# KINDERGARTEN THROUGH THIRD GRADE CLASSROOM TEACHERS' USE OF TECHNOLOGY TO SUPPORT ALL STUDENTS' READING DEVELOPMENT

by

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*To my mother and father.*

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# ABSTRACT

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Adviser: Dr. Julie Ricks-Doneen, Ph.D.

This study provides important insights about the dynamic landscape of technology integration in early childhood education, particularly its role in supporting reading development among students in kindergarten through third grade. The research methodology adopted for this study was a mixed-method approach, incorporating both quantitative and qualitative research methods. Quantitative data were collected through a survey distributed to K-3 teachers, while qualitative data were gathered through semi-structured interviews with selected participants. All eight participants had experience teaching struggling readers and students with Individualized Education Programs (IEPs), and the majority (75%) had experience teaching students with IEPs specifically for reading skills. The study also found that all participants used technology in their classrooms to develop students' reading skills, with varying degrees of intensity. The qualitative findings revealed six major themes, including personalization and differentiation, engagement and motivation, balance between technology and traditional methods, resources and professional development, accessibility and practicality, and support for diverse learners. The participants of this study emphasized the importance of

technology in providing personalized learning experiences, promoting engagement and motivation, and enhancing reading instruction. However, they also expressed concerns about the limitations of technology, the need for balanced instruction, and the importance of professional development. The quantitative findings highlight the prevalence of technology use in reading instruction, while the qualitative findings provide insights into the complexities of technology integration. The findings also highlight the importance of professional development, resources, and accessibility in ensuring equitable opportunities for all students, which has implications for policy, practice, and future research.

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# CHAPTER ONE

# INTRODUCTION

My daughter was diagnosed with learning difficulties in skills such as reading, writing, and mathematics. Her teacher told me that an evaluation test would be done on her to determine her educational level. It turned out that she was at a low level, and she qualified as learning disabled student for an Individual Education Plan (IEP). The teacher indicated that the use of technology would be integrated into my daughter's educational curriculum via tasks at home and others in writing, or computers at school. I worked with her teachers until 2022 and am pleased to say that my daughter is progressing because these programs focus on reading, writing, and mathematics, and in particular, the problems, games, and activities developed in the programs. The role of technology, per the teacher's recommendations, improved my daughter's educational level to a large extent, and we—me, my daughter, and her teachers—are all witness to the significant progress she has made. The use of technology supported my daughter's development, and I became curious about how teachers in early elementary grades may utilize technology to support all students, particularly in reading development. My dissertation topic grew from this personal experience.

## Supporting All Learners

There has been increased emphasis during the last few decades to ensure that curriculum, strategies, and programs meet the wide range of students in the classroom. The Individuals with Disability Education Act (IDEA) ensures that students with a disability are entitled to a free appropriate public education (FAPE). Schools must

provide FAPE through programs and services. The FAPE must meet the student's unique needs and provide educational benefits. There is an emphasis in IDEA on providing services for students in the Least Restrictive Environment (LRE) and to have special education students served in inclusive general education classrooms whenever possible (Villegas et al., 2017). While not all students will meet the qualifications to receive special education services, educational systems designed to support all students have been expanding in schools across the nation. Universal Design for Learning (UDL), Response to Intervention (RTI), and Multi-Tiered Systems of Support (MTSS) are all systems that have as a basis the best practices for all learners.

UDL is a learning environment that includes many teaching methods that support and provide flexible learning opportunities in the classroom. UDL also serves as a framework for examining learning goals, methods, and materials to help teachers define concepts and develop solutions for learners in the classroom. The successful implementation of UDL has shown promise towards inclusiveness and diverse learner opportunities, and teachers' role in including and selecting appropriate practices has led to positive student outcomes (Novak, 2022). UDL can be used to design lessons and set flexible goals that meet the needs of teachers to achieve different academic standards that suit students and their needs (Hall et al., 2015).

RTI and MTTS identify additional supports for students through a systematic and data-driven approach. Building on sound learning environments for all students (Tier 1), a tiered system of support identifies students who may need more targeted interventions (Tier 2) or individualized and intensive interventions (Tier 3). These systems reach across educational content and are not specific to a particular subject matter. Teacher

professional development is necessary for these systems to be effectively implemented in schools.

Against this backdrop of teachers supporting the needs of all learners in their classrooms and fueled by my interest in the role of technology in my daughter's learning journey, this dissertation asks the question of how Kindergarten through third grade (K-3) teachers use technology to support all students' reading development and explores the role of professional development in these teachers' understanding and use of technology. In the next sections, I will provide information on the importance of reading, information about struggling readers and the role of technology in supporting reading.

**Reading and its Importance**

The act of reading opens the gateway to limitless knowledge and imagination, transcending time and space. Through printed words, we uncover the wisdom of the past, delve into authors' intricate minds, and traverse real and fantastical realms (Cunningham & Carroll, 2011). Reading fosters empathy, allowing us to understand characters' lives, and enriches our thoughts with language's vibrant hues, enabling eloquent communication (Katzir et al., 2018). Amid distractions, valuing reading affirms our desire to explore human thought, seek enlightenment, and connect with the written word (Frankel et al., 2016).

Proficiency in reading serves as the cornerstone of academic achievement, unfurling a path paved with comprehension, critical thinking, and knowledge assimilation (Katzir et al., 2018). Moreover, solid reading skills foster an inquisitive spirit, propelling students to explore diverse subjects and engage with a broad spectrum of perspectives (Cunningham & Carroll, 2011). According to Käsper et al. (2018), the reading skills

acquired during this period, from K-3 play an important role in improving other skills, such as writing, critical thinking, mathematics, information literacy, and problem-solving skills. Thus, reading skills developed at the K-3 level are important for the future academic success of children (Käsper et al., 2018).

Reading has long been a national focus in the United States because of its profound impact on education, literacy, and cognitive development. A strong emphasis on reading proficiency has been driven by the fact that reading is the foundation of all other academic disciplines. Technology may benefit all developing readers by enhancing their strengths while targeting the skills that require further development (Hornery et al., 2014). Teacher training and technology use are pivotal in aiding students to develop their reading skills (Frankel et al., 2016). Reading instruction begins with a focus on phonics and narrative understanding, progressing to higher-order skills, such as comprehension strategies and critical analysis, while including vocabulary enrichment and reading fluency development. According to Petscher et al. (2020), proficiency in reading is fundamental because it enables students to understand and succeed in different subjects like English language, science, history, and math. A student is better equipped to comprehend textbooks, instructions, and research materials when he/she can read. Recent research has shown that proficient readers are better equipped to excel in subjects across the curriculum, and literacy skills are essential for lifelong learning and success in the workforce (Petscher et al., 2020). This dissertation will focus on how teachers use technology to develop students' reading skills.

## Struggling Readers

Struggling readers is a term used to describe students who face difficulties in reading and challenges in comprehending text at the expected level for their age or grade level (Le Cordeur, 2011). These students face difficulties in various aspects of reading, including decoding words, understanding text, and fluency. Struggling readers can experience a wide range of difficulties, which may be related to factors such as language development, cognitive skills, or environmental influences (Martin & Capellini, 2021). There can be various reasons for reading difficulties, including lack of exposure to reading materials, insufficient instruction, language barriers, or other underlying cognitive or developmental issues (Tomas et al., 2021).

Typically, children are only formally identified as struggling readers after third grade because children's development and learning abilities vary significantly in the early years of schooling. Children sometimes exhibit delays or struggles in achieving some reading skills. Teachers provide support for reading skills through daily read-alouds using a variety of stories, by incorporating songs and nursery rhymes throughout the day, and by engaging children in noticing print in their environment (Hasiana, 2017)

According to Skues and Cunningham (2011), age and readiness are factors that impact the results of diagnostic models used to identify and support students with poor reading development skills. The assessment results for identifying struggling readers are only sometimes reliable because young children may not be developmentally ready for certain assessments (Skues & Cunningham, 2011). Aro et al. (2022) also raises the concern that age and readiness affect the reliability of assessments. Another reason that it is challenging to identify young children as struggling readers is because children

younger than third grade may still be developing their language and communication skills (Skues & Cunningham, 2011).

Several research studies have revealed that a child's cognitive abilities and learning patterns undergo significant shifts as they progress from kindergarten through third grade. The reading skills of a young child change and could improve as the child matures (Algozzine et al., 1982). Elementary school reading specialists typically do not diagnose very young students, especially students of grade three or below. Reading specialists aim to take into account a holistic view the child's overall development, including social and emotional skills, physical development, and behavior. A wide range of factors influence students' reading skills, and a comprehensive evaluation is essential before considering them as struggling readers (Eissa, 2018). For example, within the RTI framework, all students would be engaged in activities to support reading development. However, if these practices do not yield significant results for individual students, they may be provided with more targeted interventions (Skues & Cunningham, 2011).

The effect of poor reading skill development can increase as the student progresses throughout the grades because some disorders, such as dyslexia, can affect the ability to link information received by the brain, such as spoken and written language, and are exhibited by poor coordination and inability to focus, which negatively affect learning to read (Cortiella & Horowitz, 2014). Professional development is necessary to improve teachers' skills when working with struggling readers (Schnorr, 2011). It is crucial for us to understand-teachers' perceptions about such training and professional development. More specifically, this research seeks to discuss teachers' perceptions of the use of technology with students to improve their reading skills.

## Technologies as Tool to Assist Reading Development

The term technology includes a range of low-tech to high-tech tools or interventions. Examples of low tech supports include visual prompts, such as printed sequence cards, a line reader to help guide a child's eye in the reading of text, or a tool that helps a child with pencil grip. High tech tools can include programs that may be used on a computer, tablet, mobile phone, or other device. These programs may use factory settings or may be modified for personalized needs and works to promote improved function and capability of students (Allen et al., 2009).

Today's technology has increased and expanded the scope of education to help children in the classroom. Importantly, technology can help the students to overcome the challenges related to reading. Many researchers (Gronsky, 2015; Murchland & Parkyn, 2010; Schnorr, 2011) have found that technology can improve a child's cognitive abilities related to reading by strengthening fundamental skills. According to Biancarosa and Griffiths (2012), technology provides students access to different types of reading materials, including e-books, articles, and online libraries. This ensures that students can access diverse content that caters to their interests and reading levels.

As Young and Maccormack (2014) pointed out, technology helps in two ways: it helps students learn how to complete tasks and it can help overcome areas of difficulty. It also focuses students on the computer screen while reading the distinguished words aloud so that they can learn unfamiliar words. Furthermore, students can see and write new words and form new sentences using computers. This approach supports those who are struggling with reading and helps students build sentences as they understand the word from what they read in the tasks (Young & Maccormack, 2014).

The role of technology has become an essential resource for knowledge and support in the education system. Technological intervention in educational curricula has changed and improved over the years (Gatchalian, 2019). The use of technology can help students complete their tasks efficiently and reach a degree of flexibility and differentiation in educational methodologies while still meeting students' diverse needs and facilitating teachers' requirements (Dikusar, 2018). Finally, technology also helps to provide students with individual learning events. Caruana (2015) mentioned that teachers have incorporated technology into the teaching process to help children with reading challenges. This technology utilization was implemented to assist with many written language problems, such as reading and listening. In his research, Caruana (2015) focused on developing standards-based Individualized Education Plans (IEPs) for students with poor reading skills in the K–12 public school setting. Caruana (2015) discussed special educators' challenges in creating these standards-based IEPs. The author found that choosing technological tools for these challenges related to reading can benefit these children. Using different technologies to improve reading skills allows the student more opportunities to use those skills they are better at (e.g., listening) and may help focus the student on writing as s/he integrates the skills for support (Caruana, 2015).

## Statement of Purpose

This research examines teachers' use of technology to support Kindergarten through 3rd grade students' reading skills development. By investigating how teachers implement and integrate technology into their teaching practices, this study sheds light on the effectiveness and implications of these approaches in improving reading outcomes for all students. Within this dynamic educational landscape, the study zooms in on the

precise ways technology intertwines with instructional practices. It seeks to delve deep into educators' pedagogical approaches to harness technology effectively, potentially enhancing the reading skills and knowledge acquisition of kindergarten to third-grade students. This investigation is underscored by the awareness that contemporary technology holds the promise not only to accommodate the unique needs of these students but also to amplify their overall reading experience significantly. This study aims to contribute insights into the confluence of technology, pedagogy, and inclusive education by better understanding teachers' strategies to integrate technology into teaching practices. Through these insights, the research strives to illuminate the multifaceted ways that teachers employ technology to empower students to enhance their reading skills development, ultimately fostering a more inclusive, equitable, and enriched reading journey for all students.

The purpose of using technology is to maximize the potential of academic performance and meet the needs of students for their reading skills. Today, technology sources allow teachers to obtain knowledge about how to support students in their reading skills. By focusing on K-3 teachers, I aim to investigate how technology is utilized during this critical stage to provide targeted support to students with their reading skills. By focusing on K-3 teachers, this research hopes to uncover strategies, challenges, and opportunities related to technology use in this specific context. Ultimately, it aims to provide insights for teachers and researchers to develop effective practices for reading instruction.

## Research Questions

This research study seeks to understand K-3 teachers' use of technology to support students in reading skills and answer the following research questions**:**

1. How do Kindergarten through third-grade classroom teachers use technology to support all students' reading development?

The sub-questions of this research study include:

   a. What are technology tools that teachers use in the classroom?
   b. What resources (such as professional development, consultations, and suggestions from colleagues) do teachers use to make decisions about technology to support students' reading development?
   c. What other resources (such as PD) do teachers feel they need to make decisions about technology to support students' reading development?
   d. To what extent do teachers believe technology is important to use in the classroom?

## Significance of the Study

My research will investigate how teachers utilize technology to support reading development; by examining the specific tools and strategies employed by teachers, my research study can inform best practices for integrating technology into early reading instruction. My research study will also identify the resources teachers use to make decisions about technology and those they feel they need. Thus, my research findings can help educational stakeholders, including administrators and policymakers, allocate resources effectively. By understanding the gaps in resource availability and teacher

support, this study can contribute to developing targeted professional development programs and support initiatives.

# CHAPTER TWO

# THEORETICAL FRAMEWORK AND LITERATURE REVIEW

First, to provide a theoretical framework for this dissertation study, I will review Piaget's cognitive development theory, Vygotsky's social-historical theory of cognitive development, and Erikson's theory of psychosocial development. These theories are related to children's learning and development in the context of their environments. Additionally, I will review ' adult learning theory, which provides information related to the support of adult learning contexts, including professional development. Second, empirical studies about the importance of reading, challenges to reading development, the role of technology in supporting students' reading development, and professional development to support reading instruction will be reviewed.

## Theories that Guided this Research

### Piaget's Theory of Cognitive Development

Piaget's (1952) theory of cognitive development considers the stages of cognitive development of the child and focuses on skills and the development of cognitive systems of children in learning. Piaget's evolution of ideas in the observation of children led him to the theory of the four stages of cognitive development in childhood:

1. The sensory stage from birth to 2 years old
2. The preoperational stage from 2 to 7 years
3. The concrete operational stage from 7 to 11 years
4. The formal operational stage from 12 years and older

Since this research focuses on supporting reading development in early elementary grades, the characteristics of the preoperational and concrete operational stages are relevant.

In Piaget's theory, the transition from the pre-operational stage to the concrete operational stage is a pivotal period characterized by significant changes in children's cognitive abilities and understanding of the world (Lange, 1982). During this transition, children progress from intuitive, symbolic thought to more logical and concrete reasoning (Mooney, 2000). During the preoperational stage, children begin to exhibit language development and symbolic representation (Piaget, 1952). They become engaged in imaginative play and demonstrate an understanding of symbols, such as using a stick to represent a sword in pretend play (Lange, 1982). However, their thinking remains predominantly egocentric, where they struggle to consider perspectives other than their own.

The concrete operational stage represents a significant leap in cognitive development (Piaget, 1952). At the concrete operational stage, children start to grasp the concept of conservation the fact that certain properties of objects remain unchanged despite superficial transformations (Mooney, 2000). At this stage, they can now successfully perform mental operations, such as reversibility and classification, allowing them to solve concrete problems systematically (Piaget, 1952).

The transition from the pre-operational stage to the concrete operational stage is not sudden; it occurs over several years (Lange, 1982). During this transition, the children gradually overcome the limitations of egocentrism and develop a more objective understanding of the world through experience and interaction (Mooney, 2000). Piaget

posited that children develop skills through exploration and interaction in their environment, and through developing concepts and language to help them navigate their explorations alongside peers. During the transition period, hands-on experiences play a vital role in facilitating children's understanding of conservation and other logical concepts (Piaget, 1952). Educational experiences, social interactions, and individual maturation all contribute to the variation in how children make this transition. As children progress through the concrete operational stage, their cognitive abilities continue to develop, laying the foundation for further intellectual growth and problem-solving skills (Piaget, 1952). Thus, the transition from the pre-operational to the concrete operational stage represents a crucial phase in Piaget's theory of cognitive development, marking significant advancements in children's ability to think logically, solve problems, and understand the world around them (Mooney, 2000).

