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EXPLORATION OF YOUNG CHILDREN AND FAMILIES USE OF  
MOBILE TECHNOLOGY IN A RURAL SCHOOL DISTRICT

A Dissertation

School of Education

Duquesne University

In partial fulfillment of the requirements for  
the degree of Doctor of Philosophy

By

Kimberly L. Dickert-Wallace

May 2022

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Kimberly L. Dickert-Wallace

2022

EXPLORATION OF YOUNG CHILDREN AND FAMILIES USE OF MOBILE  
TECHNOLOGY IN A RURAL SCHOOL DISTRICT

By

Kimberly L. Dickert-Wallace

Approved March 14, 2022

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## ABSTRACT

### EXPLORATION OF YOUNG CHILDREN AND FAMILIES USE OF TECHNOLOGY IN A RURAL SCHOOL DISTRICT

By

Kimberly L. Dickert-Wallace

May 2022

Dissertation supervised by Dr. Amy Olson

This dissertation explores the use of mobile technology with young children ages 2 to 5 in a small rural school district in southwestern Pennsylvania. Grounded in an understanding that family-child relationships are central to children's development and school readiness, this study seeks to understand the ways families engage with children around technology use, how young children use technology, and how these habits compare to national data. The data also led to ways the school district might support families and young children using mobile technology in developmentally appropriate ways. Thirteen families that live in the Mountain Valley School district completed the Young Child Technology survey answering the questions based on one child in their home between the ages of 2 to 5. Using the results produced by Qualtrics software, the survey data were analyzed for frequencies and comparison to national data collected by

the Common Sense Media survey (2020). Many of the Mountain Valley School District trends were like national trends. Young children now use mobile devices at a higher rate independently than before. However, families are looking for support from teachers to help them guide them on what apps to use and how to use mobile technology with their young children to support their development. It is important to note that the data was collected almost two years after the Covid-19 pandemic changed access and use of mobile technology for many people.

## DEDICATION

This dissertation is dedicated to my daughters. May you find your passion, work hard at making your passion your life's work, and stay connected to the ones you love and are the source of your joy.

## ACKNOWLEDGEMENT

I want to acknowledge my husband, Patrick, for all your support to help me complete this journey. Your words of encouragement, support of reading pages upon pages of my work, and your new skill of falling asleep with the light on while my fingers tap away on the keyboard are true signs of your love and support.

My daughters, Ruby and Clara, I acknowledge your many words of encouragement, your patience in listening to my excitement about my work, and the loads of laundry and other chores that you picked up so that I could work. I am thankful for your love that helped push me through this process in the hopes that my work will help other families stay connected and grow strong in the changing world.

I acknowledge my proofreader. My sister, Julie, for her time, encouragement, and skills as a proofreader. My work is more precise and cleaner because of the time and insight.

I acknowledge my parents and how their passing led me on this path of discovery. What started as a journey to occupy my mind, transformed to working on a clear path to make this a better world. Thank you for your example and it is an honor to carry on your legacy.

God, for giving me the energy and desire to keep searching for a space to use my gifts from Him.

I acknowledge all those that asked me why and what I was doing this work for. Thank you for fueling me forward to prove I could keep moving forward, search for

something more, see myself stretch longer than I thought I could, and help me learn that there is always more to come.

I want to acknowledge Dr. Chris Oldham for your encouragement and willingness to share insight. Your words pushed me through many dark times of the process.

The Duquesne University Ed.D. faculty and staff, I acknowledge work you poured into me to meet me where I started and guided me to bring my passion to light while helping me see things in myself that I didn't. Especially my dissertation chair, Dr. Amy Olson. Her calm encouragement and support kept me digging when I only saw the surface. I acknowledge the support of my committee members, Drs. McGown and Williams. Your keen eye and insight to my work helped shape my work. Your positivity and support helped me to see a bigger goal and picture.

Acknowledgment is due to my cohort members. We entered this journey together and we supported each other as we grew as people and researchers. I have gained so much insight and treasure the support from each of you.

I acknowledge those that helped my survey come to life, August Delbert, Nicole Kording, Courtney Silvio, Whitney Grove, Crystal Theys, Lisa Sowers, Heidi McIntosh, and Jordan Schreyer. Without your input and support, my survey would not have been successful.

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## **Chapter 1 Problem of Practice**

### **Social, Cultural, and Historical Perspectives on the Problem**

When a modern technology or advancement is created in our world, like the television or mobile devices such as a smartphone, they have an impact on our culture, families, and children. It took 14 years for the television to reach fifty million global users (Radesky et al., 2016). Within four years, the internet reached the same amount of people globally. Smartphones reached the same number of users in less than three years. Radesky et al. (2016) stated that in the past we have had time to watch that change occur and often the use of the new technology has been slow. This is not the case with mobile devices.

Not only do the devices themselves impact culture, families, and children but the information and how that information is accessed makes an impact. Mobile devices, unlike television, could give the user access to information about anything that they want now they want it, call, or text anyone at any time, and more than a box in a room and programed to limited options to watch. However, access to options and information on a mobile device can be limited to some that causes a division in the use and access. I will explore how that divide impacts people and how they use mobile devices.

Despite the prevalence of mobile technology, one does not have to look far into research of technology use to discover the term, “digital divide,” which was defined as “inequalities related to the disparities in access, actual use and use efficacy of digital resources” from a 1999 United States government report (Vassilakopoulou and Hustad 2021). As quickly as digital technology has developed, the focus on the digital divide has also changed. In the late 1990’s the gap focused mostly on access to internet and

computers (Vassilakopoulou & Hustad, 2021). Today, there is less focus on a digital divide due to general access but more focus on the types of devices families have access to, the ways they access the internet, and the norms around screen time. For example, according to Bowles (2018) access to technology devices and internet has changed for many families. She stated that “rich” students had access to internet earlier and were able to gain tech skills that helped create the original digital divide. But now the families of those same children are concerned about how the screen time is affecting their child’s development and limiting their screen time. She went on to make the proactive statement such as, “It could happen that the children of poorer and middle-class parents will be raised by screens, while the children of Silicon Valley’s elite will be going back to wooden toys and the luxury of human interaction” (Bowles, 2018). Bowles (2018) continued by referencing Dr. Richard Freed work. His work found that access to the technology and internet are not as much of an issue, but he added to the definition of the digital divide that limiting access to the technology of children is now the issue (Freed, 2015). Families of different incomes feel differently about the use of technology and some limit the access of the technology of their children more than others.

In March 2020, when Covid-19 caused people to have to be at home to work and learn online, the concept of this digital divide became even more important. For my research, I am connecting the access and use of digital and mobile technology to support young children’s development into current situations and discourse. Because all families of various incomes need to learn how to manage the use of technology, there is a need to help support them in that learning. From my experience and the literature, I understand families of different income levels use technology and the support for that technology

differently. Schools can be the common link to helping support families with using technology. With schools providing the technology, they can be the example and resource for families. There is a way for families to be able to share the “luxury of human interaction” and use technology too (Bowels, 2018). My work will explore these inequities and to define supports needed for families with small children to use to maintain connections with each other while using technology to support growth and development of the child.

Seeing how technology is being used more in our culture and is here to stay. We need to look at the impact that use has on our children. There remains a concern about potential negative impacts of technology access and use on children. For example, Wong et al. (2015), looked at the challenges experienced by children living in low-income situations. According to Wong et al. (2015), most differences in children that lack access to technology or internet shows a gap in academic success. In other words, in a technology-dependent culture, the gap in technology availability and use negatively effects a child’s self-confidence and academic competence impacting the child’s psychosocial development. However, Bowels (2018) offers a counterpoint that increased technology use does not necessarily benefit children’s development, and both Bowels (2018) and Wong et al. (2015) point out potential negative impacts on children’s interaction by adult caregivers or parents.

These concerns align with my experience, namely that children with internet access may develop social skills with peers by either using the technology to communicate with each other, i.e., Facetime, or have conversations about the games, apps, or ways they are using the technology. From my interaction with boys eight and

above, I understand that they use the Xbox in their own homes to play the same games as their friends at the same time and connect with each other over the internet. Playing with headphones, the boys do not need to be in the same place physically to interact and play “together.” From my experience collaborating with girls, in the similar age range, use more social media to connect. In conversations with the girls in my conversation with them, they are more active with more social apps than their boy peers. They use group messaging or game apps like, Game Pigeon, with some limited use of Facetime or snapchat to connect with friends. Children, my experience, have shown their lack of interaction with their peers one on one or primarily through conversation. Most of the communication is short or based around a game, photo, short video, or app.

Students not engaging in face to face or oral conversation as a primary means of communication was a trend on the rise. March 2019, Covid-19 removed most options of interaction face to face when learning and work became based at home. This change created another gap perpetuated in other ways between families that did and did not have access to internet or devices. Workplaces and schools gave mobile devices and hotspots for internet needs to families closing access gaps.

However, another gap remains in the types of devices children use. For families in lower incomes, below \$30,000, Anderson & Kumur (2019), found that one-fifth of adults owned smartphones as they state and that many lower income families rely on smartphones for internet access. When a smartphone is the primary device, internet is limited by data limits on a cell phone plan and access is limited by the device, which has a smaller screen than a tablet or computers or completing tasks as well as limited access to apps and websites (e.g., a mobile site may not be as functional as a site designed for

computers). Anderson and Kumur (2019) also found that about 5 million school-age children do not have access to broadband internet at home in low-income homes. And low-income families are more than twice as likely than other income groups to be classified as digitally unprepared. Thus, the digital divide encompasses access to the internet and devices, and research suggests that families from lower economic classes have less access and less effective access to the digital world.

Research, often presented as deficit language, also states that children in low-income families were less likely to have the same social opportunities as their peers in higher income situations (Shehu, 2019). Because, according to Shehu (2019), children from homes with “limited financial resources” are “less likely to have social opportunities” because of limited resources and the opportunities available to these families compared to their peers of higher income status. Her work examines peer acceptance in early childhood. She stated that children, from an early age feel the need to connect with people either peers or other people. Shehu (2019) continued by stating that these experiences and interactions first happen with families and caregivers and help support a young child socially, emotionally, and cognitively in the first five years of life. She added that previous research found the way children interact with their peer in early childhood is the same pattern in later stages of child development.

The work of Shehu (2019) of Barr et al. (2020) explored how children develop in a technological world through the lens of theorists like Bronfenbrenner. Barr et al. (2020) defined the understanding the importance of measuring “the interaction between the individual and the changing contexts within which children develop.” Relationships are important in the development of a child. The first relationships that are impacting a child

are those of their family and adult caregivers, and these relationships may be impacted by young children's solitary use of technology.

For example, McDaniel and Radesky (2018) are concerned with the impact the growing use of technology has on caregivers-child relationship. While understanding the benefits we get from technology, especially since it is more mobile, they voice the concern of what impact it is having on family relationships. Advances of technology has given us the ability to be more flexible by working from home as pointed out by McDaniel and Radesky (2018), shifted time focused on work and disrupted time with other relationships in our home. They termed this disruption as "technofence," which they defined as the interruption digital and mobile devices when otherwise people would be interacting together with face-to-face conversations, meals, or playtimes. As a result of families using more mobile technology, there were fewer adult-child interactions, adults were less responsive to children when they are using mobile devices, and adults were observed to be more hostile to children when they were seeking attention while the adult was using a device (McDaniel & Radesky, 2018). Both adult caregivers and children feel the effects of technofence, and children even voiced their discontent quoted by McDaniel and Radesky (2018) they wished parent or adult caregivers would not use mobile devices during "family routines".

With the growing use of technology and the understanding of the importance of relationships for children and adults in a child's development, I want to understand how adults are working with technology themselves and with the children in their care to support the use of technology without disrupting relationships to have influence in a young child's development. Technology is mobile and part of everyone's life and as an

educational leader, it is important to find a balance and support our young learners and families to maintain that balance in the use of technology that helps them grow into successful individuals.

### **Local Contextual Perspectives on the Problem**

A small rural school district, Mountain Valley School District (MVSD) in southwestern Pennsylvania, located about fifty-five miles from a major city, educates about 1600 students. The school district covers an area of 235 square miles, making it one of the largest in the state for landmass, but has a small population of students served in Pennsylvania. The median age of the residence of this district is 51 years old. It is an aging population with little growth of young families with children moving into the district. The rural location and aging population limit that tax base for funding the district, it is one of the most underserved districts in the county for many services. Services that are limited include mental health, early interventions, law enforcement, and Child and Youth Services. This school district has an average per capita income of about \$31,132 per year (censusreporter.org, 2021). This is an average of the per capita income as reported for the five distinct areas towns and townships that are in the MVSD. The two larger population areas do have a higher per capita income reported while the remaining areas that feed the one elementary school are within the poverty level of \$26,200, according to the according to the U.S. Department of Health and Human Services for 2020. The elementary school building that serves this part of the school district is a Title 1 school. Most families in the school district would be classified as low to middle class.

Within the Mountain Valley School District there are several early childhood education providers. But those providers are not located throughout the district. The

concentration of the centers is in the southern end of the district. This area has a denser population, but it is also the area of the district that has more families with middle income. The early educational providers report families have the option of scholarship for children to attend at all locations. Various providers have varying amounts of families using these resources. Local reporting of numbers as a school district are difficult to find. Other research will look at free and reduced lunch numbers. Families need to apply for free or reduced lunch. The formula for eligibility is based on income. The income from all sources is divided by number of times the payment is made throughout the year and the number of persons in the home is part of the calculation. Both the 2020-2021 and 2021-2022 school years provide free breakfast and lunch to all learners. This district also supports families with food bags every week. Families that are in need can request to get a food bag every Friday sent home with “child friendly” food options for the weekend. This program has been extended to throughout the summers of 2020 and 2021. All four buildings of the school district have this program for the learners. The highest number of participations is in the elementary level. The larger elementary school averaging fifty bags a week, the Title 1 elementary school averaged about 80 bags a week, and the middle and high school buildings averaged 10 to 15 bags between the two buildings. In my experience working in the school district families are more engaged with the child and their needs at the elementary level. They are also willing to reach out for support if they know that support is there. The numbers of the bags per building sent home could support this observation as well. But it is important to factor in as children get older, they become more self-conscious about support such as food bags sent home on a weekly basis. All the schools do try to make the distribution of the food bags discreet.

There are areas with a high percentage of families living in poverty in the school district. The structural and systematic effects of childhood poverty are unsurprisingly associated with so-called “achievement gaps” in student performance in school. Magnuson & Waldfogel (2016) argued that one likely reason for achievement gaps is that more affluent families have more resources to invest into supporting their children’s development. Families in the Mountain Valley School District that are living in the low-income situation struggle with transportation issues or lack of availability to resources to help their children prepare for school like their peers that live with high incomes. MVSD understand the community and the needs for support of the community. They attempt to reduce these hurdles by supporting and promoting options for early educational resources for children ages two to five in the district. These include public library programming, community organizational programming, and early learning centers. However, the early learning centers are not equally distributed around the school district. The concentration of options is in only part of the school district. This concentration is in the area where largest population base for the district. Because of the rural setting, access to resources is limited when families do not have consistent transportation. There is no public transportation in the school district other than one bus that travels from the center of town to neighboring towns with no stops in the school district (Westmoreland Transit, 2021). Therefore, young children in the area that has limited options for early childhood learning centers or other resources do not have the same early intervention needed to support their development to be as prepared as their peers for kindergarten.

A noticed gap that is not discovered until a young learner enters kindergarten in MVSD, that influences children’s academic success upon entering school, is the increase

in the number of learners entering the school district classrooms with the need for speech services. Personnel at the Title 1 funded elementary school expect an increase of 16% of incoming learners in the 2020-2021 school year who will require speech services. That increase will result in 31% of the total school population in need of speech services.

This trend need for speech service is what caught my attention and where my interest in research began. I began to question why the numbers were growing and what could the school do to support speech development and reduce this gap for learners. Because of this trend and anecdotal evidence provided by families and teachers, I became interested in investigating the use of mobile technology by children ages 2-5 and if the degree to which the technology is used and if it can support or hinder speech development. The increasing prevalence of technology across contexts means that children at younger ages have more access to technology (both mobile devices and the internet) than their peers in previous generations. Furthermore, the proliferation of mobile technology means most families have at least one smartphone in the home and that access the internet is not limited by socioeconomic status and income levels in the same ways as it was by access to home computers in the past.

With the increase in the number of learners needing speech services in this school district, the members of the school board need to understand the urgency of the issue and the possibility of needing to add more staff for speech services. Because of the size, aging population of the community, and the funding sources for the school district, taxpayers would be interested in what the school district is doing to address issues that if not addressed would cause an increase in taxes. Many families and community members also

want to know that they are supporting and being supported by the school to get the best education for their child as possible.

Because of the increased need for speech support for incoming learners was only recently identified, this problem is not one that the community or school district has addressed to date. The Mountain Valley School District does offer supports to families for early childhood education to help discover the needs of services that might be needed like speech before the child reaches kindergarten. First, are the early intervention options in the school buildings. There are four classrooms, two in each elementary building, dedicated to for preschool-age children. These classrooms are for children ages 3 and 4 by September 1 of the school year. The children that are age four can ride the school bus. Younger children need transportation to school. For families with transportation barriers, the age 3 child might not be able to attend, but as a 4-year-old, the school district pre-school setting is an option. Secondly, these classrooms are also partially funded through a grant. The grant opens spaces in the classrooms for families that meet the income requirements for the child to attend free of charge. The grant requirements have about fifteen spots out of 30 to 35 spots. Finally, in partnership with the United Way and the school district the Tiny Mounties program was created in February of 2018. This program works with families in the school district to help prepare the families and children for kindergarten. The community also houses four other preschool options that families can choose to send their child to for early intervention and learning opportunities. Any young children that would need early intervention services before they are in kindergarten, would be provided services by the local Intermediate Unit (IU).

