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Perceptions of Missouri Public School Early Childhood Teachers and Administrators in Regard to Technology and Current Practices

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by

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Declaration of Originality

I do hereby declare and attest to the fact that this is an original study based solely upon my own scholarly work at Lindenwood University and that I have not submitted it for any other college or university course or degree.

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Abstract

The purpose of this study was to identify the perceptions of Missouri public school early childhood teachers and administrators in regard to technology and current practices. If educators have not analyzed their current perceptions regarding technology, they may not use developmentally appropriate technology practices with students (Dietze & Kashin, 2013). According to Anderkin (2015), the position statement from the National Association for the Education of Young Children and the Fred Rogers Center for Early Learning offers guidance for developmentally appropriate technology practices in early childhood. Participants in this study were asked interview questions to determine their perceptions of technology in early childhood classrooms. The interview questions were also utilized to identify what teaching strategies were currently being used when implementing technology and the perceptions of early childhood educators in terms of professional development regarding technology in early childhood. High-quality professional development opportunities for early childhood educators play a role in developmentally appropriate technology integration (White, 2015). The sample group for the study included nine Missouri Preschool Program (MPP) teachers affiliated with public schools in southwest Missouri and nine administrators affiliated with public schools in southwest Missouri with a minimum of one MPP classroom. Results from this study indicated most early childhood educators are in favor of technology in the classroom in moderation. Both teachers and administrators reported a lack of professional development opportunities specific to implementation of technology in early childhood.

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Chapter One: Introduction

It is the pedagogical belief of early childhood educators to place an emphasis on the "learning of socio-emotional skills, and [early childhood educators] reported that they carry out practices where children have an active role in their learning" (Mertala, 2017, p. 1). Active learning in early childhood classrooms is carried out through the utilization play. (Wong & Logan, 2016). According to Kweon and Kim (2016), play is "…thought to be critical in [early childhood] developmental theories" (p. 1). Early childhood play based theories are based on the works of Froebel, Dewey, Montessori, Vygotsky, and Piaget (Dietze & Kashin, 2013).

Today, "technology tools—including tablets, smartphones, e-books, interactive whiteboards, and other tools" surround even the youngest of children (Blackwell, Wartella, Lauricella, & Robb, 2015, p. 2). Plowman (2016) stated, "During the period up to the age of entry to formal education, little distinction is made between the technologies that are dedicated to learning and those that children use for playful purposes" (p. 2). An, Alon, and Fuentes (2014) noted, since the 1980s, technology has increased and changed dramatically and has created the need to integrate technology into early childhood curriculum. Some research suggests technology is not appropriate in early childhood education as it does not provide children with hands-on experiences, yet children often come into early childhood classrooms already familiar with advanced technology (Davidson, Given, Danby, & Thorpe, 2014).

Hsin, Li, and Tsai (2014) explained, "Because of the rapid development of technologies, they have changed children's lives and ways of learning, particularly in the past ten years" (p. 85). The National Association for Education of Young Children

(NAEYC) (2012) and the Fred Rogers Center for Early Learning offered guidance to early childhood educators through a position statement: "Technology and interactive media are tools that can promote effective learning and development when they are used intentionally by early childhood educators, within the framework of developmentally appropriate practice to support learning goals established for individual children" (p. 5). Despite information promoting technology, some early childhood educators still struggle with integrating technology with current pedagogy (Dietze & Kashin, 2013).

This chapter includes the background and purpose of a study designed to focus on teacher perceptions of technology in early childhood classrooms. The theoretical framework is established, along with the research questions which guided the study. Additionally, relevant terms are identified and defined, followed by the limitations and assumptions.

Background of the Study

According to DeGraff (2014), the term digital native describes a child who was born and grew up during a time when technology surrounded them. Children today are digital natives entering schools, even as early as preschool, with exposure to searches, video chats, and programmed toys (Stephen & Plowman, 2014). Anderkin (2015) stated, "[The] belief in an affinity between young children and technology reflected in the widespread use of the term 'digital natives' should also be treated with caution" (p. 4). Sanders, Parent, Forehand, and Breslend (2016) explained, "The increasing adoption of these devices has contributed to a rapid rise in screen time exposure for children" (p. 1). The educational benefits of technology with early childhood students have not been sufficiently substantiated (Chassiakos, Radesky, Christakis, Moreno, & Cross, 2016).

For the past two decades, the American Academy of Pediatrics (AAP) (2015) advised families to limit the amount of time children spend on media and technology.

As technology in the lives of early childhood students continues to proliferate, educators are talking about the possibility of integrating technology into the classroom (Dennis, 2016). The NAEYC (2012) emphasized, "With guidance, these various technology tools can be harnessed for learning and development; without guidance, usage can be inappropriate and/or interfere with learning and development" (p. 2). According to Cameron (2015), even though data support the use of technology in early childhood, educators still limit the use of it, or use it in ways contrary to best practice. It has been suggested technology integration is the first addition to the categories of play since before the 20th century (Dietze & Kashin, 2013).

Theoretical Framework

The theoretical framework for the proposed study, interpretivism, is a result of "cultural anthropology in the early twentieth century" (Butin, 2009, p. 60). An interpretivist researcher essentially "documents the perspective being investigated" (Butin, 2009, p. 60). Taylor and Medina (2013) determined when "applied to educational research, this paradigm enables researchers to build rich local understandings of the life-world experiences of teachers and students and of the cultures of classrooms, schools, and the communities they serve" (p. 4). Butin (2009) explained an interpretivist "does not attempt to adjudicate between competing truth claims in order to determine the one best answer; rather interpretivism suggests that all one can do is accurately and thoroughly document the perspective being investigated" (p. 60). Identification of common themes within the research is the intent of an interpretivist (Butin, 2009).

Throughout this study, parallels were drawn to interpretivism through teacher perspectives on the use of technology with early childhood students. In addition, current technology implementation strategies of early childhood teachers were investigated and compared to current recommendations of best practices. Data were collected through interviews completed with early childhood educators currently teaching in public school settings. The NAEYC (2012) stated, "Young children live in a world of interactive media. They are growing up at ease with digital devices that are rapidly becoming the tools of the culture at home, at school, at work, and in the community" (p. 2). Technology is no longer a thing of the past; "technology and interactive media are here to stay" (NAEYC, 2012, p. 2).

In addition to technology becoming ubiquitous, the accessibility for children to interact with technology continues to increase as well (Lauricella, Blackwell, & Wartella, 2017). According to Johnston (2014), "Today's young children live in a technology-driven society" (p. 3). Technology options in the educational setting are increasing (Tsai, Shen, Center, & Chiang, 2014). Early childhood pedagogy focuses on developmentally appropriate strategies, yet the "notion of developmentally appropriate technology is contested as it is rooted in a Piagetian model of development" (Plowman, 2016, p. 3). Technology does not always align with this pedagogy, and Kweon and Kim (2016) emphasized play as a crucial component in early childhood education. Research has shown early childhood students can benefit from technology integration to build on their learning (Dietze & Kashin, 2013).

Blackwell, Lauricella, and Wartella (2014) stated, "Despite the excitement around technology, some school leaders and policymakers may fail to recognize that technology

in and of itself may not have the inherent power to change teaching and learning practices" (p. 82). The NAEYC (2012) reported early childhood teachers need resources to apply developmentally appropriate technology practices. White (2015) reported a lack of information available on how early childhood teachers perceive and use technology within their classrooms, or if developmentally appropriate technology practices are utilized. Blackwell et al. (2014) indicated the lack of professional development is a barrier for implementation of developmentally appropriate technology.

Statement of the Problem

Technology is all around; even the youngest members of society have access to various modes of technology and are entering schools as digital natives (Bittman, Rutherford, Brown, & Unsworth, 2011). Traditionally, early childhood education has been focused on building student skills through play and hands-on investigative learning (Gerde, Schachter, & Wasik, 2013). When implemented in developmentally appropriate ways, early childhood students can benefit from technology integration (Dietze & Kashin, 2013).

The NAEYC (2012) reported early childhood teachers need resources to apply developmentally appropriate technology practices. According to Butin (2009), "There is clearly a need for more research into literacy and technology for this age group, particularly for the youngest children, and to investigate children's use of a wider range of digital technologies" (p. 10). Early childhood teachers need more information regarding best practices for integrating technology into early childhood classrooms (Önkol, Zembat, & Balat, 2011).

Purpose of the Study

The purpose of this study was to determine the perceptions of Missouri public school early childhood teachers and administrators regarding technology and current instructional practices. If educators have not analyzed their current perceptions regarding technology, they may not use developmentally appropriate technology practices with students (Dietze & Kashin, 2013). Davidson et al. (2014) acknowledged early childhood teachers play a significant role in scaffolding student use of technology to enhance learning, yet there is "limited attention given by preschool educators to digital technology" (p. 2).

Blackwell et al. (2015) stated, "Many educators receive new technologies with little training or support and are expected to know how to use them effectively" (p. 2). There is limited information available on how early childhood teachers perceive and use technology within their classrooms, or if developmentally appropriate technology practices are utilized (White, 2015). This study can serve as a resource for administrators who wish to design relevant professional development for early childhood teachers to implement developmentally appropriate technology practices.

Research questions. The following research questions guided the study:

1. What are early childhood teacher and administrator perceptions about using technology in early childhood classrooms?

2. What strategies are Missouri early childhood teachers using to implement technology in classrooms?

3. How do Missouri early childhood teachers and administrators identify best-practice strategies to implement technology?

4. What are teacher and administrator perceptions of professional development regarding technology in early childhood?

Significance of Study

Early childhood educators currently debate the appropriateness of technology in early childhood classrooms (Lentz, Seo, & Gruner, 2014). Based on the works of Froebel, Dewey, Montessori, Vygotsky, and Piaget, best practices in early childhood education have traditionally focused on children constructing knowledge through hands-on, play-based curriculum facilitated by teachers (Dietze & Kashin, 2013). Times are changing, and children today are entering schools, even at the early childhood level, with different skills than previous generations due to their technology-immersed lives (Jorgensen & Logan, 2015).

Early childhood students have a desire to interact with technology; when teachers are not knowledgeable of developmentally appropriate practices, inappropriate usage may be the result (NAEYC, 2012). Edwards, Nuttall, Mantilla, Wood, and Grieshaber (2015) recommended educators examine technology integration "…and seek to understand how these aspects intersect with the traditional pedagogical approaches" (p. 70). Recognizing the perceptions of early childhood educators regarding technology, and then taking necessary measures to transform negative attitudes to positive, will aid in ensuring best technology practices are incorporated in early childhood classrooms (Önkol et al., 2011).

Definition of Key Terms

Terms specific to this study are defined:

Administrator. The term administrator refers a school leader who "is responsible for the goal setting, encouraging teacher participation in decision making,

ensuring a healthy and orderly school climate and ensuring that the desired student outcomes are met" (Shakeel & DeAngelis, 2016, p. 5). Included in this term are principals, directors, and coordinators who oversee a minimum of one Missouri Preschool Program (MPP) classroom.

Developmentally appropriate practices. Developmentally appropriate practices (DAP) "is a term used by many early childhood educators to describe shared experiences that reflect and respond to the typical needs and interests common to children of that chronological age" (Goldstein, 2015, pp. 11-12).

Developmentally appropriate technology. According to the NAEYC (2012), developmentally appropriate technology includes media and technology tools used to encourage collaboration and a child's inherent interest to create knowledge. Developmentally appropriate technology is utilized in research-based intervals spanning across curriculum and encourages and allows for self-expression, collaboration, and inquiry-based learning (More & Travers, 2013).

Early childhood. Early childhood refers to children birth to age eight (NAEYC, 2012). This current study focused on children ages three to five years old.

Interactive technology. Interactive technology refers to devices and digital materials including desktop computers, digital cameras, SMARTboards, tablets, smartphones, software programs, applications (apps), e-books, the Internet, and other tools utilized in an instructional activity to increase engagement, creativity, and social interaction (NAEYC, 2012).

Limitations and Assumptions

The following limitations were identified in this study:

Instrument. The study involved original survey and interview questions. Interview consent was purely voluntary for this study. Participants' answers varied in detail and length.

Sample demographics. Purposeful sampling was utilized for this study. A limitation of purposeful sampling "is that it limits the number and type of inferential statistics that are available to analyze the data" (Haegele & Hodge, 2015, p. 70). The sample encompassed only selected educators (administrators and MPP teachers) within school districts in southwest Missouri which also have been awarded the MPP grant. The selected schools may not be representative of all districts in southwest Missouri or other regions of the state. Also, the schools included in the interviews had a range of grade configurations within buildings.

Assumptions. The following assumptions were accepted:

1. The responses of the participants were offered honestly and without bias.
2. The participants answered questions based upon their experiences.
3. The researcher remained unbiased throughout the data collection, analysis, and reporting of the results.

Summary

The NAEYC (2012) and the Fred Rogers Center for Early Learning and Children's Media explained, "Children's experiences with technology and interactive media are increasingly part of the context of their lives, which must be considered as part of the developmentally appropriate framework" (p. 5). Using the theory of nterpretivism as a framework, early childhood teachers and administrators in Missouri public schools were interviewed regarding their perceptions and current practices of technology

integration in early childhood classrooms. The data were analyzed to determine if best practices are currently being used.

The next chapter includes a review of literature on the topic of technology in early childhood classrooms. The literature review is focused on traditional early childhood pedagogy, current recommendations for technology usage, advantages of technology in the classroom, professional development, and research-based best practices for utilizing technology in early childhood classrooms. Chapter Two also includes a closer look at the theoretical framework and how interpretivism was linked to this study.

Chapter Two: Review of Literature

Society has seen a dramatic change in recent years regarding the use of technology, spurring a debate about whether technology is beneficial or harmful to early childhood students (Nikolopoulou & Gialamas, 2015b). Early childhood pedagogy has seen minimal change as the focus has remained for professionals to "implement play-based experiences with the children in early learning programs" (Dietze & Kashin, 2013, p. 2). Recent studies have shown technology, when used correctly, is valuable to early childhood students (NAEYC, 2012). The essential focus of this study was on the perceptions of Missouri public school early childhood teachers and administrators in regard to technology and current practices.

The literature reviewed for this study is divided into five categories. These categories are focused on early childhood pedagogy, the benefits and concerns of technology in early childhood, recommendations for developmentally appropriate implementation, barriers to developmentally appropriate implementation, and professional development opportunities for early childhood educators. Each section includes findings from experts and theorists in the field of early childhood education.

The literature review provides in-depth knowledge of technology in an early childhood setting. Early childhood pedagogy and recommendations for implementation are compared and contrasted. The literature review guided the study and analysis of practices currently used by Missouri public school early childhood educators.

Theoretical Framework

Taylor and Medina (2013) stated, "No research paradigm is superior, but each has a specific purpose in providing a distinct means of producing unique knowledge" (p. 1).

Will explained, “A paradigm is thus a comprehensive belief system, world view, or framework that guides research and practice in a field” (as cited in Taylor & Medina, 2013, p. 1). For this study, an interpretivist theoretical framework was utilized. Focused on human beings and their interpersonal relationships, interpretivist research creates a detailed account of events (Eslami, 2013, p. 2375).

Taylor and Medina (2013) explained interpretivism is “influenced strongly by anthropology which aims to understand other cultures, from the inside” (p. 4). An interpretivist perspective “assumes that the world is not simply out there to be discovered, but an ongoing story told and refashioned by particular individuals, groups, and cultures involved” (Butin, 2009, p. 60). Since interpretivist research is based on interpretations, individuals will have differentiated views of the same event (Eslami, 2013). Within interpretivism, the researcher strives to create an understanding of the research group by “learning to stand in their shoes, look through their eyes and feel their pleasure or pain” (Taylor & Medina, 2013, p. 4). As a result, empathy and identification are developed, building an increased understanding of the study (Eslami, 2013).

Discussions by early childhood professionals regarding the use of technology in an early childhood setting have changed over the last decade (Lentz et al., 2014). According to the NAEYC (2012), “There is conflicting evidence on the value of technology in children’s development” (p. 3). Teacher perceptions of technology can impact use within the classroom (Nikolopoulou & Gialamas, 2015b). By using the interpretivist research perspective, the focus of this study was to determine the perceptions of Missouri public school early childhood teachers and administrators in regard to technology and current practices.

Early childhood teachers play a critical role in understanding technology and the role it plays with young children (Davidson et al., 2014). The interpretivist paradigm, when related to educational research, allows "researchers to build rich local understandings of the life-world experiences of teachers and students and of the cultures of classrooms, schools and the communities they serve" (Taylor & Medina, 2013, p. 4). When utilizing an interpretivist framework, a qualitative study using verbal descriptions is typical (Eslami, 2013).

According to Hallström, Elvstrand, and Hellberg (2015), teachers in early childhood classrooms are minimally utilizing technology during instruction. There is a substantial amount of money being spent on technology in the classroom; therefore, "we need to work with teachers to help them better understand how to effectively integrate technology into their classroom" (Blackwell et al., 2014, p. 89). To understand the perceptions of early childhood teachers and administrators regarding technology, the data for this study were collected through interviews. According to Willis, "The interpretive paradigm favours qualitative methods such as case studies, interviews and observation, because these are the best methods for understanding how humans interpret the world around them" (as cited in Echenique, Molías, & Bullen, 2015, p. 1). Using ethnographic methods such as interviewing authenticates morally sound relationships, which in turn deepens the reliability of the accounts (Taylor & Medina, 2013).

History of Early Childhood Pedagogy

The following review of literature presents a chronological overview of various theorists in the field of education. Ogunnaike (2015) explained, "Early Childhood Education theories provide a framework for understanding the nature, abilities, and how

to create learning environments that enhance children's overall development" (p. 9). Paving the way for a radical change in early childhood pedagogy, German educator Friedrich Froebel founded the first kindergarten (Elkind, 2015). Prior to Froebel, preschool-aged children attended one-room facilities called Bewahranstalts (Bauernschuster & Falck, 2015). Bauernschuster and Falck (2015) explained Bewahranstalts were a location to store young children up to 12 hours per day with no regard to enhancing their development.