Based on Piaget's theory, my understanding is that through reading, children learn to make connections between concepts in the reading and the surrounding environment. As children's reading skills develop, this might support the kind of conceptual conversations they may have with their peers. According to Lange (1982), technology can enhance the interrogation of children through e-books, speaking letters, and other methods (Lange, 1982).

**Vygotsky's Social-Historical Theory of Cognitive Development**

Vygotsky's (1978) socio-historical theory of cognitive development revolves around the interplay between cognitive development and social interaction. Vygotsky's theory also describes the zone of proximal development (ZPD), which refers to the range of tasks that a learner can perform with the assistance of others but cannot yet perform

independently. In other words, it is the gap between what a learner can do without help and what they can achieve with guidance and support. Teachers often use the concept of the Zone of Proximal Development to tailor instruction to a student's current level of understanding and to challenge them appropriately. Vygotsky proposed that learning is not merely a separate process but an integral part of a person's cognitive development and cultural advancement. In his view, individuals acquire knowledge and skills through interactions with others and participation in cultural practices and activities. Vygotsky emphasized that learning occurs within a social and cultural context, meaning that the cultural environment and societal influences shape how individuals learn and develop cognitively.

Vygotsky emphasized the importance of scaffolding to help adults and children progress through their zone of proximal development. This assistance could involve explaining, modeling, asking leading questions, or breaking tasks into manageable steps to support the learner's understanding and skill development. Vygotsky emphasized social interaction and interactive situations that allow the child to expand mental development, language development, and cognitive abilities with assistance and guidance (Mooney, 2000).

Mooney (2000) describes Vygotsky's ideas about ZPD and scaffolding in early childhood programs as solutions that encourage and develop the child through planning and observing others. Vygotsky also said that observation is how the teacher can assess students' level in the classroom and their progress in the curriculum within the ZPD, thereby modifying plans and interactions to focus on areas where a child may need more support or scaffolding. Similar to Piaget, Vygotsky focused on how children learned

skills and ideas from peers. Vygotsky's theory indicates that the expansion of the child's knowledge and planned school curricula can expand competence as the teacher focuses on ZPD. Notably, scaffolding can be provided by both peers and teachers. Teachers can provide interactive work that helps children succeed. An example of how a teacher might use Vygotsky's concept of guidance in reading instruction might be demonstrating strategies that a good reader typically uses (Antonacci, 2000; Boardman et al., 2016).

**Erikson's Theory of Psychosocial Development**

According to Erikson (1958, 1963), the development of a strong identity and a feeling of purpose in life are critical. From childhood to maturity, Erikson believed that personality develops in a fixed order through eight stages of psychosocial development, with each stage building on the one before. Individuals go through a psychological crisis at each level, which can either benefit or negatively impact their personality development. These crises, according to Erikson (1958, 1963), are psychosocial in character because they include individual psychological demands (i.e., psycho) colliding with societal needs (i.e., social). According to the theory, completing each step successfully results in developing a healthy personality and attaining basic values. Erikson's theory provided a framework for understanding the individual's experience across the different stages of life.

The eight stages of psychological development identified by Erikson are as follows:

1. Trust vs Mistrust: Birth to one year
2. Autonomy vs Shame and Doubt: 18 months to two to three years
3. Initiative vs Guilt: Ages three to five (preschool years)
4. Industry vs Inferiority: Ages five to twelve (childhood)

5. Identity Confusion vs Role Confusion vs Ages 12 to 18 (adolescence)
6. Intimacy vs Isolation: Ages 9 to 40 (young adulthood)
7. Generativity vs Stagnation vs Ages 40 to 65 (middle of adulthood)
8. Ego Integrity vs Despair vs Age of 65+

McLeod (2018) suggests that a person's experiences could positively or negatively affect personality development as they move between stages later. Failure to finish a stage effectively can result in a decreased ability to complete subsequent stages, an unhealthy personality, or a diminished sense of self. Completing each stage results in a healthy personality and the acquisition of essential virtues, characteristics, and strengths that the ego can use to resolve subsequent crises.

Since children in early elementary grades are navigating stages three and four, teachers who apply an understanding of psychosocial development will seek ways to help students take initiative and develop a sense of industry. They will strive to make the child feel appreciated, confident, and comfortable learning new things and building relationships with peers without fear. During these stages, children become able to perform their increasingly complex tasks, as the teacher provides opportunities to participate in educational experiences, events, activities where students take on both support and leadership roles in the classroom. Particular to the area of reading, teachers can provide opportunities for joint projects where students use different kinds of texts as resources to discover, create, and integrate their interest with peers. If the teacher is effective, the child may be better equipped to articulate and communicate their own experiences and achievements (Cherry, 2022).

**Malcolm Knowles's Theory of Adult Learning**

Adult learning theory, also referred to as Andragogy, was introduced by Malcolm Shepherd Knowles (1980). Knowles' adult learning theory explains how adults learn concepts and how the adult learning process differs from children's learning. Knowles's adult learning theory is comprised of five assumptions about the characteristics of adult learners. Four assumptions were described by Knowles in 1980, and in 1984, Knowles added the fifth assumption.

1. Self-concept: As a person matures his/her self-concept moves from one of being a dependent personality toward one of being an independent, self-directed human being. They take ownership of their learning journey in terms of determining how they want to learn and how they demonstrate their learning (Bandpay, 2016).
2. Adult Learner Experience: As a person matures, he/she accumulates a growing reservoir of experience that becomes an increasing resource for learning. They incorporate past experiences with education, jobs, and life events into the learning process (Bandpay, 2016).
3. Readiness to Learn: As a person matures his/her readiness to learn becomes oriented increasingly to the developmental tasks of his/her social roles. Learning becomes effective when adult learners find that learning will help them accomplish specific goals and tasks (Machynska & Boiko, 2020).
4. Orientation to Learning: As a person matures his/her time perspective changes from one of postponed application of knowledge to immediacy of application, and accordingly his/her orientation toward learning shifts from one of subject-centeredness to one of problem-centeredness.

5. Motivation to Learn: As a person matures the motivation to learn shifts from external to internal (Knowles 1984). In contrast to children, who are motivated by general parental and teacher approval for learning, adult learners focus on internal motivation sources unique to the individual (Bandpay, 2016), and their individual quality of life, both personally and professionally (Machynska & Boiko, 2020).

Malcolm Knowles' adult learning theory is related to the topic of my study in several ways. For example, Knowles emphasized the importance of adults taking responsibility for their own learning. In the context of my study, teachers are adult learners who are actively engaged in improving their teaching practices. By incorporating technology into their classrooms to support students' reading development, teachers engage in self-directed learning to enhance their instructional skills and meet the diverse needs of their students.

Furthermore, Knowles proposed that adult learners are ready to learn when they believe they need to know something for immediate application. In the context of my study, teachers may be more receptive to incorporating technology into their instruction if they recognize the immediate benefits it can offer in supporting students' reading development. Providing professional development opportunities that demonstrate the practical applications of technology for improving reading skills may enhance teachers' readiness to learn and implement new instructional strategies.

## Empirical Research Review

### Research Concerning the Importance of Reading

Reading proficiency is closely tied to overall educational attainment and socio-economic outcomes. Consequently, the U.S. recognizes the significance of investing in

effective reading programs and strategies to ensure citizens have the skills and knowledge necessary to meet the demands of an increasingly complex and information-driven world (Public Broadcasting Service, 2023). National initiatives and policies have been implemented to address reading challenges and promote literacy, making reading a perennial focus in the country. Proficiency in reading has gotten attention in Michigan for a variety of reasons. The most important fact is that 55.6% of third-grade students in Michigan scored less than proficient on the statewide reading test. The analysis of recent data about educational outlook shows that Michigan students are included in the bottom 10 percent of states in reading proficiency as measured by National Testing Data (Chambers, 2018). The State of Michigan has spent tens of millions of dollars on improving early literacy skills, but one out of three fourth-grade students still need better reading skills (Levin, 2020). More than two-thirds of states try to promptly identify children who struggle with the basics of decoding text and to teach them the skills they need to become literate (Levin, 2020).

Michigan's commitment to enhancing reading skills among its students arises from the belief that skilled readers perform better in all academic subjects and are better equipped to meet the demands of a constantly changing job market. Additionally, a strong emphasis on reading aligns with the state's efforts to bridge achievement gaps and ensure that every child, regardless of their background, has an opportunity to thrive in school (Hamdan & Musial, 2015). Michigan has introduced various initiatives, such as early literacy programs and professional development for educators, to strengthen reading skills from an early age (Hamdan & Musial, 2015).

According to a study conducted by Cunningham and Carroll (2011), reading profoundly impacts children's skills and profoundly affects growth and academic success, encompassing a multifaceted array of benefits. Beyond serving as a means of acquiring knowledge, reading actively contributes to cognitive, linguistic, and emotional aspects of a child's holistic development. By engaging with a diverse range of texts, children expand their vocabulary and enhance critical thinking abilities and analytical and problem-solving skills. This cognitive growth is underpinned by exposure to varied sentence structures, ideas, and perspectives found within different reading materials. Moreover, reading nurtures language acquisition by presenting proper grammar, syntax, and communication norms, ultimately enabling children to articulate themselves more effectively in both written and verbal communication.

Walgermo et al. (2018) mentioned that the influence of reading extends into realms beyond the academic area, impacting creativity, imagination, and cultural awareness. By exploring fictional narratives, children are transported into imaginative worlds, fostering creative thinking and empathy as they connect with diverse characters and scenarios. Importantly, reading is not confined to the classroom; it nurtures a passion for lifelong learning, encouraging children to seek knowledge and information across various domains beyond their formal education. This love for learning cultivates self-confidence as children successfully navigate increasingly complex texts. Additionally, reading exposes children to diverse cultures and viewpoints, enhancing their social and emotional intelligence and preparing them for a globally interconnected world. In essence, reading stands as a cornerstone of children's personal and academic growth,

offering a rich tapestry of benefits that equip them for success in both present and future endeavors (Cunningham & Carroll, 2011).

Regarding the importance of tackling the challenges of children related to reading development, Hornery et al. (2014) has described that if reading challenges are left unaddressed during their initial phases, they can lead to severe ramifications. Children encountering problems in reading face compromised prospects, as their inability to read hampers their chances to engage in the labor force and contribute to their nation's advancement in an increasingly tech-driven global economy. A comprehensive interdisciplinary approach is essential to tackle the issue of reading development challenges from an early stage. This approach should encompass robust psychological, social science, and educational research methodologies. Furthermore, it is crucial to integrate the groundbreaking emphasis on positive psychology, which delves into how mentally and emotionally well-adjusted individuals tend to extract the most fulfillment and productivity from their lives (Hornery et al., 2014).

**Research on Challenges to Reading Development**

Reading is a challenge for several students. According to a report by the National Association of Special Education Teachers (NASET), one out of every five people in the U.S. faces challenges related to learning. Almost three million children (ages 6 through 21) have some form of learning difficulties and receive special education in school (NASET, 2020). Other studies have also shown that specific learning challenges are considered a high-incidence disability; “for example, reports indicate that over 2.8 million students are being serviced for specific learning programs because of their inefficiencies towards reading and writing. This number of students is approximately

47.4% of all children receiving special education services" (Turnbull et al., 2007, p. 2). These data suggest there is a great need to understand better the challenges and problems that students face with reading development.

Students with poor reading skill or poor reading outcomes are often referred to a team within the school, which may include reading specialists, psychologist or counselors. Some children who struggle in an academic area also exhibit problematic behaviors. At times, poor academic performance and/or behavioral issues leads to a lack of motivation, hyperactivity, and even "tuning out" of the classroom (Ashraf & Najam, 2017). Differences in gender across all grade levels with regards to reading difficulties have been explored, with the intent of providing tailored approaches for individual student to overcome reading challenges.

Students face different types of challenges related to reading development. Different research studies have identified the challenges of reading in young students. According to Frankel et al. (2016), reading is a complex cognitive process that involves the interaction between the reader and the written text, facilitating the extraction of meaning and comprehension. Reading encompasses decoding words and integrating prior knowledge, context, and linguistic structures to construct a coherent mental representation of the text. Katzir et al. (2018) emphasize the role of reading as a dynamic interaction between bottom-up processes, where individual words are identified, and top-down processes, where the reader's background knowledge and expectations shape interpretation. This interaction is crucial as many researchers have highlighted that skilled reading goes beyond mere word recognition, involving strategic inference-making and the development of higher-order cognitive skills. According to Katzir er al. (2018), "in

essence, reading is a multifaceted skill that amalgamates language processing, cognition, and comprehension, ultimately allowing individuals to access, understand, and internalize information from written sources and enriching their cognitive, social, and intellectual experiences" (p. 5). In the following sections I will describe components of reading development. Although each component has its own impact on the development of reading skills, it is clear that these components are related and intertwined in their contribution to overall reading development.

### *Phonemic Awareness*

Lack of phonemic awareness is also an important challenge in young students' reading development. Pfost et al. (2019) conducted their study with the aim of exploring the impact of phonological awareness on the reading development skills of young children. According to Pfost et al. (2019), phonemic awareness is described as the ability to recognize, identify, and manipulate individual sounds (phonemes) in spoken words. It is a foundational skill in reading development and plays a crucial role in helping students understand the alphabetic principle, which is the understanding that written letters represent spoken sounds. Phonemic awareness is typically developed before children learn to read print, often during preschool and early elementary school years, including grade 1, grade 2, and grade 3.

The results of a study conducted by Pfost et al. (2019) also showed that phonemic awareness training supports vocabulary development. As students become more adept at identifying and manipulating sounds in words, they develop a deeper understanding of word structure and meaning. This increased awareness can facilitate vocabulary acquisition and comprehension, as students are better able to decode and understand the

meaning of new words encountered in text. Furthermore, phonemic awareness training has positively impacted students' spelling abilities. By developing an understanding of the sounds in words, students could apply this knowledge to spelling tasks, accurately representing the sounds they hear in their written work. This leads to improved spelling accuracy and overall written expression.

Regarding the impact of poor phonemic skills on the overall reading development of young students, Te Brink (2022) mentioned that poor phonemic awareness among young students makes it challenging for students to understand the relationships between letters and sounds. Without recognizing and manipulating individual phonemes, students may struggle with decoding words accurately. This difficulty can hinder their ability to read new or unfamiliar words, leading to frustration and decreased reading comprehension. Along with this, phonemic awareness difficulties can also negatively impact students' vocabulary development. Students who struggle to segment and blend sounds in words may need help accurately understanding and using new words they face in textbooks. This can reduce their comprehension and limit their overall vocabulary growth (Te Brink, 2022).

***Decoding***

According to a study conducted by Kang and Shin (2019),is one of the most common problems and challenges young students face regarding reading in their classrooms. Decoding is the ability of students to put sounds to letters in order to sound out written words, sentences, or language. Students of beginning classes, such as students of grade 1 to grade 3, face problems when they meet new or unfamiliar

sentences, words, or terms. The decoding problems become intense when students lack knowledge about sounds that are linked with the letters and the pattern of letters.

The results of the Kang & Shin (2019) study also indicated that as students develop the ability to accurately and fluently decode words, they become more capable of reading text independently and comprehending what they read. Strong decoding skills enable students to tackle increasingly complex texts as they progress through school. Regarding the importance of effective decoding skills for the improvement of the overall reading skills of young students, Kang and Shin (2019) stated that effective decoding facilitates vocabulary acquisition. Te Brink (2022) also highlights a link between poor phonemic awareness skills and students' struggles with decoding. By accurately decoding words, young students are exposed to a wide range of vocabulary in context, which enhances their understanding of word meanings and usage. This, in turn, supports overall language development and reading comprehension. Furthermore, decoding proficiency is closely linked to reading fluency, which refers to the ability to read text smoothly, accurately, and at an appropriate rate. When students can decode words quickly and effortlessly, they can better focus on understanding the meaning of the text rather than struggling with individual word recognition (Kang & Shin, 2019).

### *Comprehension and Fluency*

Regarding how poor comprehension skills negatively impact the overall reading development of young students, Hassan and Dweik (2021) described that poor comprehension can also affect decoding skills. Poor comprehension can, therefore, result in limited exposure to new ideas, concepts, and information, further exacerbating reading difficulties. Hassan and Dweik (2021) also found that students who struggle with

comprehension may lack effective reading strategies for monitoring and repairing comprehension breakdowns. They may not engage in meta-cognitive processes such as self-questioning, summarizing, or connecting the text with their prior knowledge. Reduction in reading fluency also results from poor comprehension skills.

Poor fluency and slow speed are also some reading challenges that are common among young learners. In this regard, Álvarez-Cañizo et al. (2015) described that reading fluency is actually young students' ability to read text accurately and smoothly and with expressions. Poor fluency among young students is identified if a young student shows disjointed reading, frequent hesitations, word-by-word reading, and a lack of appropriate phrasing and intonation. Regarding the reasons why young students develop poor fluency in reading, Álvarez-Cañizo et al. (2015) described that lack of automaticity in decoding words is one big reason for poor fluency among young readers. Students who have not yet mastered letter-sound correspondences or phonics rules may need to expend significant cognitive effort on decoding individual words, which disrupts the flow of reading. Limited exposure to reading materials and insufficient practice can also contribute to poor fluency.

