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Investigating Early Childhood Educators' Experiences In Teaching Phonological Awareness: A Case Study

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INVESTIGATING EARLY CHILDHOOD EDUCATORS' EXPERIENCES IN TEACHING PHONOLOGICAL AWARENESS: A CASE STUDY

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ABSTRACT

Literacy instruction, or teaching educators how to teach reading, is increasingly important as the effects of illiteracy impact everyone from the individual level to the societal level. The cost of illiteracy to the global economy is estimated at $1.2 trillion U.S. dollars (World Literacy Foundation, 2015). Improving literacy for all becomes a social justice concern as access to literacy opens avenues to further education and to improved physical and mental wellbeing. Over the past forty years, neurocognitive and behavioral science has demonstrated how the human brain learns to read. However, educator training programs and professional development have not kept pace with emergent science, leaving educators ill prepared to teach reading. The problem addressed in this study was the impact of professional development about the science of reading, specifically improving educators' own understanding phonological awareness, beliefs and perceptions of reading instruction. Three research questions guided this study. Educators were asked to describe their professional development experiences in the areas of literacy and phonological awareness; to describe any changes they made to their pedagogical practices as a result of their learning; to use their observational skills and to indicate if they observed students responding to the changes the educators made to their instructional practices.

Five themes emerged from the data analysis, including a) Change, b) Collaboration, c) Confusion, d) Confidence, and e) Communication. Findings from the case study described

educators' recommendations on how to improve professional development and instructional processes. Recommendations included clear consistent communication, differentiated and tiered professional development, and time for knowledge building, collaboration and application. Providing educators with the knowledge to fill in the gaps in their understanding, the time to process, reflect, and apply the research and strategies as well as the purpose and rationale behind the professional development will aid them in making meaningful pedagogical change.
Keywords: phonemic awareness, phonological awareness, literacy, reading, five pillars of reading, educator preparation programs, phonology, literacy professional development, science of reading, reading wars, Simple View of Reading, Cognitive Foundations Framework.

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DEDICATION

I dedicate this dissertation to my husband and children, who continually inspire me, challenge me, and show me that expanding boundaries and pushing the limits is critical to growth. To Paul, Megan, and Thomas, your love, continual support, and encouragement were invaluable to this endeavor. Thank you for always believing in my ability; I know I would not have completed it without your encouragement, dedication, and reassurance.

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CHAPTER ONE

INTRODUCTION

People are not wired to read (Korbey, 2015). Snow (2020) states that "reading is a "human contrivance that has existed for only approximately 6000 years" (p. 3). Yet, literacy is considered an essential life skill with the benefits of literacy being far-reaching (Khan, Saeed-Khan, Yousafzai, & Khan 2019; Hanford, 2019; UNESCO, 2019). Miller and McCardle (2019) posit that "literacy provides access to and facilitates meaningful and sustained engagement with critical societal systems and infrastructures such as health care, education and broader civic engagement" (p. vii). The ability to read is "profoundly transformative, both for individuals and for a population's health and wellbeing" (Snow, 2020, p. 1). Many countries use literacy rates to account for the educational attainment of their populace, as it results in a more educated labor force (Federal Reserve Bank of Cleveland, 2019).

Roser and Ortiz-Ospina (2018) explain that with the rise in literacy rates, the rates of inequalities between counties in the United States decreased. Additionally, with the rise in literacy rates, the standard of living increased for the population (Roser & Ortiz-Ospina, 2020). According to the READ Educational Trust (2017), literacy provides economic, social, health and nutritional benefits. People who read proficiently have more access to text, language, and diverse ideas; thus developing a richer and broader vocabulary and developing more background knowledge that informs reading and writing comprehension (Gonsalves, 2015). Miller and McCardle (2019) share that literacy, "particularly reading, provides access to and facilitates meaningful and sustained engagement with critical societal systems and infrastructures such as health care, education, and broader civic engagement" (p. vii). Literacy is a crucial life skill for human development.

Personal Interest

As an early elementary educator for over 20 years, I have observed student literacy rates remain stagnant for over ten years according to district, state and federal summative assessments (Hanford, 2019; NCES, 2019). These literacy rates are in line with national and international standardized assessment scores. Hempenstall (2013) as cited in Snow (2020) posits that reading failure is approximately 30% yet the neurocognitive science in the past four decades indicates that 95% of children can learn to read. A disconnect exists between the research and the practice of teaching reading.

Professional development experiences provided by school districts vary by quality, duration, and intensity. Many school districts goals and objectives vary annually; requiring frequent shifts in professional development experiences and opportunities. Mid-career and novice educators with less access to professional development require content knowledge in the science of teaching literacy. This highlights the need for a study that focuses on specific content, phonemic and phonological awareness, and educators' perceptions as they learn about and teach the specific content area.

Literacy is one of the most widely studied and researched of human skills (Castles, Rastle & Nation, 2018; Shaywitz, 2003; Snow, 2020). Since the 1600s, researchers in the psychological sciences and neurocognitive fields have been seeking to determine how people learn to read. Snow (2020) explains that educators "should be successfully teaching 95% of children to read, yet in reality high rates of reading failure are common in western industrialized nations" (p. 1). Castles et al. (2018) indicate that research has coalesced around a "strong scientific consensus around the importance of phonics instruction in the early stages of learning to read" (p. 6) with the information corroborated by significant governmentally funded studies such as the National

Reading Panel in the United States, The Rose Review in the United Kingdom, and the Department of Education Science and Training in Australia. Snow (2020) explains that these three governmentally funded reports explain the "linguistic basis of learning to read" (p. 8) and indicate that direct explicit instruction in the "alphabetic principle and how phonemes and graphemes map" (p. 8) are necessary to teach reading to students. However, while the consensus about the importance of literacy exists along with the major components required to effectively teach literacy, literacy rates remain stubbornly consistent in the United States with 34% of fourth-grade students achieving at or above the National Assessment of Educational Progress (NAEP) proficiency level (NCES, 2019). This indicates that 65% of fourth-grade students are achieving within the basic or below basic proficiency level (NCES, 2019). These rates of literacy have remained relatively static since the early 2000s (NCES, 2019). This indicates that a challenge continues to exist in improving literacy for students at the elementary level.