An advocate for children, Froebel was concerned about the development of young children and opened the first kindergarten (Shikwesha, 2015). Bauernschuster and Falck (2015) reported, "The name 'kindergarten' was chosen by Froebel because this child care institution should be like a garden (German 'Garten') where experienced gardeners in harmony with nature should cherish children (German 'Kinder') like small plants" (p. 4). At Froebel's school, children enhanced their fine and gross motor skills through play, and their social skills were developed through stories and songs (Shikwesha, 2015).

Froebel's encouragement of play by young children led him to create a line of toys and other educational enhancements called Gifts and Occupation (Elkind, 2015). Shikwesha (2015) stated, "The number of innovations that Froebel pioneered included play-based, child-centered, holistic education, parent involvement and training, educational paper folding, use of music, games, and movement activities for education" (p. 14). Worldwide, Froebel's theories had an impact on future philosophers (Elkind, 2015).

In the United States, "John Dewey (1859-1952) has made, arguably, the most significant contribution to the development of educational thinking in the twentieth

century" (Devendorf, 2016, p. 19). Before an educational movement by Dewey, schools across America had children sitting in desks memorizing facts while receiving non-differentiated instruction from the teacher (Leong & Bodrova, 2000). Dewey felt as though students should be at the center of learning (Kolb, 2014). Like Froebel, Dewey's philosophy views the teacher as a facilitator (Rolfe, 2014). Devendorf (2016) explained, "Dewey's philosophical pragmatism, concern with interaction, reflection and experience, and interest in community and democracy, were brought together to form a highly suggestive educative form" (p. 19). Dewey believed educational growth occurs naturally when connections are made from previous experiences occurring in home life and in school (Rolfe, 2014). According to Raider-Roth and Silin (2015), Dewey's ideas are mirrored in the core ideas of early childhood. Dewey's philosophy transformed education from a teacher-centered model to a child-centered model (Leong & Bodrova, 2000).

Across the globe in Rome, Italian educator and philosopher Maria Montessori (1870-1952) believed early childhood was a special time in regard to education (O'Donnell, 2014). According to Rathunde (2015), "For many parents and teachers, Montessori education is best known for providing students with freedom of choice to pursue their interests at school" (p. 258). In the early 1900s, Montessori opened the first House of Children (Casa Dei Bambini), a school for preschool-aged students (O'Donnell, 2014). Montessori promoted the idea children learn differently from adults and learn through constructive activities and play (Baligadoo, 2014).

Montessori classrooms are still in use today, even in the United States, and are operating with guidance from the American Montessori Society (Sharp, Downey-Magee,

& Lowry, 2015). Even from the beginning, Montessori classrooms were very planned out, and students were allowed free exploration within set parameters (O'Donnell, 2014). Mirroring the concept of Dewey, the role of the teacher in Montessori classrooms is to scaffold children's learning based on their individual needs (Baligadoo, 2014). O'Donnell (2014) explained, "At the bottom of all Montessori's theory and practice was the simple notion and the understanding the way children developed was the key to successful education" (p. 14). Montessori changed "innovation in the classroom with her teaching toys, individualized education, manipulative materials, and programmed instruction" (Baligadoo, 2014, p. 431). O'Donnell (2014) described Montessori's work as echoing the philosophy of Dewey, but also impacting the work of future philosophers (Rathunde, 2015).

A few years after Montessori got her start, a Russian educator and psychologist named Lev Vygotsky (1896-1934) asserted early childhood development is not spontaneous but rather the outcome of a child's interaction with his or her environment (Leong & Bodrova, 2000, para. 5). Paralleling Dewey and Montessori, Vygotsky also believed the role of educators is to facilitate a child's learning experience by scaffolding developmentally appropriate experiences while setting high expectations (Ogunnaike, 2015). Through his research, Vygotsky developed the term zone of proximal development (ZPD), in which learning takes place when children can grasp a concept in a collaborative setting, then move on to completing the skill independently (White, 2015).

Noting the need for individualization, "Vygotsky recognized that the kind of assistance needed to help children develop new skills and concepts within their ZPD took different forms for children of different ages" (Leong & Bodrova, 2000, para. 5). A

fundamental concept in Vygotsky's framework and the implementation of the ZPD is play; "it is incorrect to conceive of play as activity without purpose; play is purposeful activity for a child" (Vygotsky, 1967, p. 17). Vygotsky (1967) claimed, "Play is central to early childhood education because it allows young children to learn social, cognitive, emotional, language and physical skills that are essential to their overall development" (p. 12). The idea of the ZPD is one of Vygotsky's greatest contributions to education (Daniels, 2016).

Following Vygotsky's concept of child development, the research of Swiss psychologist Jean Piaget (1896-1980) influenced the field of education (*Funk & Wagnell's New World Encyclopedia*, 2015). While in Paris working with children and intelligence tests, Piaget was intrigued when he repeatedly observed children at relatively the same age made similar errors (Leong & Bodrova, 2000). The notion children have their own logic and learn differently than adults led Piaget's research in cognitive development; he explored learning and conceptualized four stages of a child's development (White, 2015). Leong and Bodrova (2000) summarized Piaget's stages of development into the sensorimotor, preoperational, concrete, and formal operations stages.

According to White (2015), "The most common developmental stage represented in the early childhood preschool is children in the preoperational stage of this learning theory. High fidelity instruction is presenting children with an opportunity to interact with concrete items" (p. 21). Providing an understanding of children's intellectual growth, just as the philosophers before him, "Jean Piaget's observations about the centrality of play in children's cognitive development, has informed a strong awareness

of play's value in education" (Henriksen, Keenan, Richardson, & Mishra, 2015, p. 5). Piaget's work impacted early childhood education (Leong & Bodrova, 2000).

According to Ogunnaike (2015), early childhood education is "where it all begins" (p. 10). Early childhood educators must be aware of research-based developmentally appropriate practices when implementing technology in the classroom (NAEYC, 2012). When merging 21st-century skills with 19th- and 20th-century pedagogy, the focus needs to be "technology integration efforts on the pedagogy that technology enables and supports, rather than on the technology itself" (Ertmer & Ottenbreit-Leftwich, 2013, p. 175). The works of Froebel, Dewey, Montessori, Vygotsky, and Piaget laid the foundation for guidelines for implementing developmentally appropriate technology practices into early childhood classrooms (White, 2015).

Concerns and Benefits of Utilizing Technology in Early Childhood Education

Early childhood students are entering schools with different skills than previous generations due to their technology-immersed lives (Jorgensen & Logan, 2015). Anderkin (2015) shed light on the debate about technology in early childhood by asking what many early childhood educators wondered, "When the purpose and function of play in the life of the preschool child is considered, is the integration of technology developmentally appropriate and beneficial?" (p. 6). Radesky, Schumacher, and Zuckerman (2015) explained the importance of limiting technology exposure of infants, toddlers, and early childhood aged students "…because effects of screen time are potentially more pronounced in this group" (p.1). Research resulting in concerns

regarding technology and early childhood children has been completed by educators, medical personnel, and psychologists as well (Dietze & Kashin, 2013).

According to Montessori, a child's interaction with the world is a crucial part of his or her development (Baligadoo, 2014), which would extend to interacting with technology. The AAP (2015) expressed concerns regarding technology usage by children and presented findings indicating excessive use of technology can have an adverse effect leading to attention problems, sleep disorders, and childhood obesity. Violent technology often utilized by children has a negative impact on behavior (Blackwell et al., 2014). Radesky et al. (2015) stated, "Interactive media use by young children may displace sensorimotor activities (e.g., manipulation, climbing, building) that support development of visual-motor skills important to later success in math and science" (p. 2). In the field of education, the works of Froebel, Dewey, Montessori, Vygotsky, and Piaget have historically pointed to play as the fundamental mode early childhood students use to construct knowledge (Dietze & Kashin, 2013). Typically, educators search for current practices, but this is not always the case when it comes to integrating technology into early childhood (Ko & Chou, 2014).

Studies have shown technology to have a negative effective on the development of young children (Radesky et al., 2015). An, Morgenlander, and Seplocha (2014) stated:

> Many preschool educators justify their reluctance to use computers and interactive media because such technologies seem to violate these two traditional tenants of preschool education have long been committed to providing concrete, exploratory learning (e.g., hands-on, using real materials that children manipulate directly). (p. 89)

Blackwell et al. (2014) explained technology could potentially have a negative impact on the amount of time children can spend on other activities, such as reading, which could therefore lead to a negative impact on literacy skills.

On the other side of the debate regarding the place of technology are those who believe "digital technologies extend possibilities for preschoolers' participation and engagement in the meaning-making process while simultaneously allowing them to participate in various types of play" (Anderkin, 2015, p. 26). Technology is here and will continue to evolve, and students must be equipped with necessary skills for the future (Ally & Prieto-Blázquez, 2014). Anderkin (2015) explained technology can be incorporated into the pedagogy of early childhood, and educators must apply the foundation in the "philosophies of play, such as social connectedness, opportunities for real-life extensions, and active meaning-making apply to quality technology use. Children need open-ended activities built around opportunities for discovery, sensory experiences, and multi-modal approaches with multiple pathways" (pp. 29-30). The use of technology should not become a replacement for the research-based practice of hands-on learning, but as a way to expand a child's experience (Dietze & Kashin, 2013). One way to expand on experiences when technology is used is to take students on virtual field trips (Paciga, Lisy, & Teale, 2013).

Research has also indicated a child's interaction with technology can lead to an increase in the development of social and cognitive abilities (Jorgensen & Logan, 2015). In addition, technology has been proven to increase student engagement, even at the early childhood level (Cameron, 2015). McNierney explained technology is only beneficial for early childhood students when it allows children to be learners who "actively navigate

their own learning or co-construct knowledge with others" (as cited in Dietze & Kashin, 2013, p. 2). When implemented in appropriate ways, technology can be beneficial to early childhood students (White, 2015).

Önkol et al. (2011) noted early childhood teachers report a positive climate and increased student cooperation when students are using technology. Historically, "Vygotsky's research demonstrates the power of collaboration in early childhood education through his social learning theory" (Cicconi, 2014, p. 64). The use of developmentally appropriate technology leads to an increase in student collaboration, child-initiated problem solving, and student autonomy (Anderkin, 2015).

Technology can also have a positive impact on literacy skills (Cameron, 2015). The use of iPad technology, e-books, and apps offer students the ability to integrate reading, phonological awareness, vocabulary, and other literacy concepts in one activity (Lentz et al., 2014). The utilization of technology helps early childhood students emerge in their reading and writing skills, and the use of keyboards allows students who are unable to form letters to gain print skills by typing the letters (Jorgensen & Logan, 2015). Paciga et al. (2013) explained technology could even play a role in increasing a child's communication abilities.

There are both positive and negative points to be argued regarding the use of technology in early childhood education (Dietze & Kashin, 2013). The fact of the matter is technology is here, and usage by society will continue to increase (NAEYC, 2012). In order for students to have necessary skills for the future, it is imperative early childhood educators seek out developmentally appropriate practices for integrating technology into current pedagogy (White, 2015).

Developmentally Appropriate Practices in Technology

Technology is a beneficial tool in early childhood, but with research indicating the possibility of an adverse effect if not used properly, it is vital educators implement developmentally appropriate technology practices (Jorgensen & Logan, 2015). Developmentally appropriate practices essentially meet students where they are individually, and the methodology "is based on the historical studies of Vygotsky, Dewey, Piaget, and Erikson. Being developmentally appropriate is at the core of an effective early childhood teacher" (Cameron, 2015, p. 5). White (2015) explained early childhood educators are faced with the challenge to blend technology into current pedagogy to ensure technology practices are appropriate.

Harris (2014) asserted technology should encourage constructivist learning and innovative thinking among early childhood students. It is important to note "appropriate use of technology and media depends on the age, developmental level, needs, interests, linguistic background, and abilities of each child" (NAEYC, 2012, p. 6). Dietze and Kashin (2013) explained technology is not a replacement for the early childhood pedagogical foundation of play and inquiry-based learning, but rather serves as an instrument to link play and learning.

More and Travers (2013) believed developmentally appropriate technology practices should be a fluid integration of all aspects of early childhood education, not just traditional teaching situations. The NAEYC (2012) and the Fred Rogers Center for Early Learning led the way in developmentally appropriate practices in technology integration with recommendations for early childhood educators (White, 2015). The NAEYC (2012) stated, "Technology and interactive media are tools that can promote effective learning

and development when they are used intentionally by early childhood educators, within the framework of developmentally appropriate practice… to support learning goals established for individual children" (p. 5). Despite information promoting technology, some early childhood educators still struggle with integrating technology with current pedagogy (Dietze & Kashin, 2013).

Sehnalová (2014) explained the ability to "integrate a computer successfully into preschool education requires suitable engagement of pedagogues who are computer literate and who then become familiar with suitable educational programs and change their existing methods of work" (p. 4). As part of 21st-century skills, the NAEYC (2012) recommended teaching young children how to be digital citizens, ensuring they have "an understanding of the use, abuse, and misuse of technology as well as the norms of appropriate, responsible, and ethical behaviors related to online rights, roles, identity, safety, security, and communication" (p. 10). According to White (2015), the practice of simply allowing students to have free time with technology does not guarantee a stronger academic outcome. The NAEYC (2012) stated, "Young children need tools that help them explore, create, problem solve, consider, think, listen and view critically, make decisions, observe, document, research, investigate ideas, demonstrate learning, take turns, and learn with and from one another" (p. 6). To ensure the utilization of technology is comprised of developmentally appropriate practices, educators need to be deliberate in implementation (Cameron, 2015).

Early childhood students have a desire to interact with technology, and if teachers are not knowledgeable of developmentally appropriate practices, improper implementation can result (NAEYC, 2012). It has been reported due to the capabilities of

new technologies, such as touch screen devices, it is easier for teachers to "help children develop and enhance their investigations" (Geist, 2014, p. 63). The NAEYC is not the only organization which has offered guidance for developmentally appropriate practices in technology instruction (Cameron, 2015). The Pennsylvania Digital Media Literacy Project developed a checklist based on the position statement from the NAEYC and recommended educators utilize the list to ensure technology is purposeful, engaging, and encourages creativity (Robb et al., 2014).

The NAEYC (2012) stated, "When used wisely, technology and media can support learning and relationships. Enjoyable and engaging shared experiences that optimize the potential for children's learning and development can support children's relationships both with adults and their peers" (p. 1). More and Travers (2013) developed a framework with guidelines categorized into three sections—accessibility, content, and individualization—and encouraged early childhood educators to assess a specific piece of technology before utilization within the classroom.

Another tool which has assisted educators in implementing technology effectively is the Substitution Augmentation Modification Redefinition (SAMR) model (Romrell, Kidder, & Wood, 2014). Developed by Dr. Ruben Puentedura, the SAMR model is a tool used to evaluate the level of learning with technology (Romrell et al., 2014). Romrell et al. (2014) explained:

> It is more important for educators and instructional designers to focus on how mobile devices can be used to improve learning. Often, mobile devices are

> simply used to perform the same tasks that were previously completed without the use of a mobile device. (p. 1)

Turner (2015) explained the SAMR model is a useful tool for educators to utilize in order to integrate technology to attain higher levels of learning, as not all technology promotes this. Within the SAMR model, the substitution level utilizes technology as a substitute for other tools, whereas in the augmentation level, technology is a substitute for other tools with an additional component which would not be possible without technology (Romrell et al., 2014). The modification level of technology integration takes an activity and reshapes it, whereas the redefinition level of technology integration creates an activity which would not be previously possible (Fabian & MacLean, 2014).

When early childhood teachers utilize technology integration methods in ways which can be considered modification or redefinition, it creates an enhanced experience for students (Romrell et al., 2014). Turner (2015) explained the SAMR model was designed to make educators aware of the fact technology integration is "a means toward a larger goal, which is more powerful and engaging classroom pedagogy. The mere existence of technology in a classroom, in itself, is not a high enough goal for classroom instruction" (p. 13). Anderkin (2015) explained, "A balanced approach to technology use requires active and intentional use alongside careful planning on the part of the teacher" (p. 56). In order to obtain successful integration of technology at a higher level, teacher buy-in is critical (Fabian & MacLean, 2014).

Paciga et al. (2013) indicated many early childhood educators utilize "easy" technology in their classrooms. For example, teachers often use interactive whiteboards to present information, but without giving students the opportunity to interact with the

technology, there is no benefit when compared to traditional whiteboards (Kim, Kim, Lee, Spector, & DeMeester, 2013). White's (2015) data indicated early childhood teachers largely utilize technology for whole-group instruction, and White emphasized the need for "social change toward implementing technology based on a more systematic process of effective evaluation, identification, and use of developmentally appropriate technology is warranted" (p. 103). Blackwell et al. (2014) believed policymakers and leaders in education need to be aware of the fact technology alone will not change early childhood teachers' instructional practices.

Accessibility to training for early childhood educators on developmentally appropriate technology practices and use of those practices is vital, or there could be negative consequences for students (Cameron, 2015). The NAEYC (2012) stated, "Teachers can avoid the passive and potentially harmful use of non-interactive, linear screen media that is inappropriate in early childhood settings. Intentionality is key to developmentally appropriate use" (p. 8). Early childhood educators play a vital role in "encouraging curiosity and creativity as well as creating positive attitudes towards technology" (Strasburger et al., 2015, p. 391). The NAEYC (2012) recommended students be allowed a period of time to discover a variety of developmentally appropriate technology. For these practices to occur, educators must analyze and critique technology using research-based recommendations prior to implementation in the classroom (More & Travers, 2013).

Barriers to Developmentally Appropriate Technology Practices

Turner (2015) explained, "In many cases, the move toward more technology in schools must be preceded by a change in school culture and expectations" (p. 13).

Barriers to developmentally appropriate practices include “lack of resources… [such as] limited hardware, access, time, and technical support” (Ertmer & Ottenbreit-Leftwich, 2013, p. 177). For educators, the shift in teaching practices can be overwhelming (White, 2015). Paciga et al. (2013) found only 33% of early childhood teachers are likely to use technology in their classrooms.