In most narrative stories, children face a fundamental problem in understanding phonics, which is essential in reading. These stories are designed to help them understand historical events and reactions, making it easier for students to learn and remember what's happening in the stories and the information they contain (Gardill & Jitendra, 1999; Haager & Vaughn, 2013). Education emphasizes teaching reading in early grades to guide the reader's emerging strategies and style and then move the student to an intermediate level to practice higher-order reading skills. Emphasis is placed on

information or reading for learning; for example, in stories in intermediate grades, differences between stories are compared based on written terms, such as new definitions, characters, words, and expressions (Haager & Vaughn, 2013).

**Research on the Role of Technology in Supporting Students' Reading Development**

Technology can play an active role in helping and empowering children with reading. It can assist students with the development of reading skills not only in the classroom and academic settings but also during prolonged periods of leisure time outside the classroom and at home. Furthermore, technology can provide new strategies with online programs for individualized instruction. With the growth of technology to assist students with reading development, teachers must also be trained to find the best fit from among the numerous possibilities that technology offers (Svensson et al., 2021).

Technology enhances academic achievement in expression, reading, and writing and improves students' overall academic performance (Adebisi et al., 2015). Technology includes a range of high to low technologies. Low technologies include tools such as sticky notes, highlighter pens, pencil grips, and word bank. High technologies include such as electric devices like computer, iPad, smart board , and audio book, all works to promote improved function and capability (Allen et al., 2009).

Using technology in the classroom improves basic principles and skills as part of the educational process. Technology can aid teachers by granting flexibility to the standard educational track, thereby allowing non-neurotypical students unique educational plans. Using technologies in the classroom enhances the student's approach to reading by allowing the use of his/her capabilities and by working to build his/her

capabilities and experiences where those reading development challenges exist (Stanberry & Raskind, 2009).

### *Technology Tools to Support Reading Development*

Technology assessments address the assistance of technology in developing enhanced communications to support children's needs. The use of computer technology in educational programs can play a significant role in meeting the needs of many students who have poor reading skills. Technological devices help overcome a wide range of classroom participation problems regarding reading development. For example, students who struggle with more traditional approaches to reading instruction may use computers to assist with word correction, research, and multimedia projects. Moreover, voice recognition allows children to talk to the computer through a microphone and prompts words to appear, allowing the child to familiarize written language (Adebisi et al., 2015). Learning via technology helps children build skills in debugging, proofreading, and speech recognition. Overall, computer technology may provide alternatives for students and help them overcome their challenges; training in the techniques allows them to integrate technologies in the classroom to learn to the best of their ability (Hasselbring et al., 2000).

Biancarosa and Griffiths (2012) mentioned that educational applications, websites, and software programs offer interactive reading exercises and games that engage students and make learning enjoyable. These tools often incorporate multimedia elements such as audio narration, animations, and interactive quizzes, which can enhance comprehension and retention and ultimately positively impact their reading skills. Teachers also use technology in the assessment of students' reading skills development,

and they take necessary measures to remove challenges identified by the assessment. In the future, the assessment of students' reading skills development will be facilitated via technology as they provide teachers with more accurate and reliable data about reading development (Biancarosa & Griffiths, 2012).

The utilization of technology to support learning was examined in a study by the Georgia Department of Education (2021), focusing on its benefits for students' reading development. Figure 1 is a representation based on this study which presents supports encompassing technology. However, it is important to note that this study did not delve into the impact of teachers' use of technology on student outcomes or establish any determinations regarding the optimal methods for employing technology in educational settings. Enhancing educators' knowledge of technology and increasing access to technology for students in multiple ways may have the potential to improve student achievement, productivity, independence, and inclusion.

The Georgia Department of Education study (2021) mentioned that the Individualized Education Program (IEP) can include a review of technical equipment and services as a particular factor for developing and revising IEPs for students who lack proficiency-related to reading development. While developing an IEP, the team uses a collaborative decision-making process to meet and organize the needs of students and provide technology services. One of the advantages of the IEP team is that it has the necessary collective knowledge and skills for making decisions about the use of technology, having access to curricular and extracurricular activities, and providing educational curricula with educational objectives and tasks that could be used through

technology. The IEP team links technology support to the IEP outcomes in a logical and supportive way for students to enhance their reading development.

**Figure 1**.

Special Education Services and Supports - Technology (used with permission from Georgia Department of Education, 2021)


## Research on Professional Development to Support Reading Instruction

Professional development is understood as the work individuals partake in to learn, improve, and acquire skills for use in professional settings. Types of professional

development may include attending conferences, training courses, workshops, or continuing education credits that are explicitly tailored to the profession. Professional development aims to help workers develop new skills and stay current on skills and information necessary to enhance one's field of study (Antley, 2020). Krolak-Schwerdt (2014) defined professional development as "activities that develop an individual's skills, knowledge, expertise and other characteristics as a teacher. Development can be provided through coaching/mentoring, collaborative planning and teaching, and sharing good practices" (p. 97).

Lemons et al. (2016) reviewed literature about special education teacher's training in and ability to deliver intensive intervention in reading for students in special education. Specifically, the authors focus on data-based individualization (DBI) as a validated method to help special educators meet the academic and behavior needs of their students. DBI is a framework for using data to guide ongoing adaptations to intensify intervention for students who have demonstrated a persistent lack of response (National Center on Intensive Intervention, 2013, as cited in Lemons et al., 2016). DBI requires continuous examination of data and response to instruction in order for special education teachers to be able to revise intervention continually based on student response.

Lemons et al. (2016) suggested that special education teachers and pre-service teachers do not typically get sufficient training in DBI to be able to implement the practice effectively. General education teachers, who may be working within RTI or MTTS frameworks, also do not have the training to deliver intensive interventions that may be necessary for student growth. The authors stated that implementing DBI successfully "...requires special educators to have deep content knowledge, to understand

how to use data to guide adaptations, and to be skilled in implementing multiple evidence-based interventions" (Lemons et al., 2016, p. 5). Guidance is provided for strengthening the preparation of pre-service teachers and for further supporting in-service teachers. Recommendations for pre-service teachers include linking DBI learning from courses to practices in clinical settings, and extended work with mentor teachers who have expertise in DBI. Recommendations for practicing teachers include having a mentorship program for novice teachers, using online training and virtual coaching to supplement in person PD, and using the Professional Learning Communities Model to Enhance Professional Development.

Dingle et al. (2011) examined the impact of contextual and individual factors on the implementation strategies of special education teachers who had participated in professional development focused on word study and fluency. Using case study methodology, three teachers from a cohort of 10 were studied closely for the study. Overall, the PD activities, named Project Literacy Learning Cohorts (LLCs), included an initial two and a half day institute, monthly follow-up meetings, an online community including resources and discussion opportunities, and monthly classroom observations over six months. Multiple data sources were used to contribute to the case studies of the three teachers. Videotapes of lessons, teacher interviews, videotapes of the monthly meetings, documentation of the online community, and informal conversations were documents collected. Additionally, the teachers completed a survey entitled Content Knowledge for Reading (Phelps & Schilling, 2004, as cited in Dingle et al., 2011). From cross-case analysis of the three teachers, Dingle et al. (2011) reported:

> We identified three interrelated individual and contextual factors that influenced how they incorporated Project LLC content into their instruction. The factors included a) participants' knowledge of reading instruction and general pedagogical skills, b) participants' motivation to participate in Project LLC and to change their instruction, and c) the curriculum used in the classroom. (p. 99)

Themes similar to both Lemons et al. (2016) and Dingle et al. (2011) include attention to the importance of teachers' content knowledge and teachers' opportunity to participate in learning opportunities over time.

### *Effective Reading Interventions*

Among the strategies used to support children with reading is Target Reading Intervention (TRI). TRI aims to help children in kindergarten and first grade who suffer from reading stutters. In a study by Feagans et al. (2012), an intervention used child diagnostic strategies in experimental sessions through identifying letters and words and phonemic awareness skills provided by the teacher through TRI. These efforts included professional development programs for the teacher in the classroom, specifically practical strategies and clear instruction of words in the school context in small groups and individually. This, in turn, helped teachers customize instruction for children who face problems in reading using TRI strategies for identifying individual words that included decoding, practicing fluency in words, and reading texts to create an effective way to enhance and improve children's readability (Feagans et al., 2012). The results of the study showed improvement in the child's reading skills in terms of the teacher's interventions and the extent of the teacher's efficiency in improving those difficulties by using

strategies that encourage their assistance and develop their performance skills to develop the child's knowledge (Feagans et al., 2012).

Spear-Swerling and Chessman (2012) examined teacher-related knowledge based on the RTI Model in Reading, an assessment of teacher background in reading instruction intervention. Their study aimed to narrate the effective professional changes in service and the professional development of the teacher's experiences in determining the teacher's effectiveness and knowledge of educational content provided to students. One of the effects of examining the teacher's reading instructions through the multiple practical reading components in education is to use RTI to determine the teacher's level and examine their knowledge in readiness for solving problems and the effectiveness of the methods used by the teacher for achieving better results for students. These tests assessed teachers' knowledge of sub-scale fluency, vocabulary, and understanding of the RTI scale.

The findings of Spear-Swerling and Cheesman's (2012) study indicated that public and private teachers were ready to implement approaches to intervene in more areas through RTI by knowing the weaknesses and strengths that appear in the teacher's knowledge, as well as methods of educational content provided to children. This study's findings indicate that the knowledge questionnaire test used in RTI and error analyses show that many participants had difficulty giving examples, recognizing the child's situation, decoding, automatic word recognition, and understanding the use of confidence-building measures in screening. Notably, there were contradictions presented by the researchers regarding the systematic approach of preparing the teacher in reading

and developing educational content to teach reading first. These contradictions must be addressed for future use, interpretation, and evaluation.

Wanzek et al. (2014) examined the effects of interference in reading in the mental training of elementary students. Interference in reading is understood as the development of important initial levels of oral reading fluency for those receiving training. In their study, Wanzek et al. (2014) found that the intellectual disabilities of two groups of students on the autism spectrum and those who suffer from reading disabilities (RD) in general need to receive an intense reading intervention. According to the researchers, the intervention should include academic, psychological, and social aspects. Concerning academics, if the intervention is requiring intense intervention from clear methodological instructions in identifying academic challenges, behavioral problems, and a decline in academic self-concept, all relate to the student's future in terms of his reading development or overall academic achievement. The teacher's role here lies in developing tests that measure the extent of reading attainment, cognitive measures, reading, phonics, fluency, and reading comprehension (Wanzek et al., 2014).

## Summary

This research draws upon several influential theories to guide its exploration. Piaget's Cognitive Development Theory posits that children progress through distinct stages of cognitive development, focusing here on the transition from the preoperational to the concrete operational stage. Piaget emphasizes the role of logical thinking and the connection between learning and growth. Vygotsky's Social-Historical Theory highlights the importance of social interaction and scaffolding for cognitive development. The Zone of Proximal Development (ZPD) and scaffolding strategies are key components, enabling

teachers to effectively assess and support students' learning levels. Erikson's Psychosocial Theory emphasizes the impact of psychological crises on personality development, and this perspective is integrated into teacher-student dynamics. Finally, Malcolm Knowles' Adult Learning Theory, or Andragogy, highlights five key assumptions about adult learners: self-concept, reliance on past experiences, readiness to learn driven by purpose, problem-oriented orientation, and intrinsic motivation. These theories collectively inform the research's exploration of teaching struggling readers, highlighting the importance of tailored instruction, social interaction, individual motivations, and past experiences to enhance learning outcomes for both children and adult learners.

Reading is portrayed as a multifaceted cognitive process involving the interaction between readers and written text, encompassing word decoding and integrating prior knowledge and linguistic structures to construct coherent mental representations. It is a dynamic interplay between bottom-up word identification processes and top-down processes shaped by background knowledge. The multifaceted nature of reading is linked to various benefits that extend beyond mere word recognition, including critical thinking, language acquisition, creativity, and social and emotional intelligence. The impact of unaddressed reading challenges can lead to severe consequences, affecting children's future prospects, employability, and contributions to society. Therefore, addressing challenges related to reading development requires an interdisciplinary approach that considers psychological, social science, and educational research methodologies.

Early intervention is crucial for better outcomes. Statistics show that a significant portion of the population is affected by poor reading skills, and early identification and intervention are essential to provide appropriate support. Gender differences have been

observed in the prevalence of poor reading skills among students, underscoring the need for tailored approaches. By understanding the presence of reading development challenges and poor reading skills in students and implementing interventions, educators, parents, and specialists can foster high-quality learning opportunities and minimize the impact of these challenges on children's reading development.

It is noted that technology aims to support students by enhancing their capabilities and experiences in areas where challenges exist. Technology plays a role in facilitating, helping, and enabling solutions to the problems faced by students with challenges in reading. Some of the technology intended for use by children is the computer, which is used for learning, correcting words and errors, writing, searching, and playing multimedia projects. Also, in terms of reading, students can listen to stories and read stories using the speaking device on the computer. They can repeat words as much as they want, which helps them with their pronunciation.

Professional development supports the teacher's understanding of how technology is used and how it can be implemented to facilitate children’s learning processes and meet individual needs. As noted previously, there has been an increased emphasis during the last few decades to ensure that curriculum, strategies, and programs meet the wide range of students in the classroom. Against this backdrop of teachers supporting the needs of all learners in their classrooms and fueled by my interest in the role of technology in my daughter’s learning journey, this dissertation asks the question of how Kindergarten through third grade teachers use technology to support all students’ reading development and explores the role of professional development in these teachers understanding and use of technology.

# CHAPTER THREE

# RESEARCH METHODS

The research was intended to examine teachers' use of technology to support students' reading development in kindergarten through third grade classrooms. This research aimed to explore what supports or hinders teachers from learning about technology and teachers' perceptions of what supports they still need about using technology with students in the classroom.

This study conformed to a mixed-method approach and drew upon teachers' lived experiences and stories. Quantitative data was collected from teachers through a Qualtrics survey, and Qualitative data was collected from teachers' interviews. Invitations to participate were distributed to K-3 general education teachers throughout districts located in southeast Michigan. Using this mixed-methods approach, I inquired about teachers' experiences with and use of technology in classrooms among typically developing children and those struggling with reading. The specific research question that was addressed in this research study was:

1. How do Kindergarten through third-grade classroom teachers use technology to support all students' reading development?

The sub-questions of this research study included:

   a. What are technology tools that teachers use in the classroom?
   b. What resources (such as professional development, consultations, and suggestions from colleagues) do teachers use to make decisions about technology to support students' reading development?

c. What other resources (such as PD) do teachers feel they need to make decisions about technology to support students' reading development?
d. To what extent do teachers believe technology is important to use in the classroom?

This chapter discusses the methodology followed in this research study, including the research design, research context, research participants, instruments, procedures, and ethical concerns. Furthermore, it provides a description of quantitative and qualitative data analysis. Finally, the chapter concludes with a summary.

## Research Design

A research design is an overall plan or structure a researcher develops to guide the research (Creswell, 2014). Methodologies, procedures, and techniques that a researcher utilizes to collect data, analyze data, and answer research questions are part of a research design. For this research study, I have selected a mixed-method approach.

### Mixed-Methods Approach

For this research study, I used a mixed-method approach, which uses quantitative and qualitative research approaches at the same time. According to Adu and Miles (2023), the methods that are used to collect data in research have their own strengths and limitations. Jain (2021) described that mixed-methods research offers a valuable framework to explain the results because mixed-methods research approach enables the researcher to have multiple perspectives, and provides contextual understanding, explores complexity, and enables the triangulation of data. According to Love et al. (2022), the mixed research approach is a type of research methodology in which the researcher focuses on collecting and analyzing quantitative and qualitative data. In a mixed research

approach, a researcher merges, links, and analyzes both numerical and non-numerical data to develop a deep understanding of facts or research questions (Ponce & Pagán, 2015). Educational phenomena can be better understood when researchers utilize qualitative and quantitative methods in a single research study. The mixed-method approach enabled me to deeply understand teachers' experiences regarding using technologies and their perceptions about professional development needs regarding using technologies in the classroom. In order to collect the data, surveys and semi-structured interviews were conducted with participants. The participants were school teachers who were teaching grades K-3.

A survey was selected as one of the data collection methods because, according to Jain (2021), surveys are well-suited for capturing quantitative data, allowing for identifying trends, patterns, and correlations among variables related to the research questions. Semi-structured interviews were conducted to collect the qualitative data Regarding the qualitative research approach, Teherani et al. (2015) have described that the qualitative research enables the researcher to have a systematic inquiry in a natural setting. Interviews provide the opportunity to have in-depth exploration, allowing participants to express their thoughts, feelings, and insights in their own words (Jain, 2021). I collected the data for this research through surveys (Appendix C) and interviews (Appendix D) with participants.