Snow (2020) posits that literacy is "widely agreed to be an essential skill for living in first world developed economies" (p. 3) When people are less skilled in literacy, they are at a disadvantage not only in reading but also in other aspects of their lives. Illiteracy affects the people, their community, their nation, and the world (Organisation for Economic Cooperation and Development (OECD), 2016). As of 2019, nearly 750 million people worldwide are unable to read, while over 250 million children are achieving below proficiency in basic literacy skills (UNESCO, 2019). Low literacy levels are correlated with poor physical and mental health as well as an increased probability of involvement with the legal and criminal justice systems (Ankney, 2019; Gottfried, 2015; Joshi, 2019; OECD, 2016; World Literacy Foundation, 2015). The World Literacy Foundation (2015) estimates the cost of illiteracy to the global economy at $1.2 trillion U.S. dollars. The effects of poor literacy impact everyone not only at the individual

level but societies as well. Improving literacy for all becomes a social justice concern as access to literacy opens avenues to further education and physical and mental well-being options.

Therefore, comprehensive literacy instruction needs to occur for individuals to acquire proficiency in reading and writing skills. Moats and Tolman (2020) explain that the human brain is hard-wired for spoken language and over the past 100,000 years, capacity for language has evolved and now is "fully adapted for language processing" (p. 1). Providing this instruction is crucial to individuals, communities and the overall economies of countries. However, while literacy rates continue to improve globally, inequities still exist (Roser & Ortiz-Ospina, 2020). Joshi (2019) explains that, in the United States, over 30 million adults cannot read or write above a third-grade proficiency level.

Several reasons exist for ineffective literacy instruction. Joshi and Wijekumar (2019) posit that oral language and socioeconomic status contribute to the poor literacy rates. Snow (2020) posits that oral language competency is another factor that impacts reading acquisition. Another hypothesis for why students struggle is a lack of direct systematic explicit instruction in the essential components of reading (Castles et al., 2018; Eunice Kennedy Shriver National Institute of Child Health and Human Development, 2000). Hanford (2019) argues that literacy teacher preparation is misguided or perpetuated by scholars who believed that reading is a process that is derived naturally.

Joshi and Wijekumar (2019) posit that the lack of educator knowledge about the science of teaching reading impacts student literacy instruction and acquisition. Moats (1994) identified that many classroom educators have an incomplete understanding of how to teach reading. While the research about reading development is voluminous, Snow (2020) and Moats (1999) discuss that the consensus to integrate and to teach reading across the domains of education, speech and

language, and others, remains elusive. This may be a contributing factor as to why pre-service educators are under prepared to teach reading. However, pre-service educators, in a study conducted by Binks-Cantrell, Washburn, Joshi and Hougen (2012), overestimated their own individual ability to teach reading. These researchers found that pre-service teachers performed better on assessments of literacy knowledge when taught by higher education faculty with experience in literacy instruction. The educator's perceptions of their own individual skills can impact how educators are teaching students to read.

Laura Stewart, director of the Reading League, as cited in (Gewertz, 2020) explains that state-level educational leaders are becoming increasingly aware of these problems and are passing legislation to require pre-service educators to master "reading instruction that's solidly grounded in research" (p. 1). While the expansion of legislation surrounding the teaching of content is not novel, the voluminous research behind how to reach reading has reached a crescendo; the components necessary to teach reading are now considered settled science (Gewertz, 2020). Legislators, in concert with families, education professionals and researchers, are working to create requirements for pre-service and in service educational professionals (Gewertz, 2020). Since 2017, "11 states have passed legislation to "expand evidence-based reading instruction in grades K-3" (Gewertz, 2017, p. 1). While states have varying rules for teacher preparation and licensure, states across the country are working together to create a plan for ensuring that the educators have a foundation in how to teach reading (Gewertz, 2020). For example, in a personal interview with K. Tipton, February 15, 2020, Tipton explained that, in New Mexico, teacher special education licensure requires six hours in the teaching of reading, but it does not specify comprehensive literacy instruction that includes all critical components. In Arkansas, the 2017 Right to Read Act was passed that created new requirements for pre-service

educators and Institutes of Higher Education (IHE) to demonstrate proficiency in the science of teaching reading. The Arkansas legislation also provides methods by which experienced educators must demonstrate proficiency in reading instruction skills as well. However, the great effort, according to Stacy Smith, Arkansas' assistant commissioner for learning services, has been to change people's attitudes about the science of teaching reading (Gewertz, 2020).

This overestimation of educators' experience and their ability to teach reading is one of the foundations of the study. Educators attend institutes of higher education expecting to receive the training necessary to provide the instructional strategies and pedagogical practices to teach their students. The Southern Regional Education Board (SREB) 2018 report noted that only 25% of the teacher preparation programs surveyed provided instruction in the five components of literacy instruction. This rate has increased to 39% with additional progress in states' requirements for teacher licensure through the use of teacher licensure examinations (SREB, 2018). Progress in undergraduate programs is occurring with educators being trained in the science of teaching literacy. The National Council on Teacher Quality (NCTQ, 2020) found that over two-thirds of surveyed educators do not have a strong foundation in the subjects they teach and only 50% of the sampled education programs teach the essential components of literacy identified by the National Reading Panel. This is an increase from the 35% of traditional instructional programs sampled in 2013 (NCTQ, 2020). Interestingly, graduate programs remain less responsive to the current science behind literacy instruction. Unfortunately, educators with degrees and certifications from their states may be unaware they were provided less robust literacy preparation. The educators' perception of their skills and confidence in which they can deliver reading instruction may often "exceed their knowledge" (Buckingham & Meeks, 2019, p. 6).