In order for the use of technology to increase in early childhood classrooms, educators must recognize the significance of using it effectively, and the perceptions of teachers must be known (Önkol et al., 2011). Blackwell et al. (2014) reported a barrier to the implementation of technology in early childhood classrooms is in part due to “teaching beliefs, comfort with technology, and perceived values of technology for student learning” (p. 83). Ertmer and Ottenbreit-Leftwich (2013) reported a significant correlation between the attitudes and beliefs of teachers and the implementation of technology in the classroom. In fact, Nikolopoulou and Gialamas (2015a) found the beliefs of teachers regarding technology integration have as much of an impact on implementation as teacher experience with technology. Kim et al. (2013) stated, “What teachers say they do was significantly correlated with both their beliefs about effective ways of teaching and their actual practices with regard to technology integration” (p. 81). A study conducted by Tambunan (2014) indicated a teachers’ proficiency with technology relied on several components, including their perceptions of technology and their willingness to improve their craft.

Chen (2008) noted, “Requiring teachers to change their pedagogical beliefs can be a daunting task because it may involve challenging fundamental beliefs” (p. 67). Early childhood educators must feel supported in the use of technology to shift their

pedagogical practices from the keeper of technology to the facilitator of technology (Ertmer & Ottenbreit-Leftwich, 2013). Chen (2008) explained, "The findings suggest that although teachers' beliefs may affect their interpretation of proposed policies and hence their practices, it is necessary for researchers to consider teachers' beliefs and various contextual factors all together when undertaking an educational innovation" (p. 66). Unless teachers have a positive attitude toward technology, they will not utilize developmentally appropriate techniques, or they will simply not use technology at all (Nikolopoulou & Gialamas, 2015a).

In order to have a positive attitude toward the integration of technology, early childhood educators must first feel competent at using technology (Turner, 2015). Ertmer and Ottenbreit-Leftwich (2010) reported, "Teaching with technology requires teachers to expand their knowledge of pedagogical practices across multiple aspects of the planning, implementation, and evaluation processes" (p. 260). Pedagogical transformations require backing from school administrators and a shift in culture (Chen, 2008).

Administrators play a vital role in the implementation of innovative technology (Vu, McIntyre, & Cepero, 2014). One way to support teachers is providing time to explore and learn with technology prior to the requirement of implementation (Ertmer & Ottenbreit-Leftwich, 2010). Administrators must provide teachers with clear expectations, including supporting teachers in acquiring positive attitudes toward technology and building teacher confidence in its use (Blackwell et al., 2014). This support is best offered through the scaffolding of teacher experiences (Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, & Sendurur, 2012).

Al Mulhim (2014) explained, “Lack of time is a universal problem in using technology; it is found wherever using technology is mentioned no matter how developed in the country” (p. 490). Teachers feel time is a barrier in terms of lesson planning, attending training, and fitting required components into the schedule (Nikolopoulou & Gialamas, 2015a). Chen (2008) reported teachers often feel as though there is not enough time during class to cover all of the required content, and implementation of creative uses of technology is regarded as time-consuming.

An additional barrier is lack of funding (Nikolopoulou & Gialamas, 2015a). White (2015) stated, “The lack of funding also is a barrier for acquiring developmentally appropriate computer applications, training, and maintenance” (p. 67). Schools who have seen successful technology integration report having sufficient technology resources to access (Ertmer & Ottenbreit-Leftwich, 2013). Without access to appropriate resources such as equipment, applications, and professional development, developmentally appropriate technology integration in an early childhood classroom will be inconsistent (White, 2015).

Professional Development

In the field of early childhood education, professionals are divided in their beliefs on the role of technology into those who implement developmentally appropriate technology and those “who are reluctant to even start discussing technology and interactive media as viable tools for engaging preschoolers in learning” (Paciga et al., 2013, p. 89). On the other side is the belief students need “technology skills in order to be productive members of society” (Davies & West, 2014, p. 1). Rehmat and Bailey

(2014) explained access to technology in schools is on the rise, yet research indicates there are a limited number of teachers integrating technology into their lessons.

It has been reported there is a decline in the positive perception of technology among educators due to the fact there have been "no increases in support for more student-centered uses of technology, including individualized learning and developmentally appropriate models" (Blackwell et al., 2015, p. 12). Teacher attitude is a crucial component to address, as it has been reported teachers can attend the same professional development and receive the same support from administration, but the actual implementation will vary depending on each teacher's attitude (Kim et al., 2013). High-quality professional development opportunities for early childhood educators play a role in developmentally appropriate technology integration (White, 2015).

Greener and Wakefield (2014) explained, "There is a real need for Learning Technologists to focus on the pedagogical need for such technologies, rather than just demonstrating 'how' they are used" (p. 264). In addition, Turner (2015) stated, "It is important that professional development plans have clear expectations of what a teacher should be able to do when developing a curriculum" (p. 14). The focus of professional development needs to be on the teachers, not technology, and "what they believe comprises good instruction and good learning; how they put those beliefs into practice; and how they can be supported by the contextual, cognitive, and affective factors that exist in their school environments" (Ertmer & Ottenbreit-Leftwich, 2013, p. 180).

Chen (2008) suggested, "It is beneficial to provide teachers with feasible examples of how to implement promoted ideas and resolve conflicts among various beliefs, organizational supports, and constraints, and related practices" (p. 74). One form

of professional development utilized by teachers to guide their learning is Twitter (Visser, Evering, & Barrett, 2014). Another way teachers can access professional development is through teacher collaboration (Voogt et al., 2015).

Professional development should inspire early childhood educators to analyze their current practices and beliefs and inspire them to try new strategies (Sharma, 2016). In the planning of professional development, administrators should consider the frequency and duration of early childhood educator training (Ertmer & Ottenbreit-Leftwich, 2010). In addition to access to ongoing professional development, early childhood educators need to be provided time to engage and explore with technology prior to implementation (Dietze & Kashin, 2013). Limited training in developmentally appropriate technology practices is considered to be a barrier to the implementation of technology in early childhood classrooms (Ertmer & Ottenbreit-Leftwich, 2013).

Summary

Benjamin Franklin declared, "We may not be able to prepare the future for our children, but we can at least prepare our children for the future" (as cited in Middelton-Moz & Zawadski, 2014, p. 105). Children are growing up in a culture surrounded by ever-changing technology advancements (NAEYC, 2012). Early childhood pedagogy is based on the theories of Friedrich Froebel, Maria Montessori, John Dewey, Lev Vygotsky, and Jean Piaget (Ogunnaike, 2015). Due to the increase in technology usage by the youngest of students, Palaiologou (2016) reported early childhood educators need to appraise their current pedagogical practices to reassess how early childhood students learn. Early childhood students are the future of society, and for students to be prepared,

the role of early childhood educators is to develop the whole child and not just academic skills (Baligadoo, 2014).

There is a debate among educators about the appropriateness of technology in early childhood classrooms (NAEYC, 2012). The AAP (2015) reported technology has the potential to have harmful effects. Other research has supported and even advocated for technology as a motivational tool for students, offering opportunities for students to collaborate and increase relationships with families (Robb et al., 2014).

Allen (2017) stated, "It is important that practitioners understand children's technological development and therefore can plan how to support it" (p. 74). In order to ensure technology integration is developmentally appropriate, "educators need to perpetually keep each child's unique learning style, culture, interests, and developmental ability in mind when embedding technology into the early childhood classroom" (White, 2015, p. 22). Researchers have indicated a number of barriers for early childhood educators when it comes to technology integration in their classrooms (Nikolopoulou, & Gialamas, 2015a).

White (2015) indicated a lack of funding, time, and access to quality professional development are barriers to developmentally appropriate implementation of technology in an early childhood classroom. An additional barrier includes teacher attitude; a positive attitude regarding technology has been reported to improve technology instruction, and on the other hand, a negative attitude can be a barrier to implementing developmentally appropriate technology (Kim et al., 2013).

An interpretivist framework was utilized to collect data on the perceptions of early childhood teachers and administrators in Missouri public schools in regard to

current practices of technology integration in early childhood classrooms. Chapter Three includes a review of the methodology used in the study. The research design and ethical considerations are outlined. The instruments and data collection methods used are discussed as well.

Chapter Three: Methodology

Blackwell et al. (2015) stated, "Technology tools—including tablets, smartphones, e-books, interactive whiteboards, and other tools—are increasingly a part of early educators' practice, even as controversies over the appropriate role of technology in young children's lives continue" (p. 2). Children today are already entering early childhood settings with digital abilities (NAEYC, 2012). The perceptions of early childhood educators are essential for successful technology integration in early childhood classrooms (Nikolopoulou & Gialamas, 2015b).

Kim et al. (2013) explained previous researchers have primarily focused on teacher perceptions of technology and recommended research be conducted in regard to teachers' pedagogical beliefs related to technology. Ertmer and Ottenbreit-Leftwich (2013) stated, "Technology integration is no longer an isolated goal to be achieved separately from pedagogical goals, but simply the means by which students engage in relevant and meaningful interdisciplinary work" (p. 175). Inductive reasoning methods were utilized within this qualitative research study to determine the perceptions of early childhood teachers and educators regarding the use of technology in early childhood classrooms.

In this chapter, the purpose of the study is identified, and the research questions are restated. This chapter also includes a closer look at the population and sample for the study. More detailed explanations of the instrumentation and data collection procedures are documented. Lastly, the ethical considerations are addressed.

Problem and Purpose Overview

According to Ertmer and Ottenbreit-Leftwich (2010), educators are not implementing effective technological practices. Zimmerman (2016) explained the importance for early childhood educators to ensure "young children's engagement with technology supports early learning and whole-child development" (para. 1). Technology is often not implemented effectively due to barriers such as teacher perceptions (Kim et al., 2013). Chen (2008) stated, "When trying to integrate technology into their instruction, teachers refer to their existing beliefs and prior experiences" (p. 67).

Early childhood pedagogy historically has been implemented through play-based, hands-on activities (Ogunnaike, 2015). Current and previous pedagogies are a barrier to technology integration due to the fact many early childhood teachers feel technology goes against their early childhood beliefs (Blackwell et al., 2014). The NAEYC (2012) reported research has come to reveal the benefits of technology as a tool in early childhood classrooms.

Another barrier reported is a lack of professional development specific to technology in early childhood, and Turner (2015) explained teachers need to feel knowledgeable in technology before they will use it. High-quality professional development opportunities for early childhood educators play a role in developmentally appropriate technology integration (White, 2015). The purpose of this study was to determine the perceptions of Missouri public school early childhood teachers and administrators in regard to technology and current practices.

Research questions. The following research questions guided the study:

1. What are early childhood teacher and administrator perceptions about using technology in early childhood classrooms?

2. What strategies are Missouri early childhood teachers using to implement technology in classrooms?

3. How do Missouri early childhood teachers and administrators identify best-practice strategies to implement technology?

4. What are teacher and administrator perceptions of professional development regarding technology in early childhood?

Research Design

A qualitative research method was utilized within this study and was designed to allow for analysis of the perceptions of Missouri public school early childhood teachers and administrators. The instrument utilized to collect data for this study was a set of interview questions designed to produce open, truthful responses from participants. The interviews were conducted in a time and place suitable for the participants.

Before conducting interviews, the researcher gained informed consent of the participants according to Institutional Review Board (IRB) guidelines. Potential interview participants were identified through the Missouri Preschool Program (MPP) Renewal Awardees located on the Missouri Department of Elementary and Secondary Education (MODESE) (2016) website. A total of nine MPP teachers and nine administrators were interviewed. Interviews were conducted via telephone. The researcher utilized two sets of interview questions, one for administrators and one for teachers. Responses were used to identify themes and categories which emerged

regarding perceptions of technology, usage of best practices, and perceptions of professional development opportunities currently available.

Ethical Considerations

Once approval was received from the Lindenwood University (see Appendix A), research began. Information collected through interviews was secured in a locked cabinet. Information stored electronically on a personal computer was password-protected. All documents will be destroyed three years after the conclusion of the study.

In order to assure anonymity, all information gathered from participants remained confidential. Data codes were assigned to each participant and school to decrease the possibility of identifying participants. Each participant received an informed consent form, which offered the opportunity to opt out of the study and also stated possible risks of the study.

Population and Sample

The population for the study was retrieved from the MODESE (2016) website, and consisted of 98 MPP classrooms across Missouri, 78 of which are affiliated with a public school. Bluman (2013) explained in many instances the feasibility to use the entire population is limited, in which case a sample of the population is utilized. A purposeful sampling method was applied. In order to be a participant in this study, interviewees must have met the following criteria: teaching in an MPP classroom affiliated with a public school in southwest Missouri or serving as an administrator affiliated with a public school in southwest Missouri with a minimum of one MPP classroom. Utilizing the Fiscal Year 2016 and Fiscal Year 2017 MPP documents for both renewal programs and new awardees found on the MODESE (2016) website, it was

determined there were 13 public schools in southwest Missouri with a minimum of one MPP classroom during the 2016-2017 school year. Participants selected for the study were also chosen based upon the willingness of the schools' educators to participate. A total of nine MPP teachers and nine administrators were interviewed from the sample.

Instrumentation

The instrumentation for this study included 10 semi-structured interview questions (see Appendices B and C) created by the researcher to provide candid information regarding the perceptions of early childhood teachers and administrators. The questions were constructed based upon an interpretivist framework. Questions were developed utilizing key characteristics identified from the work of previous surveys completed by the NAEYC regarding technology in early childhood classrooms. The interview questions were field-tested by early childhood teachers and administrators within the public school system who were not included in the study. Questions were revised based upon suggestions from the pilot group.

Interviews were conducted to gain a better understanding of the perceptions of early childhood teachers and administrators regarding technology in early childhood classrooms. Each participant received a letter of introduction (see Appendix D), a letter of informed consent (see Appendix E), and an advance copy of the questions prior to his or her interview.

Data Collection

First, approval was received by the Lindenwood IRB prior to contact of any potential participants. Next, participants in the study were contacted via electronic communication or telephone regarding the study. After receiving confirmation of an

interest in participating in the study, each participant was provided an informed consent form along with a copy of the interview questions through electronic communication. Next, the researcher scheduled a time for the phone interview to occur. A reminder of the date, time, and location of the interview was sent to each of the participants prior to the interview. It should be noted participants were allowed to withdraw from the interview process at any time.

With permission from the participants, the interview data were audio-recorded to ensure responses were documented accurately. After the interviews, the recordings were transferred to the researcher's password-protected computer. The researcher then transcribed the recorded interviews into a Microsoft Word document. All electronic data were stored and secured on a password-protected computer. In order to ensure accuracy of the data, the researcher randomly checked the transcripts against the recorded interviews. To maintain necessary ethical precaution, participants were identified by codes throughout the study. Upon completion of the study, data will be retained for three years. Lastly, at the end of the three years, all data will be destroyed.

Data Analysis

Open-ended interview questions were created to elicit responses from participants revealing their perceptions regarding technology in early childhood classrooms, current practices being implemented, and perceptions of professional development opportunities related to early childhood technology. At the completion of the interviews, the data were analyzed. Patterns which emerged were compared to the NAEYC (2012) findings and other literature reviewed in Chapter Two.

Summary

Within this chapter, the qualitative methodology used in this study to identify the perceptions of Missouri public school early childhood teachers and administrators regarding the use of technology in early childhood classrooms was described. The sample for this study included MPP teachers and administrators affiliated with public schools in southwest Missouri. Phone interviews were used to collect data. Data were analyzed through thematic analysis. During the study, ethical considerations were used to ensure research information was protected and all participants' information remained confidential.

In Chapter Four, the results of the data collected are revealed. Information for the study was obtained through interviews with early childhood teachers and administrators. In chapter four, the data is also organized and analyzed.

Chapter Four: Analysis of Data

The purpose of this study was to determine the perceptions of Missouri public school early childhood teachers and administrators regarding technology and current instructional practices. According to Thorpe et al. (2015), technology is part of society, even for the youngest children, and the "beliefs and attitudes: understandings of children's learning with digital technologies is a factor affecting pedagogical practice in early childhood classrooms" (p. 176). Plowman (2016) explained during the distinct timeframe of preschool, technology integration is not typically correlated to early childhood pedagogy. Among early childhood educators, "there is a common belief regarding technology usage in preschool education can cause negative effects on children" (Turgut, Center, Bornova, Tunga, & Kisla, 2016, p. 89). However, Cameron (2015) clarified technology can be beneficial when teachers are intentional in their implementation of technology activities to meet lesson objectives.

Four research questions guided this study:

1. What are early childhood teacher and administrator perceptions about using technology in early childhood classrooms?

2. What strategies are Missouri early childhood teachers using to implement technology in classrooms?

3. How do Missouri early childhood teachers and administrators identify best-practice strategies to implement technology?

4. What are teacher and administrator perceptions of professional development regarding technology in early childhood?

Qualitative data were collected through phone interviews with administrators and teachers in southwest Missouri whose buildings include an MPP classroom. The instrumentation for this study was based on an interpretivist framework. The instrumentation included semi-structured interview questions created by the researcher to elicit the perceptions of early childhood teachers and administrators.

Interviews

Teachers of MPP classrooms. Nine MPP teachers from southwest Missouri were interviewed for this study. To maintain necessary ethical precaution and to ensure anonymity, each teacher was assigned a code. For example, the first teacher interviewed was referred to as Teacher A, and the second teacher interviewed was referred to as Teacher B throughout the entirety of the interview process.

Interview question one. Tell me about yourself (age of students you teach, number of years as an early childhood teacher, curriculum utilized within the classroom, comfort with technology).

The teachers interviewed indicated having a significant range of years of experience as early childhood educators. Teacher H was in her first year as an early childhood teacher, the teaching experience of the participants extended to that of Teacher F, who was in her 34th year as an early childhood educator. Teacher D reported she has been a preschool teacher for two years. Teacher E indicated this was her fourth year as an early childhood teacher. Her classroom is comprised of four- and five-year-olds with "17 students full day, and all kids head to kindergarten the following year." Teacher C said she has students who are four and five years old. She went on to state, "This is my 26th year in education and my fifth year teaching preschool."