However, when I served as the director of the Tiny Mounties program, I learned that these services are difficult for families to receive for two main reasons. For one thing, the process to refer young children often changes. When we first referred families, the staff from an early childcare provider could call in the referral for the family. After the referral, the IU would contact the family to make an appointment to meet at a convenient time and place for the family. Without notice, the process changed that year to the family members only had to make the call. The evaluation appointments were made at one location in the community on a specific location, instead of coming to the family or a location close the family could walk to get to the appointment. The location was often at least 8 to 10 miles away on a weekday that was when the IU staff was in the district. This was a barrier for many of our families that needed to arrange transportation, make other arrangements for other children, or work schedules. Therefore, many children were not able to make the evaluation meetings. Because of these changes, the confusion of the process, hesitation from the family, or other barriers lead to a drop in referrals and evaluations as well. We voiced the concern to the school district, and they would step into get our families and the UI connected. The process was time consuming and labor intensive on school staff. Delays occurred with this process because these children will be future learners in our building, but not always a priority at this time. Also, some families would not tell us that they could not get to the evaluation site on the given time or place. After a child has been referred, the family then must meet the Intermediate Unit Screener in a specific location on a specific day. The screening does not happen where and when it is convenient for the family. As stated before, transportation can be an issue for many families in the school district.

Making home visits with Tiny Mounties program, with every family in the program had at least one child ages 2 to 5, lived in a variety of income levels but all families that we worked with owned at least one smartphone. This was verified by families self-reporting how to contact them and listing they could receive text messages and use an app on a mobile phone for communication with the program. Each of the families that we did home visits with also had a television.

In my personal experience, the television and smartphone would interrupt the interaction between the child and the adult caregiver. In one example, as we entered the home to work with the family, the television was in the room that the father and daughter were in together. The show on the tv was “Game of Thrones.” The television was not turned off as we collaborated with the father and child independently. In the conversation with the father, he was more interested in the show than he was with our conversation. I am assuming that was the same interaction with the child and him when we were not there. First, the content of the tv program was not age appropriate for the young child. Second, it did not support her learning and growth. Finally, it was clear that the tv show was distracting to the father when we were there on an appointment, which leaves one to wonder what the interaction is between the child and adult when we are not there.

In my current role as a school counselor, I speak with many adult caregivers that struggle to understand how to use the mobile device and the child’s learning that are in their care. Therefore, they do not interact with the children in their care and the mobile devices. Some state they do not feel comfortable with technology and therefore leave the child on their own to use the device and complete the work on their own. Like most schools during the 2020-2021 school year, schooling for the Mountain Valley School

District is done mainly on an iPad for attending Zoom lessons with the teacher and classmates, posting assignments, and completing work for the class. Families can work with paper and pencil if that is the choice of the family or child. However, all lessons can only be accessed by the family and child on a mobile device. Lessons are synchronous and often recorded for the family or child to access at another time. Even those recorded lessons need to be accessed on a mobile device and need wi-fi. Others report that they are working at home and do not have time to interact with their child and the technology. These families are completing more paper pencil work with or for their child to complete schoolwork. They report that they do not know how to use the device the way the child needs to use the device. Based on personal experience, most children are more knowledgeable and proficient than their parents and grandparents with technology, its applications, and resources.

Since March 2020, and the experience of the teachers working with learners in different settings with technology being the connector to the learning, many have had a unique perspective of students access to technology, internet, and support from families with technology. In the Mountain Valley School District, teachers, mostly middle-income professionals, witnessed the homes and heard students' families on Zoom sessions. From meeting and personal conversations with teachers, many felt that students did not care for devices the same outside of school as they did in the buildings. Internet was an issue for many families. The district had to supply hotspots and often a variety of hotspots for families to be able to connect. At times, those connections were still very unstable contributing to the growing gap. They also did not feel the support of families when they reached out to them with concerns about a student's lack of progress.

Technology that focuses on this work has become much more mobile and used more for entertainment or educational purposes in the last five years. This technology that I am focused on has changed from television to gaming systems, like Atari, to computers then laptops and more mobile devices like iPads, cell phone and smartphones.

Mountain View School District does offer supports to girls in fifth grade to address the development of young girls and how the pressures of relationships impact their development and choices. The ROX program, a program I run in my school, is a curriculum for girls and the pressures they face with culture and technology. This program has been offered to fifth graders for about 10 years in the MVSD. The sixteen-week curriculum helps girls build skills to be confident individuals “who learn to control their own relationships, experiences, decisions and futures” (ROX, 2021). Both elementary buildings offer the ROX curriculum. Most girls in the fifth grade become part of the program that is free to the participants. The school pays for the participation to encourage all that want to participate without a financial concern. The curriculum keeps updated to address the pressures of mobile and technology pressures on young girls.

### **The Candidate’s Leadership Perspective of the Problem**

As a former school board member, creator, and former director of the Tiny Mounties program and now a school counselor at one of the school district’s elementary schools, I have seen how various parts of the school district and community can come together to support each other to make change in issues such as this for young learners. A background in early childhood as well as my years on the school board help to shape my understanding of what can be done in a district to offer support. There are resources in place to support early learning. Not all families can take advantage of these resources for

several reasons that are beyond the scope of this project. However, it is likely that mobile technology is in every home. And there is conflicting evidence about the impact of that technology to support a young child's development. There are also concerns about the digital divide.

### **Social Justice Implications**

Technology is not harmful to the development of children. The use of technology and its impact on relationships cannot support a young child's development. From the research presented, we know that families of various incomes use technology. They have different barriers with their children and technology and have different ways and reasons the adults use technology. These differences affect the relationships and development of young children development. The importance of this work is to understand how families of low-income in the Mountain Valley School District are using technology and help support them in helping their children develop and prepare them for entering kindergarten with the same growth and development as their peers.

### **Problem of Practice**

As an educator, helping young children be successful in school has been important to me. When I reflect on my path through education to this point, early education has been a foundation to that path. I understand that the families are the first educators are in the environment that a child is surrounded by from birth. When I combine my passion and the research, it is important for me to understand how to impact families, to support them, and to prepare their children to enter kindergarten. It is also clear that technology is part of the fabric of education. As an educational leader, I plan to use the knowledge to gain understanding of families, how they use technology, and how

school districts can support families to prepare their children to be successful and develop as the whole child.

When I started my research, I was concerned about speech development of incoming kindergartners. I also saw the increased solitary use of technology for extremely young children and wondered how the reduction of social interaction to focus on solitary entertainment via technology was affecting the speech development of young children. As I read research, the work of Drs. Radesky and Freed, among others, showed me the importance of relationships of adults to children and their development and that mobile technology is disrupting that relationship and impacting development.

However, I also know that technology will continue to proliferate in the homes of young children. Therefore, following the work that I have read, I want to discover how to work with families and technology to support the growth and development of young children. With a better understanding, I hope to impact my community, as well as others, to make a difference in early childhood family relationships while using technology to help children develop and be prepared for school.

The problem of practice at the center of this dissertation is the use of mobile technology of parents or adult caregivers with young children ages 2 to 5. The work focuses on how that use effects the relationship between adult caregivers and young children ages 2 to 5. The future of this work hopes to learn more from families and explore the effects on the development in early childhood.

### **Research Questions**

1. How do families with young children (age 2-5) in a small rural school district in southwestern Pennsylvania use mobile technology with their children? How do these habits compare to national data?
2. How might the school district support families and young children to use the mobile technology in developmentally appropriate ways?

## **Chapter 2** **Review of Actionable Knowledge**

### **Introduction**

The problem of practice at the center of this dissertation is an exploration of the use of mobile technology with young children ages 2 to 5. Grounded in an understanding that (a) family-child relationships are central to children’s development and school readiness, (b) the literature about children’s “screen time” has generally demonstrated more negative than positive associations with child development outcomes, (c) the school context in which this study is taking places in experiencing an unprecedented rise in language development concerns for young children, and (d) since March of 2020, Covid-19 required children of all ages to drastically increase their use of technology in response to the Covid-19 pandemic. This study seeks to understand the ways families engage with children around technology use and the ways even young children use technology independently. It is hoped that a greater understanding of the current practices will provide spaces for the school district to better support children and families in using mobile technology. To that end, this chapter will first present a review of the literature of speech and language development of toddlers and preschoolers. Second, I review how difficult transition into school can be for young children with speech development delays. Followed by exploring screen time and digital divides in technology access and use of young children from the history of television to mobile devices most used today. Finally, I present the theoretical framework that centers on children’s relationships: Bronfenbrenner's ecological systems theory is the lens of focus for this work and its relation to the Mountain Valley School District.

### **Speech and Language Development of Toddlers and Preschoolers**

A child's speech and language development need to be cultivated. The first three years of a child's life are the most intensive time of brain development and maturing for acquiring speech and language skills (National Institute of Health, 2021: Undiyaundeye & Basake, 2018). Research shows that young children have a critical period when the brain develops speech and language (Undiyaundeye & Basake, 2018). This period passes without exposure to language; children have a more challenging time with speech and language development.

Vick (2018) connected language and speech, stating that language is the words people use to express ideas and the rules used to put those words together. Speech, she continues, is the sound of language that comes from the "lips and tongue" (p. 39). In other words, the first words of a child come from the connection of speech and language. Early language development and mastery of all sounds in the American English language can take up to eight years for a child to learn (Vick, 2018).

Moving from making sounds to language is studied around age 2. Children are putting words together, starting to build a vocabulary and communicating with others. Fisher et al. (2006) studied how children build or used sentence structure to build their understanding of words. In their work, young children started to learn verbs from the sentence structure and the interaction of adults with objects and verbal interaction (Fisher et al. 2006). Adults used objects and simple sentence structure for children as young as 2 years to help them build new vocabulary and understand words.

Chung & Weismer (2021) studied children ages 2 to 5 for language development. Their work focused on this age group because of how children's language naturally develops during this age. If certain parts of language did not develop in these three years,

there would be delays moving forward. Specifically, they stated that most “approximants” or “semivowels” are important speech synthesis and recognition indicators. Approximants are usually fully developed in most languages by the age of four. If they are not, it is an indication of possible phonological delays. At times the development will come at 5 years old. However, if the delay of approximants is after 5 years old, there will be “residual or persistent errors” in speech (p. 809).

Gierut (1998) discussed how adult caregivers could support speech development in numerous ways, but there must be consistency to hearing speech and interactive exposure. The best environment to develop the child’s speech and language skills is rich with sounds, sights, and constant exposure to the speech and language of others. To enhance this learning process, children require a response from a parent or adult caregiver. The National Institute of Health (2022) stated that a child needs to hear a word at least “100 times” before beginning to say it. However, it is not enough to hear words. To enhance this learning process, children require interaction from a parent or adult caregiver. Gierut (1998) pointed out how the interaction of a team working with a speech development delayed child helps address the delays and make growth in their development. This research shows that a child needs the support of adults to grow and develop, but this is not a guarantee.

### **Speech Development and School Transition**

Studies have shown that children who have difficulties with speech and language development will also have difficulty reading skills later in school. For example, Al Otaiba et al. (2009) reviewed research with children with speech and language impairments. They stated that independent from intelligence, vocabulary, memory skills,

or social class, children need component sounds like syllables, rhymes, and phonemes to build foundational skills for reading and predict later success in reading.

Al Otaiba et al. (2009) compared research addressing children with both speech and language impairments and discovered that in both cases, if children had early intervention (i.e., in preschool experience or other services like the Tiny Mountie program) to address the impairments the children skill deficit decreased. With these findings in mind, it is essential to identify young children early and address their needs. This work hopes to draw attention that children ages 2 to 5 need support to develop the foundational skills to prevent the elevated risk of struggling with reading later in school. If a child reaches kindergarten without introductory speech and language skills that families and adult caregivers can support developing, their future success in school can be altered.

In preschool interventions, professionals work one-on-one or with small groups of children to address the identified language or speech skills. Generally, these interventions use face-to-face interactions. Al Otaiba et al. (2009) only cited one intervention (Segers & Verhoeven, 2004) that used a computer to develop of skills. That study does not show significant growth in the young learners, whereas the interventions with the young children with an adult showed at least some growth in the skills addressed by the interventions. This research study was from 2004; there may be improvements in apps or computer programs to support more growth. However, the practice emphasizes interaction between adults and children as more effective in supporting speech and language development.

In summary, the literature demonstrates that ages 2-5 when children are often in daycare and preschool settings and transitioning to kindergarten are crucial for speech and language development. Current understanding of best practice suggests that children benefit from face-to-face interaction with adults during this time to develop more vital foundational skills for speech and language skills. Not developing these skills result in difficulties at school transitions, including slow or struggling reading skills. There is little in the literature to suggest technology can help support skills development for children with speech/language concerns. This technology is growing in popularity of use with children ages 2 to 5 years old. It is essential to understand the access and the way technology is being used that impacts early learning and how it can be used effectively by or with a child to help that child grow and develop.

### **Technology Access of Toddlers and Preschoolers**

#### **Television Access to Increased Mobile Device Access**

Our culture is changing. Technology has become an integral part of everyday life. The impact has increased since the outbreak of Covid-19 in March 2020. What once was a fixed tool limited to desktop computers, used by “white collar” employees and educational institutions, is now accessed by a diverse range of individuals from the noticeably young to the elderly, across geographic and socioeconomic contexts.

It is essential to explore and understand that this period of development is critical for young children to build speech and language skills, and that adult interaction supports that development. When children use technology with adult caregivers, they are more likely to hear the sounds that support their learning and growth. The potential for growth is elevated with adult-child interaction when using technology because the adult

reinforces the language and speech skills. However, if they use the mobile technology independently, there is a lack of interaction and no exchange of information occurs, limiting the learning experience and language development. If the technology is used independently by a child, vital language and speech development may be hindered, and even disrupted. The growth potential is elevated with adult-child interaction when using technology because the adults reinforce the language and speech skills.

The development and implementation of technology have grown exponentially in the last decade. Many families use technology with their children or are using it independently with limited interactions with each other. The research suggests technology may hinder this development more than help. Kuhhirt & Klein (2020) stated that children learn a language better when interacting with someone in their native language rather than learning from a computer. A mobile device may have the same effect and have a more significant impact since the device can be accessed more often by a child. In addition, if the child is using the mobile device independently, there is no interaction with an adult to build the young child's speech and language skills. While this research included three categories of mobile devices: smartphones, iPods, and tablets (Kabali et al., 2015), my research focuses on smartphones and iPads that have replaced technologically obsolete iPods. The addition of data plans and the availability of Wi-Fi in public locations or hotspots supplied to families by schools or workplaces due to the changes caused by Covid-19 to work or learn from home have changed the way people access data. Adult caregivers reported in the survey adopted from the Common Sense Media 2013 survey that children used the devices independently as young as two years

old (2015). If children use the devices independently at this early age, such usage may take away from potential interaction between adults and children, hindering development.

Another potential concern is that the digital platforms most often used by younger children include YouTube or other streaming apps accessed on mobile devices. These platforms automatically play one video after another using viewing algorithms to suggest new content without input from the individual watching (Bowes, 2018). If the child is watching independently, the adult caregiver does not know what the child is watching after the first video. Content continues playing until the child becomes bored or a caregiver turns off the device.

In addition, contemporary trends in technology have prioritized mobility. Today it is common to see people of various ages, regardless of income, using handheld devices for many different purposes. These trends also impact children. Kabali et al. (2015) did a cross-sectional study of 350 children aged six months to 4 years. The data collected at a pediatric clinic in an urban, low-income, minority community. The survey showed that while 97% of the households had a television, mobile devices were also highly prevalent; 83% had tablets and 77% smartphones. Half the children at age 4 in this group had their own television and 75% had their own mobile device. Over 95% used mobile devices and had used these devices before their first birthday. By the age of 3- and 4-years-old, children used the devices without assistance. YouTube and Netflix were the applications most used by children in this study.

These findings demonstrate that mobile technology is widely accessible and commonly used independently by young children for video entertainment. Independence is a crucial design feature with mobile devices geared toward personal selections and

algorithmic queuing of additional content on apps like YouTube and Netflix. Mobile devices are also highly convenient in that they can be taken anywhere by a child and used “on the go” without needing power or Wi-Fi.

However, primarily due to the rapid proliferation of such devices, we know little about the specific impacts of mobile technology on children. Many of our current understandings are based on the “screen time” associated with televisions. Based on a synthesis of the literature reviewed, for the purposes of this work, screen time is defined as the time one spends in front of a screen of a television or mobile device. In the next section, this literature is further explored.

Children with healthy attachments to their adult caregivers “regulate their emotions better, score higher intellectually and academically and have higher self-esteem than kids without” that bond to the family (Freed, 2015). This indicates the importance of the parent/adult caregiver-child relationship as essential to the child’s overall development.

### **Digital Divide in Screen Time Access and Use**

#### **Digital Divide in Homes**

Pre-digital divides in technology access were associated with the cost of devices. For example, in the 1950s, when Maccoby and other researchers were exploring the impacts of television on families, there were stark class differences in television access due to the expense of the device. Kuhhirt & Klien (2020) state that families in a higher-income level limit their children’s exposure to television with “more cognitively stimulating recourses (e.g., expensive toys) and activities (e.g., reading to children, museum visits)” (p. 4). If these families expose their children to television, they select

programming that is “more suitable for children and their learning” than families living in a lower income status (Kuhhirt & Klein, 2020). Kuhhirt & Klein (2020) also reference several other studies that found children from lower-income families have a “negative association between TV exposure and language development (p. 4).

Today those devices are less about access to the device than access to the internet. McCloskey et al. (2018) looked at the use of mobile devices or preschool-age children in rural Head Start centers. At the time of publication, mobile devices were already on the rise and being used by many. They noted that access to devices is no longer an issue for families in lower income as it once was. According to their data, there were no significant patterns in technology access or use of apps of families with young children across economic groups. However, Anderson & Kumar (2018), seven out of ten adults with households under \$30,000 owned a smartphone, but about half of those same households did not have broadband services or a computer. Therefore, these families must use the small screen of a smartphone and data to complete the work that others can use larger devices making tasks more cumbersome (Anderson & Kumar, 2018). Their work contrasts this with families in households earning \$100,000 or more having access to multiple devices and two-thirds having broadband, high-speed internet access in the home. Adults from households earning \$100,00 or more also spend at least part of their day using the internet for work-related tasks. That time spent builds comfort with technology and the internet, which is another potential gap. Lower-income individuals have less time and often feel “digitally unprepared” with technology (Anderson & Kumar, 2018). Broadband was another hurdle, but that is slowly changing for the families they studied in Colorado. From personal experience, the Mountain Valley School District

still has many families without broadband access. With the district, the area and the cost of the services are more often limit the family's ability to have broadband.