Statement of the Problem

Veteran educators as well as pre-service educators may not have had the benefit of the instruction in the science of teaching reading (Greenberg, McKee, & Walsh, 2013; Moats, 2020; SREB, 2018). Moats (2020) explains that educators require additional instruction to fill in gaps in their training and to fully understand the foundations upon which literacy instruction rests. Training in phonemic awareness and phonics is essential to early literacy instruction. Educators require more training in these domains to increase their own effectiveness (Moats, 2020). Across the United States, to meet their staffs' professional development needs and to assist in closing the research to practice gap, districts provide extensive training in the science of how to teach reading, specifically phonological and phonemic awareness. The problem in the field is that many educators are under prepared to teach reading to the nation's youth due to multiple factors, from inconsistent state requirements to a patchwork of institutions' of higher education preparation programs own focus.

Purpose of the Study

This researcher aimed to understand how educators process and experience their own knowledge and affective experiences as they learn, integrate, and assimilate novel information as they acquire the research behind the science of teaching reading. The research documented how educators describe their experiences as they acquire, learn, process, assimilate knowledge about the science of teaching reading, specifically phonological awareness and proficiency.

The purpose of this intrinsic case study is to describe and to understand the experiences of educators through the perceptions of early elementary education staff in a small public school as they pursue and participate in professional development about the science of teaching reading (Baxter & Jack, 2008; Creswell & Poth, 2018; Stake, 1995). Professional development in reading

for this study is defined specifically as phonological awareness training. The study's central phenomenon focus is influenced by the research literature indicating that educators with all levels of academic attainment are often less prepared to teach reading to students specifically in the area of phonological awareness and automaticity (Cohen et al., 2017; Cunningham et al., 2004; Kilpatrick, 2015; McMahan et al., 2019; Moats, 2020; Snow, 2020). This case study occurred in two sites in a small public school in New England. Educators have been participating in training in the science of reading, specifically phonological awareness and automaticity.

Research Questions

Educator preparation in how to teach basic literacy skills varies widely across institutes of higher education programs in each state of the United States. According to the NCTQ (2020b), Texas has developed best practices in teaching elementary educators so that they have "sufficient knowledge of the science of reading instruction" (p. 1). Texas requires their elementary education preparation programs to address the science of reading in their educational curriculum. The Colorado State Department of Education made changes to their Colorado Reading to Ensure Academic Development (READ) act in their senate bill SB 19-199. The Colorado legislature declared that "(ii) research shows that reading instruction that is focused around the foundational reading skills of phonemic awareness, phonics, vocabulary development, reading fluency including oral skills, and reading comprehension is highly effective in teaching young children to read" (Colorado Gen. Laws, 2019). In this bill, the state required that early elementary educators Kindergarten through 3rd grade be trained and demonstrate proficiency in teaching reading (Colorado DOE 2020).

Yet NCTQ (2020b) has found that "74% of all teacher education programs fail to explicitly cover all five components of scientifically-based reading instruction" (p. 2). Schimke

(2020) in her review of local Colorado education news, reported that "state officials ordered one of Colorado 's largest teacher preparation programs to change the way it covers reading instruction as evaluators found texts used in the reading courses contradicted or dismissed science-based approaches to reading instruction" (pp. 1-2). Texas is highlighted as the only state as of 2020 that adheres to the best practices in which all new elementary educators are required to pass a rigorous test of instruction as of 2021 (NCTQ, 2020). Seventeen states, such as Massachusetts, Arkansas, Connecticut, Mississippi, New Hampshire, North Carolina, Ohio and Wisconsin, are also using an assessment that uses scientifically-based reading principles (NCTQ, 2020). These states currently meet the goals to prepare elementary educator preparation. In 2020, two states, according to NCTQ (2020) are close to meeting the goal of educator preparation, while six states remain significantly far away from meeting the goal of educator education.

This lack of standard preparation is a concern for pre-service and mid career education professionals. While educator programs are making progress in training undergraduate pre-service educators, graduate education programs continue to vary in their ability to train educators in the science of reading (NCTQ, 2020). Expanding legislation across different states continues to impose new regulations on the requirements for educators to demonstrate their proficiency in reading skills (Gewertz, 2020).

However, districts rely upon multiple formats of professional development, from in-service training to outside contracted experts, to fulfill the gaps in the research to practice processes and to meet educator and student needs (Allen & Kelly, 2015; Folsom, Smith, Burk, & Oakley, 2017). Many myths about how students learn to read continue to blur the settled science behind how to effectively teach reading, impacting community's and educators' understanding and perceptions of what is effective literacy instruction (Wren, 2020). To understand educators'

experiences and perceptions of their own expertise while participating in literacy professional development processes as they learn more about how to teach reading, the researcher asked the following questions.

RQ1: How do early elementary educators describe their professional development experiences in the specific areas of literacy and phonological awareness?

RQ 2: How do early elementary educators in a small public school district describe any changes to their pedagogical practices as they've learned the science of teaching reading?

RQ 3: How do early elementary educators observe their students responding to their changed literacy practices in phonological awareness?

Conceptual Framework

The study explores educators' experiences and perceptions as they teach phonological awareness skills to early elementary students while the educators undergo literacy professional development in the science of reading. Researchers indicate that poor academic outcomes are likely for students who have not achieved reading proficiency by the end of third grade (Durrance, 2017; NCES, 2019; Schneider, 2019). The research to practice gap, educators' own understanding and knowledge of the science behind teaching literacy, and the implementation of the research, must be addressed if lifelong challenges with reading are to be avoided and remediated (Binks-Cantrell et al., 2012; Miller & McCardle, 2019). For example, according to the National Council of Teachers of English (NCTE) (2019), reading is an activity that makes "demands upon the reader" (p. 1) inclusive of phonics. Researchers have noted that students must learn to "read with accuracy and proficiency, have access to multi-genre materials, study vocabulary, text and word structure, and respond to reading material through creative

expression" (NCTE, 2019, p. 3). These general guidelines can be part of the Simple View of Reading, a "model that defines reading comprehension as a product of lower skills such as word recognition and higher level thinking processes such as listening comprehension" (Birsch & Carreker, 2018, p. 840).