Teacher I explained she has three-, four-, and five-year-olds and this is her eighth year teaching early childhood. Teacher G indicated, "I have been in early childhood education for 14 years." Her classroom currently has four- and five-year-old students. Teacher A and Teacher B have both been early childhood teachers for 15 years. Teacher A's classroom has three-, four-, and five-year-olds, while Teacher B's classroom has just four- and five-year-olds. The mean of the number of years as an early childhood teacher among the sample population was 10.89 years. Overall, the students served in MPP classrooms ranged in age from three to five years old.

In regard to the level of comfort with technology, Teacher H was the only participant to respond, "I am very comfortable with technology, but we are limited here." Teacher E reported she was comfortable with technology, whereas Teacher A reported, "I am OK with technology; it is not my strong suit." Teacher D stated, "I know a little bit to kind of get me in trouble, but I am not tech savvy." Teacher B and Teacher D felt their level of comfort was medium.

Per the requirements of the MPP grant, the schools must utilize one of the four MODESE-approved curriculum models within their MPP classrooms (Missouri Department of Elementary and Secondary Education [MODESE], 2016). As shown in Table 1, three of the approved curriculums were represented in the study. The only MODESE-approved curriculum not represented was the Emerging Language & Literacy Curriculum.

Table 1

Curriculum Utilized by Teachers within MPP Classrooms

Participant	Curriculum Utilized
Teacher A	Project Construct
Teacher B	Project Construct
Teacher C	Creative Curriculum
Teacher D	Project Construct
Teacher E	High Scope
Teacher F	Creative Curriculum
Teacher G	Creative Curriculum
Teacher H	Project Construct
Teacher I	Creative Curriculum

Interview question two. What are your thoughts on technology in early childhood classrooms, and what do you feel is appropriate use?

Eight of the nine participants reported technology in early childhood classrooms is acceptable to use in moderation. One teacher, Teacher A, declared, "I am not a fan of technology in preschool classrooms. I am finding that a lot of the kids have a lot of technology at home, and that is predominately what they spend their home time doing." Although reporting technology in early childhood was appropriate, Teacher B, Teacher C, Teacher D, and Teacher G did specifically mention the need to limit the time allotment of the utilization of technology. Teacher A, Teacher E, and Teacher G reported this year

they are seeing a trend in their students having decreased fine motor and social skills when compared to previous years. Teacher A mentioned she has students this year who have never seen a board game and have never been read to at home from a book, but rather she has students report they read books from a laptop or tablet. Teacher A and Teacher G suggested students today are not getting out and moving their bodies like they used to, which is leading to a decrease in motor skills. Teacher D explained, "I think there is a lot to be said for old school play." Teacher F indicated the students like using the video screen. She went on to report technology was "really good for down time."

Teacher H reported she was limited on what technology she could use, but indicated, "I think it would be great [to use more technology]. I don't think all of the time, but I think it is pretty important." Teacher I stated in past years when they have not had the MPP grant and were able to use technology more, "It was nice to have a SMARTboard and carpet when we are going over letters or if we were using Dr. Jean.," a music artist for young children. Overall, a majority of the teachers indicated some form of technology is appropriate in early childhood classrooms.

The teachers reported a variety of answers regarding what they feel is an appropriate use of technology. Teacher B reported technology should be engaging and interactive. Teacher C felt technology is "very important," and students need computer skills in this day and age. Teacher D explained the appropriate use of technology includes educational games and videos, along with using devices to investigate answers. Teacher E believed technology should be supplemental, while Teacher F indicated technology is best used to show motor videos and not on a daily basis. She also reported

technology is useful during downtime periods for students to be engaged in an educational game.

Teacher G revealed technology is most appropriate when it is being integrated into her unit of study and "making it apply to what we are learning about." Teacher H expressed appropriate practice includes using iPads and SMARTboards during lessons. Teacher I believed technology is useful to help introduce a lesson as a way for students to enjoy learning a specific concept. Teacher A did not feel technology is appropriate for early childhood and therefore did not report appropriate usage.

Interview question three. What types of technology do you use within your classroom? If you utilize technology, please explain which you feel is the most important and why. If you do not utilize technology, please explain which type of technology, if any, you would like to have access to in your classroom and why.

As indicated in Table 2, there is an array of technology used within MPP classrooms. Teacher D reported, "A lot of technology they [MODESE] don't approve the purchase of, a television or things like that." The interviewees conveyed due to guidelines set forth by the MPP grant, they are limited in access to technology. The Fiscal Year 2017 MPP administrative manual found on the MODESE (2016) website states, "Computers for children's use are NOT an allowable expense using funds from the Missouri Preschool Program. Computers should ideally have a limited presence in the MPP classroom. Children should have a timed experience when using the computer" (p. 11). Technology utilized within the classroom is either paid for by the school district or as Teacher D stated, "We have a television I use that was donated."

Out of the teachers interviewed, 55% reported having at least one iPad in their classrooms; these teachers included Teacher A, Teacher B, Teacher C, Teacher D, and Teacher G. Teacher E reported having access to tablets but would prefer to have access to iPads. Teacher B had the only classroom with a SMARTboard. Teacher E reported she has an eBeam in her classroom, but it was not as user-friendly as a SMARTboard for preschool students. Teacher H expressed, "Really the only thing we have in the actual classroom is just a radio; I know that is sad, but we do use it." Teacher I indicated she only has access to a radio. Teacher F stated, "We do not have any hands-on technology where they can actually play on a computer or an iPad or anything." All results are shown in Table 2.

Table 2

Types of Technology Utilized by Teachers within MPP Classrooms

Participant	Technology in MPP Classrooms
Teacher A	Teacher iPad
Teacher B	SMARTboard, iPad, teacher computers
Teacher C	iPad, teacher computers
Teacher D	TV, radio, teacher iPad
Teacher E	eBeam, shared tablets
Teacher F	TV
Teacher G	Teacher laptop, teacher iPad
Teacher H	Radio
Teacher I	CD player

The types of technology the teachers noted are most important in their classrooms varied among the sample. Teacher A expressed the desire not to have any technology in her classroom because she has observed a decrease in skills among her students and believes they get enough technology at home. Teacher B stated the SMARTboard and iPads are the most important technologies in her classroom. They enable the students to take "virtual field trips which allows our students to go places that they never have the opportunity to actually visit." Teacher C and Teacher G also mentioned the desire to have SMARTboards in their classrooms. Teacher G reported she previously had a SMARTboard, but she recently moved into a new classroom which does not have a

SMARTboard and expressed the desire to have one again; however, “with the grant you cannot spend money on technology; it is not an allowed purchase.” Teacher H declared if she could have any technology in her classroom, “I would want a SMARTboard for sure. Just for the things I could do with it, have the kids interact with it, get them engaged more. Get them where they can see real pictures.”

Teacher E stated interactive technology is the most important. Teacher I indicated she feels the CD player, which is used as a listening center, is most useful for the students. Teacher F said she feels a screen in the classroom gives her the ability to show videos and engage the students in gross motor activities, which is especially important on rainy days. Teacher D reported, “As far as technology in our classroom, I really think the radio for read aloud purposes because reading is so, so beneficial for the little kids.” Figure 1 displays the types of technology the MPP teachers reported are most important in preschool classrooms. It should be noted some teachers indicated multiple types of preferred technology in early childhood classrooms.

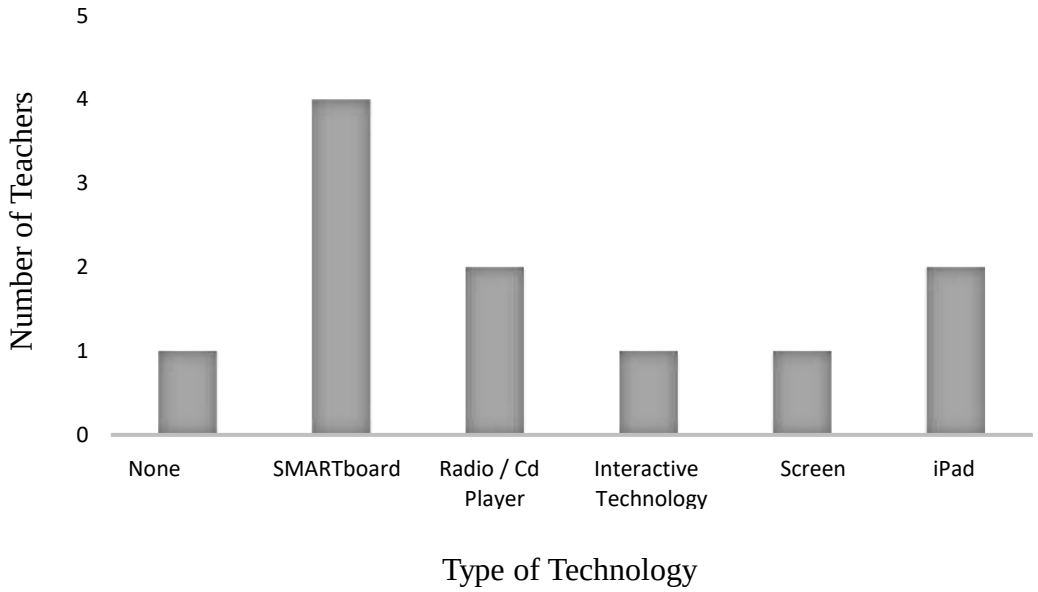

Figure 1. Preferred technology of MPP teachers.

Interview question four. With what frequency do you utilize technology?

The teachers reported using technology to complete tasks such as e-mails, data collection, or as group activities with their classes. Teacher A indicated, "I have an iPad I have at school; I have it for my assessments and e-mails. I use it every day. I do not let my kids have access to it." Teacher B stated she uses technology two to three times a day, for only a few minutes at a time. Teacher B said, "There may be times that the usage is longer, but that depends upon the activity." Teacher C reported using the iPad for assessments, "I probably use it during the school day an hour a day."

Teacher D reported while she uses the radio daily with her class, "things like the television or the iPad to pull something up for them to see, is once or twice a week." Teacher E said she uses technology daily. Teacher F reported in regard to technology usage with the students, "We are allowed for 10 minutes a day, and we do not use it every

day." Teacher G reported her technology usage depends on the week and what she has planned for the unit of study. Teacher H said, "I would say every day I at least get on and check e-mail and that kind of thing, but it is nothing directly related to the kids." Teacher I indicated, "I will take pictures and upload them for the parents to see what we are doing." She also reported using technology for students to listen to audio books.

Interview question five. What types of technology do students have access to within your classroom, how do they typically utilize it, and with what frequency?

Out of the teachers interviewed, 66.6% reported students have access to technology within their classrooms. Teacher B stated her students use "SMARTboards, iPads, and computers; we use them as learning tools." Teacher C indicated her students go to a computer class once a week. Teacher D explained when it comes to her students using the radio, "I usually pair a younger one with an older child, and the older child can follow the printed picture instructions."

Teacher E reported her students have access to eBeams. Teacher G explained, "I try to use it by integrating it into our study, and making it apply to what we are learning about." She went on to say she uses her teacher laptop with students. Students in Teacher G's classroom utilize e-books on occasion as well. Teacher I stated students use "CD players all during centers. Also, computer class once a week, they use iPads when we do computers." Student use of technology in the early childhood classroom ranged from no use to daily use.

Teacher A stated, "Well, in theory, they could use the iPad or computer, but I have never done that with them." Teachers H and F also reported students do not use technology in their classrooms. Teacher C mentioned her students get "computer class

25 minutes per week." Teacher G indicated, "For one thing, we set the timer and are pretty conscious of how long they are on it." Students in her classroom utilize technology two to three times per week. Teacher I also reported her students have computer class once a week for 50 minutes. Teacher B, Teacher C, and Teacher E expressed students in their classrooms use technology daily. Below, Table 3 shows the results.

Table 3

Frequency of Technology Usage By Students

Participant	Frequency of Technology Use by Students
Teacher A	None
Teacher B	Daily
Teacher C	Once a week
Teacher D	Daily
Teacher E	Daily
Teacher F	None
Teacher G	2-3 times per week
Teacher H	None
Teacher I	Daily

Interview question six. When students are using technology, what is the role of the teacher or aide during this time?

Over half of the teachers, 66.6%, responded the role of the teacher while students are utilizing technology is to facilitate, guide, or support the process. Teacher B stated, "The teacher is the facilitator, along with overseeing that appropriate usage is taking place." Teacher D had a similar response, "We are a support, and we monitor the material that is being viewed and used." Teacher C reported she feels it is the role of the teacher to guide the students, "Kids can learn more if you turn them loose and let them figure it out on their own." Teachers E and G indicated the role is to support the students when navigating the devices.

Teacher H expressed the role of the teacher or aide is "definitely a facilitator, keeping an eye on the students, making sure they are using it correctly for one, and making sure they get the hang of it." Other responses included Teacher A stating in the past when she used technology with students, "It was a center, and I was there with them." Teacher F believed the role of the teacher is to stay with the students and offer encouragement to participate. Teacher I felt the students need to "try to figure out themselves," but she is there to support them if they need help.

Interview question seven. How do you determine if technology is being used effectively and if students have learned a specific concept through utilization of the device?

Seven out of nine teachers interviewed reported they know if technology is being utilized effectively and if students have learned a specific concept through observation. Teacher B and Teacher C simply stated, "Observation." Teacher D said she knows

technology is being used effectively through not only observations but conversations with students. Teacher E indicated she utilizes observations, data collection, and notes to determine if the technology is effective. Teacher F indicated she observes the students "implement or request certain things. They are remembering and learning the sequences of the dances and the moves." Teacher G reported she knows through "informal observations and hearing what the kids say." Teacher H mentioned she "just kind of is watching and seeing how they progress. Seeing if they are getting the hang of it or if they are getting that skill."

There were two teachers who offered different answers. Teacher I said she utilizes the CD player in her classroom as a listening center. She does not assess its effectiveness. She went on to explain, "It is more just for them, not so much if they have met the concept. I think it is more the introduction for when they go to kindergarten." Teacher I was unable to speak on the effectiveness of iPads, as students utilize those during computer class with a different teacher. Teacher A reported due to the concerns she has regarding her students' development, she does not utilize any technology. Teacher A stated, "I feel like technology has replaced their social interactions at home." Therefore, Teacher A was unable to speak to this question.

Interview question eight. Do you feel there are any barriers which stand in the way of implementing technology? If yes, then explain. If no, then explain.

The barriers indicated by teachers included four out of nine teachers reporting there are restrictions tied to the MPP grant which provides funding for their classrooms. Teacher D said, "I feel like our hands are kind of tied since our funding, a majority of our funding, is through the grant right now." Teacher G explained, "Honestly, the

restrictions from the grant." Teacher C felt the grant restrictions are a barrier and has been guided to put a time limit on how long students can access technology. She went on to say, "I just don't feel like 15-20 minutes of technology is enough." Teacher H mentioned, "I do not think money is as big of a barrier as the actual guidelines we are trying to follow, but it would be an issue." Teacher F said the biggest barrier for her is "just the age of my class, I guess. I think they are very young."

Teacher E indicated students are lacking social skills. The biggest barrier is the "things parents are doing at home and the current technology used." Teacher B reported, "Time is definitely a barrier," along with when technology does not work effectively and when students have limited knowledge of technology. Teacher A said, "If I really wanted to push for technology, there might be some financial issues. But really, I am the barrier." Teacher I mentioned the biggest barrier is limited access to different types of technology. The barriers are summarized in Figure 2.

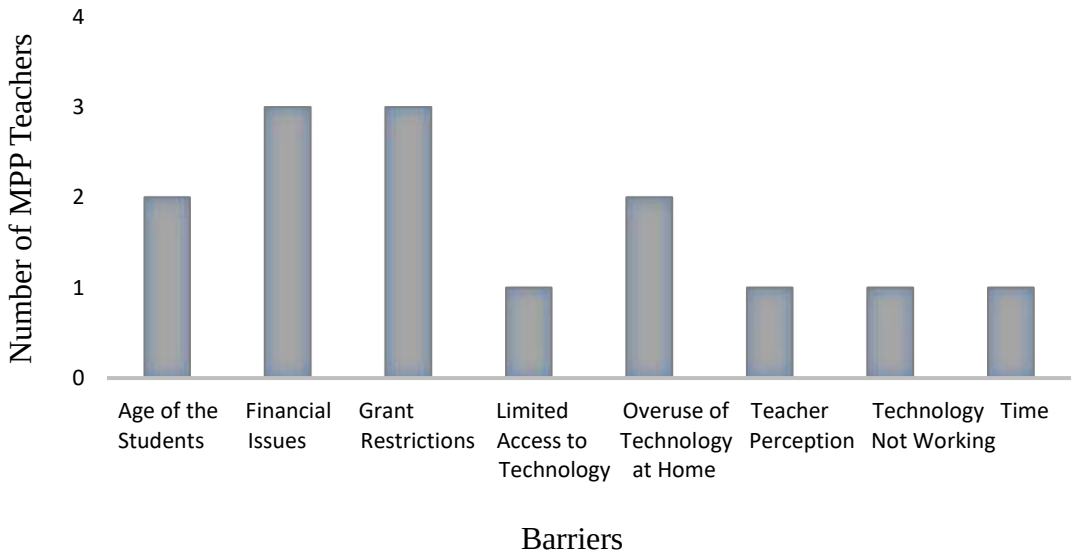

Figure 2. MPP teacher perceptions of barriers.

Interview question nine. What opportunities for professional development related to technology in early childhood have you had?

Teacher A reported she attended strong in-district professional development which was technology-based. She indicated, "They did have some training for technology in preschool. They are really trying to include us." Teacher B has not had any opportunities for training related to technology in early childhood. Teacher C mentioned limited professional development opportunities, stating, "When we went to the Conference on the Young Years we did go to one class about the iPads, but that is really all we have had." Teacher D explained in regard to building-wide trainings, "I am not afforded that opportunity because I am preschool, but when I was in kindergarten we had building-wide ones I have participated in." Teacher E said she could access in-district Instructional Technology Facilitators (ITFs) for help regarding technology in the classroom.