Furthermore, pre-digital and digital divides may also be related to differences in use and beliefs about screen time. Before smartphones and other mobile devices, researchers were already concerned with the potential negative impacts of television exposure on early childhood development. For example, Maccoby (1950) studied effects on interaction within families and the access to television when it first was available. She found that while the family spent time together watching the television, inter-personal communication within the family during television watching was minimal. Time in front of the television, replace family's social interactions. Family impacts included "intensified issues of coming to meals, going to bed, and doing homework", but she also found caregivers set boundaries for television use (Maccoby, 1951, p. 429). Maccoby (1950) found that families in the highest income levels spent less time watching television, were more critical of the programming, and were more concerned about the effects of television on family life and child's schoolwork (Maccoby, 1950).

Similarly, De Craemers et al. (2018) found an inverse relationship between parent education levels and household television screen time in modern times. The higher the parents' level of education, the lower the amount of television viewed in the household. As De Craemers et al. (2018) study revealed, households with two highly educated parents watched the least amount of television. Despite concerns with television screen time from the very early days of television use, Cardany (2010) recently found that 45% of parents still used television to occupy their children's time.

Like television, there are gaps in mobile technology use due to families' boundaries on screen time. Schoeppe et al. (2016) stated that adults understand the need to limit children's exposure to screen time and its importance to their development, but often do not limit it successfully and often serve as a poor example of limited screen time themselves. Other agencies have defined guidelines for adult caregivers to use with children and technology.

Understanding that not all technology is harmful. Organization can be a resource for recommendations for how to use technology with young children. The National Association for the Education of Young Children (NAEYC) is a leader in early childhood education. NAEYC the American Academy of Pediatrics (AAP) have set guidelines for "screen time" or mobile technology for children. NAEYC worked with the Fred Rogers Center to create a position statement in 2012. The statement acknowledges that technology is an integral part of our culture and should be used with children to help them develop digital citizenship to make strong choices to help support their development and learning that will last a lifetime. Importantly, adult caregivers and early childhood caregivers need to be a part of the growth of young children. NAEYC's statement is directed to early childhood educators to support children in their learning centers. Families can also apply the same guidelines for the growth and development of their children with the use of technology and mobile devices to support that growth and development. Like the AAP, NAEYC discourages children under the age of two from using mobile devices for any period. Children ages 2 to 5 years year should be limited to the amount of time and how the mobile devices and technology are used with or by the child. NAEYC references Common Sense Media to define screen time as, "the total

amount spent in front of any and all screens” (pg. 3 NAEYC,2011). According to the NAEYC statement, several vital factors to guide the use of technology with young children. They are (a) the content on the technology should be children developmentally appropriate, (b) should be interactive and should not replace play with other children, interaction with adults or active play, (c) children’s use of the technology should be closely monitored, and (d) adults are models to young children to demonstrate “appropriate, effective, and positive ways to use technology” (pg. 7). All these guidelines support NAEYC’s ideas that, “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.” (pg. 2, 2011). These guidelines are essential to know and understand the use of that time when technology has become an integral part of most families’ daily lives. The limits set by the AAP are focused more for entertainment purposes. They also support limited to no screen time for children under age two and a limit of one to two hours for children ages 2 to five. Freed (2015) stated there is a difference in how children use technology and its effects on their development. When used for educational purposes, children develop and grow. When overused as an entertainment technology, it displaces other experiences that support development and growth.

For example, the American Academy of Pediatrics (AAP) urges that children do not have any screen time until 18 to 24 months unless video chatting. The recommendation for children ages 2 to 5 is an hour or less per day. The AAP has revised their recommendation from a limiting screen time to a time limit to also encourage families to “acknowledge that technology is a part of everyday life and noting the critical

importance of parents and their children engaging together in technology use” (McCloskey et al. 2018, p. 83-84.) The World Health Organization has a similar recommendation, with the difference being no screen time for children under 2 years old.

Despite these recommendations, there is vast variety in screen time in U.S. households. In addition, there are gaps in screen time in mobile technology use due to the boundary’s families place on screen time. Schoeppe et al. (2016) argue that adults understand the recommendations and the need to limit children’s exposure to screen time but often do not limit it successfully and often serve as a poor example of limiting screen time themselves. For example, parents can use technology for education, entertainment, and escape from parental stress, like television has been in years past (Chen et al. 2020).

Another area of the divide was explored by Anderson & Kumar (2018). Their work found that many adult caregivers felt “digitally unprepared” to interact with young children using technology. Feelings of comfort and competence may be related to experience. For example, Prensky (2001) coined the term “digital native” and “digital immigrant”. In this research, digital natives are defined as individuals born after the 1980s and exposed to digital technology at an early age. Digital immigrants are people that use digital technology but do not have exposure to the devices until later in life. Their experiences create another digital divide of understanding and use of mobile technology.

However, Kesharwani (2020) challenges Prensky’s terms generational aspects and argues that they do not just fit age groups but adapt to new technology. The argument made by Kesharwani (2020) is that both digital natives and digital immigrants “live in the same digital world” and both groups have great knowledge of the technology, but the

digital immigrants use the digital devices more proficiently (p. 1). Therefore, age cannot define if you are a digital native or immigrant, it is your experience and use of the technology that should define the group that you are.

Nonetheless, there are often generational divides with technology within any family between the caregivers and the children in terms of experience with mobile technology. Especially in a rural area like the Mountain View School District. In my experience, families follow the generational definition of digital native or immigrant. Noticing Prensky's terminology, Freed (2015) further develops the familial impact by arguing that parent/adult caregivers are the immigrants to new mobile technologies used for entertainment rather than educational or work-oriented tasks. Children's experiences and subsequent expertise with mobile entertainment can take a traditional family hierarchy and turn it upside down so that children are seen as the "better judges of how they should use their (the children) devices and time" (p. 3). The issue with this gap is twofold. First, according to Freed (2015), entertainment applications on mobile devices take away from time with family. This reduces family interactions known to support young children's development, primarily if this time is used on a device independently without social interaction with an adult or more advanced learner. Second, parents/adult caregivers do not perceive that the independent use of devices creates a rift in family members connecting to each other as they have in the past. Before, families used technology more together, like watching television together in the same room, and could have a conversation about the content they were viewing together. With individual devices, families may not know what the other members are watching, and limited conversation happens within the family.

In support of the argument that experience matters, McCloskey et al. (2018) found that parents were more comfortable with technology themselves, the higher the children's use of the technology. Although the children used the technology more than their peers with a less comfortable parent, McCloskey et al. (2018) found that many of those more comfortable parents still expressed concern about using technology with young children. When synthesizing the digital gap between generations, if caregivers are not confident with technology, the child is less encouraged to use or monitored on mobile devices.

### **Digital Divide in Schools**

Digital divides also impact children's school experiences. Locations of the school are the primary factor that created the digital divide within schools. If a school is urban, suburban, or rural is how Kormos (2018), Powers et al. (2020) and Dolan (2017) look at the reasons for the digital divide. The most common cause for the digital divide between the different locations of schools is funding. However, each of these authors offer other areas that cause the digital divide between the school locations.

For example, Kormos (2018) explained the digital divide between urban, suburban, and rural schools and how it impacts relationships between teachers and learners. Kormos (2018) found that the higher poverty rate of urban and rural schools impacted resource allocation, with suburban schools having greater access to technology. The lower the budget for a school district, the less money is spent per student, including technology expenditures. Urban schools are additionally impacted by gaps in training and teacher preparedness for use in technology in schools. In contrast, rural school districts are impacted by the slow speed of broadband and subsequent reduction in access to internet resources (Kormos, 2018). Because of these gaps, Kormos (2018) argues that

technology is used differently across school settings. Kormos (2018) also noted how each of the three districts' use of technology influenced teacher-student relationships. Of the three contexts, rural schools had the closest relationships between teachers and students. Kormos (2018) argues this because the technology was not an integral part of the learning classrooms, and the teachers did not use the technology as other context schools.

Powers et al. (2020) looked at the digital divide in rural schools with 1:1 device. The 1:1 program is defined as the school “equip each student with a laptop, notebook, or tablet computer for use at school, and in some cases, at home” (Powers et al. p. 61). Powers et al. (2020) noted that schools in low-income schools use computers or devices differently than schools in higher income areas. Low-income schools use the devices more often for “drill and practice and for free time” (p. 61). High-income schools use the technology to develop of “higher-order thinking skills and analyses (p. 61).

Like the work of Kormos (2018), professional development, access to updated devices and the lack of a support system to run the devices is often the issue for rural districts. Powers et al. (2020) also noted that students may be able to use the devices in the school building but using those devices outside of the school building can be limiting. Therefore, students can not complete homework on a device because they do not have internet access or parental or family support. The lack of family support can cause parents and families not being comfortable with using computers.

There are gaps for rural schools, but a benefit is measured in the Powers et al. (2020) data. It was discovered that it did increase the students desire to learn, and the teachers were able to use the technology to individualize instruction (Power et al., 2020). This positive may be a result of the 1:1, not that the school is a rural setting.

Dolan's (2017) work with the digital divide agreed with much of the findings of Kormos (2018) and Power et al. (2020), but a striking difference she found was a divide of different demographics of the teachers from students. Many teachers in schools are "predominantly White, middle-class women" (p. 17) which is often a significantly different demographic than the students they teach. This cultural difference can lead to yet another digital divide in schools (Dolan, 2017). The teacher may not understand how the students can or do access technology or the internet at home. The Mountain Valley School District teachers experienced this firsthand when learning transitioned to hybrid or full remote models. They discovered that many learners in their classrooms did not have the technical understanding, support, or access like they did even in their homes without school supplied devices and understanding.

### **Screen Time and Language Development**

Lin et al. (2015) found a significant association between television screen time and language delays in children older than two years and had a significant association. This work also found that non parental caregivers tend to let children watch more television than the child's parents. In other words, children may access screen time in childcare and preschool settings.

Overall, recent evidence linking screen time and language delays is mixed. Kuhhirt and Klein (2020) suggest that most studies use small sample sizes with a good deal of variability. Dore et al. (2020) also pointed out that the research is inconclusive since it is not clear what other activities a family is doing while not on-screen time. Another variable is how the family is interacting with each other in various activities. Finally, the type of programming is also important to note for what the child is watching

and its impact on their development. Dore et al. (2020) stated that preschool children can learn in language and early literacy skills from “high-quality” educational media (p. 2). Other screen activities such as *Minecraft*, could develop other skills, like creativity in young children (Dore et al., 2020).

Nevertheless, some researchers argue that media use might affect children’s language development because it may displace other activities, decreasing the quality and quantity of time for adults and children interacting without technology. For example, Khan et al. (2017) stated that some research found that the media displaces other activities that would promote speech development. This work continued by stating that if media is part of the caregiver’s routine, there might be an interaction between adults and children around media usage. However, the quality and quantity of the interactions are likely to be lower than it would be doing free or other activities.

### **Potential for Different or Greater Impact with Mobile Technology**

The literature demonstrates that both adults and children are using the devices and they are often used independently. Mescher (2020) supported this by stating that families can use devices to share and connect, but they also distract from loved ones. When people connect to a mobile device, it can be challenging to be physically, mentally, and emotionally connected to their loved ones. Not only do adults use the device to distract their children, but they also give the child a device to occupy them. Some families, as stated by Radesky et al. (2016) find the effect of calming the child or teaching them patience from the design of the game having to reach a certain level to advance or the opportunity to buy “the extras” (p. 505).

Time with a parent or adult caregiver is a meaningful and vital experience that is displaced using mobile technology by both adults and children to being more than 6 hours a day, which leaves less time for the adults and children to interact (Freed, 2015). Freed (2015) cited research from Stanford University researchers stated each hour spent on the internet by an adult at home reduces time face to face with family by 24 minutes. If both child and adult use mobile devices and are not just limited to use at home, that takes away even more time to interact.

According to interviews by Radesky et al. (2016), caregivers stated that technology was a better resource for learning than hand-on toys, because the technology was more motivating to interact with, it developed fine motor skills, and boosted a child's independence because they could find and download apps. Families were giving the children the freedom to select the apps to add to the devices. When asked what resource families used to find educational apps, the app store or they "let the children find the application themselves" (Radesky et al., 2016. p. 505).

There are also concerns of technology use affecting behavior of young children. The concern of children becoming addicted to devices is a concern of parents (Radesky et al., 2016). Kabali et al. (2017) found that children that use mobile devices develop "media multitasking" (p. 5). Media multitasking, according to Kabali et al. (2017), is believed to lead to "task inefficiency, lapses of attentiveness, and safety hazards" (p. 5). Both Kabali et al. (2017) and Radesky et al. (2016) stated the concerns of young children's development of attention span, time management, critical thinking, creativity, and social interaction due to the exposure to technology.

These concerns can be alarming. It is the hope of this work that ways to support families with young children are discovered and technology can be used to support development and the positive impact of technology can be the focus.

### **Potential for Positive Impacts of Mobile Technology Use on Children's Relationships**

Much of the literature discussed the negative impact of using technology on early childhood learning and development. However, Gjelaj et al. (2020) did collaborate with parents and early childhood educators in Kosovo. They discovered that not all who work with early childhood think that technology with young children is harmful. Nevertheless, it is essential to understanding the use and attitudes of those using the technology with the child impact relationships. Parents' use or attitude towards media positively correlates with the child's technology use in their care. In works cited by this work, most parents reported positive attitudes toward children using technology and thought it was vital to the child's development (Gjelaj et al., 2020). Many disagreed with recommendations from experts regarding guidelines for screen time for young children.

The Common Sense Media organization surveys parents or adult caregivers of children. They use a survey as well to gather their information about children's media habits. Most recently, the survey was March 13, 2020; less than one week before most of the country entered the "stay-at-home" orders and schools went full remote (Rideout & Robb, 2020). In the five years since Kabali et al. (2015), there has been an increase in mobile media usage in young children. Much of the research reviewed about screen time stated that boys spend more time on screen media than girls. The Common Sense Media survey found that children in lower-income households spend more time with screen

media than children in higher-income homes. The difference is almost two hours a day between the two groups. Nikken and Oprea (2018) refer to work done by Berger et al. (2009) and Warren (2005) that shows children from lower-income, less educated families or those living with single parents may encounter less interaction from a parent or adult caregiver. They also note that this gives a child more time to use a device independently (Nikken & Oprea, 2018). Harris et al. (2017) found that children from lower-income homes spent more time on all media devices, including mobile, with more frequency and longer duration. More frequency and longer duration of use would impact the time of interaction with an adult caregiver with the child, which could impact the young child's language development.

Furthermore, suppose this usage is higher based on the income of families. In this case, this limitation of language development could be different from peers from other income-based families when they enter kindergarten. The work concluded that access to the devices is not an issue with different income levels, but the devices use varies among the levels. Harris et al. (2017) stated that children living in lower income used more non-educational material on the devices. Lin et al. (2015) believed that parents' education decreases a child's time with a screen. That time is limited because the parent believes the time watching television negatively affects their child's development. Lareau (2003) did ethnography studies of American families and found that parents with more financial resources engage their children in more cultural activities and organize family time to help develop skills. Those activities limit the time children get to spend on screens.

According to Kabali et al. (2015), children use the devices while the adult caregivers are occupied by chores, running errands, or giving the child the device to put

them to sleep. Suppose young children are using the device to occupy the child while the adult is busy. There is limited interaction between the adult and child that would be a crucial time to help develop the child's language skills. Another concern is what the child is watching if they are using the device independently.

Smartphones reduce the need for wi-fi access; that allows for more access to content on the internet. This access can be anywhere, and the child can use it without the help of a parent or adult caregiver at home without their knowledge. In 2012, Divanm et al. stated that worldwide cell phone use increased from 5% in 1995 to over 70% in 2010. The accelerated use of smartphones began in the early 2000s.

Parents can use technology for education, entrainment, and an escape from parental stress, like television usage used in years past (Chen et al. 2020). Research often states that children with highly educated adult caregivers tend to raise their children focused on schooling and give them more cultural experiences than children raised by lower educated caregivers (Kuhhirt & Klein, 2020). In other words, children with higher educated caregivers have more structured activities and family time created by the caregivers. Whereas children in setting with lower educated caregivers usually have more time for unstructured activities. Their families create time together on in organized activities rather than free time by themselves that could be used on a mobile device. This work assumes that structured time produces less time for technology use, but it does not mean that time is used in other ways to support the early learner's development. Lareau (2011) compares children raised in various income-based homes. Suppose families have higher income give their children different social structured experiences. The children are often involved in activities and things they are interested in, and the adult is the initiator

of the activities. Children raised in families with less monetary resources are involved in less organized activities. They have more time that is less structured with activities and can give more opportunity for the child to have less interaction with adults or choose a device independently.

This research does not explain the definitions of structured activities or what is meant by “cultural” experiences. Families with higher incomes have more resources such as additional childcare support, transportation options for taking children a broader range of experiences, and possibly more time for engaging with children in those options. Families that live in lower-income situations can give their children similar experiences, but other factors such as time or transportation limit these options. Bowels (2018) cited that families in a high-income level choose screen-free lifestyles and middle- and lower-class families do not have the same option. Another income gap is the ability to limit the use of mobile technology. According to Freed (2015), he was often the first to tell families that limited screen time with mobile devices can help a child’s development. He went on to say that mobile technology is not bad. We need to be mindful of how it is used and modeled use to our children. By changing our focus to connecting with children in our care instead of a mobile device, we can support growth in the children.

Lareau (2011) also stated that children have many things in common with likes and activities no matter the resources. They include things like television shows, eating at fast-food restaurants, and specific toys that are popular. In the current culture, I would add mobile devices, YouTube, Netflix, and games and apps played on the mobile devices to things that all children share as interests independent of financial resources.

The pace of life also varies for families, depending on financial resources. The more resources and effort families put into developing a child's talent with organized activities, the faster the pace the family life becomes (Lareau, 2011). With fewer activities that a child is in the free time, they must do as they would like with that time. According to Harris, Straker & Pollock (2017), children with less structured activities use technology more than their peers involved in more activities. The use of technology is for entertainment. They will be playing more games and watching more video content. The design of mobile technology is a concern. The technology companies like Facebook and others work with psychologists to make the platforms addictive or present publications to media that the platforms are educational (Freed, 2015). An example of how the platform is addictive is one video auto-plays on YouTube. That video might be related to the first queued for a child to watch, but the content can change over time (Bowles, 2018). ConnectSafely, which sounds like a family-friendly name, supported children under thirteen to join Facebook when that platform wanted to expand their audience. Facebook funds ConnectSafely and other companies with financial interests in growing Facebook (Freed, 2015). The purpose of the support for expansion was not to develop a younger Facebook user but the companies' development.