## Research Context and Participants

All research was conducted with participants in southeast Michigan school districts. Surveys and interviews were conducted with teachers directly. Kindergarten through third-grade general education teachers were identified through professional

networks, such as Oakland University's (OU) School and Field Services (SFS), a department that coordinates educational opportunities within public schools for students enrolled in professional programs aimed at teacher certification. Additional recruitment was facilitated by professional relationships between current OU faculty and teachers in the region. I aimed to recruit 1-2 teachers at each grade level (K, first, second, and third). Participants included one Transitional kindergarten (TK) teacher, one kindergarten teacher, and two first, second, and third grade teachers.

**Rationales for Focusing on K-3 Teachers**

Previous research studies have found that the early years of a child's education, from kindergarten to grade three (K-3) levels, are very important because these years act as the foundational periods for the development of basic reading skills in the classroom. Thus, reading skills developed at the K-3 level are important for the future academic success of children (Käsper et al., 2018). By focusing on K-3 teachers, I aimed to investigate how technology is utilized during this critical stage to provide targeted support to children in the classroom. Davis (2012) provided explanations about specific practices of K-3 teachers using technology for students with reading disabilities. Insights from the K-3 teachers who participated in this study were integral to understanding the specific challenges and effective strategies related to using technology implementation for children in the classroom. By encompassing two teachers for each grade, K, 1, 2, and 3, this study sought to offer insights into the use of technology and its perceived impact on enhancing reading skills among young learners.

By concentrating on K-3 teachers, I gained an understanding of the strategies, challenges, and opportunities associated with technology adoption within this specific

context. Ultimately, this research aimed to contribute valuable insights to both teachers and researchers, fostering the development of effective practices that may have a lasting impact on the educational trajectories of children.

**Educational Backgrounds and Experience of Educators**

The survey results indicated participants' diverse educational backgrounds and teaching experience. The majority holding bachelor's and master's degrees suggests a solid educational foundation among educators, which is crucial for effective teaching and integrating technology in education. The broad spectrum of grades taught and significant experience with struggling readers and students with Individualized Education Programs (IEPs) underscores teachers' varied challenges in supporting reading development across different student needs.

**Demographics for Participants, Gender, Degree, and Grade Taught**

The demographic diversity of participants, spanning from kindergarten to 3rd grade, including Transitional Kindergarten (TK), enriched the study's findings by incorporating a broad spectrum of educational experiences.

**Table 3.1**

Demographic data of the interviewees

| Participant | Gender | Grade | Degree |
|---|---|---|---|
| **P1** | Female | 1st Grade | Bachelor's degree |
| **P2** | Female | 2nd Grade | Master's degree |
| **P3** | Female | 1st Grade | Master's degree |
| **P4** | Female | Kindergarten | Bachelor's degree |
| **P5** | Female | 2nd Grade | Bachelor's degree |
| **P6** | Female | Transitional Kindergarten (TK) | Bachelor's degree |
| **P7** | Female | 3rd Grade | Master's degree |
| **P8** | Female | 3rd Grade | Bachelor's degree |

The analysis of data obtained in response to this question showed that educational qualifications among the participants varied, with the majority holding a bachelor's degree (62.5%, n = 5), followed by master's degrees (25.0%, n = 2), and other qualifications of “credit beyond Master” (12.5%, n = 1). This distribution underscores a diverse educational foundation among educators in the sample. Bachelor's degrees are a common requirement for teaching positions, particularly at the K-3 level, so it is not surprising to see a majority of participants with this qualification. Teachers with bachelor’s degrees bring foundational knowledge and skills acquired through their undergraduate studies to their teaching practice. A smaller proportion of participants, representing 25.0% of the sample, hold master’s degrees.

The data analysis collected in response to this question showed that two participants were teaching first-grade students and two were teaching second-grade students (25.0% each, n = 2). Two participants indicated that they taught third-grade students (25.0%, n = 2). One participant was teaching Kindergarten (12.5%, n = 1) and other grades (12.5%, n = 1), suggesting a well-distributed sample across early educational stages.

The data analysis obtained in response to this question indicated that three participants with 37.5% (n = 3) reported 10 or more years of experience. This was followed by those with 4-6 years of experience (25.0%, n = 2) and three other participants (37.5%, n=3) reported less than 1 years of experience, highlighting a mix of veteran and mid-career educators. This result showed that my research study experienced teachers/participants within the sample, who likely bring a wealth of knowledge, expertise, and instructional strategies honed over years of practice.

## Data Collection

For this research study, two types of data were collected: quantitative data and qualitative data. Eight teachers participated in the study. For the first phase, these eight teachers complete the survey in order to collect the quantitative data. The survey (Appendix C) contained 13 different questions about different aspects, including the consent of participants to begin the survey, educational qualification, the grade the participants were teaching in their school, teaching experience, and their experience about having students in class who struggle with reading. The survey also contained questions about the participants' experience with teaching a student recommended for IEP with reading components, their experience of using technology in the classroom, and how often or how often they use technology in their classrooms. It was designed in Qualtrics and was distributed to all participants through email, which contained information about the research and a link to the survey.

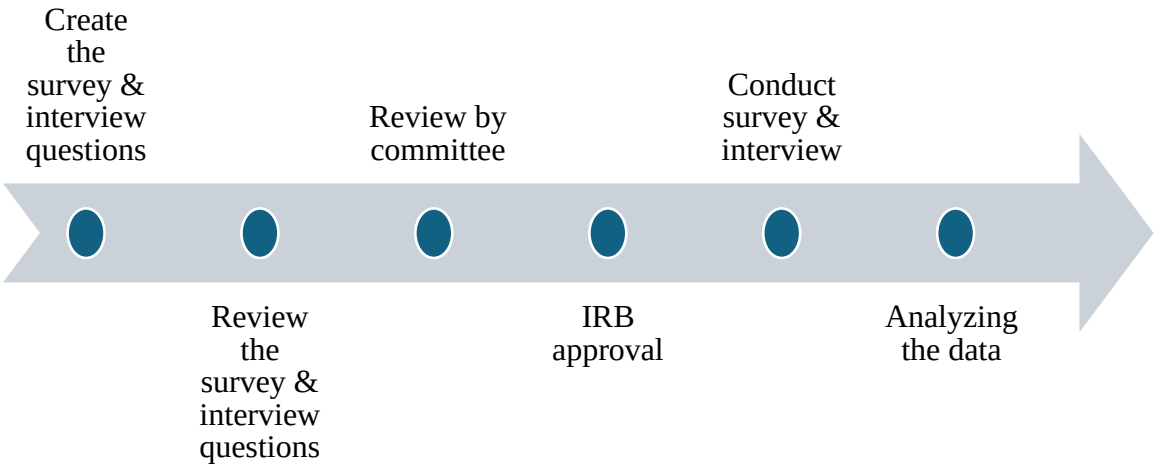
For the second phase, after these eight teachers completed the survey, they emailed the researcher to schedule an interview (Appendix D). The participants were given the choice to take part in an interview at the time of their choice. All interviews were conducted through Zoom. Interviews were recorded so that data could be organized easily. Before recording the interview, the participants were informed about this protocol, and their consent was obtained regarding the recording of the interview. The interviews contained open-ended questions about different aspects such as "how they are using technology in the classroom," "how they use the tools," "what the advantages of using technology in the classroom are," "teachers' use of technology" and "PD experiences related to technology." While conducting interviews with each participant, I also made

notes of the important information that I heard from teachers so that I could utilize them for coding, categorizing, and making themes of collected data. I also prepared a separate file of each participant of the interview to make a track record of the interview recordings, interview questions, and consent form of the participant for participating in an interview.

The research was created in English because the study was conducted in the United States. The participants were interviewed via Zoom to get the transcript. Once our IRB approved the research, the research information sheet was provided to all interview participants. The information is available in Appendix A. Teachers participating in the study were able to respond to and answer questions at their convenience, and they chose not to answer any questions that made them uncomfortable. An overview of the data collection process is shown in Figure 3.1.

**Figure 3.1**

*Data Collection Process*



## The Instruments

The first instrument I used in this research study was a survey. According to Jones et al. (2013), a survey is an important tool for collecting numerical data in educational research and is one of the most common tools used in research. According to Brewer (2009), a data collection method that requires a researcher to collect data from a sample of individuals regarding their thoughts, ideas, opinions, experiences, attitudes, and characteristics is referred to as a survey. The surveys are designed in such a way that they contain structured questions and are aimed for collecting specific information from the respondents.

Using Qualtrics' intuitive design tools, I created a questionnaire that focused on different aspects of the main research question. Qualtrics data tools helped me to summarize the participant' responses. There were 13 questions in the survey and all questions were closed-ended. The survey questions were related to the demographic information of participants, their teaching experiences, educational qualifications, and the presence of struggling readers in their classrooms. The survey also contained questions about the use of technology by participants in their classrooms and the impact of the use of technology on the development of students' reading skills. The survey also contained questions that aimed at collecting data about the satisfaction of research participants and their perspectives on the effectiveness of technology on students' reading skills. After developing a survey on Qualtrics, a hyperlink was created. All participants were sent an email which contained the link to the survey.

The second instrument I used was a semi-structured interview. In designing my research study, I developed interview questions which aimed at gathering valuable

insights into the use of technology to support students in classrooms. According to Gill et al. (2008), in the qualitative research method, data can be collected through structured, unstructured, and semi-structured interviews. The semi-structured interview is a method of interview in which a researcher prepares questions before the interview to define areas that need to be explored, but it also allows the interviewer or interviewee to have an open discussion about different factors to pursue an idea or response in detail. In this way, use of semi-structured interviews allowed me to have responses from participants about areas that I needed to explore through this research study (Gill et al., 2008).

The duration of each interview was between 45 minutes to 60 minutes. The interview questions were divided into different categories/blocks or parts to ensure that they included how teachers use technology, describe reading instruction, strategies used with students who struggle with reading, how they learned about technology, the type of technology, and any PD opportunities focused on technology. The categories were organized to obtain the teachers' experiences and beliefs about using technology in the classroom. While making questions for the semi-structured interviews, I ensured the interview questions allowed participants to provide qualitative responses that could offer a m ore in-depth understanding of their experiences about the use of technologies to support children in the classroom.

## Data Analysis

### Quantitative Data Analysis

Survey data were analyzed using SPSS software. According to Noels (2018), SPSS is a type of software package that is commonly used for statistical analysis of data in education as well as in many other fields, including social sciences and health sciences.

I used SPSS for descriptive data collected through the survey. These data included grades taught, years of teaching, gender, and degree. The analyzed data were interpreted to describe the findings.

**Qualitative Data Analysis**

I adopted the following steps for analyzing data collected from interviews. Table 3.2 represents an overview of steps that were used to analyze the qualitative data:

**Table 3.2**
*Steps used for the analysis of qualitative data*

| Steps | Procedures |
|---|---|
| **Familiarizing with the data** | Transcribing data, reading and re-reading, noting down initial codes. |
| **Generating initial codes and refined decode** | Labeling and categorizing segments of data that represent important concepts or ideas through bottom-up or inductive approach, allowing codes to emerge directly from the data. |
| **Searching for the themes** | Identifying potential themes by clustering related codes together by looking for patterns, repetitions, and connections across codes that suggest broader themes or concepts. |
| **Reviewing the themes** | Reviewing the identified themes in relation to the coded data by checking whether each theme accurately represents the data it is derived from, refining and revising themes as needed, and merging or splitting them to better capture the nuances of the data. |
| **Defining and naming themes** | Clearly defining each theme, articulating what it represents in the data by using descriptive and evocative names for the themes that capture their essence. |

**Data Familiarization**

I recorded the audio during the interview with the consent of the participants and used the transcription feature of Zoom to create the transcription. These transcriptions

were downloaded in Atlas.TI. In addition, I also took notes during each interview. According to Lester et al. (2020), verbatim, gisted, and multi-model transcripts are commonly different types of transcripts utilized in qualitative research. Verbatim transcripts are very effective because these transcripts capture the exact spoken words, including pauses, stutters, and other noses during the interview. I used a verbatim transcript for the translation of my data into text because it provided me with exact information and data of the interviews. Technological innovations help researchers to manage interview data. Qualitative Data Analysis Software (QDAS) packages are one of those technological innovations (Lester et al., 2020). QDAS are specialized software platforms and tools that allow researchers to transcribe, manage, analyze, and interpret qualitative data (Clark, 2023).

After obtaining transcript data, I read through the transcripts multiple times to gain a deep understanding of the information shared by the participants. This initial step was crucial as it helped me to become familiar with the data, allowing me to absorb the nuances of the teachers' experiences and insights. A good familiarity of the researcher with data is based on a transcription of data (Lester et al. 2020). I repeatedly reviewed the interviews to improve my familiarity with the diverse perspectives and narratives provided by the participants.

For this research study, qualitative data were collected through participant interviews. This study employed a qualitative data analysis approach as delineated by Braun and Clarke (2006). Utilizing Atlas.TI QDAS software facilitated the organization and analysis of textual data derived from interviews. The analysis followed a systematic sequence of steps designed to ensure rigor and depth in understanding the data.

### Generating Initial Codes

After the data familiarization step, I proceeded to the next step: generating initial codes based on the content of the interview transcripts. According to Lester et al. (2020), a code is a type of short phrase or simply a word that a researcher uses to assign meaning to a particular piece of data. Although coding is done at later stages of data analysis, coding at different phases allows the researcher to have better thematic analysis (Lester et al., 2020). That is why I developed the initial code, and these codes were brief, descriptive labels that highlighted essential information or concepts within the data. As I reviewed each transcript, I identified the key ideas and recurring themes. These initial codes were the foundation for organizing and categorizing the data during subsequent analysis. This phase was critical in breaking down the raw data into manageable units, making it easier to identify patterns and themes across the interviews. Each code represented a specific aspect of the teachers' experiences, practices, or perceptions regarding using technology to support students with reading and their reading development. Table 3.3 below shows examples of initial codes developed from qualitative data analysis.

**Table 3.3**

*Illustration of Initial Coding*

| Participant | Quote from Transcript | Initial Code |
|---|---|---|
| P7 | think that technology like is especially supportive. I have a couple students in here that are ESL, so I have about 25 students and 2 of them specifically, sometimes they need, like some help, because they speak mostly Spanish. So I let them have their Chromebook out and like, if they need to translate, or even just, especially the beginning of the year. It was really helpful. | Attitudes towards technology |
| P4 | Yeah, I think technology can be really effective to help, especially the kids who might be struggling with the renew development, because sometimes you can find different, like, I've been able to find different websites that help me teach some of my kids. We call them snap words like high frequency words like I or me or my, that maybe they're struggling to graph. So it makes it like a game that they can play online to kind of help them figure out<br>ust being able to use that visualizer and the smart board together to figure out different ways. I can make learning more online, but interactive with the smart board because they can go up and like circle different things on the smart board, or if we were like reading. Sometimes, if it says like, this is the cat come up and circle or we'll pretend like writing on the smart board. | Attitudes towards technology<br><br>Technology enhanced activities |
| P5 | We get. We have professional development once a month. | Development in Technology |
| P6 | I only really have access to Chromebooks in my building. We had ipads that were really outdated, and they wouldn't allow you to like update apps or anything. So if I had like in my old district. I worked in another district prior to this, and we had a set of 5 ipads that we could use during like centers time. And that was really nice because I was able. | Technology tools |

**P = Participants**

After developing initial codes, I began refining them. In this regard, I examined the similarities and differences between codes, identified patterns, and grouped related codes together into broader categories. This process helped me develop refined codes.

Table 3.4 below represents refined codes, their definitions, and the relevant source used to develop them.

**Table 3.4**
*Illustration of Refined Coding*

| Code | Definition | Example Quote | Source |
|---|---|---|---|
| Customized Learning | Refers to tailoring educational experiences to meet the individual needs of students. | Technology adapts to student needs and progress". (P6). | P6 (Interview) |
| Student interest | Involves engaging students and maintaining their motivation in reading activities through interactive tools. | Engagement and personalized learning keeps students interested" (P5) | P5 (Interview) |
| Blended Approach | Describes the integration of both technology and traditional methods in reading instruction. | "Balance between technology and traditional learning methods is crucial." (P8) | P8 (Interview) |
| PD Needs | Indicates the necessity for professional development to enhance teachers' skills in integrating technology. | Desire for more training on reading programs. (P5) | P5 (Interview) |
| Tech Accessibility | Highlights challenges related to ensuring all students have access to and can effectively use technology. | "Challenges with technology, like the practicality of Chromebook for young learners." (P6). | P6 (Interview) |

## Themes

Six themes emerged from the process of the qualitative data analysis. Below, table 3.5 illustrates the relationship between quotes, codes and themes.