Teacher F indicated she had not been afforded opportunities for professional development related to technology in early childhood. Teacher G said she had not attended professional development specific to preschool, but rather general technology training which is offered by people in-district. Teacher G noted she has not been to technology training specific to early childhood due to the fact she does not utilize much technology and chooses to attend training which is more beneficial to what she is currently doing.

In regard to opportunities for professional development, Teacher H said, "No, I don't believe so. We have kind of kept an eye open for that stuff, but I don't believe so." Teacher I reported when it comes to technology, "As far as for the kids I haven't really

looked too much because I do not have access to the iPads." The information provided by the teachers indicated in-district training is where they receive a majority of their technology professional development.

Interview question 10. What is your biggest support when it comes to implementing technology?

Teacher A mentioned her administrators are very supportive. She reported, "If it was something I wanted and felt it was important they would back me, and they would do whatever they could to help me." She also mentioned there is a technology teacher in her building who is a great resource. Teacher B has access to a computer teacher who can help her. She also said about the other teachers, "We lean on each other as well as other educators for support." Teacher C felt having a computer teacher accessible to her is her biggest support. Teacher D expressed, "The building administration is very supportive of technology building-wide." Teacher E said her biggest support is access to in-district technology coaches. Teacher F pointed out she has a technology person within her district who can help her if she needs it.

Teacher G felt her principal is tech savvy and supports the use of technology. She also mentioned, "There are several people within the district if I asked for help that would help." Teacher H was certain her principal would be behind her. She added, "He is very pro-technology, you could say." Teacher I declared, "We have a new administrator this year, and she is wonderful. She is very supportive of our preschool program." The results are shown in Figure 4.

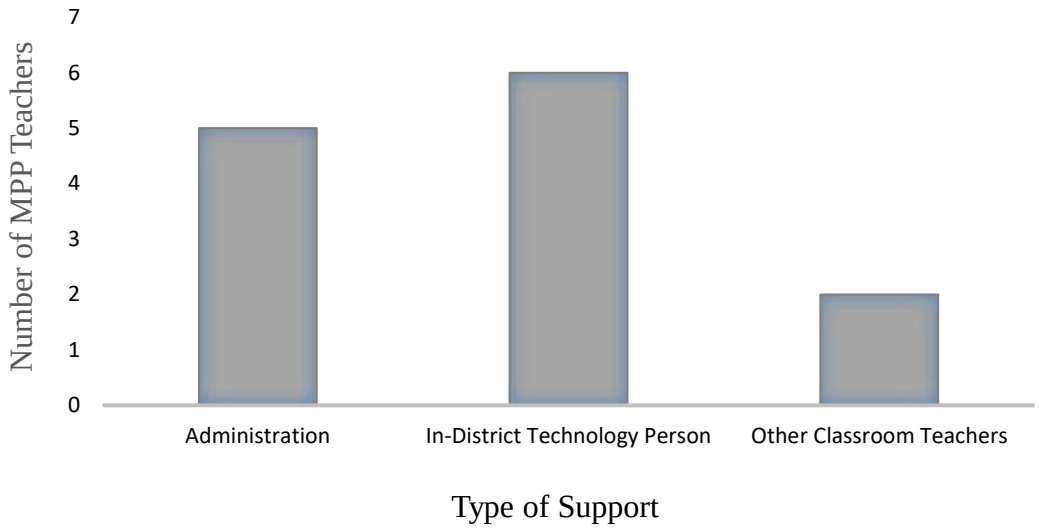

Figure 3. MPP teachers' biggest support in technology implementation.

Administrators. To maintain necessary ethical precaution and to maintain anonymity, each administrator was assigned a code. For example, the first administrator interviewed was referred to as Administrator 1, and the second administrator interviewed was referred to as Administrator 2.

Interview question one. Tell me about yourself (age of students in your building, number of years in education).

Administrator A indicated he has been a principal for eight years and has "preschool through fourth grade. I also have Parents as Teachers under my umbrella. Basically birth through 10 years old." Administrator B has been a principal for six years, and stated, "We have preschool through second grade and right under 700 students." Administrator C is in his fourth year as principal, and he reported, "I have preschool through 12th grade. I am the only principal here. With preschool, we are approximately 245 to 250 kids." Administrator D is in her eighth year as an administrator; she stated, "This is my fifth year as principal; I spent three years as an assistant before that. I am a

preschool through the 12th grade principal, and we have about 178 kids." Administrator E is currently the director of early childhood and serves students three years old to kindergarten-eligible, as well as Parents as Teachers. This year is her 23rd year in education.

Administrator F has been in education for 23 years, and her titles include assistant principal and preschool director of a preschool through eighth-grade building. She mentioned, "We have everything from three-year-olds to 14-year-olds in our building." Administrator G is in his eighth year as an administrator, serving five years as an assistant principal before becoming principal where he is currently in his third year. Administrator G indicated he works in a preschool through fourth-grade building. Administrator H is the principal of a preschool through fourth-grade building and reported this is his 18th year in education. Administrator I stated, "I oversee preschool through sixth grade. Second year as a principal. I was an athletic director for three years prior to that. I have an MPP preschool and an ECSE." The administrators involved in this study have a wide range of ages under their umbrellas of leadership.

Interview question two. Does your school or district currently have a technology initiative?

Four out of nine administrators reported their districts do not have technology initiatives district-wide or within their buildings. Not having a technology initiative does not mean these schools do not utilize technology, but rather they are not currently working toward a plan specifically focused on increasing technology in the district. Administrator D and Administrator I simply stated, "No," their districts do not have a technology initiative. Administrator F replied, "We are not involved in any technology

initiative at all." Administrator A reported his district does not have a one-to-one initiative, but they "are working on increasing our bandwidth for our district." Administrator A went on to explain "As far as my building every spring we do a fundraiser, and we purchase new devices for our students." He added within his building there are Chromebooks, iPad carts, laptop carts, and traditional computer labs available.

Administrator B reported, "The high school has gone one-to-one. The middle school is exploring; it has steps in place to go one-to-one, but it has not put definite years to it." She went on to explain the district does not know which phase will come next due to the money side of things. Administrator B explained:

> In our building, we have the basics. All classrooms have interactive SMARTboards and document cameras. All classrooms have at least one computer, and some have two. Each classroom has access to checking out iPad carts and Chromebook carts. But because you have to check them out it limits its usage. This does include preschool. Preschool all have one iPad.

Administrator C indicated his district does not have a technology initiative. He did report through a program called Computers for Education they can access refurbished educational technology, and he has a set in most classrooms except preschool.

Administrator C explained his answer further, "The reason for that is we are an MPP classroom. They stress the social learning a lot more than the academic learning for the Missouri Preschool Program. Actually, they don't want you to have SMARTboards in there." Administrator G reported, "We don't have a one-to-one initiative in the other buildings, but we definitely have a technology push." He went on to explain the high

school in his district does have a one-to-one technology initiative, and the district has adopted Chromebooks as the district-wide device.

Administrator G said in his building teachers also have iPads in their classrooms. The exception to that is the preschool. The reason the preschool classrooms are different is similar to the reason Administrator C described, "On the preschool side, there is no technology. Part of the reason is on the MPP side they have a very strict curriculum." Administrator D indicated he is unsure if MPP does not allow for any technology, "but for instance, they didn't want a projector in the room. So we took the projector out and things like that." Administrators E and H simply responded, "Yes," their districts have technology initiatives.

Interview question three. Tell me your thoughts on technology in early childhood classrooms (specifically with 3-5 year olds).

Administrator A described his thoughts, "If you asked me this probably before I got involved in administration, I would have been all for it. Now here recently we have seen a lot of needs in occupational therapy and physical therapy for students." Administrator A explained the philosophy in the early childhood classes in his building when he stated, "I'd say we lean more towards play for learning rather than every kid having an iPad at four-year-olds." Administrator D indicated, "I think they are exposed to technology way earlier, and many times I think it is for the simple fact for entertainment." She also mentioned, "I am not anti-technology, I just am at an early age."

Administrator F reported she does not think three- and four-year-olds should use technology at school since many of them have the opportunity to use it at home. She

explained, “But they don’t have the experience of using play dough, scissors, markers, crayons, those basic things we used to do.” Administrator F reported with the three- and four-year-olds they focus on motor development, “We have done enough research in our building to find that impacts their reading and their learning if they haven’t done and they don’t have the motor development and motor skills.” She went on to add it is not until students turn five that they start working with technology.

Administrator B reported, “It [technology] is an exceptional tool to use sparingly.” The purpose of using the device would be “to engage and ignite and to give a different way of looking at content and a different way to interact with content.” Administrator B was adamant technology must not be used as a time filler, but must be intentional in the application of the devices. She gave an example in the preschool in her building, “I see more interaction with our SMARTboards because we have a low student-teacher ratio. They still get to manipulate, move, and interact with the SMARTboard because of those lower numbers.” Administrator E explained, “We have such a limited time we are working on those interactions skills and social skills, and that is hard to do if they are on a lot of technology at this age.” She believed technology should be limited to work on things such as social skills.

Administrator E described how she feels technology should be interactive, “I think it should be used as supplemental and not to replace that.” Administrator C explained he would like the option to utilize technology more than the MPP grant allows. Administrator C said, “The thing about it is, we live in such a digital age.” He went on to add, “I think in order to be able to prepare kids for the future they have got to be introduced to technology at a very early age. That is when they learn the best.”

Administrator G would also like to utilize technology more than the grant allows and mentioned the preschool is very limited in what they can use. He said, "I am pro-technology, so I would want that in there." Administrator G explained his choice of technology would be "some type of tablet device." Administrator H also reported he would like to have more technology in preschool than the grant allows. He explained "We are having those conversations with her and finding out ways we can implement technology in the classroom, and ways they would accept that with ECRS and licensing and all that good stuff." Administration H indicated he is working closely with the MPP representative assigned to their district on ways to integrate additional technology.

Administrator G mentioned he feels educators need to get technology into student hands, but "we just need to get a little more help from above." Administrator I was the fourth administrator to specifically refer to the restrictions of the MPP grant in regard to technology implementation with three- to five-year-olds. She felt strongly about the use of a laptop or other device to incorporate music into the classroom. In regard to other technology, she reported, "It depends on what type of technology." She did mention in the early childhood special education classrooms they have seen positive results when using devices to increase communication among students with a language delay.

Interview question four. Does your school have a specific digital curriculum they utilize within the early childhood classrooms? If so, please explain.

Nine out of 10 administrators reported they do not use a specific digital curriculum within their early childhood classrooms. Administrator A explained, "No, within the preschool playschool we do not. K-4 we have a Promethean board in every classroom." Administrator B reported, "No specific digital curriculum at all."

Administrator C, Administrator D, Administrator E, Administrator G, and Administrator I simply responded "No" when asked the question. Administrator F explained in the MPP classroom they utilize the TV "for Go Noodle. We use it for brain breaks and movement activities and that type of stuff." Administrator H stated, "I do not have a specific digital curriculum. I would like to incorporate technology into the existing curriculum." He went on to report he would like to get more interactive technology into the hands of students.

Interview question five. What types of technology do teachers use within your building, and which do you feel is the most important?

Administrator A indicated the preschool classrooms within his building "have the old-fashioned television, things like that, but they do not really use that either." He attributed one factor in the limited technology to the fact, "I have veteran preschool teachers, and that may be part of that. If they had ever wanted to pursue something, I would be behind it 100%. It has never been approached as an initiative at the preschool level." Administrator D stated, "I just kind of really have mixed feelings" in regard to technology in early childhood, and "I am just not a huge proponent of technology at that age." Administrator D explained she feels it is good for students to use technology to listen to books on tape, but it is "also not the same as having someone sitting with them reading to them pointing out the words, pointing out the pictures to them. They don't get that from an online book that they get from a real interaction." Ultimately Administrator D felt no technology in early childhood is best.

Administrator C reported technology in the early childhood classrooms within his school is limited. He stated, "One of the reasons why is, we are a little bit old school

while trying to look toward the future toward preparing the kids. We still do a lot of paper and pencil activities, and especially with our preschool kids." He reported with the state assessments being computer-based, he has noticed his district is a little behind due to the fact "the kids do not know how to drag and drop. They don't know how to highlight, copy, edit and paste, and so on and so forth. It puts us at a disadvantage."

Administrator C explained once students are in kindergarten, teachers introduce computers. In the end, Administrator C said the SMARTboard is the most important piece of technology he feels should be in an early childhood classroom, because it is optimal for whole-class interaction. Administrator C explained, "If you can interact with the kids digitally, but as a group it always seems to be more advantageous than, I think, than one-on-one."

Administrator H indicated due to grant restrictions, the MPP teachers do not utilize technology in their classrooms. He went on to add, "I think access to the web is a priority right now because there are so many resources out there. I would say if we could get access to a SMARTboard that would be huge." Administrator B explained the teachers have access to SMARTboards and iPads within their classrooms. She indicated, "I think the SMARTboard just because I see that is where they get the most interaction." Administrator E reported the early childhood teachers have access to eBeams, a set of seven tablets shared among all classrooms. In the future, she indicated, "We are getting stations of touch screen Chromebooks," and each classroom will have five. Administrator E reported technology which is interactive is vital.

Administrator F reported the MPP teachers have access to teacher Chromebooks and teacher iPads which students do not manipulate. She explained, "Under MPP we

were told we were to be a technology-free program, and we are holding to that." If they were not held to restrictions of the grant, Administrator F indicated she would like to have tablets in the MPP classrooms as well as a SMARTtable. She expressed, "It is a more durable student-friendly item, more their size as far large motor stuff. I really like the SMARTtable for the younger kids."

Administrator G reported the MPP classrooms are limited in their technology. If he had an opportunity he would like to have a SMARTboard, and "the whole purpose would be for the students to be on that board to manipulate whatever it is." Administrator G went on to add tablets would be beneficial for learning to write letters correctly or for utilizing text-to-speech for students to have a story read to them.

Administrator H indicated there is not technology in his MPP classrooms, but for his teachers, "Access to the web is a priority right now because there are so many resources out there." Administrator H said if he could have any piece of technology, "A SMARTboard—that would be huge." He went on to mention after working with the MPP representative, he received permission to use SMARTboards in the classroom but is unable to use grant money to purchase one. Administrator I explained the MPP teachers have access to a laptop and a teacher iPad. Students have access to "old technology" including cassette players for listening centers. Administrator I reported she feels "at this time the individual iPads would be the most important thing." The results are shown in Figure 3 below. It should be noted some participants indicated more than one type of technology preference.

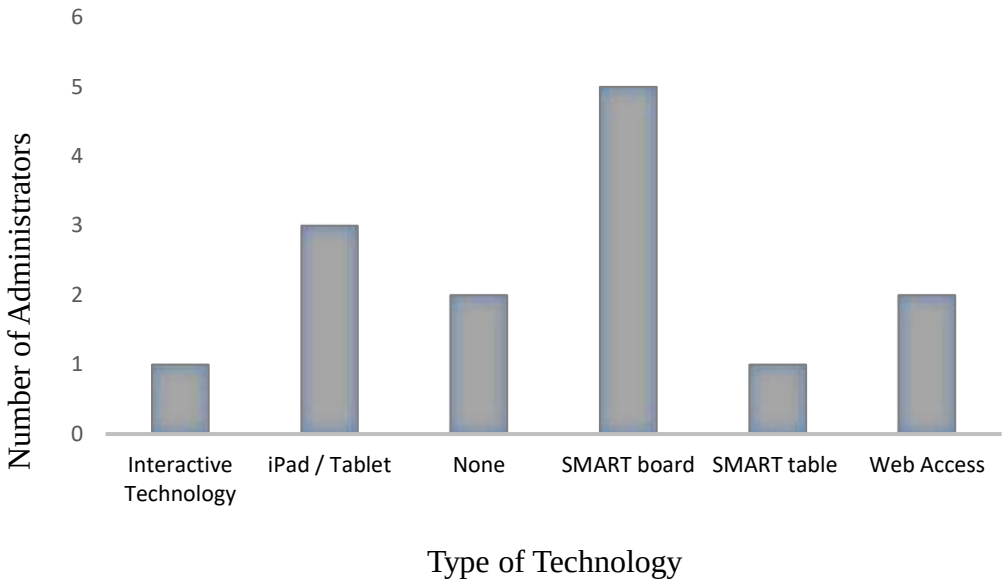

Figure 4. Preferred technology of administrators in MPP classrooms.

Interview question six. What do you feel is the role of a teacher when it comes to technology implementation?

Administrator A felt technology implementation is best implemented by the classroom teacher versus a computer teacher who visits with the students. Administrator A reported he removed the role of computer teacher within his building and "took those resources and put them in the hands of the classroom teachers. It has been much more effective in developing skills for students." Administrator B, Administrator D, and Administrator G agreed the role of the teacher when using technology is as a facilitator. Administrator B responded the role of the teacher is a facilitator "not necessarily presenting new content all the time, but facilitating the questioning, the exploration, and the discovery of content instead of delivering content." Administrator D added the role of the teacher is "facilitating, observing, watching." Administrator G was certain the teacher is "a facilitator no matter what." He indicated if students are using technology

during centers, teachers should be "spending time with that kid. They may be asking questions, not necessarily teaching how to operate the device, but questions about what was that story about, who was your favorite character, what color is she wearing, things like that."

Administrator C explained technology is "just another form of education." He went on to describe technology as a tool that "doesn't take over the role of the teacher nor does it take over the role of curriculum." Administrator E felt technology implementation "needs to be well thought-out, researched in what we are going to have them do." She specifically mentioned choosing an application because it "looks like a cute game" should be avoided. Administrator E added, "It needs to be purposeful, tie into our learning objectives and our goals. So that it is actually utilized for a purpose and not just used as a time filler."