Time with a parent or adult caregiver is a meaningful and vital experience that is displaced using mobile technology with mobile technology by both adults and children to being more than 6 hours a day, which leaves less time for the adults and children to interact (Freed, 2015). Freed continued to cite research from Stanford University that stated each hour spent on the internet by an adult at home reduces time face to face with

family by 24 minutes. If both child and adult are using mobile technology and not just limited to use at home, that is taking away even more time to interact.

### **Potential for Positive Impacts**

The use of technology is not all harmful. As Zaman & et al. (2016) discovered, parents and adult caregivers play a role in mediating the use and activity of the technology with children. If adults interact with young children and technology, children can learn from time and exposure to technology. Cardany (2010) stated that human interaction is essential for learning. Conversation with adults before, during or after a child watches screen media will help them learn from the content they watched. This interaction connects children and adult caregivers to their development leading to successful development in the Social Ecology Theory. With the focus of this work not being an intervention with adult caregivers but supporting them to help their child develop and use technology in that growth and development, it is vital to think of how that interaction can be supported for families.

Radesky et al. (2020) pointed out how difficult it is for caregivers to monitor what a child is watching on a device individually. Her work is to understand how families are using it and help support caregivers to use the technology to help the growth and development of their children. It was discovered that children use devices more on the weekend than on weekdays and when the child has their device, the usage is higher than using a shared device. Rose et al. (2020) also noted that families living in lower income reported children spending more time on a device.

### **Bronfenbrenner's Social Ecology Theory**

Urie Bronfenbrenner started the work on his Social Ecological System in the 1970s. In his book, *The Ecology of Human Development*, he defined “ecology theory at the study of human development in context or enduring environments” (Velez-Agosto et al., 2017). While always focused on a child’s development, the first theory was simple, with only two layers. The child was in the center of the circle; then, there was an upper layer that included the child’s setting (e.g., home, school, and community settings in which the child participated). This second layer of social systems was called the supportive layer. The Social Ecological System theory also emphasizes the importance of relationships. These relationships include that between the learner and the learning (Carter, 2019).

Note that in the early model, the culture is specified but included in the supportive layer. In the 1990s, he refined his theory and added more detail to look like we know today’s model. Besides the more defined areas of the system, he also put culture as an essential part of the macrosystem. The change in our culture using technology is vital to think about the focus of this problem of practice.

The scope of the work to explore this claim will use Bronfenbrenner’s social ecology theory. Mabhoyl & Seroto (2019) explain Bronfenbrenner’s framework as the human being in the center of a multiple nesting system that develops from complex interactions with other individuals and other systematic factors from several environmental systems. Using this framework as a lens for understanding how a child develops, a child needs the interaction of parents or adult caregivers to help them grow and develop. With limited interaction between adults and children, language development

is affected. He defines the systems into five layers. They are microsystem, mesosystem, exosystem, macrosystem, and chronosystem.

The microsystem is the innermost system that is closest to the child. This system is the level that the child has the most direct contact with either other people, environments, or organizations (Velez-Agosto et al., 2017). The structures included in this level would be family, school, and community. With the focus of young children in this work, the child's family or adult caregivers, school or childcare provider, peers, church, and health systems impact the child's development at this level.

The last four decades have seen many changes in family structure, communities, technology development, and changes in the earth's environment. These things impact a child and their development. Some of those things are implied to be in Bronfenbrenner's model like family in the microsystem. However, the family structure has changed in the population since his work that can impact a child's development.

More children today are not being raised in a house with one or both biological parents. Grandparents, extended family, or children in foster care numbers are increasing. According to Shovali et al. (2019), approximately 2.6 million grandparents in the United States are primary caregivers for their grandchild. In later work, Shovali et al. (2020) cite Solomon and Marx (1995) stating that children raised by grandparents' struggle with academics than the peers raised in the care of biological parents.

If a child is not living with biological parents, often assume there has been trauma in the child's life due to family structure change which often impacts their education with attendance and academic performance (Shovali et al. 2020). Bronfenbrenner's model does not address trauma in any layer and its impact on a child's development. If the

separation is due to trauma or other factors, children's development and attachment are affected when a child's attachment, either physical or emotional attachment to a parent, is disrupted (Hayles et al. 2018).

Christensen (2010) addresses these children that have had trauma in their lives with the need for resiliency. Some children have faced trauma or adversity in their life and overcome the loss or hardship to improve their lives. According to Christensen, the ability to overcome difficulties in life is due to resiliency. Resiliency is another topic that is not included in the Bronfenbrenner model.

Technology is another influence in families that can change the interaction between adults and children that impacts a child's development that is not addressed in the work of Bronfenbrenner. The only technology that would have been part of his work would have been television. Also, at the time of his work, new technology or inventions took much longer to become a large part of the culture. Computers, cell phones, and Internet have not shared that same time frame. According to Radesky (2016), these devices have grown in use by most individuals in our culture in about ten to fifteen years. Compared to the adoption of other technology in the past.

Technology is making an impact on relationships. Wong et al. (2020) looked at the impact of parents' technology use, parent-child interaction, and child screen time. This work, if it is like similar studies of families and watching television habits, young children will follow in their parents' footsteps in the amount of time they spend on devices and the time spent on devices will replace time spent together. Suppose the adults are distracted by technology, technoference. In that case, children may be by themselves to play with mobile devices or television for extended periods, leading to young children

having consequences for lack of interaction and screen time in their development (Wong et al. 2020).

The mesosystem is the second layer of the circle outside of the child in the center. This layer is where the various parts of the first system work together for the child's development. Very young children rely on parents or adult caregivers to add to the organizations to impact the child's development. The interaction between the adult noticing the need for additional resources and bringing another organization into the microsystem is an example of the mesosystem. Various component of the microsystem, early intervention programming, would work together to impact the child's development that is delayed. As an educational leader, I am an advocate for learners in my community. With the understanding from this focused work, I intend to impact how the school will work with learners that have an impact from a disrupted relationship between themselves and an adult caregiver because of technology use. As a school counselor, I work with families, teachers, administration, and learners to help remove barriers in education. This research can lead to changes in policy and understanding of the use of technology in learning and relationships.

What is challenging for young children ages two to five is that they may not have people or organizations in their microsystem that can recognize the need for additional help with speech to bring in microsystemic interactions expected of older children in the school setting. The results from a lack of resources because of socioeconomic status or options for quality childcare. According to Ansari (2018), children with preschool experience enter kindergarten with stronger skills than their peers who did not have the early learning experience. Bassok et al. (2016) offered from research from 2010 that even

though there has been a higher public investment in public preschools, low-income children were still less likely to attend formal childcare or preschool than their peers in 1998. Bassok et al. (2016) continue by stating they found a “slight narrowing of the SES gap” because of access to technology in the home and a decreased gap due to the way parent-child enrichment activities were used both inside and outside of the home (p. 2).

The exosystem system is the larger ring that extends out from the child to include other people and places that the child would not interact with but impact their development. Examples of these systems would be the child’s parents’ workplace, and extended family members who do not live with the family or in the neighborhood. A child may be affected by this system because of how parents or adult caregivers use technology for work. For example, the adults might be on technology more while working at home and disconnect from the adult caregiver/child relationship. Another possibility is that a caregiver may have access to better technology, or Internet, or both. They might have stronger skills in using technology to help young children and the ability to be at home with the child could lead to more support of the child’s use of technology and time to interact with the child and the technology.

The fourth system, the macrosystem, would be policies, government, the economy, values, customs, and laws. These influence the child’s world. Bronfenbrenner (1986) argues for the need for the United States to introduce policies that would make work life and family life more balanced. Families are under much more stress because both adult caregivers are working or single parents need to work, both examples of microsystem issues, and that family structure breaks down. First, it affects the parent’s relationship with each other and then disturbs the parent-child relationship. He continues

by stating that when the parent/child relationship is seriously disturbed, children are affected, impacting a child at any age. This information is still relevant for families today. Since the many changes because of Covid-19 since March 2020, families might be spending more time at home. Nevertheless, the use of time at home is not focused on family time together.

The final system in Bronfenbrenner's theory is the dimensional component of his work. The chronosystem looks at the impact of time on the child's development. For example, the impact of letting a child aged two use technology or waiting to expose a child when they are older to using technology. This part of his framework is crucial to a child's development in the last few years with the increased use and reliability of technology.

### **The Impact of Covid-19 Related to Technology shifts on Bronfenbrenner Levels**

The increased push for on-line learning as a solution for remote teaching and distance learning in response to the Covid-19 pandemic has also resulted in shifting norms for "screen time" in recent months. The increased use by older students may affect how families are using technology with younger children. Also, access to internet users of the technology for households has changed to the families and older children needing the wi-fi connectivity for distance learning. School districts supply families that do not have access to wi-fi with hotspots so their children can learn. This capacity would impact families in the lower socioeconomic status that did not have wi-fi before for financial reasons or did not live in an area with the option for this service.

Covid-19 has caused different reasons for trauma in the families of the Mountain Valley School District. According to Janssen et al. (2020), families faced issues many

issues that cause stress in their family lives. These stressful concerns from financial insecurities, concerns about health of the family members, the lack of options for physical and social activities and boredom. In addition, they also are facing more responsibilities and additional tasks for the adults in the family such as childcare, change in work environments, homeschooling, and caring for other family members (Janssen et al, 2020).

In summary, Bronfenbrenner's theory demonstrates how a child's development and behavior are influenced by their interactions within overlapping contexts, connections within and across settings, and participation, communication, learning from individuals in their settings who are also influenced by their interactions in more competitive settings (Galindo & Sheldon, 2012). Galindo & Sheldon followed up these thoughts by stating that the nature and quality of the interactions impact the child's development. Mabhoyl & Seroto (2019) added that the framework of Bronfenbrenner as the human being is to be thought of as a multiple nesting system that develops from complex interactions with other individuals and other systematic factors from several environmental systems. My study will look at the relationship of adult caregivers and children, which according to Galindo & Sheldon, is essential in their development due to the use of technology and mobile devices, which is the systematic factors mentioned by Mabhoyl & Seroto.

Technology is a part of our daily life and culture. We are relying on it more and more for a variety of needs and uses. It is essential to understand how it is being used and how to promote development in children effectively. With that knowledge, we can help families, adult caregivers and educators use technology to develop young children and preparing them well for their education. Through a survey about the use and beliefs of

technology in family life, it is the hope of this work to gain a better understanding of the how technology fit into families in the Mountain Valley School District. The information gained from the survey will provide information to the teachers and administration be able to serve the families and learners of the community.

### **A Child in Mountain Valley School District in this Work**

Taking Bronfenbrenner's framework, this is the adaptation to the Mountain Valley School District community. Figure 1 shows the rings that impact the child as they develop. Just as Bronfenbrenner designed, the child is in the center and surrounding rings are layers that impact child development. For the study, the age of the child is age two to six. As of June 2019, the Pennsylvania Department of Education changed the compulsory age to enter school from eight to six years old.

The microsystem is the first layer that makes the most direct impact on the child. Due to the child's young age that this study focuses on, limiting factors impact the child. They include family structure, neighborhoods, early intervention resources, early childhood learning options, technology, and community programming.

In the community of focus, the family structure is varied. The children in this study are raised in a home by two-parent families, single parents, grandparents, other relatives, blended families, or foster family situations. The various family situations are due to the absence of a parent in death or incarceration for many children. No specific data can be sited to list the numbers of children in each of these categories. However, the school administration can confirm that all these situations exist in the school district based on information from families given to the school. Shovali et al. (2020) site that data from the 2013 National Survey of Children in Nonparental are (NSCNC) from the Center

for Disease Control and Prevention, 2013 states that grandparents were the most common caregiver to children not living with biological parent(s) at 73.3% of the children in the sample. In that same sample, just over half the families (52.9%) were children identified as non-Hispanic White, 11.9% were Hispanic, 21.8% non-Hispanic Black, and 13.5% listed as non-Hispanic other. The Mountain Valley School District would reflect the averages reported in the study, with most of the children living with grandparents as non-Hispanic White.

As for the neighborhoods, they vary as well within the school district. The school district is very rural. Neighborhoods vary in the district. Some are close to borough settings and more spread out in township settings. Many residences are in very remote locations, while others live in settings closer to a business district. There are also two areas of section eight housing units in the school district. According to the county website, each township and borough have a police force. Some areas employ only part time officers and rely on the Pennsylvania State Police to help with coverage.

The local Intermediate Unit provides early intervention. These services are available for children from birth to five years old. According to the Pennsylvania Department of Education, these services are for children with developmental delays and disabilities. There have been changes in the last two years for speech screening for early intervention related to speech delays. Before 2018, families would request services for their child and a provider from the Intermediate Unit would come to the home and screen the child. In 2019, even before Covid-19, it was challenging to make a referral that a visit would follow up with a provider. As of 2020, providers will not come to the home, but there are locations in various communities assigned for families to bring their children

when given for assessment. Because of the families' structures and varied socioeconomic status in the school district, getting children to the appointments is a struggle. Because of this change, early intervention for speech is limited for the children in the school district.

Six years old being the compulsory age for children to start school, states that children must be enrolled at age six into first grade. The state of Pennsylvania does not require children to attend kindergarten. Children enrolling earlier into early childhood education settings help children with delays and disabilities and get them to support at an earlier age than entering school at the age of eight. Another way to make sure children with delays and disabilities get support earlier is through educational professionals guiding families to early intervention services. In that case, access to early childhood learning is vital for children with delays and disabilities. Access to early childhood learning centers is also limited in the large school district. Families have access to only five providers in the same district and county. There is one more provider that is in the county next to Westmoreland County. One of the providers in the school district has two classrooms in each elementary school building. These three-year-old children is enrollment is based on financial need but does not provide transportation for these young learners. The eligibility for this program is the same requirements as the Head Start program, which Bronfenbrenner stated. The family's gross annual income cannot exceed 100% of government family guidelines for the family size. If the family qualifies for the services, transportation can often be an issue for getting the child to this early childhood learning option. When the child turns four years old, they can be transported by the school district buses to and from school each day.

Four other options for early childhood learning centers are in the southern end of the school district. Only one of those centers provides transportation for children ages four and older. The other centers do not provide transportation to any of the children. If a child from the northern part of the school district wanted to attend one of these options, it would be a fifteen to twenty-mile drive to most early childhood learning center options. No public transportation is available for families. The other option in the next county would be an option for the northern part of the school district. This option is also a ten to fifteen-mile drive for many families. If families did choose this option and needed early intervention, it would not be easy because the school is in a different county than where the family lives.

As a focus of this work, technology impacts a child's development as well. Due to Covid-19 and the need for distance learning, every family in the school district has at least one technology device for a current learner in the school. Because these learners need to be on-line for classroom meetings on zoom or working on Schoology, a platform used by the school to contain the materials for on-line learning, they need to access to the Internet. If the family did not have access to the Internet before distance learning, the school district provides a hotspot for the family to take part in distance learning. The Internet is available to all families in the school district. Therefore, if the child between age two and six is in the home with an older child who needs Internet access for school, they now have access to the Internet and at least one device in the home to use. If a family member is working remotely due to the current pandemic, they might have added internet to their home for work purposes. If the child has an old cell phone or device to use, they can access the Internet on that device from the hotspot or newly added Internet

use at home. The access to devices and uses of devices is changing during this time. Families and children use technology in different ways. However, this use is impacting the development of the child.

Some community programming is available to children in this age group other than early intervention and early childhood learning centers in the community in focus. There are two libraries in the school district that have offered programming. One library is more active with programming than another. Nevertheless, both have a children's book section and are within walking distance for many families. The United Way and the school district have partnered to create a program to work with young children and families to prepare them for kindergarten. This program has story times, small playgroups, and individual family visits. Both the child and the caregivers are the focus of the programming for this resource. The YMCA in the district has programming for young children from childcare to swim lessons and other sports groups. There is also a dance studio that offers dance and movement classes for young children.

The next layer of Bronfenbrenner's theory is the Mesosystem. This layer defines the relationship between the influences in the microsystem. In other words, the components in the microsystem interact with other components to impact the child's development. Family stability, even though the structure might be different if the child can depend on one or more adult caregivers for love and support, they will grow and develop positively. If a child needs early intervention and the family supports this service, the work needed will be more productive and the child will progress in growth. The family's opinion of education is also a key factor for the child's development. If they

support education and the professionals working with the child, they will learn to respect education.

An example of this will be how families use technology with the child or interact with the technology independently without adult interaction. What the child is watching or doing on technology is another example of how technology would affect the child's development. Children will also learn how to use technology from those around them and allow others to use technology. If families take advantage of community resources with the child, they learn to work with others and build trust with other people.

The exosystem layer contains events or parts of life that indirectly affect the child's development. Socioeconomic status (SES), social welfare and community services available or used by the family, and family employment fill this layer to impact the child's development. As noted earlier, some of the early childhood learning options for families are dependent on the family's SES. If the family is at a certain level, they can qualify for some of the learning options for free at an early age. There are some community social welfare and community services that are available to families in the district. They include Section Eight Housing, Faith in Action, Getting Ahead programming, community food bank services, clothing closets at the schools, Food 2 Go 4 Kids (weekend food program for families), and some of the programs available to families with children in this area. If families take part in these programs, the family can impact the child's development.

Family employment can also impact a child's development if the adult caregivers are employed or not. If not employed, there is additional stress on the family, and the use of drugs and alcohol or abuse might be present. Suppose the adult caregiver(s) are

working. If they are working outside the home, they have limited time with the young child because of work and the need to put the child in childcare. This limitation of time together limits the interaction time between adult and child. If the family has older children that younger ones can stay home with at this time, the older children might be distracted by schoolwork and have limited time to interact with the younger child(ren). Finally, if the adult caregiver might be working from home, especially in since March 2020, and they need to occupy the child to get work done. All three of these possibilities take time away from adult to child interaction.