**Table 3.5**

*Themes and codes*

| Theme | Code | Example Quote |
|---|---|---|
| Personalization and Differentiation | Customized Learning | "Technology...adapts to student needs and progress." |
| Engagement and Motivation | Student Interest | "Engagement and personalized learning..." |
| Balance Between Tech and Tradition | Blended Approach | "Balance between technology and traditional learning methods." |
| Resources and Professional Development | PD Needs | "Desire for more training on reading programs." |
| Accessibility and Practicality | Tech Accessibility | "Challenges with technology, such as practicality of Chromebooks for young learners." |
| Support for Diverse Learners | Inclusive Tech | "Helpful for ESL students, allowing them to translate and learn at their own pace." |

### Searching for Themes

After completing the steps of generating initial codes and refining codes, I moved to the next stage, which included searching for themes. At this stage, I searched for overarching themes that highlighted the shared experiences and insights of the teachers. According to Lester et al. (2020), the application of codes, the development of categories, and the development of broad themes are three steps in developing themes. By applying my initial codes, I developed different categories of codes, which gave me broad themes. Finding a relationship in codes helps categorize the codes. Codes can be categorized based on their analytical or conceptual relationship.

After developing initial codes and refined codes, I started to work on categorizing them to obtain final codes. To do so, I first grouped different initial codes into different categories, keeping in view their analytical and conceptual relationship. By doing this, I developed the final codes. Table 3.5 represents some examples of final codes, with a quote from the interview script relevant to the code and participant.

**Table 3.6**
*Code Category and Final Codes*

| Participant and Source | Code Category | Final Code |
|---|---|---|
| P6 (Interview) | Technology adapts to student needs and progress. | Customized Learning |
| P5 (Interview) | Engagement and personalized learning keeps students interested. | Student Interest |
| P8 (Interview) | Balance between technology and traditional learning methods is crucial. | Blended Approach |
| P5 (Interview) | Desire for more training on reading programs. | PD Needs |
| P7 (Interview) | Technology is helpful for ESL students to translate and learn at their own pace. | Inclusive Tech |

Per Lester et al. (2020), after categorizing codes, themes are developed by using two steps: the first step is bringing together various related categories of codes, and the second step is assigning statements to these categories. While assigning statements to categories, I ensured the theme name was inclusive for all underlying categories. I reviewed to make sure that the theme names that I have assigned are descriptive of their contents and that there is a relationship between them. While developing themes, I kept in view the conceptual and analytical goals of this research. Lester et al. (2020) stated that in qualitative research, themes align with the conceptual and analytical goals of the

research, and that is why themes are designed by keeping in view the research questions or goals.

Different types of themes emerged as I categorized the similar codes in the same groups. These themes represented the salient central topics or issues in the data. By examining patterns, commonalities, and variations in the codes, I identified these key themes that reflected the essence of the teachers' responses about use of technologies for students to develop reading skills of students. This process involved considering what is explicitly stated in the interviews and what is implied or suggested. It allowed me to move beyond the surface-level content and delve deeper into the underlying meanings and messages conveyed by the participants. Thematic analysis provided me with a structured framework for organizing the data and enabled me to explore and interpret the teachers' perspectives comprehensively.

### Reviewing and Refining Themes

In the next step, I reviewed and refined the identified themes. This is an important step because it helps the researcher ensure that each theme is distinct, coherent, and accurately represents the contents (Lester et al., 2020). I carefully analyzed each identified theme to determine whether each theme is capturing the essence of the data it represents. According to Lester et al. (2020), the process of refinement of themes involves different steps, such as clarifying the boundaries of every identified theme, refining the definition of themes, and making sure that each theme aligns with the objectives and context of the study.

### Defining and Naming Themes

I followed these steps and refined each theme by clarifying the boundaries of every theme and refining the definitions of themes. For example, similar themes were categorized into one major category. I categorized the theme of students' interests and customized learning into one major category: personalization and differentiation. Through these steps, I had well-defined themes, facilitating a systematic and rigorous exploration of the teachers' experiences and perceptions related to technology and students with reading disabilities. This rigorous approach enhanced the credibility and trustworthiness of the analysis. Table 3.6 below represents the six themes developed by following the steps mentioned above.

**Table 3.7**
*Development of themes through final codes*

| Theme | Code |
|---|---|
| Personalization and Differentiation | Customized Learning |
| Engagement and Motivation | Student Interest |
| Balance Between Tech and Tradition | Blended Approach |
| Resources and Professional Development | PD Needs |
| Accessibility and Practicality | Tech Accessibility |
| Support for Diverse Learners | Inclusive Tech |

### Interpreting

Finally, I interpreted the themes in the context of my research question and objectives. I analyzed the coded data within each theme related to the research questions, seeking to uncover the deeper meanings and insights conveyed by the teachers. This interpretation resulted in writing an explanation of my research's results.

## Ethical Considerations

Ethical issues for the study procedures have been examined. The planned research study was presented to the Institutional Review Board (IRB) for preliminary evaluation and approval of the methods. To comply with ethical issues in the research procedure, all research participants were given a thorough explanation of the study objective. The IRB reviewed the informed consent form and the interview questions. The forms ensured that participants were informed of the interview and what was required of them, as represented in Appendix A. I obtained permission from the research participants to collect their information. The research participants were also explained how their confidentiality will be protected throughout the research. During all interviews and throughout the research process, it was made sure that participants' anonymity, privacy, and confidentiality were protected.

Ethical considerations in research are very important. I ensure that I treat all the people involved in my study fairly and with respect. I got permission from the teachers I interviewed and let them know how their information would be used. I kept their responses confidential and never shared their names or personal details in my research report. I have also followed the rules and guidelines set by my university and other organizations overseeing research. I was honest and transparent in my research, and if there were any potential risks or discomfort for the teachers, I did my best to minimize them.

## Summary

This research examined K-3 teachers' use of technology for students in general education classrooms. The teacher's interaction with the students using technology can

provide insights into teachers' challenges while using technology to support children in the classroom, including aspects related to letters, pronunciation, spelling, and other factors contributing to developing the student's academic skills. The research provided an overview of teachers' strategies in the classroom, including children with challenges in reading development.

# CHAPTER FOUR

# RESULTS

This research examined teachers' use of technology to support students' reading development in kindergarten through third grade in the classroom. This research's purpose was also to explore what supports or hinders teachers from learning about technology and teachers' perceptions of what supports (PD) they still need with regard to using technology with children in the classroom. Chapter four represents the findings of this study. The findings presented in this chapter result from the analysis of data collected through surveys and interviews. The participants of this study were teachers of kindergarten, Transitional Kindergarten (TK), and grades 1, 2, & 3.

## Quantitative Data Results

The quantitative data for this research study was collected and analyzed through a survey. The analysis of the survey data revealed insights into the willingness of the participants to participate in the research study, educational backgrounds, the grades research participants are teaching, teaching experiences, the experience of teaching struggling readers, the experience of recommending struggling readers to be evaluated for IEP, experience of teaching students who had IEP, experience of teaching students who had IEP for reading, experience of using technology in classroom, current usage of technology by participants in classroom, (likelihood) of using technology in classroom to develop reading skills of students, and attitudes toward technology use among educators.

In the survey, the research participants were asked about their experience of teaching struggling readers. The results showed that all participants (n=8) had experience

teaching struggling readers in their classrooms. This finding indicated that reading is a common challenge across different teaching environments.

The participants were also asked about their experience teaching students with IEP. Again, all 8 participants of this study had taught students with IEPs. The response rate for this question was 100% (n=8). They were then asked if they had any students whose IEP components included for reading skills. Results showed that six participants (75%) had taught students whose IEPs specifically included components for reading skills. This result showed that addressing reading difficulties is a prevalent challenge across the diverse teaching environments represented by the participants. it also indicates that a majority of the students receiving specialized support through IEPs require assistance with developing their reading skills.

***Intensity of Technology Usage in Classroom***

This research study analyzed the intensity or likelihood of technology usage by teachers in their classroom. In this regard, the following question was included in the survey to collect the data from participants:

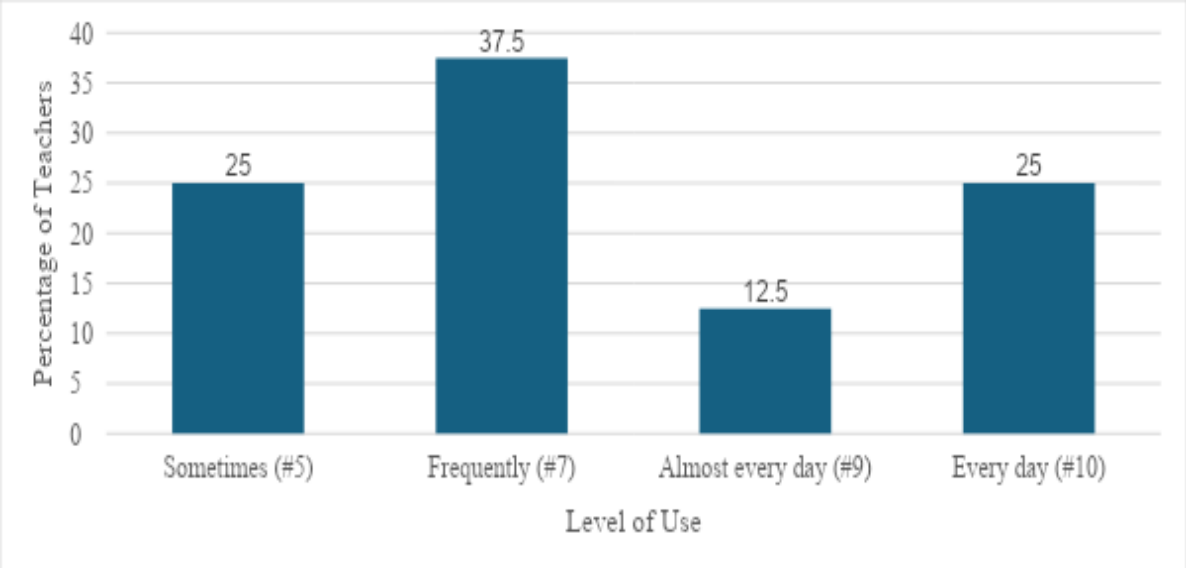
● How much do you use technology with children to develop their reading skills?

Teachers were then asked about the integration of technology in classrooms. All of the participants reported having used technology in their classrooms. This result indicates that teachers commonly use technology to develop students' reading skills. Following this question, they were asked how much they used technology in their classrooms to develop students' 'reading skills. Figure 4.1 shows the distribution of responses to this question, in which 0 indicated "not at all," five indicated "sometimes,"

and ten indicated "every day). For this question, no participants selected a value lower than five.

**Figure 4.1**

*Distribution of Reported Use of Technology*




The result showed variation in reported technology usage levels by research participants when integrating technology into reading instruction. Participants' individual teaching philosophies, comfort levels with technology, access to resources, and instructional goals may influence their usage patterns. The participants (teachers) from the survey with higher usage scores may have good access to technology, and they extensively use technology to differentiate instruction, provide personalized learning experiences, and address the needs of students.

Results shown in this figure indicated that all participants used the technology in their classrooms to develop students' reading skills but to varying degrees. This result shows that all participants commonly recognize the value and importance of integrating

technology into teaching practices and supporting reading skill development. The result showed variation in reported technology usage levels by research participants when integrating technology into reading instruction.

***Attitudes Toward Technology***

In this research study, the attitude of research participants towards the effectiveness of technology in helping students and teachers with reading skills was also measured. Using a scale of strongly disagree (0) to strongly agree (10) participants rated the following statements. Please indicate your agreement with the following statements about technology:

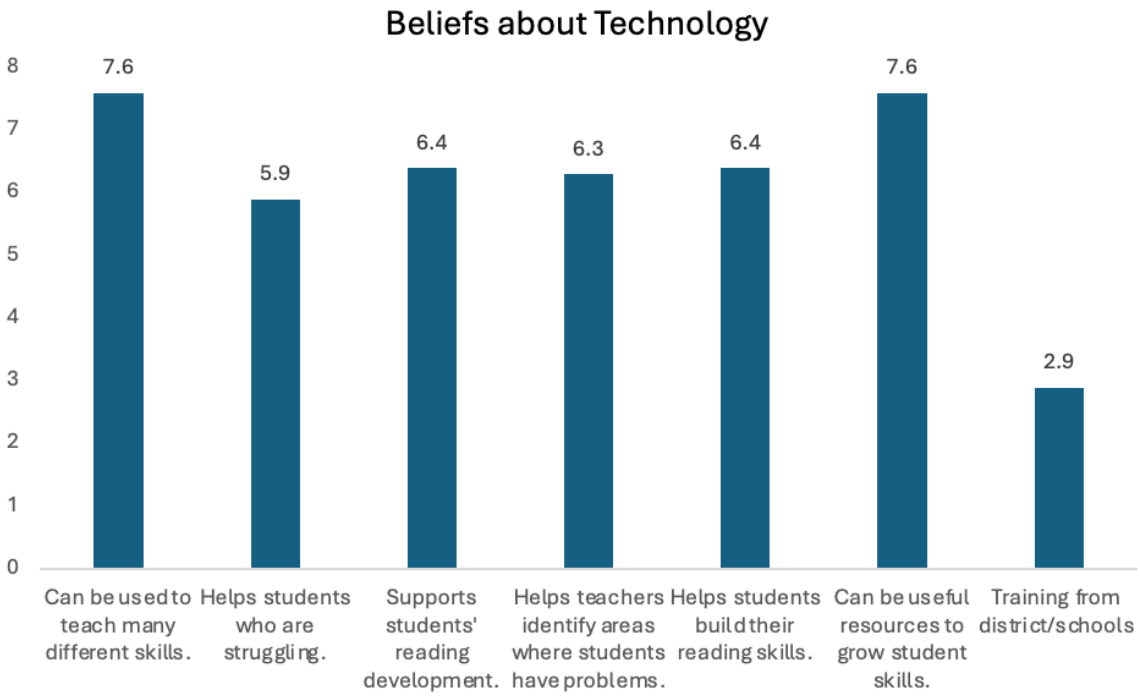
1. Technology can be used to tech many different skills
2. Technology helps students who are struggling
3. Technology supports students' reading development
4. Technology helps teachers identify areas where students have problems
5. Technology help students build their reading skills
6. Different program and apps can be useful resources to grow student skills
7. I got practical technology training from my district/schools

Figure 4.2 shows the average agreement with specific statements about technology beliefs in teaching. The results showed that the participants expressed positive attitudes toward using technology in education, with mean scores on various statements indicating agreement to strong agreement. The belief that technology can teach different skills received a mean score of 7.625 (SD = 1.06066), while the role of technology in supporting students' reading development was rated with a mean of 6.375 (SD = 1.30247). However, the perceived adequacy of practical technology training received was

somewhat lower, with a mean score of 4.625 (SD = 2.92465), suggesting room for improvement in professional development initiatives. This finding showed that teachers recognize technology as a valuable tool that can enhance teaching and learning experiences, promote engagement, and improve student reading skill development. As per results, there is also an acknowledgment of the need for more advanced and effective professional development initiatives to better equip teachers with practical skills and knowledge for integrating technology into their instructional practices.

**Figure 4.2**

*Average Responses to Beliefs about Technology in Teaching*




A final question on the survey asked teachers to rate their feelings about using technology to support reading development by rating from “I could do with out it” (0) to

"I could not teach without it" (10) For this statement, the average response was in the middle of the range (M = 5.9).

Overall, the survey data findings provide a comprehensive overview of the current state of technology integration in education, as seen through the experiences and perspectives of a small sample of Kg-3rd grade educators. The positive attitudes toward technology and the noted need for enhanced training highlight key areas for future focus in educational development and policy.

## Qualitative Data Results

### Major Themes

The qualitative analysis of teacher interviews identified six key themes regarding the integration of technology in supporting students' reading development. These themes encompass personalization and differentiation, engagement and motivation, balancing technological and traditional methods, the need for professional development and resources, accessibility and practicality challenges, and support for diverse learners. The analysis of codes and themes was discussed in chapter three.

### Theme 1: Personalization and Differentiation

Personalization and differentiation in the context of teachers' use of technology refers to the customized and tailored approaches used by teachers to meet the individual needs of students in their reading development journey. This theme represents the fact that technology offers opportunities and enables teachers to adapt instructions based on students' unique learning styles, preferences, and abilities.

> “For reading, what I do a lot is I have a visualizer that connects to my smart board. So, when I'm introducing a new book that they can read at their level, I'll put it up on the visualizer." (P1).
>
> "We use it for like intervention systems in my school. So, I use a couple of different programs during our intervention time for students. And then I'll also pull like students, one on one during that time.”(P1).
>
> "Use Google Classroom and use different sites to do more research-based stuff, which is nice. "(P2).

Within this theme, teachers are observed to use various technology tools and resources to provide personalized learning experiences for students. For example, they may utilize adaptive learning platforms that adjust the difficulty level of reading materials based on students' performance, ensuring that each student receives instruction at an appropriate level.