Administrator F reported the teacher's role is to ensure "apps are age-appropriate, developmentally appropriate, something they can be successful with." Administrator H noted, "Teachers need to show the kids how they can gain access to pretty much anything they need." He felt technology enables teachers to look at the learners' needs and incorporate a visual aspect to the lesson which also may encourage students to add a kinesthetic piece to the lesson as well. Administrator I reported the role of the teacher is to talk to students regarding the purpose of using technology, "making sure they are being safe with them, making sure it is limited time." Administrator I stressed the importance of ensuring there is a time limit on technology.

Interview question seven. Do you feel there are any barriers which stand in the way of implementing technology? If yes, then explain. If no, then explain.

All nine administrators felt there was at least one barrier standing in the way of implementing technology. Administrator A reported, "I feel a veteran staff has some resistance there just because they have taught preschool for 20 years and have never needed whatever it is." He added there is the potential of some resistance to technology in part due to the decrease in social and motor skills of students. Administrator B indicated time is a barrier, "Time to find the things they want to use because we do not have a set curriculum in terms of technology. So time to prep for that." She went on to explain limited class time available is also a barrier. She noted, "If students take a turn with discovery and a turn with their questioning," additional time will be needed.

Administrator B added another barrier is the fact there are times technology does not work or the Wi-Fi is down. Administrator C explained the grant restrictions are a barrier, "Aside from the grant, it is going to be a cost kind of deal, you know. Modern technology is still pretty expensive." He explained it is not only the devices which are expensive, but the cost of "maintaining them, and then lasting long enough, not getting torn up." Administrator D stated, "We are a pretty tech-savvy school kindergarten through 12th grade." She also mentioned, "I think funding is a barrier."

Administrator H indicated he is having to pull from his elementary budget to cover the costs of technology for the MPP classroom, and he stated, "I would say financially I am limited." Administrators D and G also reported grant restrictions are a barrier.

The importance of having the ability to access "basic Wi-Fi and staying connected" was also mentioned by Administrator F. Administrator I reported three barriers, all of which have been indicated by other administrators. The first barrier is

access to Wi-Fi and the ability to "actual connectability to the outside world." The second barrier Administrator I mentioned was money, and "trying to make sure we are following the accreditation requirements for the grant" was the last barrier indicated by Administrator I. Administrator E indicated time is a barrier, because teachers have to "judge how much time and how beneficial it is versus other things." She went on to describe a barrier no other administrator mentioned, "Early childhood is unique as you know, and not all technology they are using say kindergarten through fifth grade is appropriate for three-year-olds."

Administrator E indicated the lack of knowledge regarding early childhood education by those making the decisions on the type of technology districts purchase is a barrier. When districts give the same technology to MPP classrooms as they give to the older grades, Administrator A exclaimed, "[If] it's not quite what we need, you know it's not useful, so we are not going to use it." She went on to say when choosing technology, "I think just getting what is developmentally appropriate for our kids and what is going to be interactive and useful." The results are summarized in Figure 5.

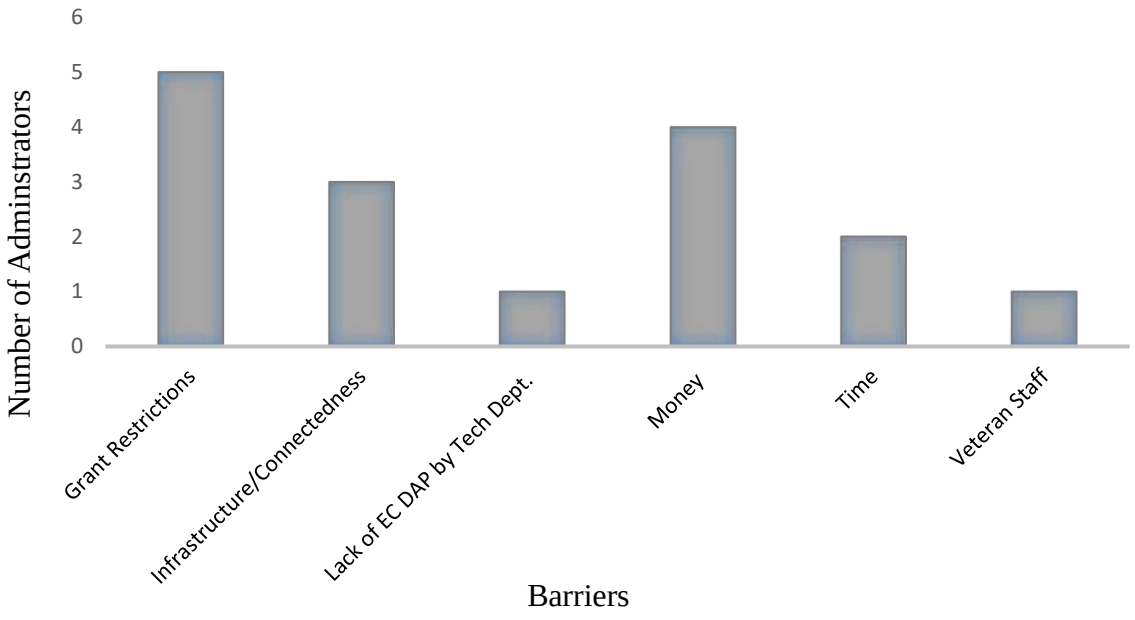

Figure 5. Administrators' perceptions of barriers.

Interview question eight. What types of support do you offer teachers when it comes to technology implementation?

Administrator A indicated his school has early release time, and one afternoon a month "is dedicated specifically to technology." Teachers have the opportunity to attend sessions led by other teachers. Administrator A gave the example one session was on "Google, learning more about what tools are available beyond Google Docs and things like that." Administrator A reported there is also "a district support, who is a teacher, who gets paid to spend a couple of hours a day to go teach other teachers about technology in their classroom." The only stipulation to this support is that teachers have to be interested in accessing it.

Administrator C reported he tries to offer as much as possible. He noted, "There is always training available," along with an Instructional Technology person who is available if teachers have questions. Administrator C felt in regard to teacher support, "There is a lot of stuff that is available to them." Administrator D indicated within her building there are teachers who are "very tech-savvy. On our PD days we have offered some different rotations, Google training, things like that." In addition to training, there is a part-time technology person available to teachers.

Administrator F stated there is a technology coach available for teachers "to help them implement new technology and try stuff out. If she learns something new she will go over and actually teach the preschool teachers." Administrator F explained the technology coach share "different resources that are within the guidelines with the MPP grant technology and use items that are in the boundaries of the grant." She added will has been beneficial to have.

Administrator H stated his district has a technology director "available for troubleshooting or updating websites or whatever it may be." Administrator H added in regard to availability of technology, they have been fortunate enough to access a variety of devices building-wide. He declared, "I'm not saying money is not an issue, it is always is, but we have been very happy with what we been able to purchase." Administrator B stated about support for preschool, "Honestly, it is very little." Administrator B said, "There is not required technology training in our preschool program at this time." If a teacher were to seek professional development related to technology outside of the district, Administrator B indicated, "If they seek it out on their own and ask to go, which is supported." She added the district does have support from a

technology director as well as a technology person within their building; “questions can be asked, troubleshooting that type of thing,” but it is not a requirement for teachers to utilize them.

Administrator E also reported, “We do not have a whole lot, honestly.” Administrator E indicated they have access to technology support, “but still it is very much tiered for the older kids, so it is kind of on their own.” Administrator I stated, “The training piece is vital,” and she reported offering to support teachers with any training they wish to go to along with finding time for them to go.

Interview question nine. What opportunities for professional development related to technology in early childhood have been offered to you and/or the early childhood teachers within your building?

All nine administrators reported the teachers in their buildings have not attended professional development specifically related to technology in early childhood beneficial for their programs. Administrator A indicated the MPP teachers attend the Conference of the Young Years, which is preschool-specific professional development. In regard to teachers attending an early childhood technology-specific conference, he stated, “I do not believe so.” Administrator B explained the MPP teachers have only attended the training on administrating the Desired Results Developmental Profile assessment which has a technology piece for teachers. Administrator C simply stated, “No, because it goes against the grant.”

Administrator D stated they are fortunate to have teachers in her building who “are very tech-savvy. On our PD days, we have offered some different rotations, Google

training, things like that." The teachers had not been to training outside the district specifically related to technology in early childhood.

Administrator E indicated she is aware of trainings which are device-specific, but "most of the trainings I have seen is for SMARTboards, and we don't have them or iPads." Administrator F indicated the early childhood teachers in her building have attended the Conference of the Young Years, but in regard to topics discussed at the conferences, "I don't remember there was a whole lot of technology in the classroom." Administrator G reported, "Not in preschool." Administrator H stated, "Because I am kind of limited with MPP, I do not have any plans to get them trained." Lastly, Administrator I stated, "There is actually not a lot of PD out there for technology in early childhood is what we have found." Administrator I indicated they do look for training, though.

Interview question 10. What is your biggest support when it comes to implementing technology?

Four out of nine administrators asserted their superintendent is their biggest support in technology implementation. Administrator A reported his greatest support when it comes to implementing technology is from his superintendent, whom he reported is "technology-oriented" and would be supportive if Administrator A did want to pursue more. Administrator D also indicated her superintendent is her biggest support due to the fact "he is very tech-savvy. He is all about a lot of technology." She went on to explain in grades kindergarten through 12, teachers have access to Chromebooks, iPads, laptop carts, SMARTboards, Apple TVs, and computers. Administrator D reported, "The higher

ups have always been supportive when it comes to what we need for the classrooms or the kids."

Administrator F also stated having the support of the administration is beneficial. She went on to explain, "We have support of our families." Administrator G indicated his superintendent is very supportive especially in regard to technology implementation. He explained his superintendent "has been very supportive of our one-to-one initiative at the high school and has been very open for purchasing things at the elementary." Administrator H stated, "My superintendent and my school board, both see the benefit of teaching kids through technology. I feel we are pretty comprehensive PK-12."

Administrator I reported two areas of support, the first a full-time technology person within the district, and the second the "teachers' willingness to try new things." Administrator I went on to explain, "If you don't have the teachers' support to try it, then it doesn't matter what all you have in your building or classroom." Administrator E noted her biggest support is "the teachers helping each other because there is only a handful of them."

Administrator B felt strongly her "biggest support is our in-house instructional coaches. They are such a go-to phenomenal resource." She reported the teachers have the opportunity to access help from coaches with anything, including technology implementation. She explained, "The instructional coach will walk alongside the teacher and look for avenues, plan and reflect on those avenues. That really is our greatest resource." Administrator B added, "And of course colleagues" are a resource as well.

Summary

The use of technology is on the rise in elementary schools (Arora, 2016). Technology use with younger students, specifically those in early childhood, has elicited a mixed response among educators in regard to its appropriateness in the classroom (Konca, Ozel, & Zelyurt, 2016). Chapter Four depicted the perceptions and opinions of administrators and MPP teachers from southwest Missouri in regard to technology in early childhood.

The study conducted was a qualitative investigation which utilized interview questions to gain a better understanding of the views and opinions of educators in regard to technology in early childhood. In this study, a majority of the viewpoints of the participants favored technology in early childhood classrooms. The data collected from administrators and MPP teachers were analyzed and are presented in Chapter Five.

Chapter Five: Summary and Conclusions

According to the NAEYC (2012), young children have technology readily available, yet just having access to technology without guidance does not lead to best practices. Kazakoff (2016) stated, "Thus, schools likely play a key role as a place to learn about new technologies for children" (p. 3). When it comes to technology within early childhood classrooms, "preschool environments have many unresolved debates on the use of technology" (Konca et al., 2016, p. 10).

One reason for the debate is researchers who have suggested technology is not appropriate for early childhood education as it does not provide children with hands-on experiences (Davidson et al., 2014). Another reason is years of recommendations from the AAP (2015) advising adults to limit the amount of time children spend on media and technology.

Sanders et al. (2016) explained, "The increasing adoption of these devices has contributed to a rapid rise in screen time exposure for children" (p. 1). Historically, "children typically spend most of the time in their preschool setting choosing freely from a range of activities provided by the educators. Play, alone or with others, is considered to be an important medium for learning" (Livingstone, Marsh, Plowman, Ottovordemgentschenfelde, & Fletcher-Watson, 2015, p. 7). Early childhood educators are forced to reexamine their deeply rooted play-based pedagogy developed by Froebel, Dewey, Montessori, Vygotsky, and Piaget to find appropriate ways to integrate new technology practices (White, 2015).

The other side of the debate among educators indicates "because of the rapid development of technologies, they have changed children's lives and ways of learning,

particularly in the past ten years" (Hsin et al., 2014, p. 85). Offering guidance for technology implementation are the NAEYC (2012) and the Fred Rogers Center for Early Learning and Children's Media, who explained, "Children's experiences with technology and interactive media are increasingly part of the context of their lives, which must be considered as part of the developmentally appropriate framework" (p. 5).

Ally and Prieto-Blázquez (2014) reported technology is here and will only continue to grow; therefore, it is vital students are armed with necessary skills for the future. White (2015) indicated there is limited information available on how early childhood teachers perceive and use technology within their classrooms, or if developmentally appropriate technology practices are utilized. If educators have not analyzed their current perceptions regarding technology, they may not use developmentally appropriate technology practices with students (Dietze & Kashin, 2013).

This qualitative study included examination of the perceptions of early childhood teachers and administrators in southwest Missouri in regard to technology and current practices. Limited information is available regarding developmentally appropriate practices in technology implementation at the early childhood level (White, 2015). This study will serve as a resource for administrators by providing professional development topics early childhood teachers could pursue to implement developmentally appropriate technology practices.

In this chapter, the research questions which guided the study are answered, and the findings are presented with corresponding data to support. In addition, conclusions, implications for practice, and recommendations for future research are provided concerning technology in early childhood.

Findings

The purpose of this qualitative study was to examine the perceptions of administrators and early childhood teachers in regard to technology implementation in the classroom with three-, four-, and five-year-olds. The study involved data gathered from nine MPP teachers affiliated with public schools in southwest Missouri and nine administrators affiliated with public schools in southwest Missouri with a minimum of one MPP classroom. A total of nine public schools from southwest Missouri were represented in this study. Information was gained through interviews which occurred via telephone. The study was guided by four research questions.

Data collected were then analyzed, and the findings were summarized and applied to the corresponding research questions. Also, supporting literature from Chapter Two was incorporated to provide further comparisons with the results of this qualitative study.

Research question one. What are early childhood teacher and administrator perceptions about using technology in early childhood classrooms?

During the interviews each participating MPP teacher was asked the question, "What are your thoughts on technology in early childhood classrooms, and what do you feel is appropriate use?" Eight out of nine participants reported technology in early childhood classrooms is acceptable to use in moderation. Times are changing, explained Jorgensen and Logan (2015). Teacher C agreed as she stated, "Our world it is different than when I grew up. They need it early to stay caught up with the rest of the world." Teacher H explained in regard to technology in her classroom, "I think it would be great. I don't think all of the time, but I think it is pretty important." It has been reported

technology has been proven to increase student engagement, even at the early childhood level (Cameron, 2015).

Teacher F indicated in regard to using technology in the classroom, “The kids really like it,” which can lead to increased engagement. Although 88.8% of the teachers answered they feel technology is appropriate in early childhood, they did offer insight to guidelines they believe are important to follow when implementing technology. Teacher B, Teacher C, Teacher D, and Teacher G specifically mentioned the need to limit the time students are exposed to technology.

Teacher B indicated the importance of using developmentally appropriate technology and stated, “Appropriate use of technology in early childhood classrooms would be as long as children are interacting and engaged in learning.” White (2015) explained early childhood educators are faced with the challenge to blend technology into current pedagogy to ensure technology practices are appropriate. Teacher G revealed technology is most suitable when it is being integrated into her unit of study and “making it apply to what we are learning about.” Eight of the nine teachers indicated there is a place for technology in early childhood. There was one teacher who disagreed.

Teacher A reported she does not feel technology in early childhood is appropriate. She said, “I am not a fan of technology in preschool classrooms. I am finding that a lot of the kids have a lot of technology at home and that is predominately what they spend their home time doing.” Teacher A explained she is seeing a trend in students having decreased fine motor and social skills when compared to previous years. According to Montessori, a child’s interaction with the world is a crucial part of his or her development (Baligadoo, 2014). Teacher A expressed technology “has replaced a lot of hands-on

activities." According to a University of California-Los Angeles psychology study, there has been a decrease in social skills among children due to the expansion of technology usage (Wolpert, 2014).

The teachers were also asked, "Do you feel there are any barriers which stand in the way of implementing technology?" Blackwell et al. (2014) reported a barrier to the implementation of technology in early childhood classrooms is in part due to "teaching beliefs, comfort with technology, and perceived values of technology for student learning" (p. 83). This was not the case directly reported among the teachers interviewed for this study. Perceived barriers included limited financial resources, limited time, and limited access to developmentally appropriate technology, in addition to the age of the students and interpretation of grant restrictions limiting the use of technology. Teacher E also indicated she has observed students lack strong social skills, which are important to address. In a study conducted by Mertala (2017), educators stressed the importance of focusing the foundation of early childhood on the social-emotional learning of students.

An educator's belief regarding technology integration is one of the most significant barriers (Plumb & Kautz, 2016). Teacher F said the biggest barrier for her is "just the age of my class, I guess. I think they are very young." Teacher A stated, "Really, I am the barrier." Chen (2008) reported teachers often feel as though there is not enough time during class to cover all of the required content, and implementation of creative uses of technology is regarded as time-consuming. Teacher B stated, "Time is definitely a barrier." In addition, Minshew and Anderson (2015) explained educators are often restricted in their ability to spend time learning about technology.

During the interviews, each participating principal was asked the question, “Tell me your thoughts on technology in early childhood classrooms (specifically with 3-5 year olds).” A majority of the administrators, 66.6%, reported they believe technology in early childhood is acceptable. Administrator E described how she feels technology should be interactive, “I think it should be used as supplemental and not to replace that.” Administrator B reported she believes “it is an exceptional tool to use sparingly.” The purpose of using the devices is be “to engage and ignite and to give a different way of looking at content and a different way to interact with content.”