The macrosystem is the broader scope layer that affects the child's development. This layer is based mainly on culture, values, and beliefs that the child is surrounded by while developing. A sizable cultural pattern that children ages two to five are surrounded by is the current pandemic of Covid-19. These children experience social distancing, distance learning, or caregivers working from home, and limited interaction with others outside their family unit. Many of us are using technology more than we ever have before. The county is extremely sensitive to politics. And finally, the issue of racism in our culture. Both topics are dividing people and changing the relationships of adults. These changes can affect how a child develops.

Finally, the chronosystem is the layer that involves the passage of time. This layer looks at how the timing of events and circumstances affect the child's development. Technology has been a part of our lives and culture for many years now. However, the acceleration of technology use in the last few years has changed many things in our everyday lives. The impact of this technology on relationships and the connection of a child's development will continue to make an impact on the future. This work strives to

gather data to help understand if adult and child relationships are different because of technology as well as the supports to help adult caregivers and children to work together and with technology to support young children's development.

## **Chapter 3** **Methods and Design for Action**

### **Introduction/Purpose**

The overall purpose of this mixed methods study was to explore the use of technology by families with young children. With the understanding that interaction between adults and children are important for their overall development, the first objective was to determine how mobile technology is being used by families in the Mountain Valley School District. The second objective was to see how families are interacting with their children ages 2 to 5 with the technology. The final objective was to gain an understanding how adults and children ages 2 to 5 are using the technology by themselves. These objectives are the bases of the following research questions.

### **Research Questions**

1. How do families with young children (ages 2-5) in the Mountain Valley School District use mobile technology with their children? How do their habits compare to national data?
2. How might the school district support families and young children to use the mobile technology in developmentally appropriate ways?

### **Design**

This is a mixed methods design. Quantitative data collections for this work were done through the distribution of an online or hard copy survey of district families. The responses of the open-ended questions in the survey were coded for the qualitative data collection.

### **Participants**

Participants were recruited from the Mountain Valley School District. Families with children ages 2 to 5 are the focus of the research. The preschool classrooms in the school district and the Tiny Mounties program will be the resource for families. The variety of the two sources gave the possible a range of demographic in the school district.

There are four preschool classrooms in the Mountain Valley School District that distributed the information about the survey. Two classrooms are in each of the school district elementary buildings. Each preschool program offers financial assistance for families to attend or is free for families that qualify for assistance based on income. The classrooms are full day programs. If the child is age 4, they can be transported to the program by school bus. If they child is younger than four the family must provide transportation for the child.

The goal was to reach a cross section of families that have children in early learning programs as well as families that do not have their children in learning centers to get a more detailed picture of families and children in our community. For this reason, the Tiny Mounties program was included in connecting to families in the Mountain Valley School District. This program is an early intervention program that is funded by grant funds to work with families and children to prepare them for kindergarten. Through community programing and outreach to families with children already in the school district, this program targets families in the same age groups as this study. They work with families and children one on one or in small groups to build skills to prepare the children for school. Tiny Mounties staff also work with adult caregivers and parents to help support the families to prepare their children in the next steps in their education.

### **Data Collection Tools/Instruments**

Table 3.1 provides an overview of the data collection for the research questions. The survey used items drawn from the Common Sense Media 2020 survey (Rideout & Robb, 2020) and the HEROs Technology Survey (McCloskey et al. 2018). The survey, Young Child Technology (YCT), can be found in Appendix A. Based on the idea that young children’s development is best supported with the use of technology and interaction of adult caregivers. The survey questions explore how families are using technology with their children, how their children are using technology on their own, and how adults are modeling the use of technology themselves.

Table 3.1

*Data Collection Method*

Research Question	Collection and Data Analysis
How do families with young children (age 2-5) in a small rural school district in southwestern Pennsylvania use mobile technology with their children? How do these habits compare to national data?	Families completed the Young Child Technology Survey. The survey was completed online with the Qualtrics software. The responses were analyzed with the results reports from Qualtrics. The results were then compared to national data reported by Common Sense Media.
How might the school district support families and young children to use the mobile technology in developmentally appropriate ways?	The responses to the open-ended questions in the Young Child Technology Survey were coded to discover similar themes for use of technology within families and with young children. From the data collected, the school district will be presented the data for further discussion of how to help families work with technology and their young children to support their development.

The first step to the data collection process was creating a survey to collect data. The HEROs Tech survey (McCloskey et al., 2018) was the primary source of format and content. The Common Sense Media 2020 survey (Rideout & Robb, 2020) was used for additional options for some additional questions. Both surveys and some additional questions, were combined to create the survey that families completed. The designed gathers the information needed to discover what mobile technology families have and the habits they must use it as adults modeling to young children, how children are using the technology, and if there are habits of adults and children using it together.

Items one through eight and part of nine through thirteen are from the HEROs. Many share themes from the Common Sense Media survey. Items 17 and 18 are from the CSM survey. The survey is organized with the same format as the HEROs survey. Some of the demographics, items 1 through 3 are at the beginning of the survey. The remaining demographic questions, items 20 thorough 24 are at the end of the survey.

The other survey questions that are not demographics that are from the HEROs survey had minor adjustments made to them. Many of them were made to update the question to how mobile technology is currently used. In item 5, two additions were added: practice skills and social media. Item 7 had the addition of seven items. Three (while you are shopping, while you are doing chores, and while you are preparing meals) were broken down into individual items from a group listed together in the HEROs survey. In item 8, the option for friends was removed because no literature discussed the influence of friends on mobile technology in this age group. Item 10 was modified to simplify the options. The option on the survey is using a mobile device instead of listing two different mobile devices and use for a smartphone. The first two options in item 10

were altered to combine downloading apps from two options in the HEROs survey that differentiated between free and bought apps. To not limit the answers given, item 11 was made an open-ended question with examples given to help responses. The modified from the original question that only asked for three apps. For the remainder of the items from the HEROs survey did not have a modification made to them.

Items 20, parts of 9, 13-16, 19-20 are an addition to the survey. Additional items were added to the YCT based on the literature reviewed to collect data to address the research questions. These items have a similar format to the other items and are often extend the ideas of the items before them. These questions were added in hopes of gaining insight into family perceptions of screen time, how families interact with children while using technology, and how adults use technology while with their child.

However, other items from the HEROs and Common Sense Media survey did not apply to this work. The following items from the Common Sense Media survey were not used due to not needing the information requested for this research: 1-4, 7-17, 19-20, 22-23, 27. Most of these items were removed because of the focus on television and asking for other data not needed to address the research questions. The HEROs survey also had items not used. These items not used are 1-2, 15-18, 20-2, 25-28, and 30. Many of these items were personal information or, like the Common Sense Media survey, not needed for the focus of this work.

The survey includes collecting some demographics from families, which is essential to see trends of usage or access within and across family income and to gather information. Only I saw this information and no names were collected with surveys.

## **Procedures**

A couple of parents of children in this age range piloted the YCT survey in preparation for collecting data. The survey was piloted with parents from two families using a “think aloud” protocol. Pilot participants were asked to answer the questions and provide their thoughts about what the questions are asking, any lack of clarity, and whether the examples are appropriate to parents with children in this age range. This information allowed the revision of questions prior to data collection. Input from that pilot informed the completion of the final copy of the YCT survey. After completing the final draft of the survey, the IRB of Duquesne University was completed. Once the IRB process was complete, the survey was presented to the School Board of the Mountain Valley School District. According to policy, the School Board must approve the distribution of the survey to the families of the preschool classrooms in the Mountain Valley School District. The survey was shared with the staff of the Tiny Mounties to share with families. Emails were sent to the staff members of both groups along with electronic copies of the letter to send to parents. Hard copies were also made and given to all staff members for them to send home or share with families. The survey was then live online.

The professionals who interfaced with families taking the survey had a connection with families in the event they the families had any questions. Trust with the professionals was vital for this part of the data collection. The ability for professionals to build this relationship with families was essential to the timeline of when the research would be collected. The teachers could promote families’ participation and that support increased the data collection. With this design, it was the hope to get a strong cross-

section of families with different income levels and various family structures in the data collection participants.

Families that live in the Mountain Valley School District with children in their care ages 2 to 5 were asked to complete the survey. The survey was online for parents and family members to complete using the Qualtrics software. A QR code was created for the survey link to get to the survey without needing to type in the link. Families will have the option of a hard copy if they do not have internet access or prefer to complete the survey on paper. The final option was to complete the survey with me over the telephone while I record the responses on the Qualtrics software. The link, QR code, and hard copy was supplied to the Mountain Valley Elementary Schools preschool classrooms and the Tiny Mounties program staff to give to families.

With the desire to have families and professionals and programs have a stronger connection, the survey was distributed to the educational professionals in early January once school was back in session from the holiday break. Late December 2021, I communicated through email with the before-mentioned organizations to discuss the survey and encourage the professionals of these organizations to distribute the information to families about the survey. In early January 2022, the survey went live. The survey was open for a total of three weeks. After two weeks of survey opening, an email was sent to the educational professionals with another letter attached, as well as hard copies of the letter to send out to their families as a reminder that the survey is still open. The survey was closed on January 26, 2022. The data was collected from the survey and analyzed.

## **Analysis**

Qualtrics was used to distribute the survey and provide initial descriptive data analysis. These data were used to describe how MVSD families are using mobile technology. After the completion of the dissertation process, the descriptive data will be used to create a brief report (i.e., “white paper”) to be presented to the school district to inform efforts to support families using technology to support the development of the young children in their care.

The survey of families with children between the ages of 2 and 5, data of how mobile technology is being used in the Mountain Valley School District provided descriptive data that frequencies and possibly means were found that gives a big picture of how technology is used in the home. Along with the collection of data from the survey, the list of the mobile devices that the child uses most gave data to explore the apps used and if they are more educational or entertainment based. No screen shots of devices were sent as part of the data collection process. The lists showed the intersections of how families and children are using mobile technology for the development of a child’s development or if the technology is being used other ways that do not support the child’s overall development. It was assumed from the questions in the survey, that we saw how families interact with their child with technology which is an intersection that is desired to support development in young children. This information can be used by the early childcare providers in using technology in their programs and working with families to support them using mobile technology with their children.

This data identified stakeholders and gave understanding to how the early childhood professionals in the Mountain Valley School District can use in working with

families to help promote the understanding and education of family's intersection of technology and development in young children.

## **Chapter 4: Research Findings**

The primary purpose of this study was to get a clear understanding of how families are using mobile technology with children and how that use and access may be poised to affect a child's development. Results will be shared with the Mountain Valley School District and early childhood education providers to inform potential improvements such as changing policy or providing needed information to families to decide how to use technology with children to promote their growth and development. The following research questions drove the study: 1.) How do families with young children (age 2-5) in a small rural school district in southwestern Pennsylvania use mobile technology with their children? How do these habits compare to national data? 2.) How might the school district support families and young children using mobile technology developmentally appropriate?

### **Data Source**

The data includes responses from thirteen participants. All participants completed all the questions in the survey, and several responded to the final opportunity to provide additional information they would like about the topic. A clearer picture can be seen from the responses to improve how families use technology with young children in the Mountain Valley School District.

The data presented were based on information collected from the survey participants took online. No participants chose to complete the survey in hard copy or over the telephone. There was no identifying information collected in the survey. The data were collected using Qualtrics software. Qualtrics provides descriptive data reports. Much of the data presented is used in the following data analysis. A combination of

frequencies and commonalities using SPSS software when needed and thematic grouping of open-ended responses were used to explore the data to understand how families use technology.

### **Comparison to National Data**

When comparing the Young Child Technology Survey data to the national findings of the Common Sense Media Survey from 2020, it is essential to understand that findings from the Common Sense Media Survey were reported in early March 2020 before Covid-19 changed the access to devices and the internet for many people. When looking at these data, a key point to keep in mind is that the culture, especially as it applies to mobile technology, has experienced substantial changes in the past two years because of Covid-19.

Another essential understanding is the Common Sense Media Survey (CSM), a national survey with more than 5,700 participants that responded to the questions for children 0 to 8 years old. Thirteen participants responded to the Young Child Technology Survey (YCT) questions that focused on answering the items for ages 2 to 5. Given the sample size, it is inappropriate to use statistical comparison between items in common across the two data sets. Instead, descriptive statistics are used to contextualize the response collected in the Mountain Valley School District to the national data that is the most recent on young children and families' use of mobile technology.

### **Participants and Demographic Data**

The primary demographic information was gathered from items 1-3 and 20-23 of the survey. The demographics of the participants are as follows. Thirteen participants completed the survey, all of whom identified as the mothers of the described children.

Most of the participants ( $n = 11$ , 85%) were between 30 and 49 years old. The other 15% ( $n = 2$ ) were younger, between 18 and 29.

Overall, the participants were highly educated in comparison to the district. However, the sample does have some variation in terms of educational levels: two participants (15%) have a high school diploma, four (31%) have some college experience, four (31%) have a college degree and three (23%) have a post-graduate degree. According to Census Report taken in 2019, the average for the Mountain Valley School District with a bachelor's degree or higher is 21%. The participants who completed this survey have more education than the average in the school district.

Most of the participants ( $n = 9$ , 70%) work full time. The remaining participants are divided equally. Fifteen percent of the participants work part-time and 15% are not employed outside the home.

The reported annual income of the participants was 8% ( $n = 1$ ) at \$24,250 or less, 23% ( $n = 3$ ) at \$50,000 to \$69,999, and 62% ( $n = 8$ ) more than \$70,000. One participant indicated she preferred not to say. According to census information, the participants represent only a part of the population that lives in the rural area that the Mountain Valley School District serves (Census Report, 2019). Therefore, the data show that the participants are more affluent than much of the school district.

According to the data, all the children in the study are between 3 to 5 years old. Thirty-eight percent ( $n = 5$ ) were three years old. Ages 4 was 31% ( $n = 4$ ) of the participants and 5 year old were the remaining 31% ( $n = 4$ ). The participants stated their children identified as 54% ( $n = 7$ ) males and 46% ( $n = 6$ ) as females.

### **RQ1: Children's Use of Mobile Technology and Comparison to National Data**

## **Digital Access**

Item 4 of the survey addressed the type of technology used by the child. Participants could mark all that applied. The participants all indicated their children used a tablet device ( $n = 13$ , 100%). No participants indicated their children used a laptop or desktop computer 0%. Participants reported on other devices their children used, including 15% ( $n = 2$ ) who used video game players or gaming devices to account for 11% of the usage by young children. The same percentage, 15% ( $n = 2$ ), is reported to use a smartphone. Two participants (15%) also reported that their children do not use a device at home. However, the children may still use the tablet device that the preschool supplies.

In contrast, most young children described in this survey use a device primarily their device and do not access a shared device, like an adult's smartphone. This is supported by mothers stating they use their mobile technology while with their child in a later item in the survey. These data support trends in the literature that young children have access to technology and primarily use mobile devices such as tablets. Common Sense Media survey in March 2020 stated similar findings that nearly half the children ages 2 to 4 in their survey have access to their device.

## **Device Usage**

According to the YCT, young children use mobile technology for various reasons and in different ways. Many of the trends reported from the YCT survey follow the national trends reported from the CSM survey. Common Sense Media (2020) pointed out that online activities are much more accessible to this age. For example, data from the

CSM shows that for ages, birth to eight years, 34% use mobile devices to watch online videos (Common Sense Media, 2020).

Item 5 of the YCT survey showed how often the child uses the mobile device from a given list of activities. This Likert scale gave the following choices: Never, Rarely (a few times a month), Occasionally (a few times a week), or Daily (every day). Table 4.1 reports the responses of the participants.

Table 4.1

*Children’s Purposes for Using Mobile Devices*

Purpose	Never		Rarely (a few times per month)		Occasionally (a few times per week)		Daily	
	<i>n</i>	Percent	<i>n</i>	Percent	<i>n</i>	Percent	<i>n</i>	Percent
Play for fun	4	31	1	8	7	54	1	8
Practice skills (letters, numbers, colors)	2	15	2	15	7	54	2	15
Read or look at books	4	31	4	31	5	39	0	0
Watch movies, videos, or shows	2	15	4	31	5	39	2	15
Listen to music	7	54	1	8	3	23	2	15
Take photos/make videos	7	54	5	39	1	8	0	0
Phone calls/video calls	4	31	7	54	1	8	1	8
Watch someone else use the device	2	15	5	39	0	0	6	46
Social media (TikTok, Facebook, Instagram, or similar apps)	13	100	0	0	0	0	0	0

Many participants reported that their children used mobile devices to play for fun daily, occasionally, or a few days a week. The data also states that also use the device for

practicing skills (letters, numbers, colors) with a similar frequency to using the device for fun. According to the data gathered, the device is not used often for three purposes: reading or looking at books with young children, making phone or video calls, and listening to music. The data show that 46% ( $n = 6$ ) of the children watch an adult use a mobile device daily. Of all the options for item 5 in the survey, this one had the highest percentage of daily responses. These results are similar to those that McCloskey et al. (2018) studied children in preschool in a rural setting in Colorado. Their data report that “almost three quarters of the children use a device either occasionally or daily to play games to learn, play games for fun or watch movies, videos, or shows.” (McCloskey et al., 2028).

According to the participants in the survey, no young children use social media 100% ( $n = 13$ ). A measure that was not requested in the past CSM surveys but was of interest to the work from personal experience was children watching others use a device. The data show that some children use the device daily while others rarely do. The participants reported that their children commonly watch someone else use the device daily ( $n = 6, 46\%$ ), occasionally or a few times a week ( $n = 0, 0\%$ ), rarely or a few times a month ( $n = 5, 39\%$ ), and never ( $n = 2, 15\%$ ).

With a picture of what the children are doing with a mobile device, item 6 looks at why young children use mobile devices. Table 4.2 shows the data collected. The participants were asked to rate eight reasons on a Likert scale using the same intervals as Item 5, daily, occasionally, rarely, never. The options for the participant to rate were to be entertained, to learn something, to calm down, to keep safe, to connect with other family members, to alleviate boredom, to go to sleep, and to keep out of trouble. Not many of

these options were reported to be done daily. The only items reported to be done daily were to be entertained, connecting with other family members, and going to sleep. Going to sleep and keeping safe had the most responses for never in this item.

