that learning a second language has positive impacts on academic and cognitive development (Bialystok, 2017; Li, Sisson, & Kung, 2014). It is implicated that children who learn a second language can develop various skills such as creative thinking skills, problem solving skills, and global and cultural awareness. The implications for positive social change derived from the discussions with the eight participants. It was demonstrated by all teachers in this study that their students were not only learning how to build listening and speaking skills in Mandarin Chinese, but also learning the cultural aspects of China and the people of China. Therefore, the role in the United States educational system must advocate for second language learning opportunities in grades as low as preschool so children can acquire the benefits of bilingualism, second language acquisition, or second language exposure (Harvey & Silva, 2018).

The demand for Mandarin Chinese language learning teachers is increasing in the U.S. Teachers who desire to teach Mandarin Chinese as a second language need to attend a formal teaching preparation program in order to teach in U.S. schools. Most of the teachers in this study informed me that their teacher training was provided by universities in China or Taiwan. Two teachers stated that they received training in teaching Mandarin Chinese as a second language in the United States. The professional development and growth of pre-service and in-service Mandarin Chinese language teachers is important

because it expands the landscape of Mandarin Chinese as a second language in the United States (Harvey & Silva, 2018). It is important to perform an examination of Mandarin Chinese as a second language teacher training programs in the United States, as well as provide support for Mandarin Chinese language teachers through professional development and teacher evaluation. In addition, preparing teachers for the use of technology is best to better serve their students. Mandarin Chinese language teachers should learn best practices for second language instruction and pedagogy through formal teacher preparation programs.

Recommendations for Practice

In this study, the teachers shared their experiences and perceptions with TPACK and other instructional methods that they use in their Mandarin Chinese language learning classroom for early childhood learners. The teachers reported that technology had a positive impact on language learning; however, more technological and pedagogical resources are needed to prepare lessons and activities for young learners. The need for age-appropriate language learning materials are essential for these teachers and their colleagues. A recommendation for practice would be the creation of software, apps, and other instructional materials that are specifically for young English-speakers who are learning Mandarin Chinese as a second language.

Conclusion

Mandarin Chinese as a second language has increased in popularity in American schools. Although most institutions offer Mandarin Chinese in high school and college, some schools have offered Mandarin Chinese as early as preschool. With that said,

second language curricula in early childhood pedagogy was crucial in understanding how children learn languages. Throughout the years, this change affected second language teacher preparation programs, second language curriculum, and second language teacher population in the United States. As a result, the role of the second language teacher has changed. Second language teachers have replaced rote memory skills and vocabulary drills with interactive learning, socialization, and purposeful language learning tasks (Huhn, 2012).

In this study, the participants shared their perspectives about their experiences and perceptions implementing technology, pedagogy, content knowledge, and the use of instructional methods in a Mandarin Chinese language learning classroom with early childhood learners. This study exhibited the commonalities among the teacher's experiences and perceptions implementing technology and instructional methods to teach Mandarin Chinese to early childhood learners. This study also revealed the challenges Mandarin Chinese language teachers faced navigating the complexities of the American education system.

The findings of this study suggested that the Mandarin Chinese language teachers who taught Mandarin Chinese to early childhood learners experienced and perceived positive outcomes using technology and innovative instructional methods in the classroom. However, Mandarin Chinese language specific resources were limited in early childhood. Teachers engaged in creating their own games, activities, and songs to increase their effectiveness in the classroom. In addition, the TPACK questionnaire allowed the teachers to reflect on their experiences integrating technology, pedagogy, and

Mandarin Chinese content. Based on the overall responses from the TPACK questionnaire, the teacher's responses matched the interview data and reflective journals.

Looking at TPACK through a conceptual framework lens, it is evident that teachers need a moderate to high level of technological, pedagogical, content knowledge to be effective in the classroom. By implementing TPACK and other innovative instructional methods, teachers have provided students with unlimited opportunities to be active participants in the second language learning classroom. This conceptual framework also assessed the teacher's experiences and beliefs in self-efficacy and self-confidence. The findings of this study can contribute to social change by developing age-appropriate technology and instructional resources for early childhood language learners to develop effective early literacy programs for American students in English.