Administrator G reported he feels educators need to get technology into the hands of early childhood students. He noted, “The thing about it is, we live in such a digital age.” He went on to add, “I think in order to be able to prepare kids for the future they have got to be introduced to technology at a very early age. That is when they learn the best.” Administrator I stated she had seen positive results when using devices to increase communication among students with a language delay.

Paciga et al. (2013) explained technology can play a role in increasing a child’s communication abilities. Just as the participating teachers made reference to guidelines, so did the administrators. Administrator B was adamant technology must not be used as a time-filler, but must be intentional in the application of the devices. Administrator E specifically mentioned the need to limit time students are exposed to technology in order to work on things such as social skills.

Three out of the nine administrators, or 33.3%, responded they do not feel technology is appropriate in early childhood. Administrator D indicated, “I think they are exposed to technology way earlier, and many times, I think it is for the simple fact for

entertainment." Plowman (2015) reported by the time children start school at age five, in their home environment they have had access to technology devices, and "all the children also had technological toys, including play laptops or robotic dogs" (p. 38).

Administrator A explained his philosophy, which is similar to Vygotsky, "I'd say we lean more towards play for learning rather than every kid having an iPad at four-year-olds." Vygotsky (1967) claimed, "Play is central to early childhood education because it allows young children to learn social, cognitive, emotional, language and physical skills that are essential to their overall development" (p. 12). Administrator F explained in her experience, students today "don't have the experience of using play dough, scissors, markers, crayons, those basic things we used to do," which is causing a decrease in motor skills. Technology is a beneficial tool in early childhood, but researchers have indicated the possibility of an adverse effect if not used properly (Jorgensen & Logan, 2015).

The administrators were also asked, "Do you feel there are any barriers which stand in the way of implanting technology?" Answers among the administrators regarding barriers included money, veteran teachers, time, lack of understanding among the personnel responsible for ordering devices utilized in early childhood, infrastructure or ability to get connected, and interpretation of grant restrictions. Administrator C indicated, "Modern technology is still pretty expensive." He explained it is not only the cost of the devices which are expensive, but the cost of "maintaining them, and then lasting long enough not getting torn up."

According to Brooks-Gunn et al. (2016), "Equipping each of the 50 million public school students in the United States with a laptop would cost tens of billions of dollars each year even if these laptops were replaced only every three years" (p. 2). Districts in

Missouri are "preparing for cuts because of a potential state budget shortfall of $200 million or more" (McKinney, 2016, para. 1). The cost to purchase technology and to maintain it could be a financial burden on districts.

Administrator A reported, "I feel a veteran staff has some resistance there just because they have taught preschool for 20 years and have never needed whatever it is." Chen (2008) noted, "Requiring teachers to change their pedagogical beliefs can be a daunting task because it may involve challenging fundamental beliefs" (p. 67). Carver (2016) indicated the amount of student instructional time has been identified as a barrier. Administrator E agreed with this statement by saying time is a barrier, and teachers have to "judge how much time and how beneficial it is versus other things."

Administrator E explained, "Early childhood is unique as you know, and not all technology they are using say kindergarten through fifth grade is appropriate for three-year-olds." Administrator A added, if the device is "not quite what we need, you know it's not useful, so we are not going to use it." The administrators agreed it is important to have access to developmentally appropriate technology.

Roth and Price (2016) explained, "Infrastructure is a constant challenge" for some schools (p. 7). Administrator F stated, "The importance of having the ability to access basic Wi-Fi and staying connected" is a barrier for his school. It is also an obstacle for Administrator I's school, and she indicated there is a need for access to Wi-Fi. The grant restrictions stated in the Fiscal Year 2017 MPP administrative manual found on the MODESE (2016) website include the following: "Computers should ideally have a limited presence in the MPP classroom. Children should have a timed experience when using the computer" (p. 11). The administrators' interpretation of this statement varied.

Five administrators specifically mentioned the grant is a barrier to implementing technology in early childhood classrooms, whereas four administrators did not refer to the grant as a barrier. This is interesting to note since all MPP schools are held to the same expectations.

Both teachers and administrators were asked, "What is your biggest support when it comes to implementing technology?" Five of nine, or 55.5%, of teachers reported having a supportive administrator when it comes to technology integration. Teacher H was certain her principal would be behind her. She added, "He is very pro-technology you could say." Teacher A noted her administrators are very supportive. She reported, "If it was something I wanted and felt it was important, they would back me, and they would do whatever they could to help me."

Early childhood educators must feel supported in the use of technology to shift their pedagogical practices from the keepers of technology to the facilitators of technology (Ertmer & Ottenbreit-Leftwich, 2013). Six out of nine teachers, or 66.6%, reported having access to an in-district technology person who is available for support. Johnston (2015) explained, "With the now assumed expectation that all teachers utilize and integrate technology across the curriculum, the role of the instructional technology specialist has evolved to one of a co-teacher who plans with teachers and teaches students" (p. 20). Teacher C felt having a computer teacher accessible to her is her biggest support. Teacher A indicated there is a technology teacher in her building who is a great resource.

Crompton, Olszewski, and Bielefeldt (2016) "identified support and time as the two components needed by administrators, technology coaches and teachers to

successfully implement a learning initiative" (p. 17). Of the administrators interviewed, 44.4% indicated their superintendent is their biggest support in technology implementation. Administrator D reported, "The higher ups have always been supportive when it comes to what we need for the classrooms or the kids."

Administrator I reported two areas of support, the first being a full-time technology person within the district, and the second being the "teachers' willingness to try new things." Administrator I went on to explain, "If you don't have the teachers' support to try it, then it doesn't matter what all you have in your building or classroom." Administrator B explained the technology coach in her building is her biggest support. She went on to say, "They are such a go-to phenomenal resource." She reported teachers have the opportunity to access help from the coaches with anything, including technology implementation. Administrator B said, "The instructional coach will walk alongside the teacher and look for avenues, plan and reflect on those avenues." Administrator E and Administrator B also felt teachers helping teachers is another support they have.

Research question two. What strategies are Missouri early childhood teachers using to implement technology in classrooms?

This question was specific to what teachers have access to, and these technologies are not all available for the students to use. Student-specific technology was analyzed separately. Out of the teachers interviewed, 55.5% reported having at least one iPad in the classroom, typically utilized for student assessments. Teacher E reported having access to tablets but would prefer to have access to iPads. Teacher B had the only classroom with a SMARTboard. Teacher E reported she has an eBeam in her classroom, but it is not as user-friendly as a SMARTboard for the preschool students. Teacher D

stated, “We have a television.” Teachers H and I indicated the only technology they have is a radio.

If teachers could have any technology in their classroom, 44.4% of teachers replied they would like to have a SMARTboard. Teacher B stated, “They allow the students to take virtual field trips which allow our students to go places that they never have the opportunity to actually visit.” Teacher H declared if she could have any technology in her classroom, “I would want a SMARTboard for sure. Just for the things I could do with it, have the kids interact with it, get them engaged more. Get them where they can see real pictures.”

Teacher E felt interactive technology is the most important. According to the NAEYC (2012), “Technology and interactive media are tools that can promote effective learning and development when they are used intentionally by early childhood educators, within the framework of developmentally appropriate practice to support learning goals established for individual children” (p. 5). Teacher F believed a screen to show videos is most important. Teachers D and I indicated a radio or CD player as their most desired technology due to the ability to provide a listening center for students.

During the interviews teachers were also asked, “With what frequency do you utilize technology?” The teachers reported they use technology to complete tasks such as e-mails, documentation, assessments, or for group activities with their classes. All nine teachers reported utilizing technology daily even if it is for only a short time to check e-mail.

The teachers were asked, “What types of technology do students have access to within your classroom, how do they typically utilize it, and with what frequency?” There

were 33.3% of the teachers who responded students do not use technology in their classrooms, and 44.4% of the teachers reported their students utilize technology daily. Teacher B stated her students use "SMARTboards, iPads, and computers. We use them as learning tools." Other types of technology utilized by students in MPP classrooms include eBeams, e-books, CD players, laptops, and televisions. According to Lee (2015), "The children's use of an iPad in a learning center enhanced the children's frequent interactions with their peers and their teachers because they were not merely playing and using with an iPad alone" (p. 948). The other 22.2% of teachers reported the students utilize technology one to three times per week.

During interviews, administrators were asked, "What types of technology do teachers use within your building, and which do you feel is the most important?" Administrators A and D indicated no technology is used in their early childhood classrooms. Administrator D said you could have students listen to books using technology, but it is "also not the same as having someone sitting with them reading to them pointing out the words, pointing out the pictures to them. They don't get that from an online book that they get from a real interaction." Ross, Pye, and Randell (2016) reported research has indicated mixed findings regarding e-books having both positive and negative impacts on students.

Administrator I explained the MPP teachers have access to a laptop and a teacher iPad. Students have access to "old technology" including cassette players for listening centers. Administrator I reported she feels if students could have access to any technology, "at this time the individual iPads would be the most important thing." Administrator C indicated technology is limited in early childhood classrooms but said

the SMARTboard is the most important piece of technology because it is optimal for whole-class interaction. Administrator H also reported technology is limited in the classrooms but feels access to the internet is a priority along with getting access to a SMARTboard. Administrator B explained the teachers have access to SMARTboards and iPads within their classrooms. She reported, "I think the SMARTboard just because I see that is where they get the most interaction." Nichols (2015) explained SMARTboards fall into the category of interactive whiteboards which allow adults and students to engage and manipulate content on the screen.

Due to grant restrictions, Administrator F reported they limit the time technology is utilized. Administrator F indicated she would like to have tablets in MPP classrooms as well as a SMARTtable. According to Administrator F, "It is a more durable student-friendly item, more their size as far as large motor stuff. I really like the SMARTtable for the younger kids." Mercier, Higgins, and Joyce-Gibbons (2016) explained multi-touch tables enable students to manipulate lesson materials directly and do not require the skills necessary to control items such as a computer mouse or keyboard.

Administrators were also asked, "Does your school have a specific digital curriculum they utilize within the early childhood classrooms?" Nine out of nine administrators reported they do not use a specific digital curriculum within their early childhood classrooms. Administrator H stated, "I do not have a specific digital curriculum. I would like to incorporate technology into the existing curriculum." Three of the approved MODESE (2016) curriculums do specifically address technology in some form. High Scope is one of the four MODESE-approved curriculum models (MODESE, 2016). According to Epstein (2015), "HighScope believes technology, when

appropriately designed for young children over age two and used with the guidance of supportive adults, can promote early learning and development." (p. 6).

Another MODESE-approved curriculum is Creative Curriculum (MODESE, 2016). Four out of nine, or 44%, of the schools included in the interview indicated they utilize this curriculum in their MPP classrooms. Creative Curriculum states it covers all the domains of student learning, including technology (Teaching Strategies, 2013). Included in Creative Curriculum is a book collection with e-Books "designed for use with computers and interactive whiteboard technology, [as] eBooks build children's confidence and excitement about reading" (Teaching Strategies, 2013, p. 25). The University of Missouri (2014) indicated, "One of the 11 Learning Centers is the Technology Center where children engage with technology, interact with computers and other electronic devices" (p. 14). None of the administrators referenced a technology component within their program curriculum.

Both teachers and administrators were asked the question, "What do you feel is the role of a teacher when it comes to technology implementation?" Over half of the teachers, 66.6%, responded the role of the teacher while students are utilizing technology is to facilitate, guide, or support the process. Teachers as facilitators aligns with the philosophical views of Froebel and Dewey, where "it is the students, rather than the teacher, who choose direction, set goals, and determine effort" (Glassman, 2001, p. 6). Teacher B stated, "The teacher is the facilitator, along with overseeing that appropriate usage is taking place." Ertmer and Ottenbreit-Leftwich (2013) explained an educator's role is not to hold onto the technology, but to serve as the facilitator of technology.

Administrator B, Administrator D, and Administrator G specifically indicated the role of the teacher during technology implementation is as the facilitator. Administrator G explained if students are using technology during centers, teachers should be "spending time with that kid. They may be asking questions, not necessarily teaching how to operate the device, but questions about what was that story about, who was your favorite character, what color is she wearing things like that." Ahmed (2015) explained the role of a facilitator is to guide the activity and offer encouragement for students to take ownership of their learning.

Research question three. How do Missouri early childhood teachers and administrators identify best-practice strategies to implement technology?

During the interview, teachers were asked, "How do you determine if technology is being used effectively and if students have learned a specific concept through utilization of the device?" The NAEYC (2012) stated, "Teachers can avoid the passive and potentially harmful use of non-interactive, linear screen media that is inappropriate in early childhood settings. Intentionality is key to developmentally appropriate use" (p. 8). Of the teachers interviewed, 77.7% reported utilizing observation to determine if technology is effective. Gordon and Browne (2015) stated, "Observation is the basis of so much of a teacher's work" (p. 116). Teacher H mentioned she "just kind of is watching and seeing how they progress." Teacher E indicated she utilizes observations, data collection, and notes to determine if the technology is helpful. Gordon and Browne (2015) asserted, "Observing is more than ordinary supervising. It takes energy and concentration to become an accurate observer" (p. 116). Teacher B confidently responded observation is the key to knowing if technology is effective.

Administrators were asked, “What types of support do you offer teachers when it comes to technology implementation?” Administrators play a vital role in the implementation of innovative technology (Vu et al., 2014). Bennett, Agostinho, and Lockyer (2015) explained, “Support tools have most potential to improve design decisions by engaging with the key influences that shape existing design practice” (p. 28). Of the administrators interviewed, six out of nine indicated teachers have access to a technology support person within their districts. Administrator F stated there is a technology coach available for teachers “to help them implement new technology and try stuff out. If she learns something new, she will go over and actually teach the preschool teachers.” Administrator F explained the technology coach has been beneficial to share “different resources that are within the guidelines with the MPP grant technology and use items that are in the boundaries of the grant.”

Three of the nine administrators indicated they have technology training within their buildings. Teachers have the opportunity to attend sessions led by other teachers. Administrator A gave the example one session was on “Google, learning more about what tools are available beyond Google Docs and things like that.” Administrator C reported, “There is always training available,” along with an IT person who is available if teachers have questions. One way to support teachers is providing time to explore and learn with technology prior to the requirement of implementation (Ertmer & Ottenbreit-Leftwich, 2010). Administrator I stated, “The training piece is vital,” and she reported offering to support teachers with any training they wish to go to along with finding time for them to go.

Research question four. What are teacher and administrator perceptions of professional development regarding technology in early childhood?

Within the interview process teachers were asked, "What opportunities for professional development related to technology in early childhood have you had?" It has been reported a barrier to technology implementation is the lack of professional development specific to technology in early childhood (Turner, 2015). Out of the teachers interviewed, 66.6% reported they have never had the opportunity for professional development specifically related to technology in early childhood. Teacher H said in regard to technology training for early childhood, "We have kind of kept an eye open for that stuff." The NAEYC (2012) stated if teachers are not knowledgeable in developmentally appropriate practices, it can lead to improper usage.

Teacher A reported she attended strong in-district professional development which was technology-based. She indicated in regard to in-district training, "They did have some training for technology in preschool. They are really trying to include us." Two additional teachers indicated in-district technology personnel are available for help. Teacher C mentioned, "When we went to the Conference on the Young Years we did go to one class about the iPads, but that is really all we have had." According to Crompton et al. (2016), "Educators want their professional learning to be job situated, ongoing and closely related to their job assignments" (p. 17). Professional development connected directly to teachers' lessons has been reported as having a higher success rate (Desimone & Garet, 2015).

Administrators were asked, "What opportunities for professional development related to technology in early childhood have been offered to you and/or the early

childhood teachers within your building?" All nine administrators reported the teachers in their buildings have not been to professional development specifically related to technology in early childhood. Administrator I stated, "There is actually not a lot of PD out there for technology in early childhood is what we have found." Administrator I indicated they do look for training, however. Administrator E indicated she is aware of training which is device-specific, but "most of the trainings I have seen is for SMARTboards, and we don't have them or iPads." Administrator D stated they are fortunate to have teachers in her building who "are very tech-savvy. On our PD days we have offered some different rotations, Google training, things like that." The administrators mentioned teachers attending Conference of the Young Years but were not aware if any of the sessions were about technology.

Conclusions

Conclusions were developed based upon the answers to research questions. This section includes conclusions reached concerning common perceptions among Missouri public school early childhood teachers and administrators in regard to technology and current instructional practices. The following themes are the result of analysis of participants' transcribed interviews.

Perceptions of Missouri public school MPP teachers. The widely held perception of the nine MPP teachers who were interviewed is that it is appropriate to use technology in early childhood classrooms with students. The results were aligned to the NAEYC (2012) recommendation and indicated most teachers do feel technology is acceptable in the early childhood classroom, although the actual use of technology by students in the early childhood classroom is currently limited. It was mentioned students

have a desire to interact with technology, and it can serve as motivation for students, leading to increased engagement. It was strongly suggested the role of the teacher in technology is as the facilitator, which aligns with the philosophical views of Froebel, Dewey, Montessori, and Vygotsky (Ogunnaike, 2015). McNierney explained technology is only beneficial for early childhood students when it allows children to be learners who "actively navigate their learning or co-construct knowledge with others" (as cited in Dietze & Kashin, 2013, p. 2). Önkol et al. (2011) noted early childhood teachers report a positive climate and increased student cooperation when students are using technology.

Over half of the teachers indicated a need to limit students' exposure to technology. The idea to limit technology exposure aligns with the recommendations from the AAP (2015), which specified overuse of technology can have an adverse effect on learning. It was apparent, with regard to the pedagogical debate on the importance of play, the teachers believed technology is not a replacement for the research-based practice of hands-on learning but serves as a tool to enhance a child's experience. SMARTboards and iPads were identified as the preferred choice of technology in classrooms by the teachers.

Following Vygotsky's (1967) idea of the ZPD, where educators should focus on the child's needs, one teacher indicated technology should not be used with early childhood students due to an observed decrease in motor and social skills of students. Froebel indicated children enhance their fine and gross motor skills through play, and their social skills are developed through stories and songs (Shikwesha, 2015).