Table 4.2

*Children's Reason for Using Mobile Devices*

Reason	Never		Rarely (a few times per month)		Occasionally (a few times per week)		Daily	
	<i>n</i>	Percent	<i>n</i>	Percent	<i>n</i>	Percent	<i>n</i>	Percent
To be entertained	2	15	5	39	5	39	1	8
To learn something	1	8	2	15	10	77	0	0
To calm down	9	69	2	15	2	15	0	0
To keep safe	12	92	0	0	0	0	0	0
To connect with other family members	3	23	8	61	1	8	1	8
To alleviate boredom	3	23	4	31	6	46	0	0
To go to sleep	12	92	0	0	0	0	1	8
To keep out of trouble	11	85	2	15	0	0	0	0

Few participants reported their child using a mobile device daily for many reasons. Many children ( $n = 10$ , 77%) use the device to learn something occasionally or a few times a week. A similar number of children are reported to occasionally use the device to alleviate boredom ( $n = 6$ , 46%). Twelve or 92% said their child never uses a device to go to sleep and to keep safe. The difference in keeping safe item is that only twelve people answered this item. One person did not rate this option. Another option

that had a high frequency of rarely or never was to keep out of trouble. This option had 0% selection for both daily and occasionally. The data also reports that children are not commonly using a mobile device to calm down. Young children also do not use devices to connect with other family members daily or occasionally. As stated earlier, only one child uses a mobile device daily to communicate with other family members.

Item 7 looks at when children use mobile devices to understand if they are using them when connections with adults could potentially be made. The options in this item were a similar Likert scale as the previous items with the addition of a Not Applicable option. There were twelve options for participants to rate in this item. They were while you are running errands, while you are shopping, while you are doing chores, while you are traveling (e.g., in the car together), while you are at a restaurant, while you are at a family gathering, while you are at a community activity (e.g., church, clubs), while you or another adult is using a mobile device, while you are working, while you are preparing meals, and during mealtime at home. The data is reported in Table 4.3.

Table 4.3

*Children's for Using Mobile Devices in Different Situations*

Situations	Never		Rarely (a few times per month)		Occasionally (a few times per week)		Daily		Not Applicable	
	<i>n</i>	percent	<i>n</i>	percent	<i>n</i>	percent	<i>n</i>	percent	<i>n</i>	percent
While doing chores	6	46	3	23	4	31	0	0	0	0
While traveling (e.g., in the car together)	6	46	5	39	1	8	1	8	0	0
While at a restaurant	12	92	1	8	0	0	0	0	0	0

While at another child's activity	11	84	1	8	0	0	0	0	1	8
While at a family gathering	13	100	0	0	0	0	0	0	0	0
While at a community event (e.g., church, clubs)	11	84	1	8	0	0	0	0	1	8
While the adult is using a mobile device	7	54	5	38	1	8	0	0	0	0
While the adult is working	6	46	4	31	3	23	0	0	0	0
While an adult is preparing meals	4	31	6	46	3	23	0	0	0	0
During meal time at home	12	92	1	8	0	0	0	0	0	0

All thirteen participants rated each field. The data show a different picture than what is often seen in public with young children and devices. Only two of the options were selected by one participant each for Not Applicable. One family (8%) responded that the child uses a mobile device daily when traveling. This is similar to the national finding of 7% as reported in the Common Sense Media survey (2020). Compared to other data from McCloskey et al. (2018), the data from the YCT is like the trend that more children were reported as not using the devices for most situations in the categories of never and rarely. However, the never-ever percentages are higher from the YCT than in the other data.

Four participants, 30%, reported that their child rarely uses a mobile device in the two fields: running errands and while the adult is working. These results of the YCT survey are lower than The national average found from the CSM survey is 41% for parents needing time at home to get things done (2020). Most of the results for the situations listed in this item are never or rarely (a few times a month) for all the situations that are at home. All thirteen participants, 100%, report that their young child does not use a mobile device while at a family gathering. The participants also reported that 92% ( $n = 12$ ) never use devices at a restaurant or during mealtime at home. Whereas eleven, or 84%, reported that their young child does not use a mobile device at a community event (e.g., church, clubs) or at another child's activity.

From seeing how a child uses a device in various settings, it was important to define if they are using it with someone else or by themselves most often. Mescher (2020) states that learning and bonding happen when a child uses technology with an adult. Item 8 asked the participant to use a Likert scale to share how their child was using a mobile device most often-the scale what the same scale as never, rarely or a few times a month, occasionally or a few times a week, or daily. There was not a Not Applicable option with this item.

As the data show, in Table 4.4 reports, children most often use the device they use independently a few times a week. The participants reported that their children use the device independently daily ( $n = 2$ , 15%), occasionally or a few times a week ( $n = 7$ , 54%), rarely or a few times a month ( $n = 2$ , 15%), and never ( $n = 2$ , 15%). It is therefore not surprising that the data show that most children are for the most part not using the device with an adult, sibling, or another child. Participants report that the children use

the device with an adult daily ( $n = 1, 7\%$ ), occasionally or a few times a week ( $n = 4, 31\%$ ), rarely or a few times a month ( $n = 6, 46\%$ ), and never ( $n = 2, 15\%$ ). Participants also state the frequency of the young child using the device with an older sibling, friend, or other child daily ( $n = 1, 7\%$ ), occasionally or a few times a week ( $n = 5, 38\%$ ), rarely or a few times a month ( $n = 4, 31\%$ ), and never ( $n = 3, 23\%$ ).

Table 4.4

*How Child Use Mobile Devices*

Use	Never		Rarely (a few times per month)		Occasionally (a few times per week)		Daily	
	<i>n</i>	Percent	<i>n</i>	Percent	<i>n</i>	Percent	<i>n</i>	Percent
Independently	2	15	2	15	7	54	2	15
With an adult	2	15	6	46	4	31	1	8
With an older sibling, friend, or other child	3	23	4	31	5	38	1	8

Families reported on the YCT survey data states that 69% of the children use a mobile device independently a few times a week to daily when you combine the data from the YC survey. That is a considerable increase from 48% of children using a mobile device most of the time independently, as found in the 2020 CSM survey. McCloskey et al. (2018) also found that children at a young age use technology (smartphones, tablets, or computers) on their own. Their findings were that 89% use technology on their own (McCloskey, 2018).

**Adult and Child Interaction While Using Technology**

When explicitly asked if the adult uses a mobile device with their child in Item 9, most parents said they use a mobile device with their child. Ten mothers (77%) reported yes and three mothers (23%) reported no. If the participant answered yes to this question,

they were then asked to select the best answer to why they use the mobile device with their child. There were seven options to select the best answer and the final option was Other. If that option was selected, an open field popped up to explain. Of the ten mothers who received this question, no one selected the following: It is our “together time” (0%), The child asks me to (0%), I happen to be in the same room (0%). One mother (10%) reported that she uses the device with her child because “It helps the child get more benefit from it.” Another mother ( $n = 1$ , 10%) reported that she does not use a mobile device with her child. The responses “I enjoy it” ( $n = 2$ , 20%) and “The child needs help to use it” ( $n = 2$ , 20%) were the most frequent selections of the given fields. Four participants (40%) selected the other option. All four completed the open field. One mother said they use it together to look up recipes or instructions, see or take a photo, and teach how to make a phone call if needed. Another mother said they look at pictures together, one family uses it to call “mamaw” together. The final response reported that they use the device together when the child asks for help and adds, “I will also play with them while I help if they want to include me.”

The three mothers who selected no as the answer if they use the mobile device with their child, they received a different question next. They were asked why they do not use a mobile device with their child. One mother (33%) selected that she is busy getting other things done. Another mother ( $n = 1$ , 33%) said she does not know how to use mobile devices. The last mother ( $n = 1$ , 33%) selected the “Other” option and then stated that they try to “be a technology free home.”

Bronfenbrenner’s ideas are that children are influenced by adults and the relationship with adults and other factors in the outer layers of the ecological theory

impact. For example, technology and mobile devices are the factors in the outer layers that impact the adult and the adult-to-child relationship. That change in the relationship affects the child’s development. The Young Child Technology survey item 14 was designed to see what adults and children were doing with technology together. According to Bronfenbrenner, these interactions are essential to the child’s development. The data show us how the children use the mobile device and when the adults interact with the child and the mobile device. To get more information about the adult and child interaction with the mobile device, item 14 asks families how often they interact with their child when the child is doing specific things on the mobile device. This item is a Likert scale, but the measures are different. The scale ranges from most of the time, some of the time, hardly ever, never, and not applicable. Five fields were given for families to rate. Table 4.5 shows the data for this item.

Table 4.5

*Frequency of Adult and Child Interaction on a Mobile Device*

Situations	Most of the time		Some of the time		Hardly ever		Never		Not Applicable	
	<i>n</i>	percent	<i>n</i>	percent	<i>n</i>	percent	<i>n</i>	percent	<i>n</i>	percent
Watching TV shows	2	17	8	67	2	17	0	0	0	0
Watching online videos	0	0	3	25	3	25	3	25	0	0
Playing video games	1	8	4	33	0	0	3	25	4	33
Read and listen to stories on a smartphone or tablet	2	18	4	36	1	9	1	9	3	27

Using games or apps on a smartphone or tablet	2	17	7	58	2	17	1	8	0	0
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This table shows that most of the participants report watching TV shows and using games or apps on a smartphone or tablet some of the time as the most frequent interactions together. None of the situations were reported as having interaction between an adult and child most of the time. When asked what activities the child is doing on a mobile device that the adult is most likely to join the child, only a few reported that they, the adults, use the technology with their child together. One interesting point in the data is that adults are most likely to watch TV shows with their children on a device. Two participants (17%) report that they join their child most of the time and eight (67%) reported joining some of the time. When you put the data together: over 70% of the time, the adults watch TV shows with their children while young children watch online videos. Three participants (25%) report watching the videos with their children some of the time. Three (25%) more report hardly ever. Another three (25%) report never watching online videos with their young child on a mobile device. Adults and children (58%) also use games or apps together on a smartphone or tablet.

According to Kabali et al. (2015) and Kuhhirt & Klein (2020), a conversation is vital to a child's growth and development. The data shows how children use mobile devices and how often they watch others use a mobile devices. As stated earlier, in item 5, 46% of mothers in this study reported their children are watching someone use a device daily. This activity potentially supports McDaniel and Radesky (2018) work that

states that children and adults are both experiencing technofence, defined as the lack of face-to-face conversation because of digital mobile devices.

To further explore the possibilities of conversation versus technofence, items 15, 16, and 19 of the survey look at three areas. These areas are: how adult converses with a child about the activities they are doing on mobile devices, when and where the mobile device is used impacts interaction between the child and adult, and how adults are using the devices that children are watching them use.

Research shows that growth and learning can happen when a child interacts with an adult while watching, playing, or practicing technology (Barr et al., 2020). Items 15 and 16 seek to understand how families interact while using technology. Item 15 asks the participant using a Likert scale of Most of the time, Some of the time, Hardly ever, or Never to rate how frequently they have a conversation with their child about the four different activities. The activities are watching TV shows, online videos, playing video games, and using games or apps on smartphones or tablets. Watching TV shows with their child is when the adults have the most conversation. When asking how often the adult has a conversation with the child about activities on a mobile device, item 15 uses a Likert scale similar to item 14. The frequency of conversation between adults and their young children can be found in Table 4.6.

Table 4.6

*Frequency of Conversation Between Adult and Child While Using a Mobile Device*

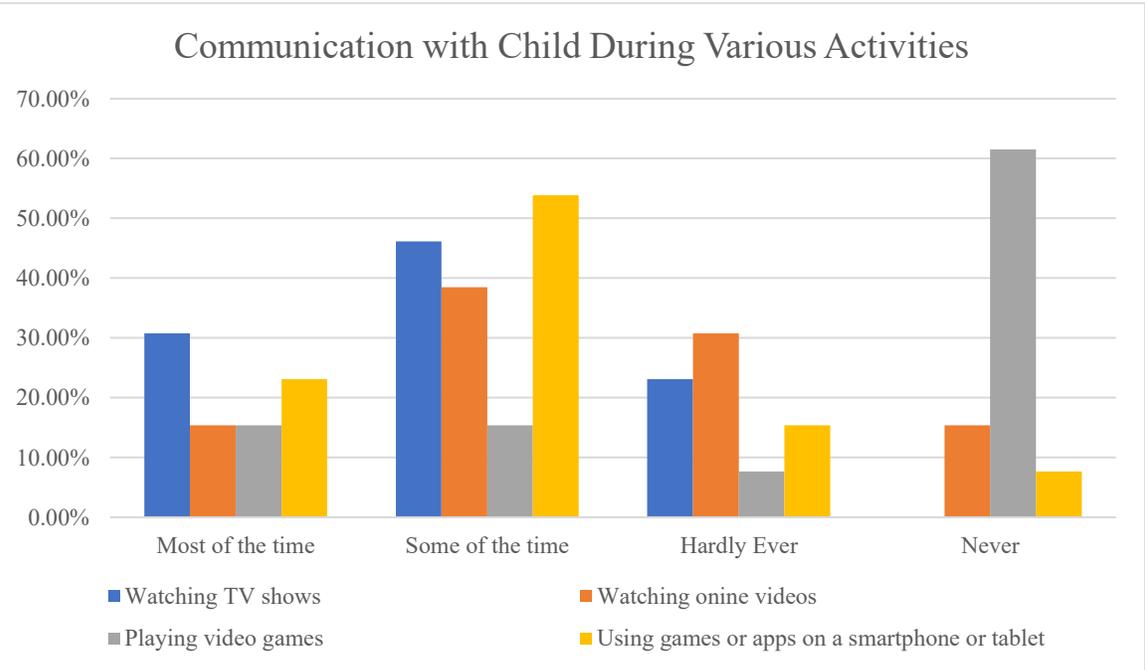
Activity	Most of the time		Some of the time		Hardly ever		Never	
	<i>n</i>	Percent	<i>n</i>	Percent	<i>n</i>	Percent	<i>n</i>	Percent
Watching TV shows	4	31	6	46	3	23	0	0
Watching online videos	2	15	5	39	4	31	2	15

Playing video games	2	15	2	15	1	8	8	62
Using games or apps on a smartphone or tablet	3	23	7	54	2	15	0	0

Participants reported in item 5 their young children did not play video games often on mobile devices. From the data in this item, if they do play video games on the device, 62% of the participants never have a conversation with their young child while they play those games. Parents reported that they have a conversation with their children most often when using games or apps and watching television shows. Figure 4.1 shows the data. If you remove the data about never communicating with the child, the remainder of the data is a natural bell curve. Most of the communication with children occurs sometimes in all areas except for playing video games.

Figure 4.1

*Communication with Child During Various Activities*



A second part to item 15 asked when they had a conversation with their child while using their device. Only four participants responded to this item (31%): two mothers (14%) spoke with their children before using the device, one mother (7%) spoke after the child used the device, one mother (7%) stated it was a combination of before, during and after the activity. No participants (0%) indicated they conversed with their child during their use of the device.

The desire to understand if an adult is interacting with young children while using devices and how that use impacts interaction is explored in item 16. Participants reported yes ( $n = 10, 77\%$ ), no ( $n = 2, 15\%$ ) and maybe ( $n = 1, 8\%$ ) that the time and place that the child is using the mobile device made a difference in the interaction between the adult and the child.

### **Family Usage**

The possibility of technofence when adults are using devices was also explored. Item 19 gathers data to explore how adults use their own mobile devices with their children. The participants could choose all the options that applied from the given list. The responses in order of frequency are answering emails ( $n = 10, 77\%$ ), texting friends ( $n = 10, 77\%$ ), making phone calls to friends or family ( $n = 9, 69\%$ ), making phone calls for work ( $n = 8, 62\%$ ), social media ( $n = 7, 54\%$ ), work ( $n = 7, 54\%$ ), watching videos ( $n = 2, 15\%$ ), play games ( $n = 1, 8\%$ ) I do not use mobile technology when I am with my child ( $n = 1, 8\%$ ). No participants (0%) indicated they engaged in watching movies/videos or reading books on a mobile device with their child.

The technofence and adult devices usage topics were also mentioned in the responses to the final open-ended question of the survey. One mother shared that she

“does not like how often my husband and myself are on the [mobile devices] around our children.” Another mother commented that she “struggles to find a healthy balance with tablet/phone time.” These comments show that adults are aware of the disruption in interaction because of their mobile device use.

According to NAYEC technology guidelines, adult caregivers play an essential role in modeling the use of mobile technology for children. However, the work of Prensky (2001) notes that adults may not be prepared for this role. Prensky discusses the differences between children as “digital natives” and adults as “digital immigrants” and exposes how adults can feel about technology and the imbalance of use of technology between adults and their children. Item 10 explores how comfortable adults are with using mobile devices, downloading apps, using a mobile device or computer without them, and a child’s independent use of apps on a tablet or smartphone. This item was another Likert scale with different ratings than the other scales used. Participants could rank the comfort level of each field from Very uncomfortable, Uncomfortable, Comfortable, and Very comfortable. Table 4.7 reports the data on how comfortable the participants are with technology.

Table 4.7

*Participants Comfort with Various Technology*

Technology	Very uncomfortable		Uncomfortable		Comfortable		Very comfortable	
	<i>n</i>	Percent	<i>n</i>	Percent	<i>n</i>	Percent	<i>n</i>	Percent
Using a mobile device	1	8	1	8	2	15	9	69
Downloading apps	1	8	0	0	5	38	7	54
My child using a mobile device without me	4	31	5	38	4	31	0	0

My child using a computer without me	5	38	5	38	3	23	0	0
My child using apps on a tablet/smartphone on their own	3	23	2	15	7	54	1	8

69% ( $n = 9$ ) of the participants in this survey report mainly being comfortable using a mobile device. This is higher than the other data points for this field. The data shows that many of the participants are comfortable to very comfortable downloading apps. Participants are also comfortable with their young children using apps on a tablet or smartphone on their own. However, the participants are more concerned with the young children using a mobile device or computer without them. It is interesting since many of participants reported in item 8 that their young children ( $n = 7$ , 54% occasionally and  $n = 2$ , 15% daily) are using their mobile devices independently.

The data show that young children are using mobile devices and apps. Item 12 explores how families select the apps that are downloaded for their young children. Several options were given the participant was asked to check all that apply. Most mothers ( $n = 9$ , 64%) said they follow a teacher’s recommendation. Many ( $n = 6$ , 43%) read about the app online or in an article. Other adult recommendations are important to five participants with 36%. As well as, the five mothers (36%) reported that being familiar with the brand name was a factor. Three participants reported that a child might ask for a specific app (21%), or it is found when they search their phone ( $n = 3$ , 21%). Two mothers, 14%, downloaded an app from an advertisement that was seen. Three mothers (21%) selected the “Other” option but did not give any other details in the open field for an explanation.