> “Additionally, teachers may integrate multimedia resources or interactive reading apps to accommodate diverse learning preferences and engage students with different modalities of learning. "We have they're kind of like ieps "IEPs", but they're reading plans. So irip IRP we it stands for. But we monitor the students over 2 years. So, for example, I have 2 children that were low last year, and they've actually grown quite a bit. And that's the beauty of first grade, as you see, a lot of growth. So we would

> work with them more. But not necessarily more on technology, and some of them are also getting help from ESL. currently. But it's pretty much the same for them as it is for the other students. But we have that as a resource. That we can use if we need to. “(P3)
>
> "I have some students who go to the resource room for additional help. I have some who are pulled by a para who uses resources from our curriculum to work like one on one or 2 on one with students, and then I will also pull students in small groups based on what they're struggling with the most. So our small groups don't stay the same they change up depending on where those students need are. “(P4)

Furthermore, differentiation is emphasized within this theme which actually highlights the importance of developing instruction to address students' varying levels of readiness, interests, and learning profiles. This theme also show that teachers utilize technology to offer multiple pathways for students to access and interact with reading materials so that students become able to explore content in ways that align with their individual strengths and needs.

**Theme 2: Engagement and Motivation:**

This theme of engagement and motivation represents how research participants (teachers) utilize technology to enhance students' interest, participation, and enthusiasm for reading activities. This theme also reveals that the use of technological tools and resources to create engaging learning experiences that motivate students to participate actively in reading instruction is of great importance.

> "Oh, I could. That's because my class is young. I definitely could teach without technology, but I feel it does support them like it.: It gives them another, you know medium to learn phonics skills and reading skills. I think it's really beneficial to them because they're engaged with, like, the little videos that they get to watch any E spark they like. They sing the songs, and they're singing about like, what does "oo" sound like? What does "ui" sound like? And they'll sing the songs, and then they can. It helps them with reading. "(P6)

Within this theme, participants (teachers) are observed to employ various strategies to promote student engagement and motivation through technology. For example, they integrate gamified reading apps or online platforms that offer interactive challenges, rewards, and incentives to encourage students to participate in reading activities actively.

Furthermore, technology can provide students with opportunities for authentic and meaningful reading experiences relevant to their interests, backgrounds, and experiences. This theme is developed because participants described that they incorporate digital texts, multimedia resources, and interactive storytelling platforms that positively impact the students' diverse interests and preferences.

> "I mean, like, I said, I think that it could be a great tool to support kids especially who are struggling or kids who want that extra. You know, they have the skills that they need. And now they need the push to go further. So you know, there's only one

> of me and 29 students. So I know, crazy, but with technology, they could be kind of on their own individual path and getting an individualized lesson. as long as, like, I said, as long as that wasn't the only thing that they were getting for reading it would be a support. So you know, do I do it without? Yes. and trying my best. But it would be a big help. I think "(P8)

This theme emerged because participants believe that technology serves as a powerful tool for promoting collaboration, communication, and peer interaction among students, which can further enhance engagement and motivation. All in all, the engagement and motivation theme highlights technology's transformative potential in cultivating students' intrinsic motivation and enthusiasm for reading.

**Theme 3: Balance between Tech and Tradition**

The emergence of the theme of balance between technology and tradition in the participants' interviews reflects the complex considerations and perspectives surrounding the integration of technology into reading instruction in kindergarten through third-grade classrooms. This theme highlights the tension and deliberation experienced by teachers as they navigate the incorporation of technological tools and traditional teaching methods in their instructional practices.

> "Yeah, I think that answer is really gonna vary based on the school district and how much investment they have put into technology programs. I think that the fact that there's more resources available online, like, like I mentioned reading A to Z get epic. You know, you can get books as long as you have an Internet connection there

> are books available on online which is fantastic. So, in that way. you know, it has changed it. That was not the case even 10 years ago. at least not widespread and definitely, not 20 years ago. I think that there are some districts that rely heavily on kids going through a program online where they to do all the lessons and check the box and pass the little test at the end and all that kind of stuff. I think that's kind of new, newer. I don't know if it's if it's the only thing that's happening. I don't think that that's best practices. hopefully, it's just used as kind of an additional support. So yeah, Things have changed. But I think there's still the biggest change. I think that's happened in reading is the debate about full language versus science of reading." (P8)

The main reason for the emergence of this theme is that participants in the study have expressed diverse views and opinions regarding the optimal balance between technology and traditional approaches to reading instruction. Some participants of this study emphasized the value of using technology to enhance and augment traditional teaching methods. Those participants considered the technology a valuable supplement to existing instructional practices. They acknowledged the benefits of technology in providing access to a wide range of reading materials, promoting interactivity and engagement, and accommodating diverse learning styles and preferences.

On the other hand, some participants of this research study have shown concerns about the potential drawbacks and limitations of excessive reliance on technology in reading instruction. They mentioned the importance of maintaining a balance between

technology and traditional methods to ensure that students receive a well-rounded and comprehensive literacy education so that their reading skills could be enhanced.

> "I guess since it's my first year, I haven't noticed a lot of changes. But I did teach Pre. K. Can I count that and we used a smart board as well, but we only used it for just like dancing and music. So I've noticed in kindergarten. I've been using it for much more educational purposes like, we'll play those interactive games. We'll do practice writing practice math facts on there. So I just noticed that you can take the smart board and make it a more educational tool. It just makes you just need to have, like the time, and I guess persistence to figure out how to make that work." (P1)

These participants think that traditional instructional strategies have many benefits in laying a strong foundation for reading development. This theme emerged because some participants expressed concerns about disparities in access to technology resources among students, particularly in underserved communities. This theme indicates the importance of maintaining a balance between use of technology and traditional strategies in reading classrooms.

**Theme 4: Resources and Professional Development:**

The emergence of the theme of "Resources and Professional Development" from participants' interviews show that access to resources and ongoing professional development plays a vital role in reshaping teachers' attitudes, practices, and perceptions regarding the integration of technology into reading instruction. Several key reasons contribute to the emergence of this theme, such as some participants of this research

study have expressed concerns in interviews about the availability and adequacy of technology resources within their educational settings.

> "I think it would be nice just to see more apps where you could differentiate for students. I think that it's hard, like within the same app. It's hard to have so many different apps to choose from and try to make sure that they're actually doing something meaningful and not just playing on them. And I feel like that's tricky to try to. You know, these kids are on this one, and these kids are on that one to try to manage that. It would be nice if that was sort of more in one app." (P4).

Limited access to devices, software applications, and digital content prevented the participants (teachers) from effectively incorporate technology into their reading instruction. As a result, participants have highlighted the need for increased investment in technology infrastructure to ensure equitable access for all students and educators.

> "No, not sufficiently enough. "(P5)
>
> "We get. we have professional development once a month, and we some of the PDs are technology related. We had one that was about how to monitor every student's Chromebook from mine. And so yeah, but it's not. It's not about like, oh, here's a new reading program. And it was science. Pro, it's not like that. It's just like, here's a new software to if you want to use it. Type of thing. you think it's usable." (P6)

Furthermore, some participants of this study frequently have emphasized the importance of ongoing professional development opportunities to enhance their proficiency in using technology for reading instruction. They described that without adequate training and support, teachers feel they are not well prepared to effectively utilize technologies in their teaching practices.

> P4 1st "It was helpful, and it was also helpful that we had a couple of teachers piloted the program last year, so we already had a couple of people in our building as kind of go-to people to ask questions." (P4)
>
> P5 2nd "Not useful" (P5)

Participants have also expressed a desire for targeted workshops, seminars, or online courses that provide practical strategies and guidance for integrating technology tools and resources into literacy instruction. This is also a reason for the emergence of this theme.

> "I'm probably like 75% successful I could use like I could always use more because my low kids they're still low, like, it's not like they're gonna they're like they've made like so much progress that they're like, you know, grade level and a but they're not like that's not. It's like. you know, normal growth. And I could always try to use something else. I would like kickstart them." (P6)

This theme has also emerged because during interviews, some participants have described that their views on resources and professional development are often influenced by the alignment between available resources and the goals and priorities set forth by their school or district leadership. Participants of this study perceived that there

is a disconnection between the resources provided and the expectations for technology integration in reading instruction. That is why they have stated that they need more resources and professional development opportunities to properly and effectively integrate technologies in their reading classrooms.

**Theme 5: Accessibility and Practicality**

The emergence of theme 5 (Accessibility and Practicality) from participants' interviews indicates the importance of accessibility and feasibility of technology integration in reading instruction. This theme emerged because during interviews, the researcher participants presented their perspectives on the extent to which technology tools and resources are accessible and practical for use in their educational settings, particularly in the context of supporting students' reading development. Their views reveal the challenges faced by research participants in accessing and utilizing technology tools effectively to support reading instruction.

> "basically not knowing what options there are like in having professional development in it or understanding what research is out there. It's not, you know, we have so much on our plate. It's not like I have time to go and look into those things. But you know other than just a few resources. I'm not sure what else there is out there. So that would be something that a huge barrier, because there might be something that's useful and helpful. I'm just not unaware of it.(P5)
>
> "Yes, it's stuff like, it's the normal technology problems like today when we're going any E spark. There were, there was one laptop that just wouldn't turn on. And we're like, Okay, well, now, I gotta, you

> know, find a new laptop for you. Someone was absent from like, Okay, borrow hers. Or but it's like stuff like that, just like glitches, and like, you know oh, my laptop froze, and I have to stop my reading group and unfreeze their laptop like things like that. They get like a little annoying." (P6)

This theme has emerged because research participants shared their opinions and thoughts about practicality of implementing technology-driven approaches in reading instruction, considering factors such as time constraints, technical expertise, and curriculum alignment. Their perspectives highlighted the practical challenges and considerations that educators must navigate when integrating technology into their teaching practices. Another reason for the emergence of this theme is that participants have discussed the impact of technology accessibility and practicality on student engagement, motivation, and learning outcomes. They described that the availability of technology resources and the feasibility of implementation of technologies influence the student's ability to access and interact with digital reading materials effectively.

**Theme 6: Support for Diverse Learners**

Theme 6 (Support for Diverse Learners) from participants' interviews has emerged because the participants emphasized on the importance of providing equitable opportunities and resources to meet the diverse needs of students in reading instruction. Furthermore, this theme has emerged because some participants have described that the use of technologies is helpful in providing support in reading skills development for diverse learners. Furthermore, this theme also indicates participants' perspectives on

strategies, resources, and support systems necessary to ensure that all learners, regardless of their backgrounds, abilities, or learning styles, receive appropriate support and instruction in reading.

> "A lot of them are determined for me by my school. And what we have access to. So like, we were using epic when I taught second grade we no longer have access to that anymore. So we don't use that anymore. Now, we have the Super Kids app, and it's like the interactive pieces with that. So, most of that is determined for me. "(P3)
>
> " use. But also, if there's something that a teacher uses, it's often. you know, something that's free, like, get epic is free. So that makes that choice pretty easy. but yeah, the it might. These answers might be different, for lower, you know, for kindergarten and first grade. but in by third grade the hope is that the kids are mostly they're at a good level where they can start reading to learn and for anyone who's not quite there. We're really just trying to do intervention groups like meeting with real humans. "(P8)

During the interview, some participants described that they have a diverse range of learners present in their classrooms, including students with varying academic abilities, linguistic backgrounds, special needs, and cultural experiences. Their acknowledgment of student diversity shows the importance of adopting inclusive practices that address all learners' unique needs and strengths. Some research participants emphasized the importance of differentiated instruction in meeting the diverse learning

needs of students. They mentioned the use of varied instructional strategies, materials, and assessments to accommodate students' individualized learning styles, preferences, and readiness levels in reading instruction.

> "it's effective for them, because you know, they think that it's fun they like to do it. It's engaging, it's bright, it's colorful and it just adds something different than what we are already doing. But I think also the check ins that it provides are helpful to me. And knowing what skills we
>
> "I think technology can be really effective to help, especially the kids who might be struggling with the renew development, because sometimes you can find different, like, I've been able to find different websites that help me teach some of my kids. We call them snap words like high-frequency words like I or me or my, that maybe they're struggling to graph. So it makes it like a game that they can play online to kind of help them figure out what different new words are. “(P1)

Research participants also discussed the role of technology in supporting differentiated instruction for diverse learners. They described that the use of different sorts of technologies, such as educational software, adaptive learning platforms, and multimedia resources, is helpful in providing personalized learning experiences that better match the unique needs and abilities of diverse students in reading. Another important aspect that theme 6 indicates is that research participants of this study stated that there should be policies in schools that promote the adoption of inclusive practices,

so it becomes possible to fulfill the diverse needs of diverse students related to reading. The participants also discussed the importance of creating a supportive learning environment where students feel valued, respected, and empowered to succeed regardless of their backgrounds or circumstances.

# CHAPTER FIVE

# DISCUSSION

This investigation into kindergarten through third-grade teachers' use of technology for supporting reading development reveals a multifaceted landscape where educators navigate the integration of digital tools within traditional learning paradigms. The research aimed to examine how technology is employed to enhance reading skills, the resources teachers rely on for technology-related decisions, and their perceived needs and attitudes toward technological integration in reading instruction. Eight teachers completed a brief survey and participated in a semi-structured interview about their practices and perceptions. As reported in chapter four, data analysis from both quantitative survey data and qualitative interview data revealed six themes. The discussion is organized around the research questions of the study and highlights the primary themes related to each question.

## RQ 1: Teachers use of technology to support all students' reading development

Kindergarten through third-grade teachers utilized technology in varied ways to support reading development. The integration of technology includes the use of educational apps, platforms, and digital tools that offer interactive reading experiences, diagnostic assessments, personalized learning paths, and engaging content that caters to the diverse needs of students. Technologies such as smart boards, tablets, and educational software are used to introduce new books, practice phonics, improve listening comprehension, and provide interactive quizzes and games. This use of technology

facilitates student engagement and motivation and allows for differentiated instruction tailored to individual student needs and progress levels.

Theme 1 – Personalization and Differentiation – revealed that through technology such as adaptive learning platforms and diagnostic assessments, teachers tailor instruction to individual student needs and progress levels. This theme underscores the significance of addressing students' unique learning styles, preferences, and abilities in reading instruction. By utilizing various technology tools, teachers can offer customized learning experiences that cater to each student's strengths and areas for improvement, ultimately enhancing their reading skills. Hutchison and Woodward (2014) outline a planning cycle for integrating digital technology into literacy instruction, emphasizing the use of educational apps and digital tools to create personalized learning experiences. Similarly, Neumann and Herodotou (2020) discuss the educational potential of digital media, including videos and interactive content, in supporting phonics, vocabulary, and comprehension skills. Such technologies enable teachers to provide personalized instruction that adapts to the learning pace of each student, thereby accommodating a wide range of learning styles and abilities. Moreover, interactive e-books and educational software offer diagnostic assessments that provide immediate feedback, enabling teachers to identify students' strengths and weaknesses in real time (Smeets& Bus, 2015).

Theme 2- Engagement and Motivation – revealed that teachers utilize educational apps, platforms, and digital tools to create interactive and engaging learning experiences. By incorporating elements such as gamification, interactive challenges, and multimedia resources, technology captures students' interest and enthusiasm for reading. This theme emphasizes the importance of leveraging technology to create a dynamic and stimulating

learning environment that encourages active participation and sustained motivation among students. Roskos, Burstein, Shang, and Gray (2014) found that e-books on tablets can significantly improve engagement among young readers, suggesting that the multimedia features of digital books are particularly effective in capturing the attention of early learners.

Theme 3- Balance Between Technology and Traditional Methods – revealed that the participants of the research highlighted the importance of maintaining a balance between technology and traditional methods in reading instruction. Teachers utilize a combination of smart boards, tablets, educational software, and traditional teaching approaches such as tools to support students' reading development (Neumann & Herodotou, 2020). Educational technologies, including apps, interactive e-books, and digital platforms, offer dynamic and interactive experiences that traditional textbooks cannot. This theme reflects teachers' awareness of the need to incorporate technology as a complement rather than a replacement for traditional instructional practices. By developing a balance between technology and tradition, teachers ensure that students receive a well-rounded and comprehensive literacy education that effectively leverages both digital and traditional resources.

**RQ 2: Technology tools that teachers use in the classroom**

The technology tools mentioned by teachers during the interview include educational apps like Super Kids, Raz-Kids, and Epic, as well as platforms such as I-Ready. These tools are chosen for their comprehensive content that aligns with the curriculum and their ability to adapt to students' varying skill levels. Other tools include visualizers connected to smart boards for book introductions, online assessments to gauge

reading levels, and websites for high-frequency word recognition. Teachers also use resources from Teachers Pay Teachers to supplement their curriculum with games and reading books.

Theme 2- Engagement and Motivation- reveled the technology tools mentioned, such as educational apps and online platforms, contribute to student engagement and motivation in reading activities. These tools offer interactive features, engaging content and gamified elements that capture students' interest and enthusiasm for reading. For example, apps like Raz-Kids and Epic provide a variety of reading materials, including interactive stories, quizzes, and rewards, which motivate students to actively participate in reading instruction. Similarly, online assessments and high-frequency word recognition websites offer interactive challenges and activities that engage students in meaningful learning experiences. Their significance is underscored in research by Zucker et al, (2009), who highlight the role of such apps in providing differentiated literacy instruction that aligns with students' individual learning paths. These tools offer a range of interactive activities, from phonics games to reading comprehension exercises, all designed to engage young learners and support their progress in reading.