The science of reading focuses on all components of literacy instruction, the five pillars as explained in the National Reading Panel Report of 2000. Many of the principles articulated by the NCTE are included in the reading comprehension part of the Simple View of Reading. The phonological awareness and phonology components are found within the second half of the Simple View of Reading, the word reading component. Therefore, although researchers have multiple perspectives on reading, the underlying components are intertwined. The Simple View of Reading theory and, by extension, the Cognitive Foundations framework provides a schema and representation that depict how the components rely and build upon each other.

Researchers have discovered though behavior and neurocognitive science how people learn to read. Through functional magnetic resonance imaging (fMRI), researchers have found that spelling and phonological instruction can improve word decoding skills, the word reading component of the Simple View of Reading (Long, 2015). A gap exists in the knowledge between what researchers know about the science of teaching reading and educators who are inefficiently or ineffectively implementing the reading components through lack of knowledge, ideological differences or other factors outside of the educator's control. This study applies two underlying theoretical frameworks to document the educator's understanding of the science behind literacy instruction and connect the educator's own learning acquisition and processes.

The study's conceptual framework is bounded and supported by the cognitive foundations framework of literacy instruction and the theoretical framework of the

transformational learning theory. The Cognitive Foundations framework by Tunmer and Hoover (2019) provides the scaffold by which educators can expand on their understanding of the Simple View of Reading theoretical framework. Educators participated in training in the science of reading, learning or expanding their knowledge of the Simple View of Reading. This approach provides the underlying framework upon which educators can build and integrate their existing knowledge of how to teach reading (Birsh & Carreker, 2018; Hoover & Tunmer, 2018; Joshi, 2019). Educators, through professional development, can use their existing knowledge of how to teach literacy or enact literacy programs and integrate the Simple View of Reading construct to close the research to practice gap, thereby meeting student need.

Educators can explore the underlying cognitive processes that inform literacy instruction, using the framework as a scaffold for how students learn to read, speak, and comprehend language. The framework provides two parallel strands of literacy, providing educators with the necessary literacy components that can be used as student's literacy building blocks (Tunmer & Hoover, 2019).

Each literacy component is described with special attention to phonological and phonemic awareness. Researchers have identified the need for strong phonemic awareness and phonological awareness to build proficient readers (Castles et al., 2018; Moats, 2014; Seidenberg, 2017). Education professionals need instruction to understand both why phonological awareness and phonemic awareness are important as well as how to teach phonological and phonemic awareness.

The Mezirow Transformational Learning Theory, a constructivist, psychocritical approach that posits how adults learn, aids in the understanding of how educational training may impact educators' perspectives in teaching phonological awareness (Kitchenham, 2008; Taylor,

2001). Transformative learning provides two categories of learning, instrumental and communicative. The instrumental learning focuses on the cause and effect relationships, or the actual hands-on learning processes, while the communicative learning focuses on the values, beliefs and ideals involved with the learning types (Mezirow, 1991).

Transformational Learning theory explains that learners must use their own interpretation of their life experiences to make meaning, integrating their new understanding with their prior understanding and redefining or transforming problems to achieve resolutions (Baumgartner, 2001; Kitchenham, 2008). Educators in instrumental learning expand or revise their current schema on how literacy is taught. In this study, educator's beliefs, attitudes, and perceptions about how literacy is taught are explored to determine their current existing frame of reference, meaning schemas, and whether they are altered by their participation in professional development.

Transformational Learning Theory describes the need for critical self-reflection (Kitchenham, 2008). Self-reflective learning is the process by which learners question why they are learning the topic. Through self-reflection, critical discourse, and experience, educators may question why they are learning the literacy-based information especially when they have been teaching reading for many years or have attended institutes of higher education. This study explores educators' experiences as they participate in professional development on the cognitive science of reading. The study explores whether educators are able to integrate and to transform their meaning perspectives about how, when, and why reading instruction should be taught. It is through this self-reflection, a hallmark of Mezirow's perspective transformation, that educators come to understand the philosophical and neurological underpinnings of literacy instruction (Castles et al., 2018; Kershner, 2019; Kitchenham, 2008).

Scope, Limitations, and Assumptions

This study is bounded by a single case. It represents the experiences of a stratified, purposive sample of early elementary educators within a small public school district in the Northeastern region of the United States. Early elementary educators, grades pre-kindergarten through grade three, were included in the study as they are the professionals undergoing the training in the science of reading and implementing phonological awareness instruction. The study scope encompasses those professionals who received training in the science of teaching reading, specifically phonological awareness and phonemic awareness at the prekindergarten through early elementary level of education. The site involves two public school elementary buildings within one small town. Each site has their own administrative and educational staff to meet student needs. The researcher is an employee of the district and was a participant in the professional development at one of the elementary school sites.

The professional development in the science of reading, specifically phonological awareness, occurred over a multiyear timeframe inclusive of the year that was interrupted by the global coronavirus pandemic. Some educators have more experience than others as the professional development has been rolled out in a staged approach. Therefore, educators' experiences and integration of the knowledge varies. It is educators' experiences while participating in the study that is of interest and can contribute to the corpus of knowledge on training educators in the science of teaching reading. The study comprised 12 participants from grades prekindergarten through grade three.

Limitations exist in all studies. Stake (1995) posits that a "qualitative study is subjective" (p. 45) and it is this subjectivity that aids in understanding and comprehending the phenomena. By seeking patterns uncovered in the data collection, the researcher focused on the "centrality of

interpretation" (Stake, 1995, p. 42). The researchers own "stance" (Creswell & Poth, 2018, p. 172) may blind the researcher to different dimensions or interpretations of the collected data. As the researcher is an educator within one of the elementary buildings, reflexivity mitigates some of the challenges facing qualitative researchers (Attia & Edge, 2017). The researcher both consciously stepped back from the research to explore their own pre-understanding but also engaged in open dialogue and learned from participants, supporting researcher development and participant development through the etic issues that arise (Attia & Edge, 2017; Stake, 1995).