After the adult reports that the child most often uses technology by themselves in an item, item 9 asked if an adult did use the device with their child. The mothers reported that 77% ( $n = 9$ ) said they use mobile devices with their children. This item had a yes or no option to respond. When the participant answered yes, they got a follow up question asking, “Which of the following reasons do you use the mobile device with this child?” There were asked to pick the response that fits best from the list. The most common answers from the list given were: “I enjoy it” ( $n = 2, 20\%$ ) and “The child needs help to use it” ( $n = 2, 20\%$ ). The options: “It helps the child get more benefit from it” and “I don’t use mobile devices with my child” got 10% ( $n = 1$ ) each. Forty percent ( $n = 4$ ) of the participants selected others. Four themes were chosen to code the response for more information. The four themes were: Photos, Communication, Seeking information, and Play/entertainment. Two responses coded Photos both stated their child likes to see or take pictures. The other mother responded that the child likes to look at pictures of himself or their family on the device. The coded response for communication had to do with the child making phone calls. One family stated that they “call her mamaw together.” Two other families indicate that they use the mobile device to make a phone call or read whom to call in an emergency. One parent reported that she and the child use it to look up recipes or instructions. A final response is in the Play/entertainment theme. A mother reported, “They will ask for help but I will play with them while I help if they want to include me.”

Three participants said they do not use a mobile device with their children. They got an additional item that asked why with seven options to select the best choice by answering no. One participant (33%) selected the option, “I am busy getting other thing

done.” Another ( $n = 1$ , 33%) selected, “I don’t know how to use mobile devices.” The final participant ( $n = 1$ , 33%) that responded selected the “Other: Please explain” option. One mother did offer more details about her response to the no response question. She stated, “We try to be a technology free home or use it very sparingly. We give it to the children more as a rare moment, special playtime.” This family reports focusing on monitoring the use of mobile devices.

### **RQ2: How the School District Supports Families’ Use of Technology with Young Children**

The Mountain Valley School District would like to continue to support their families to help young children grow and develop. Mobile technology has also been a part of the school district culture, years before Covid-19 changed education to rely more on technology. The district was one of the first schools in the rural setting to get iPads for each classroom. The commitment will continue to support the use of technology in the district even after Covid-19 does not threaten to close the school buildings for health and safety reasons but the support for remote learning days for the weather or other issues that cause a building to be closed. With a better understanding of how the families in the school district use technology, the district, and educational partners can apply that knowledge to support families.

### **Current Use**

To understand what families use mobile devices for with their children, item 11 was an open-ended question that requested the participants to write in the apps the young child uses most. Table 4.8 shows the responses to the most common apps being used by young children. App stores will categorize apps into several distinct categories. Most of

the themes in the table were selected from the categories of the Apple App Store. The last theme in the table was created because there was insufficient information, or more than one app was found when the name was given was searched.

Most of the apps listed are in the educational category. The most mentioned apps are ABC Mouse (54%) and YouTube (38%). As the table notes, more apps are listed in the educational category, but YouTube is reported to be the most widely used app by young children from other data collected in the survey. Interestingly, Kabali et al. (2015) also noted that YouTube was one of the most used apps.

Most of the apps listed that the young children use is designed for children in the targeted age range of the children in the survey. Except for Starfall, YouTube, and Minecraft. Starfall is rated for age four and over, but the app store states that it is made for children ages 6 to 8 years old. YouTube is rated for over age 17. There is a YouTube Kids app, but no participants noted the kid’s version of YouTube. Minecraft is rated for ages nine and older.

Table 4.8

*Apps Most Commonly Used by Young Child*

Theme	Name of App	Age rating (as rated by Apple App Store)	Number of family that mention the app out of 13 families	Cost
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Educational	ABC Mouse	4+, Made for Ages 0-5	7 of 13	Free
	(Hopster) Coding Safari (for Kids)	4+, Made for Ages 0-5	1 of 13	Free
	Mental Math Monsters	4+	1 of 13	Free
	Khan Academy (Khan Academy Kid)	4+ (4+, Made for Ages 0-5)	1 of 13	Free (Free)
	PBS kids	4+, Made for Ages 0-5	2 of 13	Free
	Starfall	4+, Made for Ages 6-8	1 of 13	Free
Entertainment	Disney+	4+	1 of 13	\$7.99/month or \$79.99/year
	YouTube (YouTube Kids)	17+ (4+, Made for Ages 0-5)	5 of 13	Free
Game				
Family	(Cooking Games Kids) Jr. Chef	4+, Made for Ages 0-5	1 of 13	Free
Adventure	Minecraft	9+	1 of 13	\$6.99
Unclear App name (not clear what the proper name of the App listed)	“Amazon Tablet apps for Children”	Unknown	1 of 13	Unknown
	“doodle apps”	Variety rated educational/graphic	1 of 13	Unknown
	“misc games that I have researcher and found to be appropriate”	Unknow	1 of 13	Unknown

### Adult Beliefs about the Use of Technology

Radesky et al. (2016) stated that families let the children find the apps themselves at their work. From data reported in item 12, it seems that the adult is more active in selecting the apps for their young child. The data also states that they often seek advice from adults, either teacher, names from articles, or other adults.

Item 13 asked participants if they would use a list of resources that listed apps for their child to use to support their child's academic growth. The item was a yes, no, or maybe choice. Of all thirteen participants, 69% responded yes, 31% ( $n = 4$ ) chose maybe, and 0% ( $n = 0$ ) responded no to using a list of resources that listed apps that supported their child's academic growth.

It is vital to understand how families feel about young children using technology and mobile devices so that educational professionals can help support them to use mobile devices with their children to support growth and development. Item 17 uses a Likert scale to understand five statements of use. The scale is: Strongly agree, Somewhat agree, Neither agree nor disagree, Somewhat disagree, and Strongly disagree. The five statements are: 1.) It is difficult to get my child to stop using mobile devices when I ask, 2.) I am satisfied with the amount of time on a mobile device to support development for my child, 3.) I am overwhelmed by the variety of media options available to my child, 4.) I do not know what choices there are for my child, and 5.) I know where I can get support or my child with a mobile device. The last option did have a dropdown option for the participant to write in the source. Table 4.9 shows the data reported by the participants for item 17.

Table 4.9:

*Adult Value Statements About Mobile Technology*

Statement	Strongly agree		Somewhat agree		Neither agree nor disagree		Somewhat disagree		Strongly disagree	
	<i>n</i>	percent	<i>n</i>	percent	<i>n</i>	percent	<i>n</i>	percent	<i>n</i>	percent
Difficult to get my child to stop using mobile devices	7	54	4	31	0	0	2	14	0	0
Satisfaction of the amount of time my child is on a mobile device to support their development	3	23	4	31	4	31	2	15	0	0
I am overwhelmed by the variety of mobile options for my child	3	23	3	23	2	15	3	23	2	15
I do not know what choices my child has with mobile devices	1	8	2	15	4	31	5	39	1	8
I know where I can get support for my child with mobile devices	3	23	4	31	5	39	1	8	0	0

The data shows that parents do not strongly agree it is hard to stop their child from using mobile devices ( $n = 0, 0\%$ ), but seven (54%) strongly agree that it is difficult. No parents reported agreeing or disagreeing with this same statement. Four parents, 31%, somewhat disagree, and two participants (14%) strongly disagree with the statement that it is difficult to get their child to stop using a mobile device. The remainder of the statements did not have to stand out numbers for most areas except for strongly agree.

This answer option was the least selected for the following choices: difficult to get my child to stop using mobile devices ( $n = 0, 0\%$ ), satisfaction of the amount of time my child is on a mobile device to support their development ( $n = 0, 0\%$ ), and I know where I can get support for my child with mobile devices ( $n = 0, 0\%$ ). Participants seem to know where to seek support for their child using a mobile device. Three participants (23%) strongly agree with the statement. Four more participants (31%) somewhat agree with the statement. Item 12 asks how they select apps for their young child. The response indicate that they seek help from teachers most often and use other resources for information to guide their choices.

### **Parental Controls on Mobile Devices**

The participants report struggling with getting their child to stop using a mobile device in item 17. Recommendations from NAEYC suggest limiting the use of technology for children ages 2 to 5 years old. Item 18 explores how the participants in the YCT survey limited screen time for their young children. There were only two choices for this item, yes or no. Suppose the participant selected yes, an additional open-ended space opened for them to respond to how they limit their screen time. All thirteen participants said yes (100%) to limiting screen time for their young children. Twelve mothers responded to the second part of item 18. Their response and the themes are listed in Table 4.9.

Table 4.9

#### *Time Limits Set for Screen Time for a Young Child*

Theme	Adult comment
Outside regulation (device/timer/controls by adult)	“With a time limit or by (when) dinners on the table”

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“Free time till I get home and make dinner or (finish) up with what was previous prepped”

“I only allow a certain amount of tv or tablet time each day”

“Only use for long car rides, 20 mins a day”

“They are allowed one hour a day”

“A timer”

“Make the device available only at certain times”

My child uses screen time during long trips or sometimes during downtime on weekends. Most evenings there is no device time.”

“15 minute timer on our home iPad – all apps shut off after the time is up. At this time he is only permitted to use if one day per week before school and one day per week after school and on the weekends as behavior allows.”

It is a reward. Mobile screen time is 15-20 minutes max/day”

“Parental controls”

Child choice

“20 mins a day [when child requests it for games]. Tablet is used for educational purposes too [time varies based on attention span/time task to complete task].”

“He doesn’t seem to have the attention span required for mobile devices. He likes TV, but even for playing Minecraft on a siblings phone, [child’s name] needs lots of help. Our older kids were way more interested in youtube videos and ect. So far he seems lime more of a doer than a watcher.”

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The final item on the YCT survey was a place for comments about the topics covered. The responses are listed in Table 4.10. It is clear that the participants are

nervous about their choices with their children and technology, and they are also open to having support from outside sources.

Table 4.10

*Additional Thoughts Shared on this Topic*

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Theme	Adult comment
Negative toward technology	“I don’t like my children using devices. I don’t like how often my husband and myself are on them around our children.”
Personal struggle	<p data-bbox="407 732 1338 911">Adult concern “I try to limit when and under what conditions my children use them, because I do not want them to not know how to tolerate boredom and I don’t want them to require constant entertainment from devices (as adults have fallen victim to).”</p> <p data-bbox="618 953 1349 1131">“I struggle to find a healthy balance with tablet/phone time. I do not want my child zombie-like and constantly on tablet/phone, but I want my child to be tech savvy enough to navigate the world we live in. As with everything in life, everything needs to be in moderation.”</p>
Child Controlled	“I do wish I could get them to use it for more educational purposes but sadly they use YouTube the most. They do like looking us music on it which I think is fine. But otherwise I am not thrilled about the YouTube content. However, I do think it has helped his imagination.”
School technology	“I wish that there was a timer on the school iPad to limit screen time if the parent wishes to do so. I also would prefer that the school iPads were never sent home with the kids after Thanksgiving break. This caused unnecessary arguments in out home over iPad use.”
Understanding/Education	“I think it would be interesting to understand the parental controls used for children’s devices as well. Our children have Kindles which have controls based on age level and many other options.”

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## **Conclusions**

The thirteen participants that completed the survey are embracing technology in their families. They are looking for support and help to navigate the ever-changing landscape of parenting, education, and technology. They want support from educational professionals on how to navigate these waters.

### **Identification of Stakeholders**

The data clearly shows the importance of the teachers and other educational professionals working with young children and families as a resource for working with their young children and mobile technology. This point is reinforced in more than one data point. The data stated explicitly that they select apps based on what a teacher recommends. Several also stated that they chose an app based on an article. Freed (2015) warns consumers about these articles because often, the company that created the app also owns the company that is promoting the app. The information is biased in other all-participants stated that they would like a list from the teachers to help them select appropriate apps for their child.

Families are also looking to the school to help them with school iPads. Adults would like directions on how to set limits on mobile devices. One adult also asked that the school change sending the iPad home. Since the school has four classrooms of preschool-age children, it is vital to connect with families now to start healthy habits with technology. Teachers are essential in this process to help families understand how iPads are used in the classrooms and how to help the families with the transition home with the iPad. At this point, communication from the teachers is limited to stating that the iPads need to be home in the event of remote learning days and they need to be charged nightly.

The data suggests that most children are most commonly using tablets. It sounds like a tablet that is most often for the child's personal use and not being shared with another child. The data leads us to believe that children use the device more at home than in public settings. However, in either situation, often they are using it by themselves without an adult interacting with them, especially when the adult thinks they are watching online videos. The teachers and early childhood professionals could be a resource of tips on interacting with children while using mobile technology.

Teachers and early childhood professionals are the links between home and school. Much of the data stated that families are willing to listen and look for support to help young children use technology, promote healthy habits, and grow and develop as humans and learners.

### **Using Mobile Technology in a Supportive Way**

With many young children using mobile devices on their own, it becomes a question of whether they need more guidance or interaction with an adult to use the technology for development. It is concerning that most families surveyed stated that they do not communicate with young children while watching online videos. This situation is concerning because many children use YouTube to watch videos online. YouTube, not YouTube Kids, is rated for 17 years old and older. The kids have access to lots of different content.

Furthermore, younger children have a shorter attention span and clicking is remarkably simple. Before long, a child could be watching something entirely different from what the parent is aware of them watching. For this work, I started a cartoon video on my smartphone. Once the video that I selected was over, I could scroll down and find

other related videos and others that were not. They were mixed in with similar themes as the first video I watched. One of the videos chosen was “Hip Hop Essentials.” It was a music video that used adult language and showed adult-themed images. There was no warning on the video or ads that started before the video played. It took me less than 10 minutes to have that video pop up. Close interaction with an adult is needed to monitor this activity for a young child.

The data also showed how different the communication and interaction are between adults and children from television to mobile devices. Because the television is larger and, in a room, it can be monitored much easier. A child can roam from room to room or in their room while the adult is cooking dinner, which means less supervision of the technology and device. Mothers stated that they did not feel comfortable with young children being on a laptop or computer by themselves. As teenagers and young adults, computers and the internet were starting to come into homes. Many sources would recommend to parents that home computers were recommended to be kept in a common area of the house to protect children and watch what they are doing online. The message was to permit children and young adults to use the computer with boundaries.

Similarly, it was striking that the data stated that 8 of 13 participants were comfortable or extremely comfortable with a child using apps on a tablet or smartphone on their own. However, ten of them were uncomfortable or very uncomfortable with their child using a computer without them. Again, this points back to the need to support families in using mobile devices and technology with young children to use the technology to optimize a young child’s development.

### **Comparing to the National Trends**

When comparing the Common Sense Media survey data and the Young Child Technology survey, it seems as if the Mountain Valley School District has many similarities to the national trends of 2020. It is not easy to draw more specific correlations because Covid-19 has changed many factors in our everyday lives. For example, there is more access to technology and the internet in the rural area of the Mountain Valley School District. Sixty-one percent of the participants from the YCT survey stated they have home broadband or Wi-Fi. People are spending more time at home and less time as a family in public places, and assuming more adults are working or using their mobile devices around their children because they are together more due to the Covid-19 environment.

This data was limited to only thirteen participants, but they completed the entire survey to illustrate how families use the technology. The data and the conversation have started a path to continue the work to support young children's growth and development. There is more data to collect to get a fuller picture of Mountain Valley School District families. The picture that is coming together can be used to make some suggestions to move forward to support families' use of technology, specifically mobile devices, with their young children to be another support to the development.

## **Chapter 5**

The development of a young child is dependent on adult interaction. According to Kuhhirt & Klein (2020), children's language development is stronger with a person that is a native speaker than learning from a computer. In Bronfenbrenner's theory of how a child develops, they interact with many different people, systems, and levels of interaction to grow. The microsystem is the system a child most interacts with in the early childhood stage. As they grow, they enter the following stages of development in the Ecological Model of Bronfenbrenner. Technology has become a factor in the Exosystem that impacts relationships and then the development of children.

### **Discussion of Findings**

From the data collected in the Young Child Technology survey, families in the Mountain Valley School District with young children are using mobile devices. This was becoming a trend that accelerated with the changes to our education and culture from the effects of Covid-19, since March 2020. Technology is a permanent part of young children's lives. When working with families, I frequently hear many want to raise children who are both well developed as humans, academically, and able to manage technology well.

### **Recommendations Based on Data**

The literature and data collected suggest that families would use action steps and suggestions from educational leaders and professionals in the Mountain Valley School District to support families and young children in using technology in development and growth. The data identifies school districts and educational professionals are stakeholders

that could help families make connections with each other and support healthy development of young children while using technology.

As television was in the past, technology and mobile devices are essential to be used in the home. There is a concern that, like television, technology might play a role in supporting or limiting a young child's development. The vital understanding is how to use it with young children to foster and not hinder growth and development. Families need guidance regarding what young children should be doing on the device.

It is also clear from the data collected that Mountain Valley School District families have also embraced the use of young children using mobile devices. The families that completed the survey also are asking for support from educational professionals to help them use the mobile devices with their children to support the growth and development of their children. According to the data from the Young Child Technology survey, families trust teachers to give them information on the apps to use with their children. Many of these families are also asking for understanding and guidance of how to limit screen time.

Learning from the Young Child Technology survey, the Mountain Valley School District could move in a variety of ways to support families. Some simple steps to get started could be create a committee, build resources for teachers and families to understand how to use technology with children, train teachers on the resources, and distribute the information to support families.

To support families in these ways, the school needs to create a plan for that support. Creating a committee to develop a plan for a district wide technology and mobile device use resource guide and guidance for how teachers can help families and children

use mobile devices. Bringing knowledge of educational professionals, knowledge of educational apps, and how to interact with children with a mobile device could be powerful resources for families. Educational professionals could create a variety of resources for families. For the school district to make clear policies and statements about the use of mobile devices in the classrooms and at home, organizations, like the National Association for the Education of Young Children (NAEYC) or the American Academy of Pediatrics (AAP), could be a resource to make guidelines for mobile devices for various ages in the district.