Additionally, the technology tools described by teachers align closely with the theme 1- personalization and differentiation. Apps like Super Kids, Raz-Kids, and Epic offer personalized learning experiences by adapting content to students' individual skill levels and learning needs. Websites for high-frequency word recognition and platforms like Teachers Pay Teachers have become invaluable educational resources. Teachers Pay Teachers, in particular, provide access to a wide array of instructional materials, from games to reading books, allowing teachers to enrich their curriculum with content that

resonates with their student's interests and needs (O'Neal et al, 2018). These tools allow teachers to tailor instruction to address students' unique strengths and areas for improvement in reading.

Theme 3-Balance Between Tech and Tradition- revealed that while incorporating digital resources like educational apps and online platforms, teachers also utilize traditional tools and resources to support reading instruction. By integrating a variety of technology tools alongside traditional resources, teachers strike a balance between leveraging digital advancements and honoring established teaching practices to effectively support students' reading development. As Lin et al. (2013) argue, the thoughtful integration of educational technology can significantly contribute to developing foundational literacy skills, preparing students for success in an increasingly digital world.

In their study, Jimerson and Reames (2015) explore the impact of online reading assessments on instructional strategies, emphasizing their value in informing targeted interventions and personalized instruction. The effectiveness of smart board technology in enhancing reading instruction is documented by Higgins et al. (2007), who note its potential to make learning more visual and interactive, thereby increasing student engagement and motivation. The strategic selection and implementation of these technology tools underscore a commitment to enhancing reading instruction through digital means. The adoption of educational apps, interactive platforms, and digital assessment tools in kindergarten through third-grade classrooms exemplifies the transformative potential of technology in reading instruction. These tools not only

support personalized learning and engagement but also empower educators to address the unique challenges and opportunities presented by each student's reading journey.

### RQ 3: Resources teachers use to make decisions about technology

Teachers rely on a range of resources to make informed decisions about integrating technology into reading instruction. Decisions are often guided by school policies, availability of resources, and curriculum requirements. Professional development sessions, consultations with educational technology experts, and suggestions from colleagues play a significant role in informing teachers about new tools and best practices. However, the need for more targeted and comprehensive professional development was highlighted, indicating that while existing resources are utilized, there is a gap in providing specific training on the effective use of technology for reading development. The integration of technology into reading instruction is a nuanced process that requires teachers to make informed decisions based on a variety of resources. Professional development sessions are fundamental in equipping teachers with the necessary skills and knowledge to integrate technology effectively. Desimone (2009) underscores the importance of high-quality PD in facilitating teacher learning and improving instructional practices.

Effective PD is characterized by its focus on content knowledge, incorporation of active learning techniques, and support for collaboration among teachers. In the context of reading instruction, PD sessions that specifically address utilizing technology to support diverse literacy needs are particularly valuable. Consultations with educational technology experts offer another critical avenue for teachers seeking to enhance their technological integration strategies. According to Ertmerat et al. (2010), these

consultations can provide teachers with insights into the latest digital tools and platforms and strategies for their effective application in the classroom. Such interactions can help bridge the gap between teachers' pedagogical goals and the technological means available to achieve them. A study by Vangrieken et al. (2017) highlight the significant role of peer collaboration in professional development, noting that it can lead to the exchange of innovative teaching strategies and support the adoption of new technologies. Despite these resources, there remains a need for more targeted professional development that addresses the specific challenges of using technology to support reading development. The Technological Pedagogical Content Knowledge (TPACK) framework, proposed by Mishra and Koehler (2006), illustrates the complex interplay between technology, pedagogy, and content knowledge required for effective teaching. This framework suggests that professional development should focus on the technical aspects of new digital tools and how these tools can be integrated into literacy instruction in meaningful ways.

Theme 4 -Resources and Professional Development- reveals a reliance on colleagues' suggestions as a resource for making decisions about technology and also relates to theme 6 (support for diverse learners). Teachers gave value to the input they receive from their colleagues who may have experience or expertise in utilizing technology to support diverse learners in the classroom. By sharing recommendations and strategies, teachers' colleagues contribute to a collaborative learning environment where teachers can learn from each other's experiences and best practices. This theme emphasizes the importance of peer support and collaboration in ensuring that all learners, regardless of their backgrounds or circumstances, receive appropriate support and

instruction in reading. Teachers also use professional development as an important source to make decisions about using technology in classrooms to support students' reading development skills. Teachers rely on professional development opportunities to enhance their knowledge and skills in utilizing technology for reading development. However, the need for more targeted and comprehensive professional development suggests a gap in available resources (Desimone, 2009)

In brief, while teachers have access to a variety of resources to inform their decisions about technology integration in reading instruction, there is a clear demand for more specialized professional development opportunities. Such training should aim to deepen teachers' understanding of how to effectively blend technological tools with pedagogical strategies to enhance reading development. Addressing this gap in professional development can empower teachers to make more informed decisions and better utilize technology to meet their students' literacy needs.

**RQ 4: Resources teachers feel they need to make decisions about technology**

Teachers expressed a strong desire for additional professional development opportunities. Specifically, teachers mentioned that training focused on the effective integration of technology into reading instruction would be helpful.

Theme 4- Resources and Professional Development – revealed that teachers seek research-backed PD sessions that provide insights into the latest educational technologies, strategies for integrating these tools into the curriculum, and best practices for engaging students and supporting diverse learning needs. Teachers also expressed a need for more collaborative opportunities to share experiences and strategies with peers, highlighting a desire for a community of practice around technology use in reading

instruction. The value of collaborative learning opportunities in professional development is well-documented, with studies by Lomos et al. (2011) highlighting the positive effects of collaborative cultures on teacher learning and student achievement. A community of practice focused on technology use in reading instruction can facilitate the exchange of ideas, foster innovation, and support the continuous professional growth of educators.

The demand for more comprehensive professional development (PD) opportunities reflects a broader recognition among educators of technology's critical role in supporting students' reading development. Teachers are increasingly aware of the need for specialized training that introduces them to the latest educational technologies and equips them with effective strategies for integrating these tools into their reading instruction.

Theme 5- Accessibility and Practicality – revealed that teachers identify practical challenges and considerations when making decisions about technology integration, such as access to technical support and troubleshooting resources. By highlighting the need for resources that address accessibility and practicality issues, this question underscores the importance of ensuring that teachers have the necessary support and tools to overcome barriers to technology integration in reading instruction.

Theme 6 – Support for Diverse Learners – is also linked to responses to this question. Teachers express a need for resources that support differentiated instruction and meet the diverse needs of students in reading development. This theme emphasizes the importance of providing resources that enable teachers to effectively support diverse learners through technology integration in reading instruction.

Research by Darling-Hammond et. al (2017) emphasizes the importance of high-quality PD in fostering effective teaching practices, including integrating technology. PD sessions that are grounded in research and offer practical insights into the use of educational technology can significantly impact teachers' ability to enhance reading outcomes. Teachers expressed a need for additional resources beyond traditional professional development to support their decision-making about technology integration. While professional development sessions are valuable, teachers also identify the need for access to research, technical support, developed lists of tools, collaborative platforms, and feedback mechanisms.

Professional development focused on the effective use of technology in reading instruction is essential for several reasons. First, it provides teachers with the necessary skills to select and implement digital tools that align with their instructional goals and meet the varied needs of their students. The expressed need for PD that encompasses both the exploration of new technologies, and the development of collaborative networks indicates a holistic approach to professional learning. Teachers recognize that effective technology integration requires more than just familiarity with digital tools; it also demands an understanding of pedagogical strategies that engage students and enhance learning. As Mishra and Koehler (2006) argue in their Technological Pedagogical Content Knowledge (TPACK) framework, teachers must understand how technology, pedagogy, and content knowledge intersect to create effective learning environments.

**RQ 5: Extent to which teachers believe technology is important in the classroom**

Teachers unanimously agree on the importance of technology in the classroom, especially for supporting reading development. They view technology as a critical tool

for engaging students, providing personalized learning experiences, and supporting diverse learners, including ESL students and those with reading difficulties. The survey data and interviews reflect a positive attitude towards technology, with teachers acknowledging its role in making learning more accessible and enjoyable. However, while recognizing the benefits of technology, teachers also emphasize the need for a balanced approach that includes traditional teaching methods, indicating an understanding that technology should complement rather than replace traditional literacy instruction. The consensus among teachers regarding the importance of technology in the classroom underscores a transformative shift in educational practices. Educators recognize the value of technology as an indispensable tool for enhancing reading development, engaging students, and accommodating diverse learning needs. This widespread acknowledgment among teachers aligns with contemporary educational research, which emphasizes the role of technology in fostering innovative learning environments and improving student outcomes.

Theme 1-Personalization and Differentiation- reveled technology's capacity to provide personalized learning experiences. This use of technology is particularly valued by the teachers. Adaptive learning technologies can tailor instruction to meet the individual needs of each student, enabling differentiated learning paths that cater to varied skill levels and learning styles. This personalization is crucial for addressing the diverse needs of students, including those with English as a Second Language (ESL) or reading difficulties. As Hennessy et al (2015) note, technology facilitates access to a range of resources and modalities that can support individual learning needs, making education more inclusive and equitable.

However, despite the enthusiasm for technology integration, educators also advocate for a balanced approach that respects the value of traditional teaching methods. This perspective recognizes that technology should serve as a complement to, rather than a replacement for, conventional literacy instruction methods. The role of physical books, direct teacher instruction, and hands-on activities remains vital in developing foundational literacy skills. Educators are keenly aware of the benefits that technology can bring to the learning process, yet they emphasize the need for a balanced approach that incorporates both digital and traditional methods. This nuanced understanding of technology's role in education suggests a comprehensive approach to literacy instruction that leverages the best of both worlds to support diverse learners and enhance reading development.

Theme 2- Engagement and Motivation -revealed that technology can transform reading instructions by making it more engaging, personalized, and accessible. Teachers believed in the importance of engagement and motivation for students' success. As Karchmer-Klein and Shinas (2012) highlighted, integrating technology in the classroom requires thoughtful planning to ensure that digital tools enhance rather than overshadow traditional literacy practices. Moreover, the engagement factor of technology cannot be overstated. Digital tools and resources have the potential to make learning more interactive and engaging, thereby increasing student motivation and interest in reading. Gamification, multimedia content, and interactive e-books are examples of how technology can make reading a more dynamic and enjoyable experience. As stated by Godwin-Jones (2014), leveraging technology in this way can significantly enhance student engagement and motivation, which are critical components of effective learning.

Believing in the value of technology can lead teachers to seek out and utilize digital tools and resources that create engaging and interactive learning experiences for students. Thus, the extent to which teachers believe in the importance of technology directly influences their efforts to promote student engagement and motivation through technology integration.

Theme 6 -Support for Diverse Learners- revealed that the use of technologies is helpful in providing support in reading skills development for diverse learners. This theme also indicates participants' perspectives on strategies, resources, and support systems necessary to ensure that all learners, regardless of their backgrounds, abilities, or learning styles, receive appropriate support and instruction in reading. Teachers' beliefs about the importance of technology may stem from their recognition of its potential to support diverse learners' needs in the classroom. If teachers believe that technology can provide personalized learning experiences, accommodate different learning styles, and enhance accessibility for all students, they are more likely to prioritize its use. Believing in the importance of technology lead teachers to explore and implement digital tools and resources that address the diverse needs of students, thereby supporting inclusive practices in the classroom. (Tred, 2024).

## Opportunities and Challenges

Teachers unanimously agreed on the use of technology in the classroom, with a wide range of usage levels reported. This suggests that while technology is a common element in teaching reading, the extent and manner of its use vary significantly. The positive attitudes toward technology's role in education and the expressed need for enhanced PD indicate a clear recognition of technology's potential to support reading

development alongside a critical awareness of the gaps in teachers' preparedness to maximize this potential.

Challenges such as ensuring equitable access to technology, addressing technical issues, and managing the balance between digital and traditional learning experiences were frequently mentioned. These challenges highlight the practical considerations that teachers must navigate when integrating technology into their teaching practices. On the other hand, the potential for technology to support diverse learners, including ESL students and struggling readers, was also emphasized. Technology's ability to offer personalized learning experiences and adapt to individual student needs presents a significant opportunity to enhance reading development in early education.

## Implications for Practice

The findings from this study have several important implications for educators, school administrators, and policymakers concerned with the integration of technology into early reading instruction.

**For Educators:**

1. **Professional Development:** There's a clear need for ongoing, targeted professional development that introduces educators to new technologies and provides them with strategies for effectively incorporating these tools into their reading instruction. Educators should seek out PD opportunities that offer hands-on experiences with technology and demonstrate practical applications in the classroom.
2. **Balanced Approach:** Educators should strive for a balanced approach to technology integration that complements rather than replaces traditional literacy

practices. This involves leveraging technology to enhance engagement and personalization while also valuing the importance of direct instruction, physical books, and hands-on learning activities.

3. **Collaboration:** Creating a community of practice among teachers can facilitate sharing technology integration strategies, tools, and resources. Educators can benefit from peer-to-peer learning opportunities within their schools and broader professional networks.

**For School Administrators:**

1. **Resource Allocation:** School administrators should ensure that classrooms are equipped with the necessary technological resources to support reading development. This includes not only hardware like tablets and smart boards but also access to educational software and digital content.
2. **Support for PD:** Administrators play a crucial role in supporting professional development efforts. They should prioritize funding and time allocations for PD that are focused on the effective use of technology in reading instruction. Facilitating connections with educational technology experts and organizing collaborative learning opportunities can further enhance teachers' skills.
3. **Policy and Planning:** School policies should reflect a commitment to technology integration that supports diverse learners and promotes engagement and personalization in reading instruction. Strategic planning is essential to align technology use with curricular goals and to ensure that technology adoption is sustainable and effective.

**For Policymakers:**

1. **Funding and Resources:** Policymakers should advocate for and allocate funding towards technologies that support early reading development. Investments in educational technology should be accompanied by funding for professional development, ensuring that teachers are equipped to use these tools effectively.
2. **Research and Evaluation:** There's a need for continued research into the impact of technology on reading development. Policymakers can support initiatives that evaluate the effectiveness of technology integration strategies and explore innovative approaches to using technology in the classroom.
3. **Standards and Guidelines:** Developing standards and guidelines for technology use in reading instruction can help ensure that technology integration is purposeful and effective. Policymakers can establish benchmarks for technology use based on best practices and research findings.

The results of this study provide valuable information related to the development of standards and guidelines for technology use in reading instruction. The themes emerged as results of this study indicate that technology in classrooms can help the teachers to address the diverse needs and challenges faced by educators. The implications drawn from the study's findings are as follows: These results of this study also showed that the standardization efforts should recognize the importance of personalized and differentiated instruction through technology. Guidelines can emphasize the use of adaptive learning platforms, multimedia resources, and interactive apps to improve reading experiences to individual student needs and learning styles. Benchmarks can be set to ensure that technology tools support diverse learners effectively, offering multiple pathways for engagement and comprehension. Furthermore, the guidelines for

technology use should prioritize the strategies that enhance student engagement and motivation in reading activities. By aligning with this theme, guidelines can encourage educators to leverage technology as a means to create meaningful and enjoyable reading experiences for all students.

The result of this study showed that balance between tech and tradition is an important theme. This theme recommends that the standardization efforts must address the tension between technology and traditional teaching methods. Guidelines should promote a balanced approach that acknowledges the value of both digital and traditional resources in reading instruction. Along with this, the standards and guidelines should prioritize access to resources and ongoing professional development opportunities for educators. Policies can advocate for increased investment in technology infrastructure, ensuring equitable access to devices, software applications, and digital content. Additionally, guidelines should recommend targeted workshops, seminars, and online courses that provide practical strategies for integrating technology into reading instruction effectively. All in all, the emerged themes from this study provide a foundation for the development of standards and guidelines that promote purposeful and effective technology use in reading instruction. By aligning with these themes, policymakers and educational stakeholders can support teachers in implementing technology to enhance student engagement, motivation, and reading skills development in today's classrooms.

## Limitations of the Study

This research study, aimed at understanding K-3 teachers' use of technology to support students' reading development, has several limitations that may have impacted the results.

First, the sample size, consisting of 8 teachers, is a relatively small and non-representative sample which limits the generalizability of the findings to all K-3 teachers. Diverse educational settings may employ varying levels of technological integration due to factors like funding, teacher readiness, and administrative support. To better understand how widely or effectively technology is being used across different regions or school settings would require a large sample size.

Participants' individual teaching philosophies, comfort levels with technology, access to resources, and instructional goals may influence their usage patterns. The participants (teachers) from the survey with higher usage scores may have good access to technology, and they extensively use technology to differentiate instruction, provide personalized learning experiences, and address the needs of students.

Second, the methodology based on surveys and interviews may reflect biases related to self-reporting. Teachers' perceptions of their technology use might not accurately reflect their actual practices. The reliance on self-reported data could affect the accuracy of the findings, potentially overestimating the positive impacts of technology use.