Interpretations of the MPP grant guidelines were varied, and this was apparent when discussing the barriers to implementing technology. Four teachers mentioned the

restrictions of the MPP grant as a barrier, and they indicated technology is expected to be limited. These schools stressed the importance of following the guidelines and recommendations of the grant to continue to receive funding for the program. Although all of the teachers are held to the requirements set forth by the grant, several of the schools did not indicate it is a barrier. Technology utilized within the classrooms must be purchased with school funds, as the grant does not allow technology purchases with MPP funding (MODESE, 2016). Financially, this limits the technology available in the classrooms. Other barriers included teacher perceptions of students overusing technology at home, limited access to technology, and limited time within the day to implement technology.

Professional development specifically related to technology in early childhood classrooms was reported to be limited, yet was not specifically indicated by teachers as a barrier. Blackwell et al. (2014) believed policymakers and leaders in education need to be aware of the fact technology alone will not change early childhood teachers' instructional practices. Quality professional development is necessary for developmentally appropriate technology practices within early childhood classrooms (Cameron, 2015).

One of the teachers indicated she had been to training on utilizing iPads in early childhood classrooms. Ertmer and Ottenbreit-Leftwich (2013) stated the focus of professional development needs to be on the teachers, not technology, and "what they believe comprises good instruction and good learning; how they put those beliefs into practice; and how they can be supported by the contextual, cognitive, and affective factors that exist in their school environments" (p. 180). The other eight teachers have

not had training outside of the district. The teachers reported three support systems when it comes to implementing technology in the classroom. The first and most-identified support by the teachers is in-district technology personnel. The second-most identified support is having the backing of administrators. Lastly, two teachers mentioned the support of fellow educators is what aids them in technology implementation.

In conclusion, MPP teachers do feel technology is appropriate in early childhood classrooms, but current use by students is limited. Early childhood teachers lack adequate access to professional development to aid in the implementation of developmentally appropriate practices. Many districts make an effort to supplement outside professional development with in-district training and technology support personnel, but the training is not always delivered by experts in early childhood education.

Perceptions of Missouri public school administrators. The administrators interviewed for this study were not all consistent with their responses about the use of technology in early childhood classrooms. Two-thirds of administrators believed technology could be a useful tool in the classroom. It was suggested by these principals developmentally appropriate technology usage is when technology is used as an interactive, hands-on tool to engage students. To ensure the utilization of technology is comprised of developmentally appropriate practices, educators need to be deliberate in implementation (Cameron, 2015). Two administrators specifically indicated technology is a critical component of preparing students for the future. The role of early childhood educators is to prepare students for the future (Baligadoo, 2014).

One-third of the administrators do not feel technology in early childhood is appropriate. These administrators indicated an increase in students lacking appropriate social skills. In order to improve social skills, the administrators believed students need interaction with peers and adults around them as opposed to technology. These principals stressed the fundamentals of early childhood pedagogy, which is the incorporation of play rather than technology.

In regard to the role of the teacher during technology implementation, the administrators indicated, like Froebel, Dewey, and Montessori, the role of the teacher is as a facilitator. Technology does not replace the teacher. One administrator expressed the importance of technology implementation being well-planned and directly related to lesson objectives.

In reference to barriers to implementing technology in early childhood classrooms, overwhelmingly the administrators felt there is at least one barrier. These barriers include time, grant restrictions, money, staff, and infrastructure constraints. Five administrators specifically reported they believe an obstacle to implementing technology is grant restrictions. There were mixed responses as to what part of the grant guidelines set the limitations on technology.

Time is an issue for several reasons. Al Mulhim (2014) explained, “Lack of time is a universal problem in using technology; it is found wherever using technology is mentioned no matter how developed in the country” (p. 490). Time is needed to attend training to learn methods to utilize best practices, and time is necessary to lesson plan using the strategies learned during professional development. In addition, administrators

reported their MPP classes are only three hours in length, which leads to a lack of class time to address all of the necessary skills students need to learn.

All nine administrators reported the teachers in their buildings have not been to professional development outside of their districts specifically related to technology strategies in early childhood. One administrator indicated she is aware of a few device-specific trainings, but these are only beneficial if teachers have those devices in their classrooms. High-quality professional development opportunities for early childhood educators play a role in developmentally appropriate technology integration (White, 2015).

The administrators were able to offer a variety of supports to their teachers. To supplement the lack of out-of-district professional development available to teachers, administrators reported offering in-district training and access to technology support personnel. Administrators also require support in order to be effective for their teachers. Four administrators believed their biggest support for technology implementation comes from their superintendents. Another support for administrators are the technology personnel available within their districts.

In conclusion, a majority of the Missouri public school administrators interviewed felt technology in early childhood classrooms is appropriate, and they would like to utilize it more but are restricted to interpretations of guidelines set forth by the MPP grant. The administrators indicated technology is best-used when the teacher is the facilitator of hands-on, interactive technology directly related to lesson objectives. It was noted there is a lack of professional development available for early childhood educators

specifically related to early childhood teaching strategies using technology. Administrators did try to find ways to provide in-district training to compensate for this.

Implications for Practice

Interviews conducted for this study indicated a majority of early childhood educators support technology in the classroom. Blackwell et al. (2014) indicated lack of professional development is a concern of educators. The research conducted in this study revealed similar results, as all 18 participants indicated limited professional development related to research-based technology instructional practices in early childhood. As explained by two administrators in the study, early childhood is unique, and training which is appropriate for kindergarten and up is not necessarily suitable for early childhood. Professional development is of the utmost importance when dealing with the application of developmentally appropriate technology. The literature review revealed professional development has the largest impact on teaching strategies related to technology.

During the interviews, educators indicated technology in early childhood should be intentional, integrated into the classroom objectives, interactive, and engaging. This is congruent with the recommendations from the NAEYC (2012), as they stated, "Technology and interactive media are tools that can promote effective learning and development when they are used intentionally by early childhood educators, within the framework of developmentally appropriate practice… to support learning goals established for individual children" (p. 5). The topics revealed in the study can serve as professional development sessions for educators in order to develop a deeper

understanding of strategies on how to implement technology in developmentally appropriate ways.

Due to the shortage of out-of-district training specific to technology in early childhood, it would be beneficial for early childhood educators in southwest Missouri to create professional development opportunities through a collaborative partnership. The interviews indicated the educators in the study have a variety of experiences with technology in early childhood and could be useful in serving as presenters. The collaboration could include working with the MODESE to offer more guidance and clear expectations in regard to recommendations for technology usage in early childhood.

Most importantly, this study could have a significant impact on the future of early childhood students. It is the role of the educator to prepare students for the future. Technology is only going to continue to grow and become a more integral part of society. To best prepare students for the future, it is becoming a necessity to get technology into the hands of students, even early childhood students, as an interactive tool.

Recommendations for Future Research

This qualitative study detailed the perceptions of Missouri public school early childhood teachers and administrators in regard to technology and current practices. The elicitation of perceptions of similar stakeholders in other regions of Missouri would be beneficial. Follow-up studies would allow varying perspectives on technology in early childhood to identify if the findings in this study are unique to the region studied or are applicable to other geographical locations. It would also be an advantage to gain the perspectives of a larger population.

A population which needs further study is parents of early childhood students and their perceptions of technology in early childhood. The study could involve research on what early childhood parents believe is an acceptable use of technology at home and school. This study could identify what technology students are accessing at home and with what frequency. Having a home perspective would be advantageous in creating a broader, more comprehensive understanding of the technology usage of early childhood students on a daily or weekly basis when home and school use are combined.

Within this study, there was limited demographic information collected from participants. Another important area to study could be analyzing how experience, gender, race, and socioeconomic status of students served impact perceptions of educators. In addition, there is a need to analyze how varied student demographics impact teaching strategies in the classroom.

Summary

Early childhood is different today than years ago, but what has not changed is the importance of early childhood education. According to Sarıkaya and Coşkun (2015), "Preschool education years is critical period because basic characteristics of individual are built in this period. Therefore, it is important to get successful preschool education for children in order to achieve themselves in the future" (p. 889).

Lee (2015) noted, "The contemporary experience of childhood, children use not only traditional, typical toys and materials such as blocks, dolls, balls, puzzles, sand, but also, they interact on a daily basis with technology like digital media" (p. 947). Dietze

and Kashin (2013) reported the integration of technology could potentially be the first addition to the category of play since prior to the 20th century.

Some researchers have suggested technology is not appropriate for early childhood education as it does not provide children with hands-on experiences, yet children often come into early childhood classrooms already familiar with advanced technology (Davidson et al., 2014).

The NAEYC (2012) and the Fred Rogers Center for Early Learning offered another perspective on technology in early childhood by stating, "Technology and interactive media are tools that can promote effective learning and development when they are used intentionally by early childhood educators, within the framework of developmentally appropriate practice to support learning goals established for individual children" (p. 5). Some early childhood educators believe technology is here and will continue to evolve, and students must be equipped with necessary skills for the future (Ally & Prieto-Blázquez, 2014).

The purpose of this qualitative study was to examine the perceptions of administrators and early childhood teachers in regard to technology implementation. In this study, a majority of the perceptions of early childhood educators were favorable toward technology in early childhood, although actual use of technology by students is limited. There was a portion of both teachers and administrators who felt technology does not have a place in early childhood. If educators have not analyzed their current perceptions regarding technology, they may not use developmentally appropriate technology practices with students (Dietze & Kashin, 2013).

Chapter One included background for the study, as well as a theoretical framework. Also included was the statement of the problem and the purpose of the study. In addition, the research questions which guided this study were presented. Lastly, the definitions of key terms, limitations, and assumptions were described.

In Chapter Two, a literature review was included. The literature reviewed for this study was divided into five categories. These categories were focused on early childhood pedagogy, the benefits and concerns of technology in early childhood, recommendations for developmentally appropriate implementation, barriers to developmentally appropriate implantation, and professional development opportunities for early childhood educators. Each section included findings from experts and theorists in the field of early childhood education. The literature review was later used when analyzing practices currently implemented by Missouri public school early childhood educators.

In Chapter Three, the methodology used in this qualitative study was described. The purpose of the study was identified, and the research questions were restated. This chapter also included a closer look at the population and sample for the study. More detailed explanations of the instrumentation and the data collection procedures were documented. Lastly, the ethical considerations were addressed.

Chapter Four included the perceptions and opinions of Missouri public school administrators and MPP teachers. Interviews conducted with administrators and teachers were analyzed. In this study, the perceptions of the educators interviewed indicated support for technology in early childhood.

In Chapter Five, the research questions which guided the study were answered, and the findings were presented with corresponding data to support. In addition, conclusions, implications for practice, and recommendations for future research were provided concerning technology in early childhood.

Appendix A

LINDENWOOD

LINDENWOOD UNIVERSITY ST. CHARLES, MISSOURI

DATE: August 11, 2016

TO: Lara Wilbur
FROM: Lindenwood University Institutional Review Board

STUDY TITLE: [924368-1] Perceptions of Missouri public school early childhood teachers and administrators in regards to technology and current practices
IRB REFERENCE #:
SUBMISSION TYPE: New Project

ACTION: Approved
APPROVAL DATE: 7-15-16
EXPIRATION DATE: 7-15-2017
REVIEW TYPE: Expedited

Thank you for your submission of New Project materials for this research project. Lindenwood University Institutional Review Board has APPROVED your submission. This approval is based on an appropriate risk/benefit ratio and a study design wherein the risks have been minimized. All research must be conducted in accordance with this approved submission.

This submission has received expedited review based on the applicable federal regulation.

Please remember that informed consent is a process beginning with a description of the study and insurance of participant understanding followed by a signed consent form. Informed consent must continue throughout the study via a dialogue between the researcher and research participant. Federal regulations require each participant receive a copy of the signed consent document.
Please note that any revision to previously approved materials must be approved by this office prior to initiation. Please use the appropriate revision forms for this procedure.

All SERIOUS and UNEXPECTED adverse events must be reported to this office. Please use the appropriate adverse event forms for this procedure. All FDA and sponsor reporting requirements should also be followed.

All NON-COMPLIANCE issues or COMPLAINTS regarding this project must be reported promptly to the
IRB.

This project has been determined to be a project. Based on the risks, this project requires continuing review by this committee on an annual basis. Please use the completion/amendment form for this procedure. Your documentation for continuing review must be received with sufficient time for review and continued approval before the expiration date of 7-15-2017.

Please note that all research records must be retained for a minimum of three years.

If you have any questions, please contact Sherrie Wisdom at (636) 949-4478 or swisdom@lindenwood.edu. Please include your study title and reference number in all correspondence with this office.

If you have any questions, please send them to IRB@lindenwood.edu. Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within Lindenwood University Institutional Review Board's records.

Appendix B

Teacher Interview Questions

1. Tell me about yourself (age of students you teach, number of years as an early childhood teacher, curriculum utilized within the classroom, comfort with technology).
2. What are your thoughts on technology in early childhood classrooms, and what do you feel is appropriate use?
3. What types of technology do you use within your classroom? If you utilize technology, please explain which you feel is the most important and why. If you do not utilize technology, please explain which type of technology, if any, you would like to have access to in your classroom and why.
4. With what frequency do you utilize technology? (per day / week)
5. What types of technology do students have access to within your classroom, how do they typically utilize it, and with what frequency? (per day / week)
6. When students are using technology, what is the role of the teacher or aide during this time?
7. How do you determine if technology is being used effectively and if students have learned a specific concept through utilization of the device?
8. Do you feel there are any barriers which stand in the way of implementing technology? If yes, then explain. If no, then explain.
9. What opportunities for professional development related to technology in early childhood have you had?
10. What is your biggest support when it comes to implementing technology?

Appendix C

Administrator Interview Questions

1. Tell me about yourself (age of students in your building, number of years in education).
2. Does your school or district currently have a technology initiative?
3. Tell me your thoughts on technology in early childhood classrooms (specifically with 3-5 year olds).
4. Does your school have a specific digital curriculum they utilize within early childhood classrooms? If so, please explain.
5. What types of technology do teachers use within your building, and which do you feel is the most important?
6. What do you feel is the role of a teacher when it comes to technology implementation?
7. Do you feel there are any barriers which stand in the way of implementing technology? If yes, then explain. If no, then explain.
8. What types of support do you offer teachers when it comes to technology implementation?
9. What opportunities for professional development related to technology in early childhood have been offered to you and/or the early childhood teachers within your building?
10. What is your biggest support when it comes to implementing technology?

Appendix D

Letter of Participation
Interview

Dear Title First Name and Last Name,

My name is Lara Wilbur. I am a doctoral student at Lindenwood University, and I am conducting a research study on the perceptions of Missouri public school early childhood teachers and administrators regarding technology and current practices in early childhood classrooms.

Thank you for agreeing to participate in the study. I have attached the informed consent and a copy of the interview questions. I will be in contact with you soon to schedule the interview.

Please contact me at [redacted] with any questions you might have.

Thank you,

Lara Wilbur
Lindenwood University
Doctoral Student

Appendix E

INFORMED CONSENT FOR PARTICIPATION IN RESEARCH ACTIVITIES

Perceptions of Missouri Public School Early Childhood Teachers and Administrators in Regard to Technology and Current Practices

Principal Investigator _Lara Wilbur_____Telephone: [redacted]
E-mail: [redacted]

LINDENWOOD

Participant _____ Contact info: _____

You are invited to participate in a research study conducted by Lara Wilbur under the guidance of Dr. Shelly Fransen. The purpose of this research is to determine the perceptions of Missouri public school early childhood teachers and administrators in regard to technology and current practices in the classroom.

2. a) Your participation will involve:
   - Participating in an interview of open-ended questions regarding technology and current practice in the early childhood education classroom.

   b) The amount of time involved in your participation will be approximately 30 minutes.

   Approximately 18 public school early childhood teachers and administrators will be involved in this research.

3. There are no anticipated risks associated with this research.
4. There are no direct benefits for you participating in this study. However, your participation will contribute to knowledge about the role administrative leadership styles have on teacher job satisfaction and may help society.
4. Your participation is voluntary and you may choose not to participate in this research study or to withdraw your consent at any time. You may choose not to answer any questions that you do not want to answer. You will NOT be penalized in any way should you choose not to participate or to withdraw.

6. We will do everything we can to protect your privacy. As part of this effort, your identity will not be revealed in any publication or presentation that may result from this study and the information collected will remain in the possession of the investigator in a safe location.

7. If you have any questions or concerns regarding this study, or if any problems arise, you may call the Investigator, Lara Wilbur, [redacted] or the Supervising Faculty,

Dr. Shelly Fransen, [redacted]. You may also ask questions of or state concerns regarding your participation to the Lindenwood Institutional Review Board (IRB) through contacting Dr. Marilyn Abbott, Provost, at mabbott@lindenwood.edu or 636-949-4912.

I have read this consent form and have been given the opportunity to ask questions. I will also be given a copy of this consent form for my records. I consent to my participation in the research described above by participating in the interview process.

_____ _____

Participant's Signature Date

_____ _____

Primary Researcher's Signature Date

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Vita

Lara Jean Wilbur attended College of the Ozarks for her undergraduate degree. She obtained a Bachelor's of Science in Elementary Education with an emphasis in Early Childhood in 2008. In 2012, she earned a Master's of Science in Educational Administration from Lindenwood University.

Lara started her career in education with Branson R-IV Schools in 2008 as an early childhood special education teacher at Branson Primary. In 2011, she moved to Branson High School where she was a special education teacher for students with intellectual disabilities. During her time in Branson, she served as an assistant coach for women's soccer for five seasons from 2009 to 2013 and as the assistant coach of goalkeeping for men's soccer during the 2011 season.

In 2014, Lara was hired as the principal of Nixa Early Childhood with the Nixa R-II school district. She is currently serving as principal at Nixa Early Childhood, which is comprised of two early childhood buildings serving three-, four-, and five-year-olds in the Nixa community. Lara is an active member of the Missouri Association of Elementary School Principals.