The resource guide could address three areas: apps, screen time limits, and tips for interacting with your child while using mobile devices. First, a list of age-appropriate educational apps needs to be created. These lists will need to be updated frequently to keep current. They should also include the apps that the school uses. The list could list apps that are educational with the age range that the app is most appropriate. Second, gather ideas for ways to limit and manage screen time on mobile devices. Finally, tips of how to interact with a child while they are using mobile devices.

The teachers and the early childhood professionals also can be supported by the school plan. The committee could create professional development to help teachers communicate with families, the resource guide, and how mobile devices are used in the classroom to support growth. The teacher could then feel more prepared and understand their role in supporting families to use technology with young children.

The school district could also create a guideline about how and when mobile devices are being sent home with young children. Currently, devices are sent home nightly in case of the need for remote learning. Once the threat of not being in school

daily from the Covid-19 pandemic has passed, the school could reconsider the importance of continuing to sending home the devices with younger children daily. Age could be a determining factor for these guidelines. Understanding that weather may affect school closures, the devices could be sent home in those events, if needed for flexible instruction days. The message to young children of how to use the school mobile device at home is also important. The school can also set an internal setting that the mobile device is only accessible during certain hours. This could vary for different age children.

The use of mobile devices needs to become a part of the conversation with adults when educational professionals are talking about the child. Parent-teacher conferences or from interaction with early childhood providers like the Tiny Mounties would be a prime time for those conversations. The resources that are created by the school district could be given to families at that time.

Urie Bronfenbrenner felt that other people and institutions influence growth and development and the ways the individual interacts with the influences. With the recommendations of the school district, teachers, and other early education professionals there can be major impact the growth and development of a young child with the use of technology and mobile devices.

### **Compared to the National Averages**

Common Sense Media (CSM) has been a leader in the field of this study to learn about national trends of how families are using technology. They have been looking at the impact of technology and mobile devices for several years. The data collected with the Young Child Technology survey followed many of the same trends seen in the most

recent CSM 2020 survey. As stated before, the population size of the YCT survey is quite different from the CSM survey and therefore cannot generalize the findings but suggests that more data needs to be collected.

Noting that Covid-19 has affected education and the use of mobile devices since the last CSM survey, the trends may continue to change in how mobile devices are used and the effects on a child's development in the future.

This work was designed to explore the impact technology and mobile devices have on the development of young children. The design was being formed before Covid-19 impacted education and how much we have become dependent on technology. Other scholars might take away how quickly things change with technology in education. This is a vast difference from the rate that education changes in other ways.

Like many schools, the Mountain Valley School District has a one-to-one technology policy in all the schools. Since these devices have become a vital part of the educational landscape, it is time to look at the impact they are making on the development and learning. It is also vital to keep connected to the national trends to support the best practices with children using mobile devices.

### **Relationships to Support**

The partnership with the Tiny Mounties program, designed to work with families to build a founding relationship with the school and guide families with young children in preparation for school readiness, can be a bridge to connect the findings of this work to practice within families. The direct relationship that the staff of the Tiny Mounties have with families, can serve as a model to families and other early childhood providers to

work with families on how to use technology with young children to support growth and development.

Mountain Valley School District has a relationship with the other early childhood education providers in the school district through transition planning. The knowledge gained from this work can be shared with those centers as well to adapt a culture of support for families and be a resource to help academic growth and development of children with the use of mobile devices.

### **Contributions to the Field of Educational Leaders**

Educational leaders should approach family support with technology and mobile devices design like a scope and sequence of another learning area. The use of technology is different as a child gets older, and supports are needed when a child starts learning with technology. A school district should approach the design of a plan with input from families, teachers, technology personnel, and administration. It is essential to also keep in mind the goal of the students being prepared for choices after completing high school. That end goal might be a moving target that needs to be adjusted frequently.

### **Recommendations and Implications for Educational Leadership in Social Justice**

As the data notes, there was a minimal response from the number of surveys that were sent out to families. There are many possible reasons for this limited response. The distribution of the survey information was through email and hard copy. The school staff have noted an increase of daily folders not being cleaned out by adults at home. Often, families are reading email on a mobile device when they have service. These two factors limit the adults that accessed the information. The letters IRB required to send out was very lengthy. People may not read the hard copy of the letter due to the length. If they

opened the letter from the email on their mobile device, it would be difficult to read because of the screen size. Shorter letters might get more response from participants.

Families were given the option to call me and have the survey read to them on the phone as I completed online with their responses. No one selected that option. People might not have been comfortable with this option. If the Qualtrics software had the option of the survey to be read aloud, that might have been helpful for people that had difficulty reading the survey on a device. This would give people an option to complete for a variety of reasons. In the event that the screen was too small to see, or they had difficulty reading the survey for any reason. The participant does not feel judged by answering the questions with a live person.

Another aspect to think about is taking the survey online if the internet is limited. For some of the Mountain Valley School District families, their internet connection might not be stable enough to take the survey. Offering the chance to take the survey at the school might be helpful for those families that do not have internet.

The population that the Tiny Mounties serves is also one that does not use early childhood learning options in the school district. The relationship with them is valuable to reaching families that are not connected to early intervention options as well as the close relationship they build with families.

In the planning for this work, it is essential to think about the best way to get the information from the families that are served in your school district. Maybe a survey is not the best option. If it is a survey, think about getting the survey out to the families. Not all families are trusting of the school district. Maybe mailing the survey information to homes is better.

It was planned that the Tiny Mounties program was a resource for getting families to complete the survey. Make a connection to programs outside the school to help with the distribution and data collection. They could be a valuable resource for understanding the populations' needs.

For this work, if feel the impact of the work can be giving a shorter survey to families after guidance and improvements are made to the support of families to help young children use technology to support development. This survey would collect data to see how families used mobile devices after guidance and support from the teachers, educational professionals, and school district.

The learning and design of this work were from powerful pieces of literature. Nevertheless, I feel two of the most influential authors who drove this work deeper were Richard Freed and Dr. Jenny Radesky. Their work is vital to get a framework for many ideas of children and families interacting with technology, but the pace is fast when you talk about technology. There is more to learn about these topics, and I am sure we could hear more from these two, but more scholars will emerge with this work.

Organizations also play a role in keeping up to date learning about the use of technology with families and reading about current guidelines from organizations like NAEYC and AAP. Also, Common Sense Media is a resource to keep reading about their learnings in this field.

### **Limitations**

When the topic of technology use with young children became my focus, I saw a concern in my interaction with families of young children in the Tiny Mounties program and in general observations in day to day living. I would note young children on a mobile

device while the family was out to eat or sitting in a grocery store cart while the adult caregiver shopped. This situation seemed to replace conversation between the adult and child that once occurred and were disrupted due to the use of a mobile device. When working with families with the Tiny Mounties program, there were encounters with families that either the child would not give up a mobile device to play and interact with us, the adult caregiver would not turn off the television, had adult content on the television when we came to the home with the young child present, or the device was handed to the child as we were leaving the home to entertain the child. This was before March 2020, when Covid-19 changed many families usage and access to technology.

We are slowly returning to work in person and relying less on technology to connect daily because of shutdowns, quarantining, and less remote learning. People still seem to be relied heavily on mobile devices. Also, the increased issues with using too much technology were reported with concerns about the effects on children. The negative press of warning adults because of the increased use of technology due to Covid-19 and the effects on children could have impacted my data collection because families did not want to feel judged for choices they make with their families and mobile devices.

As an educator, I also know that the amount of information that goes home in physical copies, or electronic, has declined in the past years. Also, I know that little is read by adults of what is sent home by the school. Items that are most often looked at are very brief half sheets of paper with little text or calendar type information. The more information on one paper, the less likely it is read. The first letter that was sent out for my survey was very informative but very text heavy. It was the hope that the QR code would catch people's attention and encourage participation. The second letter sent was not as

text heavy and the participation did increase after that letter was sent out to families. However, I feel like an individualized touch of handing the letter to the family by the teacher or educational professional would have given families a brief introduction to the survey and given them the opportunity ask questions.

In the effort to use less paper and be more sanitary, more places are using QR codes. This has become an effective way to use mobile technology to connection to information or websites. An assumption was made that the QR code would be an effortless way for adults to scan and link to the survey. Two participants reached out to me by email and stated they had difficulty with the QR code working. Each time they reached out, it was checked on two different mobile devices and it could be opened. Therefore, there might have been a device or user issue.

January weather in southwestern Pennsylvania can impact being in school or activities with young children. The weather was a factor for the preschool classrooms and the Tiny Mounties programming. Cancellations from weather cause schools to delay and cancel full days of instruction. The Tiny Mounties program also had to cancel programming and visits due to weather. An additional disruption in day-to-day activity was the Omicron variant surge in the school district. Many students were home because of positive cases or exposures. Events for the Tiny Mounties were also limited to the number of families that could attend because of social distancing regulations.

In the future, surveying during fall parent-teacher conferences could be a more productive period for a few reasons. First, the families would be in the building; the teacher could hand an adult the information about the survey. Alternatively, the letters about the survey could be in the waiting area for the conferences and families could

complete it while they were waiting. Finally, I could also be in the area if anyone had questions. Acknowledging these limitations, I would change the timeframe of data collection. With the change in distribution to conference time, I hope to reach more families for feedback.

The limitation of time also excluded an extension of collecting data that would be valuable. Focus groups could be formed and time spent with the groups would give greater depth to the data. Moving forward, I would like to use this similar format to collect data and add focus groups to the research design. This would enable more data collection to get a fuller picture of how families are using technology as individuals and together. Pairing the survey and focus groups, the data would be more complete.

### **Implications for Leadership Agenda and Growth**

In reflection of the work, the path forward is working toward improving support and guidance for the stakeholders in the Mountain Valley School District to help young children use technology to support their growth and development. That path is guided by the Six Core Principles of Improvement (Bryk et al., 2015). The six steps are as follows: 1.) Define the problem you are solving, 2.) Define the support needed for the stakeholders to make the support efficient, 3.) Take the data from the survey understand of the national trends and design a clear hypothesis, 4.) Design a measure to understand the support for families and young children using technology for their growth and development, 5.) Design a cycle of Plan, Do, Study, Act to examine the improvement, 6.) Work with stakeholders to understand the process and improve the support.

The problem is defined as needing a guide for educational professionals and families to use mobile technology with young children to support their development and

growth. The data collected from the Young Child Technology (YCT) Survey shows how young children and their families are using mobile technology. We also have recent national data from the Common Sense Media Survey. This information is the starting point for the work with improving support for families, young children, and educational professionals.

Moving forward with the limited picture gathered by the thirteen participants who completed the YCT survey, more stakeholders need to gather more information. Reaching more families that would be a broader community portrait would give a more realistic picture of how more families are using mobile technology. A deeper understanding of the families use as well would be helpful. Holding focus groups with families would help get a deeper understanding of how families use the technology, help families understand how each other uses technology, and learn together ways to improve the support and guidance of using mobile devices with young children.

First, in reflection of the stakeholders, this is the time that the educational professionals can also become part of the process. The YCT survey only gathered information from the families and how they use technology. The educators' missing part is how devices are used in classrooms. A clear understanding is needed to understand what apps are used in the classroom, how long and when devices are used , as well as how the professionals interact with the children to support learning. For example, Reflecting on the guidelines set by NAEYC and supported by the AAP, children ages 2 to 5 should have limited time on devices. It needs to be understood how much time children spend on devices at home and in educational settings. The clearer picture is valuable

information that needs to be shared to build a complete plan to give children time in school and at home within the recommended guidelines for time for various ages.

A critical part of the second core principle is understanding that technology, specifically mobile devices, has proven vital in our culture over the past two years. It is clear from the data in this study that our families are using the devices often so more information needs to be gathered from the stakeholders to make the improvement efficient. Gathering the stakeholders and having a broader picture of the use of mobile devices in both educational and home settings would help develop a plan to support young children in their development while still using technology.

A plan can be drafted to move forward after the data is collected from more families, a more profound collection of information gathered from family focus groups, and data collected from educational professionals. One possibility could be to create a committee to design a scope and sequence for the community to use to work with families, educators, and young children on using technology to support growth and development.

This committee would also need to address how the fourth core principle or measurement would be maintained for this process. From the experience that I have gained from this process, one way of measurement could be surveyed to families and educational professionals. One like the YCT survey could be given to families. A new survey could be designed to give the educational professionals.

To address the fifth core principle, the committee would need to review the plan, surveys, and keep up to date with new apps, best practices in technology use with young children, guidelines of use of technology, and revise the plan based on the learnings. Use

and access of technology due to Covid-19, new research will continue to help guide and direct learning and understanding of how to support all the stakeholders in this process. It will be essential to keep up to date on that research.

The sixth principle will be addressed in this process if all stakeholders remain part of the process to drive the improvement. Another critical part of this step is recommendations to the School Board for policies to reflect the best practices and plan that are created from gathering more information from the stakeholders. There is power in the data. The improvement will only continue if there is open communication, a collection of stakeholders, and the desire to make the system better.

Using the Six Core Principles of Improvement will take this work already started and make a lasting impact on the young children, families, and community of the Mountain Valley School District. Unlike how television was first viewed as a negative impact in the past, mobile technology can be used to support growth and development in young children when used in specific ways. These ways will be designed with the data collected from the Mountain Valley School District stakeholders and combined with the guidelines of NAEYC to create positive support for families, educators, and young children.

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## Appendix A

### Initial Informational Letter to Educational Professionals (Email)

Dear Teachers and Tiny RAM Staff,

My name is Kim Dickert-Wallace. I am a doctoral student in Educational Leadership in the School of Education at Duquesne University. Currently, I am conducting a research study on how families are using mobile technology with their young children. What supports they use or how educational professions could support you with using technology to help support our families in helping their young child develop.

I am asking that you contact your families with young children, between ages 2 and 5 years old, that live in the Ligonier Valley School District with the attached letter. Please feel free to share as a hard copy or email with families. Let the families know that their participation is voluntary as well. Please feel free to refer the families to me if they have any questions. The survey will be open from \_\_\_\_\_, 2021 to \_\_\_\_\_, 2021. I will send a reminder email to give to the families one week prior to the survey closing.

If you have any questions about this process, please reach out to contact me. I will be happy to answer any questions you have about this research study. You may contact me Kim Dickert-Wallace, 724-989-2583 and [dickertwallacek@duq.edu](mailto:dickertwallacek@duq.edu). You may also contact my advisor, advisor Dr. Amy M. Olson at 412-396-5712 and [olsona@duq.edu](mailto:olsona@duq.edu).

Thank you for your assistance!

Sincerely,

Kim Dickert-Wallace

724-989-2583

[dickertwallacek@duq.edu](mailto:dickertwallacek@duq.edu)

Doctoral Student, Department of Educational Foundations and Leadership

Duquesne University School of Education

## Appendix B

### Initial Recruitment Letter (Hard Copy and Option Email)

Dear Families,

My name is Kim Dickert-Wallace. I am a doctoral student in Educational Leadership in the School of Education at Duquesne University. Currently, I am conducting a research study on how families are using mobile technology with their young children. What supports they use or how educational professions could support you with using technology to help support you in helping your young child develop.

I would like to invite you to participate in my research study, which investigates your perceptions about (a) how your young child uses mobile technology, (b) the ways your young child and you use technology, and (c) the access to mobile devices and internet.

Your input is valuable!

Your participation is completely voluntary and will include completing a 15-minute survey. The survey can be completed online that you can find at the link or QR code. You may choose not to participate or to withdraw your participation at any time. You will not receive any benefits for participating and there will be no costs to declining participation.

The survey can be completed online at the link below or you can use the QR code to access it. Once you access the survey, you will be provided with a consent form that explains your role and rights as a research participant in this study. Once you have read the form and agreed to participate, you will be able to start the survey immediately.

I am also available to give you the survey over the phone if you prefer. You can reach out to me at 724-989-2583 if that is your preference and we will schedule a time to review the consent document, sign it, and answer the survey.

If you have any questions about this research study, please reach out to contact me. I will be happy to answer any questions you have about this research study or your rights as a research participant. You may contact me, Kim Dickert-Wallace by phone at 724-989-2583 or email: [dickertwallacek@duq.edu](mailto:dickertwallacek@duq.edu). You may also contact my advisor, advisor Dr. Amy M. Olson at 412-396-5712 and [olsona@duq.edu](mailto:olsona@duq.edu). Additionally, you may contact Dr. David Delmonico, Chair of the Duquesne University Institutional Review Board at (412)-396-4032, if you should have any questions about your rights as a research participant.

The survey link or scan the QR code with a mobile device:

[https://duq.az1.qualtrics.com/jfe/form/SV\\_agxfaxIV8MyWSa2](https://duq.az1.qualtrics.com/jfe/form/SV_agxfaxIV8MyWSa2)



Thank you for your consideration of this opportunity.

Sincerely,

Kim Dickert-Wallace

Doctoral Student, Department of Educational Foundations and Leadership

Duquesne University School of Education

## Appendix C

### Follow up Reminder of Survey (Email)

Dear Teachers and Tiny RAM Staff,

This is just a friendly reminder that the survey about families' use of mobile technology with their children closes in one week. Please send the attached letter to your families as a reminder to complete the survey if they wish.

As before, if you have any questions, please feel free to reach out. I really appreciate your assistance in this process.

Sincerely,

Kim Dickert-Wallace

724-989-2583

dickertwallacek@duq.edu

Doctoral Student, Department of Educational Foundations and Leadership

Duquesne University School of Education

## Appendix D

### Follow up Recruitment Letter (Hard Copy or Email)

Dear Families,

This is a friendly reminder about an opportunity to participate in a research study. Your input is valuable and will help me learn how to better support families with children who use mobile technology.

Thank you to those families that have taken the time to complete the survey. I appreciate the opportunity to learn from your responses.

If you have not had the time and would still like to participate, the survey is still open. Please use the link or QR to access the survey. You can also reach out to me at 724-989-2583 if you prefer to participate by phone.

Your participation is voluntary and will provide valuable information to help better support families in using mobile technology with their children.

The survey link or scan the QR code with the camera of a mobile device:

[https://duq.az1.qualtrics.com/jfe/form/SV\\_agxfaxIV8MyWSa2](https://duq.az1.qualtrics.com/jfe/form/SV_agxfaxIV8MyWSa2)



Thank you for considering participation.

Sincerely,

Kim Dickert-Wallace

724-989-2583

dickertwallacek@duq.edu

Doctoral Student, Department of Educational Foundations and Leadership

Duquesne University School of Education