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Appendix A: Interview Questions

1. Explain your role as a Mandarin Chinese language teacher in an early childhood classroom?
2. Describe how you use technology (i.e. SmartBoard, iPads, tablets, laptops, etc) in your lessons for early childhood learners?
3. Reflect on your experiences with technology in the classroom, what positive experiences have you had integrating technology in your classroom? What difficulties have you experienced with the integration technology?
4. How do you perceive the integration of technology as a second language learning tool in early childhood?
5. Reflect on your experiences with TPACK, how have your experiences with TPACK influenced your decision making in the classroom?
6. Reflect on your experiences with TPACK, how have your experiences with TPACK influenced your instruction within the classroom?
7. Overall, do you think technology acts as a positive learning tool in the early childhood classroom? Why?
8. What instructional methods (i.e. songs, movement, TPR, games, etc) do you employ in the classroom for early childhood learners?
9. How do these instructional methods enhance Mandarin Chinese in an early childhood classroom?

10. Reflect on your experiences with instructional methods, what positive experiences do you have using these instructional methods in your classroom? What difficulties have you experienced with the integration of instructional methods?
11. What other experiences and perceptions with technology integration and instructional methods would you like to discuss as it pertains to the teaching of Mandarin Chinese in an early childhood classroom?

Appendix B: TPACK Questionnaire Results

TPACK Questionnaire	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
TK (Technology Knowledge)					
I know how to solve my own technical problems.		3	3		
2. I can learn technology easily.		5		1	
3. I keep up with important new technologies.		4	2		
4. I have experience with a lot of different technologies.		2	3	1	
I feel confident using technology.		3	3		
CK (Content Knowledge)					
Chinese as a second language					
I have sufficient knowledge about Mandarin Chinese	5	1			
I have various ways and strategies of developing my understanding of Chinese as a second language.	5	1			
I have sufficient knowledge about Chinese as a second language	4	2			
have various methods and strategies of developing a student's understanding of Chinese as a second language.	5	1			
I perceive my methods and strategies will increase students' learning in Chinese as a second language.	5	1			
PK (Pedagogical Knowledge)					
I have experience assessing student performance in a second language classroom.	3	3			
I can adapt my teaching based-upon what students currently understand or do not understand.	4	2			

I can adapt my teaching style to different learners.	4	2			
I can assess student learning in several ways.	3	3			
I know how to use various teaching approaches in a second language classroom	3	2			
I know how to organize and maintain classroom management.	2	4			
PCK (Pedagogical Content Knowledge)					
I can select effective teaching approaches to guide student thinking and learning in Mandarin Chinese.	4	2			
I am confident in my understanding of effective teaching approaches for early childhood learners.	2	4			
TCK (Technological Content Knowledge)					
I have experience using technology that I can use for teaching children to speak Mandarin Chinese.		4	2		
I have experience using technologies that I can use for Mandarin Chinese literacy (i.e. bo po mo fo)	1	4		1	
I have experience using technologies for teaching early childhood learners.	1	4			1
I am confident that I can provide technological resources that are development appropriate for early childhood learners	1	4		1	
TPK (Technological Pedagogical Knowledge)					
I can choose technologies that enhance the teaching approaches for a lesson.	1	3	2		
I can choose technologies that enhance student learning during a lesson.	1	3	2		
I am thinking critically about how I use technology in my classroom.	1	5			
I can select technologies to use in my classroom that enhance what I teach, how I teach, and what students learn.	1	5			

I can use strategies that combine content, technologies, and teaching approaches.	1	5			
I can choose technologies that enhance the content for a lesson.	1	5			
PACK)Technological Pedagogical Content Knowledge					
I can teach lessons that combine Mandarin Chinese, technology, and teaching approaches.	2	2	2		
I can teach lessons that combine oral language, technology, and teaching approaches for young children.	2	3	1		
I can teach lessons that combine vocabulary skills, technology, and teaching approaches.	1	3	2		