Other limitations focus on the access to the participants and the organization. Creswell and Poth (2018) discuss the limitations of a researcher when a site is selected in which the researcher has a vested interest. The researcher recruited individuals to be participants in the study by allaying their natural anxieties about sharing their perceptions, feelings, and experiences.

Additionally, the study gathered rich and thick descriptions from participants based upon a rapport and relationship between the participants and the researcher. Bloomberg and Volpe (2016) explain that, while interviews can be used to provide rich and thick descriptions, they can also be challenging as not all participants are "equally cooperative, articulate, and perceptive" (p. 155). The researcher sought to create a rapport and relationship with participants. The researcher built trust through active engagement and listened to participants' voices. Through this researcher-participant rapport, the researcher encouraged open communication and rich descriptions of the participant's thoughts, experiences, and perceptions.

Assumptions exist within this case study. The researcher honored and kept confidential the information offered by the participants. The researcher kept clear documents in accordance with the data collection and data analysis methodology to support credibility, dependability and

reliability. The confidentiality of the voluntary participants, and the data collection and analysis processes, are the primary assumptions upon which the study rests.

Rationale and Significance

Rich literature exists demonstrating that, while literacy is critical as a "vehicle for learning in societies, many children and adults do not possess the basic reading skills necessary to function fully in today's society" (Miller & McCardle, 2019, p. vii). Over seven million students aged 3-21 are currently identified as in need of special education services in the United States with over nine million of these students identified with a specific learning disability (NCES, 2019; NCLD, 2017). While overall global literacy rates are high with literacy rates for people 15 years and older at 86%, the student literacy rates in developing nations has stagnated (World Population Review, 2019). In nations, such as the United States, "four in five U.S. adults (79 %) have English literacy skills sufficient to complete tasks that require comparing and contrasting information, paraphrasing, or making low-level inference" (NCES, 2019c). Unfortunately, 21% of U.S. adults do not have the literacy skills necessary to complete similar tasks (NCES, 2019c). These literacy rates are reflected in the literacy rates of elementary-aged students as well.

Students' fourth-grade literacy rates have stagnated or decreased over the past two decades, according to the United States Nation's Report Card (NCES, 2019). Fourth-grade literacy rates for students in the United States students indicate that approximately one third of students in public schools are reading at or above proficiency levels on the NAEP assessment (Joshi, 2019; Moats, 2019; NCES, 2019; Schneider, 2019). Gewertz (2020) cites that the findings from the NAEP assessment affirm that students in both grade four and grade eight have demonstrated little to no reading progress, and that between 2017 and 2019, student achievement

has declined. Over 33% of fourth grade students are struggling to comprehend grade-level material and up to 66% of students within the minority and lower socio economic status continue to struggle to comprehend grade level material (Joshi & Wijekumar, 2019). Hempenstall (2013) as cited in Snow (2020) shares that the "rates of reading failure hover around 30%" (p. 2), yet "research in cognitive science indicates that 95% of children can learn to read" (p. 2) with appropriate instruction.

The urgent need for evidenced-based literacy instruction is supported by voluminous cognitive science and behavioral research studies (Castles et al., 2018; Gewertz, 2020; Moats, 2014; Phillips, Clancy-Menchetti, & Lonigan, 2008; Shaywitz, S.E. & Shaywitz, B.A., 2008). Multi-sensory based reading instruction in phonological awareness and phonics provides a sound basis for reading remediation for students who struggle with literacy as well as a necessary component of literacy instruction for emergent and novice readers (Castles et al., 2018; Kilpatrick, 2015; Moats, 2014; National Reading Panel, 2000; Phillips et al., 2008). However, professional development for educators, whether pre-service or mid-career educators, has not kept pace with the science of teaching literacy.

Researchers find that educators are unprepared in the science of teaching reading as they have not been taught these principles in their teacher education programs (Allen & Kelly, 2015; Castles et al., 2018; Folsom et al., 2017; McNeill, 2018; Moats, 2014; NCTQ, 2020). School districts provide various professional development opportunities in behavioral approaches to literacy instruction, from three-day seminars to weeklong training in how to deploy new reading programs. These opportunities provide mid-career and novice educators with the information necessary to teach literacy and address the research to practice teaching pedagogy gap (Allen & Kelly, 2015; Folsom et al., 2017). Guskey (2014) explains that these training opportunities all

fall into the activity trap, noting that strong evidence about what works for professional development is less available during these professional development experiences. Researchers also note that professional development impact on student learning is also less available as most research is case study based or less rigorous (Guskey, 2014; Kennedy 2016). This lack of relevant research highlights the need for a study that focuses on specific content, such as phonemic and phonological awareness, and educators' perceptions as they learn about and teach the specific content area.

Alternately, educators may be hesitant to implement the most current research practices, preferring to rely upon strategies and practices that have been previously successful. Shanahan (2020) explains this challenge with an analogy regarding the logistics and delivery of packages. According to Shanahan (2020), Amazon, the multinational corporation, can move packages worldwide from warehouses to airports to warehouses with precision and ease. However, moving the packages to the specific business or residence remains challenging. In the logistics and transportation industry, this is considered the "last mile problem" (Shanahan, 2020, p. 2). Shanahan (2020) suggests that this problem also occurs in literacy instruction. Educators have been teaching students how to read for hundreds of years. Educators may ponder why they should alter their educational and pedagogical practices if their practices have been working for students in the past (Shanahan, 2020).

Understanding mid-career and novice educators' experiences and affective relationships with the information they are learning and gaining as they participate in literacy professional development is at the core of this study. Mezirow's Transformational Learning theory provides the perspective through which an educator's existing frame of reference and meaning schemas are viewed. This study explored the perceptions of regular and special education early

elementary staff as they participated in professional development in the science of teaching reading, specifically the area of phonological awareness. This study adds to the corpus of knowledge regarding how educators assimilate, integrate, and accommodate novel information and research into their pedagogical practices. The study also explored the educators' perceptions and experiences as they underwent professional development experiences and trainings, exploring whether and how pedagogical practices were altered. While specific to the site, this research may provide information to other small public school districts as they initiate and implement professional development opportunities.