Third, participation bias is another limitation. Teachers who are more enthusiastic or confident about their technology use might have been more likely to participate in the study. This could have led to an overrepresentation of positive experiences with

technology and an underrepresentation of educators' challenges or negative experiences. The aforementioned limitations could have influenced the study's results, leading to an overly optimistic portrayal of technology integration in K-3 reading instruction. Participants' individual teaching philosophies, comfort levels with technology, access to resources, and instructional goals may influence their usage patterns. The participants (teachers) from the survey with higher usage scores may have good access to technology, and they extensively use technology to differentiate instruction, provide personalized learning experiences, and address the needs of students.

Fourth, since this study was conducted in Michigan, the use of technologies in this specific geographic area may not be representative of other geographic areas.

Fifth, this study provides an overview of teachers' experiences and practices at a particular point in time. This design may not capture longitudinal changes or trends in the use of technology over an extended period.

Finally, while efforts were made to minimize researcher bias during data collection and analysis, the researcher's perspectives and interpretations may still influence the findings to some extent. It is essential to consider these limitations when interpreting the study's findings because these limitations highlight areas where future research can expand and refine the understanding of teachers' use of technology in supporting students with challenges related to reading development.

## Directions for Future Research

Given the limitations identified, future research should aim to address these gaps and expand our understanding of technology's role in supporting reading development in early education.

First, increasing the sample size and ensuring it is representative of various educational contexts is crucial. Future studies should strive for broader geographic representation and include schools with differing technology access and integration levels. This approach would provide a more comprehensive and nuanced picture of technology use in reading instruction across different settings.

Second, incorporating a mixed-methods approach that combines qualitative interviews with quantitative measures could enhance the validity of the findings. For example, observational studies or classroom-based assessments could corroborate teachers' self-reported practices with actual classroom behaviors. Additionally, implementing pre-and post-tests to measure students' reading progress directly could offer objective evidence of technology's impact on reading development.

Third, addressing participation bias is essential for future research. Employing stratified sampling techniques or incentivizing participation across a wider range of teachers, including those who might be less confident or successful in integrating technology, could mitigate this bias. Capturing a broad spectrum of experiences and attitudes towards technology use is vital for developing a balanced understanding of its benefits and challenges.

Furthermore, exploring the specific types of technology tools and their direct impact on various aspects of reading development would provide deeper insights into effective

practices. Research could also examine the long-term effects of technology integration on students' reading skills beyond the early grades.

Lastly, future studies should investigate the professional development needs of teachers in greater detail. Understanding the barriers to effective PD and identifying models of training that successfully enhance teachers' technological pedagogical content knowledge are essential steps towards improving technology integration in reading instruction.

## Conclusion

This research underscores the dynamic role of technology in supporting reading development in kindergarten through third grade. It highlights the varied ways in which educators utilize technology, the challenges they face, and the potential benefits for students' learning. The emphasis on professional development and the balance between technology and traditional methods points to critical areas for future educational policy and practice focus. As technology continues to evolve, so too will its role in education, necessitating ongoing research, training, and dialogue among educators, policymakers, and researchers to ensure that technology effectively supports all students' reading development.

The integration of technology in kindergarten through third-grade classrooms offers significant benefits for reading instruction, providing engaging, interactive, and personalized learning experiences that traditional methods cannot match. Theoretical and empirical evidence supports using digital tools and platforms to enhance student engagement, facilitate differentiated learning, and improve reading outcomes. However, successful technology integration also depends on addressing challenges related to access

and teacher training. As technology continues to evolve, so must our approaches to incorporating it into educational practices, ensuring that all students can develop essential literacy skills in the digital age.

# APPENDIX A
# IRB APPROVAL

OAKLAND UNIVERSITY

Institutional Review Board

Date: December 8, 2023 Study #: IRB-FY2024-102

Study Tile: Kindergarten Through Third Grade Classroom Teachers' Use Of Technology To Support All Students Reading Development

Submission Type: Modification IRB Decision: Exempt

Research Team: Fatem Hadadi
Julie Ricks-Doneen

The IRB has reviewed the Modification submission related to the above referenced study and determined that the changes listed below do not affect the exemption status of the study. The Modification submission is Approved and the study remains Exempt per federal regulations.

The approved modifications are the following:
Revise the recruitment email script to include a statement about contacting the PI to schedule the interview.

This submission includes the following approved document: Revised recruitment email script.

You are approved to implement the aforementioned modifications. Please retain a copy of this notification for your records.

This letter can also be found in Cayuse under the Letters tab in the Submission Details page. If you have any questions, please contact the IRB office.

Thank you.
The Oakland University IRB

APPENDIX B
INFORMATION SHEET AND CONSENT FORM

Kindergarten through third-grade classroom Teachers Use Technology to Support all students

**Introduction**

You are begin asked to be in a research study that is begin done by Fatem NewHadadi, PhD student at Oakland University Early Childhood Education Program Human Development & Child Studies. My faculty advisor is Dr. Julie Ricks-Doneen, Associate Professor, Human Development and Child Studies. Your decision to participate in this study is voluntary. You can choose to stop your participation at any time or skip any part of the study if you are not comfortable. Your decision will not affect you present or future relationship with Oakland University, the researcher, the Department of Human Development and Child Studies. If you are a student or employee at Oakland University, your decision about participation will not affect your grade or employment status.

**What is the purpose of this study?**

The purpose of this research study is to focuses on to the teacher's use of technology to support children in the general classroom or with learning disabilities children.

**Who can participate in this study?**

You are being asked to participate in the study because you are a teacher who teaches using technology to support children learning in the classroom.

**What do I have to do?**

You will be asked to take part in interview about teacher's use of technology to support children in the classroom.

**Are there any risks to me?**

For this study, the potential risks are for someone who is not part of this research may accidentally see your personal information. We will try to make sure that this does not happen by keeping your research records as confidential as possible. When the results of this research are published or presented at conferences, no information will be included that personally identifies you. If you agree to take part in this research study, you will be asked for interview at a time and place of your choice.

**Are there any benefits to me?**

Although there may be no direct benefits to you, the results of this study may benefit others in the future.

**Will I receive anything for participating?**

You will not receive anything for participating in this study.

**What if I want to stop participating in this study?**

If you want to stop participating, you can inform the research by sending an email or by calling.

**Who can I contact if I have questions about this study?**

You can contact the researcher, FatemHadadi, via email: fhadadi@oakland.edu and phone number: 248-659-2508. Also, you could contact the adviser Dr. Julie Ricks-Doneen via email: ricksdon@oakland.edu or phone number: 00000000000

For questions regarding your rights as a participant in human subject research, you may contact the Oakland University Institutional Review Board, 248-370-4898

# APPENDIX C
# SURVEY QUESTIONS

Kindergarten through third-grade classroom Teachers Use Technology to Support all students

Q1 Kindergarten Through Third Grade Classroom Teachers' Use of Technology to Support All Students Reading Development Introduction. You are being asked to be in a research study that is being done by Fatem Hadadi, a Ph.D. student at Oakland University Early Childhood Education Program Human Development & Child Studies. My faculty advisor is Dr. Julie Ricks-Doneen, Associate Professor, Human Development and Child Studies. Your decision to participate in this study is voluntary. You can stop your participation at any time or skip any part of the study if you are uncomfortable. Your decision will not affect your present or future relationship with Oakland University, the researcher, or the Department of Human Development and Child Studies. If you are a student or employee at Oakland University, your decision about participation will not affect your grade or employment status. What is the purpose of this study? The purpose of this research study is to focus on to the kindergarten through third-grade classroom teachers' use of technology to support all students' reading development. Who can participate in this study? You are being asked to participate in the study because you are a kindergarten through third grade teachers. What do I have to do? You will be asked to take an online pre-survey that may take 10-15 minute to complete. In the survey, you will be asked to provide your email if you are interested in participating in a 40-60 minute long Zoom interview about teacher's use of technology to support children in the classroom. If you agree to participate in the interview, you will be contacted to set up a time for the online Zoom interview. With your permission, the interview will be recorded via Zoom. The recording will be deleted after transcriptions are checked for accuracy. Are there any risks to me? For this study, the potential risk is that someone not part of this research may accidentally see your personal information. We will make sure that this does not happen by keeping your research records as confidential as possible. When the results of this research are published or presented at conferences, no information will be included that personally identifies you. Are there any benefits to me? Although there may be no direct benefits to you, the results of this study may benefit others in the future. Will I receive anything for participating? You will receive a $10 gift card for participating in this study. What if I want to stop participating in this study? If you want to stop participating, you can inform the researcher by email or calling. Who can I contact if I have questions about this study? You can contact the researcher, Fatem Hadadi, via email at fhadadi@oakland.edu and by phone: 248-659-2508. Also, you could contact the adviser, Dr. Julie Ricks-Doneen, via email: ricksdon@oakland.edu or phone number 248-370-4168. For questions regarding your rights as a participant in human subject research, you may contact the Oakland University Institutional Review Board at 248-370-4898.
Do you wish to complete the survey?

- Yes (9)
- No (10)

*Skip To: End of Survey If Kindergarten Through Third Grade Classroom Teachers' Use of Technology to Support All Students Re... = No*

Q2 What is your highest educational degree?
- Bachelor's degree
- Master degree
- Doctorate degree
- Other (please specify) _____

Q3 What grade are you teaching this year?
- Kindergarten
- First grade
- Second grade
- Third grade
- Other (please indicate)_____

Q4 How many years have you been teaching?
- Less than 1 year
- 1-3
- 4-6
- 7-9
- 10 or more

Q5 Have you ever had any students who were struggling more than usual with reading?
- Yes
- Unsure
- No

Q6 Have you ever wanted to recommend a student who was struggling with reading to be evaluated for an IEP?
- Yes
- Unsure
- No

Q7 Have you ever taught any students who had an IEP?
- Yes
- Unsure
- No

Q8 Have you ever had any students whose IEP components included for reading skills?
- Yes
- Unsure
- No

Q9 Do you have experience using technology in the classroom?
- Yes
- No

Q10 Do you currently use technology in the classroom?
- Yes
- No

Q11 How much do you use technology with children to develop their reading skills?

Not at all | Sometimes | Every day

0 1 2 3 4 5 6 7 8 9 10

| | |
|---|---|
| Amount of use () |  |

Q12 Please indicate your agreement with the following statements about technology.

Strongly disagree | Neither Agree or Disagree | Strongly Agree

0 1 2 3 4 5 6 7 8 9 10

| | |
|---|---|
| Technology can be used to teach many different skills. () |  |
| Technology helps students who are struggling. () |  |
| Technology supports students' reading development. () |  |
| Technology helps teachers identify areas where students have problems. () |  |
| Technology helps students build their reading skills. () |  |
| Different programs and apps can be useful resources to grow student skills. () |  |
| I got practical technology training from my district/schools. () |  |

Q13 How would you rate your feelings about using technology to support reading development?

I could do without it | I could not teach without it

0 1 2 3 4 5 6 7 8 9 10

| | |
|---|---|
| Rating () |  |

# APPENDIX D
# INTERVIEW QUESTIONS

Teacher Support Students by Using Technology In The Classroom

**Interview script:**

Thank you for completing the pre-interview survey and for agreeing to participate in an interview with me. I appreciate your time. I will be recording this interview to help me later with transcribing participants' responses. The recordings will be stored on a secure site, and once I am sure the transcriptions are accurate, I will be deleting the recordings.

**Interview Questions:**

1. How do you think Kindergarten through third-grade teachers use technology to support all students' reading development?
    - Describe how technology is effective in supporting them.
    - If you have students struggling with reading, do you do anything additional or different for them?
    - Do you have any other additional kind of tools or programs that you used with them?

2. How do you decide what technology you use to support reading development?

2. What other kinds of resources do you feel you need, or would you like, about using technology to support reading development?
    - Do you get training from the school or district?
    - Is it useful?
    - Are you successful with using technology to support reading development?
    - Do you feel there are barriers you have experienced with using technology to support reading development?

4. I am curious about changes in the use of technology over?
    - In what ways do you feel the use of technology to support reading development has changed over time (for example, in the last 10-20 years) in kindergarten through 3rd grade classrooms?
    - During the time that you have been teaching, what changes have you noticed?

5. Tell more about your feeling using technology to support students' classroom reading skills?
    - Interviewer will refer to the last question on the survey.

# APPENDIX E
# OVERVIEW OF INTERVIEWS

| Participants | Teachers' Interviews |
|---|---|
| **Interview 1** | The interview with participant 1 (P1), a 1st-grade teacher, provided insights into several aspects of technology use in reading development. P1 uses an app associated with their reading program, Super Kids, which includes diagnostic tools, assessments, and learning games aligned with the curriculum. This technology is primarily chosen by the school and is essential for engaging students and supporting personalized learning. The main tools mentioned include the Super Kids app for the reading program, supplemented by the Secret Stories program for phonics, along with various purchased resources such as games and reading books from Teachers Pay Teachers.<br>The choice of technology is largely determined by the school, based on access and available resourcesP1 expressed a desire for more integrated apps that allow for differentiation among students within the same platform, to make management easier and learning more meaningful. The importance of technology is acknowledged, especially for its role in making learning engaging and accessible. Training was provided for the Super Kids program, which was found useful, indicating a positive perception of technology's role in education. Barriers include logistical issues like login problems and internet connectivity. This interview highlights the evolving role of technology in early education, balancing between its benefits in engaging and supporting diverse learners, and the challenges of managing digital tools and maintaining student interest amidst abundant entertainment options. |
| **Interview 2** | The interview with participant 2 (P2), a 2nd-grade teacher, provided insights into her use of technology for reading development. She has utilized programs like Raz-Kids and Epic, emphasizing their role in improving listening comprehension and offering interactive quizzes. P2 highlighted the reliability of technology for students and its potential to reduce frustration among struggling readers. However, she mentioned a lack of significant professional development in technology integration and expressed a desire for research-backed resources to make informed decisions. P2's approach to technology is cautious, preferring a balance between traditional reading methods and digital tools, indicating she values technology but also sees the importance of hands-on learning with books and physical materials. |
| **Interview 3** | The interview with participant 3 (P3) a 1st-grade teacher, provided detailed insights into the use of technology to support reading development. She discusses a blend of traditional and technological approaches, emphasizing the importance of balance. P3 mentions using platforms like Epic and PebbleGo for research and reading, highlighting the accessibility of digital books and resources. She also describes using |

| | |
|---|---|
| | technology for creating audio books and enhancing fluency practice. Despite the advantages, P3 acknowledges challenges such as ensuring appropriate use and the potential for technical issues. She values technology as a tool for differentiation and engagement but stresses the importance of maintaining a human connection and the tactile experience of physical books. This reflects a nuanced perspective on integrating technology in reading instruction, considering both its benefits and limitations. |
| **Interview 4** | In participant 4 (P4)'s kindergarten class, technology is used to support reading development through visualizers connected to smart boards for book introductions and online assessments with I-Ready to gauge reading levels. She finds technology especially beneficial for struggling readers, using interactive websites for high-frequency word recognition and smart board activities for engagement. P4, a first-year teacher, chose technology based on mentorship experiences, highlighting the use of Chromebooks, smart boards, and educational games. She expresses a desire for more training on technology troubleshooting and collaboration with peers on technology use. P4 views technology as effective and essential for preparing students for future technological interactions, emphasizing its role alongside traditional learning methods. |
| **Interview 5** | Participant 5 (P5), a 2nd-grade teacher, utilizes technology to support reading development through apps like Espark, emphasizing personalized learning paths based on student needs. She discovered effective tools during student teaching in a low-income school, incorporating programs like Raz-Kids and Khan Academy. While P5 appreciates the professional development offered, she desires more specific training on reading programs. She values technology's role in education but advocates for a balanced approach, ensuring students also engage with traditional reading methods. Technology aids in engagement and personalized learning but is complemented by direct instruction and physical materials. |
| **Interview 6** | The Participant 6 (P6)'s interview focused on the use of technology in early childhood education, particularly in transitional kindergarten (TK). She utilizes technology for interventions and literacy, appreciating programs that adapt to student needs and progress. P6 faces challenges with technology, such as the practicality of Chromebooks for young learners and desires for more accessible devices like iPad. She values technology for differentiation and engagement but emphasizes the importance of training and resources for effective integration. Participant 6’s perspective underscores a cautious but optimistic approach to technology in supporting foundational reading skills. |

| | |
|---|---|
| **Interview 7** | The participant 7 (P7), a 3rd-grade teacher, uses technology to personalize learning through programs like Raz-Kids and I-Ready, adjusting to various student levels. She finds technology particularly helpful for ESL students, allowing them to translate and learn at their own pace. P7 selects technology based on district resources and personal judgment for what best suits her students. While she has received some training, she expresses a desire for the ability to extend technology use outside the classroom and for more diverse online reading resources. P7 sees technology as essential for modern education but stresses the importance of balance with traditional learning methods. |
| **Interview 8** | The participant 8 (P8) emphasizes the balance between technology and traditional learning methods. She highlights the use of platforms like Epic and I-Ready for reading resources and assessments but stresses the importance of direct, human-led instruction, especially for struggling readers. P8 points out the shift back to phonics and direct teaching methods over whole language learning, indicating a nuanced view of technology as a supplementary tool rather than a replacement for traditional teaching methods. She suggests a modest, targeted use of technology, tailored to individual student needs, can be beneficial. |

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