Definition of Terms

Five Pillars of Reading. Identified by the National Reading Panel (2000), the five pillars of reading include phonemic awareness, phonics, fluency, vocabulary and comprehension.

Grapheme. A grapheme is the smallest unit of written language that represents a single phoneme or a group of phonemes (Birsch, 2018). For example, the digraph ph represents the sound /f/.

Literacy. Frequently considered the ability to read and write, the Alberta Education department considers literacy as the "ability, confidence, and willingness to engage with language to acquire, construct and communicate meaning in all aspects of daily living" (Alberta, 2020, p. 1).

Phonological awareness. Phonological awareness is the ability to recognize and manipulate sounds in the spoken language (Johnson, 2020). Phonological awareness is a foundational skill for literacy. It is an umbrella term that comprises eight stages of development from separating words into syllables, rhyming and alliteration through phonemic awareness skills of adding, deleting and substituting phonemes in words.

Phonemic awareness. The higher ordered skills in phonological awareness. Ambruster, Lehr, Osborn and Adler (2006), in The Partnership for Reading report, define phonemic awareness as "the ability to notice, think about, and work with the individual sounds in words" (p. 2).

Phoneme. A phoneme is one of the approximately 44 distinct units of sound in the English language (Birsch, 2018). For example, the word cat has three phonemes /c/ /a/ /t/.

Science of Reading. A broad phrase that indicates the components of literacy instruction-based upon over 40 years of educational, neurocognitive, and practical research on how people learn to read (Hanford, 2018; Koperniak, 2019).

Simple View of Reading. Birsch and Carreker (2018) define the Simple View of Reading as a "model that defines reading comprehension as a product of lower skills such as word recognition and higher level thinking processes such as listening comprehension" (p. 840).

Conclusion

Literacy is critical to the success of individuals and societies. Literacy provides opportunities for individuals to access engagement with society and its components such as healthcare and education (Miller & McCardle, 2019). As a social justice, economic, and health issue, it is imperative that students have access to and succeed at learning how to read. It impacts not only their ability to succeed in their community, to access college or the workforce, but also has a direct impact on their ability to understand and participate in their own healthcare. A research to practice gap exists in education today in the area of literacy instruction. Educating students in literacy is important for the success of students and individuals in societies.

However, mid-career and novice educators alike may not have had professional development experiences that align with the research on how to teach reading. In the past three years, legislators are making attempts to mandate school districts to require educators to be

trained in reading instruction (Gewertz, 2020). Local school districts are attempting to counteract this research to practice gap by providing instruction and professional development experiences with limited success (Darling-Hammond, Hyler, & Gardner, 2017; Guskey, 2014). Professional development for mid-career and early career educators designed by public schools tend to fall into a pattern in which the activity is the important component, not the goal to be achieved (Guskey, 2014). Therefore, district leaders provide professional development experiences with varying degrees of success, intending to close the research to practice gap found in the area of literacy instruction.

This study describes and analyzes the experiences of early elementary education staff in a small public school district as they pursue and participate in district-sponsored professional development about the science of teaching reading, specifically phonological awareness (Baxter & Jack, 2008; Creswell & Poth, 2018; Stake, 1995). This study uses a constructivist psychocritical transformational learning theory lens to explore how educators make sense of the new information learned through their literacy professional development. Educators' assimilation, integration and sense making of the professional development experiences are explored through a qualitative single case study approach. Chapter 2 reviews the literature regarding literacy instruction, providing historical context and the current research regarding literacy instruction specifically surrounding the topic of phonological and phonemic awareness and educators' knowledge of teaching literacy. Chapter 3 discusses the methodology for the single case qualitative research study inclusive of the interview questions, journal entry prompts, and request for artifacts protocol. It also includes the research design and analysis along with the procedures for the study. A discussion of the credibility, dependability, and transferability follows. Chapter 4 provides further information about the research as it was conducted and

presents the findings gathered from the study's participants. Chapter 5 is an overview of the study, summarizing the findings of the study and the research process. These five chapters comprise the concepts and patterns that emerged from the interviews, journal entries and artifacts gathered from the study in which early elementary educators reflected upon their literacy professional development processes and training. These emergent patterns, while endemic to the single case, can aid others in understanding the opportunities and challenges faced by school districts and their staff as they seek to fill in the research to practice gap, improving teacher education, and improving student literacy outcomes.

CHAPTER TWO

LITERATURE REVIEW

Frederick Douglass ascribed to the notion that, “Once you learn to read you’ll be forever free” (Douglass, 1845, p. 1). Yet, literacy education is crucial to not only an individual but to communities, and the world as a whole (Joshi, 2019; Khan, Saeed-Khan, Yousafzai, & Khan, 2019; UNESCO, 2019). Reading is considered so vital that the United States Central Intelligence Agency (CIA) uses literacy rate as a measure of a country’s economic development (Khan et al., 2019; United States of America CIA, 2019). Researchers posit that, as educational attainment rates improve, literacy rates improve empowering people to fully participate in society and improve their own lives (Joshi, 2019; Roser & Ortiz-Ospina, 2018). Higher literacy rates mean that a country has a better-educated populace, and a well-educated citizenry is associated with higher economic status. Countries with higher literacy rates tend to have higher educational attainment rates of their population, resulting in a more educated labor force (Federal Reserve Bank of Cleveland, 2019).

However, the impact of illiteracy affects not only those learning to read (most often students), but also their community, and the world as a whole (Organisation for Economic Cooperation and Development (OECD), 2016; UNESCO, 2019). As of 2019, nearly 750 million people worldwide are unable to read, while over 250 million children are achieving below proficiency in basic literacy skills (UNESCO, 2019). People with low literacy levels are at a disadvantage, as low literacy levels correlate with poor physical and mental health as well as an increased probability of involvement with the legal and criminal justice systems (Ankney, 2019; Gottfried, 2015; Joshi, 2019; OECD, 2016; World Literacy Foundation, 2015). According to Graham, White, Tancredi, Snow and Colognon (2020), the effects of persistent reading

difficulties result in a chain reaction of negative consequences from a "poor self-concept, disruptive behaviors" (p. 2) to an increased risk of early drop out and mental health challenges. For example, according to a study of Texas inmates, over 80% of the incarcerated inmates are functionally illiterate, with over 48% of the population experiencing language-based learning disabilities, inclusive of dyslexia (Ankney, 2019; Moody et al., 2000). Illiteracy costs the global economy an estimated $1.2 trillion U.S. dollars according to the World Literacy Foundation (2015).

Folsom, Smith, Burk, and Oakley (2017) indicate that developing strong literacy skills is important to not only students and their families, but also the community and world. Research indicates that early literacy skills are intricately related to student literacy achievement throughout their academic settings and into adulthood (Foorman et al., 2016; Graham et al., 2020; Joshi, 2019; Moats, 2019). It is these early literacy skills that establish the foundation for academic, social and economic achievement. Graham et al. (2020) found that evidence-based targeted reading supports are necessary for all students who demonstrate early reading challenges; students without the support "experience higher risks of longer term unemployment and socioeconomic disadvantages" (p. 2).

Reasons for Low Literacy Levels

Both biological and environmental reasons are hypothesized for low literacy levels (Castle et al., 2018; Long, 2015; Patael et al., 2018). The Literacy Foundation suggests that the causes of lower literacy levels are multifactorial, from a parental lack of schooling, lack of educator training in how to teach reading, to poverty and lower socio-economic status, to learning disabilities such as dyslexia or other reading disorders (Fondation pour l'alphabetisation, 2019). Public schools in the United States identify that 38% of students have

specific learning disabilities (NCES, 2016; NCLD, 2017). Students with dyslexia comprise 5-17% of this population (Shaywitz, S.E., & Shaywitz, B.E., 2008). One hypothesis for why students struggle is a lack of direct systematic explicit instruction in the essential components of reading (Castles et al., 2018; Eunice Kennedy Shriver National Institute of Child Health and Human Development, 2000). Hanford (2019) argues that teacher preparation in the area of literacy is misguided or perpetuated by scholars who believed that reading is a process derived naturally. Graham et al. (2020) refer to not only the persistent reading difficulties sometimes referred to as dyslexia but also to the "instructional casualties" (p. 2). Graham et al. (2020) explain that these instructional casualties are avoidable and occur when a mismatch occurs between the student's reading difficulty and the appropriately targeted reading intervention. Thus, determining why students struggle to achieve early literacy skills and learning how to pinpoint and to address these challenges is necessary to meet both individual and societal needs to avert and mediate the negative consequences of early literacy challenges (Swanson et al., 2017).

Research has long provided information on how early literacy skills should be taught (Castles et al., 2018; Chall, 1979; Dahaene, 2013; Rayner, Foorman, Perfetti, Pesetsky, & Seidenberg, 2001; Treiman, 2018). The research findings have been so voluminous that many consider the information "settled science" (Gewertz, 2020, p. 2). Twenty years after the National Reading Panel was released in 2000, the debate over the reading wars has risen to national and international consciousness (Castles et al., 2018; Schneider, 2019; Moats, 2014). Several decades of neuroscience research, beginning in the 1980s, now informs educators how the human brain learns to read, and the methods by which reading can be taught (Castle et al., 2018; Dehaene, 2013).

Corroborated by neuroimaging studies and national and governmental reviews from the United Kingdom, Australia and the United States, the scientific research behind the process of learning to read has been well documented and researched; the science of effective early literacy skill instruction is settled (Castles et al., 2018; Dahaene, 2013; Kershner, 2018; Moats, 2014; National Reading Panel, 2000; Ozernov-Palchik & Gabrieli, 2018; Rayner et al., 2001). National organizations, such as the Australian Department of Education Science and Training (DEST), the Rose Review in the United Kingdom, and the National Reading Panel in the United States, all conclude that phonemic awareness and phonological awareness instruction are primary foundational skills necessary for students to learn to read (Blachman, Tangel, Wynne Ball, & Black, 2019; Castles et al., 2018; Kilpatrick, 2015; National Reading Panel, 2000). Snow (2020), for example through her oral language research, continues to inform the process of reading instruction "by bringing the role of oral language into competence into sharper focus" (p. 2). Kilpatrick (2015) as cited by Snow (2020) explains that in "optimal circumstances children's exposure to rhyme and song in the pre-school years lays the foundation for early phonemic awareness" (p. 5).

Educator Knowledge: Keeping Pace with Research

Yet, the evidence-based research has not reached all educators. Literacy education as it is taught across classrooms in the United States has not kept pace with consensus-based scientific research (Castles et al., 2018; McNeill, 2018). Educators may not know the research about how to teach reading or may have been unprepared in the science of teaching reading in their teacher education programs (Allen & Kelly, 2015; Castles et al., 2018; Folsom et al., 2017; Graham et al., 2020; McNeill, 2018; Moats, 2019; Moats, 2014; NCTQ, 2020). Putnam and Walsh (2019) explain that teacher education programs have not kept up with research on how students learn to

read. It is possible that educators may not have the underlying knowledge of the five principles of reading or may be unaware of the importance of phonemic and phonological awareness skills in the acquisition of reading skills (McNeill, 2018). Educators may also be unaware of the structures of language or the psychology behind reading (Moats, 2019). Educators' own perceptions on how to teach reading may also impact their understanding of literacy instruction as many educators have been trained to teach reading using a whole language approach (Graham et al., 2020).

Additionally, Allen and Kelly (2015) cite that teaching standards are inconsistent as states establish their own licensing standards. The International Dyslexia Foundation (IDA) (2018) posits that the licensing standards for educator certification are insufficient in preparing educators in the science of how to teach reading. Furthermore, reading specialists and special educators may not have any more specialized instruction on how to teach reading than general educators (IDA, 2019). This stands in contrast to the adoption of the Common Core English Language Arts standards that has standardized what students should know for college and career readiness across the United States. The National Council on Teacher Quality (NCTQ) (2020) found that over two-thirds of surveyed educators believe they do not have a strong foundation in the subjects they teach and only 50% of the sampled education programs teach the essential components of literacy identified by the National Reading Panel. This is an increase from the 35% of traditional instructional programs sampled in 2013 (NCTQ, 2020). Allen and Kelly (2015) suggest that when a teacher knows more, students learn more, yet the research on the effect of educators' content knowledge on student achievement is limited.

Addressing the Need

While research is mounting indicating that educators are under-prepared to teach the underlying components of literacy, school districts and increasingly, state legislatures, are developing initiatives to fill this research to practice gap (Gewertz, 2020). School districts address this research to practice gap through professional development to provide mid-career educators with the information necessary to teach reading (Folsom et al., 2017; Gewertz, 2020; Allen & Kelly, 2015). The professional development approach many districts use results in some success depending upon the quality of professional development. Some districts are creating clinical partnerships between higher education faculty and students in the elementary schools to increase student achievement and educator preparation with varied levels of success (Overstreet & Norton-Meier, 2020). However, the National Center for Educational Evaluation report suggests that content knowledge and application is not a strong and consistent measure of student achievement (U.S. Department of Education, 2016).

Legislatures in states such as Arkansas, Colorado, and Mississippi have created requirements for educators incorporating the science of reading components, the pillars of literacy as indicated by the National Reading Panel report (Arkansas.gov, 2020; Colorado DOE, 2020; Mississippi, 2020; National Reading Panel, 2000). In 2009, state school officers with support from the National Governors Association for Best Practices (NGA Center) led an effort to standardize the learning goals of all students in the United States regardless of where they resided (Common Core Standards Initiative, 2019). These standards were provisionally adopted by 46 states (ASCD, 2019). However, how educators provide instruction to meet the standards remains inconsistent (ASCD, 2019). Educators, for example, are unaware of the Knowledge and Practice Standards for Teachers of Reading according to the IDA (2019). Educator knowledge of

how to teach literacy, to master the standards, still remains elusive to many educators (Castles et al., 2018; Gonsalves, 2015; Piasta, Connor, Fishman, & Morrison, 2009). Empirical evidence collected by behavioral and neuroscientists corroborate the need for underlying specific components in literacy instruction (Castles et al., 2018; Dahaene, 2013; Moats, 2014; National Reading Panel, 2000).

Purpose of the Study

The purpose of this study is to understand and to describe the experiences of early elementary education staff as they pursue and participate in professional development about the science of teaching reading (Baxter & Jack, 2008; Creswell & Poth, 2018; Stake, 1995). This background in scientific knowledge informs educators' own reading instruction, specifically their perspectives as they undergo literacy training, specifically in the area of phonological awareness and phonemic awareness.

Disconnect Between Research and Practice

Functionally, educators have provided reading interventions to meet student need for many years (Castles et al., 2018; Chall, 1979; Rayner et al., 2001). Historically, educators taught reading using a combination of methods, some scientifically-based and others based on their experiences or their prior teacher preparation (Moats, 2014; National Council on Teacher Quality, 2018; Spear-Swerling, 2018). In many cases, educators spend time exploring why a reading challenge is occurring. However, Kilpatrick (2015) posits that the underlying etiology of reading disorders may not be as important as the etiology alone cannot determine the assessment type or the instructional intervention's effectiveness. Research over the past thirty years provides information on how to teach reading based on cognitive and behavioral science.

The research to practice movement is at a critical intersection as both behavioral reading interventions and the cognitive science data can make effective use of the evidence based and research-based information. Literacy educators can use this scientific evidence to determine the appropriate intervention to meet students' needs. The topic of phonological processing and phonological awareness was selected as previous cognitive research has highly established links between the phonological processing deficits and developmental dyslexia as students with dyslexia show less activation in the parietal cortices (Kronblichler, L. & Kronbichler, J., 2018; Zuk et al., 2018). Phonological awareness skill instruction has been found to assist in remediating dyslexia but is also critical to the teaching of reading to all students in early education (Castles et al., 2018; Kilpatrick, 2015; Moats, 2014). It is necessary then for educators to have a deep understanding of how students learn to read and to effectively teach reading, thereby ameliorating the literacy achievement gap that continues to grow. However, in-service mid-career and veteran educators do not have access to this knowledge, continuing to implement strategies and pedagogical practices that may be in inefficient or ineffective. The research to practice gap remains.

Related to Science

A growing consensus indicates that specialized knowledge of the understanding of language and print structure and the underpinnings of reading, such as the alphabetic principle to connect the phonological, semantic and orthographical nature of reading is necessary (Blachman et al., 2019; Castles et al., 2018; Moats, 2014; Piasta et al., 2009; Rayner, Foorman, Perfetti, Pesetsky, & Seidenberg, 2001). Educators involved in literacy instruction must master not only the pedagogical strategies to teach reading but also comprehend the cognitive processes involved

with the reading process. It is critical for educators to understand the cognitive underpinnings of literacy development.

Literacy instruction involves the development of two major and related skill sets: foundational skills and reading comprehension skills (Foorman et al., 2016). The Simple View of Reading (SVR) theory, developed in 1986 by Gough and Tunmer, posits that a student needs to use their listening comprehension skills and their decoding skills in a multiplicative manner (formula: D * LC =RC where D is decoding, LC is listening comprehension, and RC is reading comprehension) to become a proficient reader. Snow (2019) explains decoding as defined by the level of skill. Novice readers involve the underlying skills of phonological awareness, segmenting and blending (Kilpatrick, 2015; Snow, 2019). Skilled readers apply their skills by automatically and unconsciously recognizing words as they have internalized the sound-symbol correspondence and understand the alphabetic code, applying their skills to familiar and novel words (Snow, 2019). Listening comprehension involves understanding spoken words.

Conceptual Framework

According to Ravitch and Riggan (2017), a conceptual framework provides the foundation for a study, delineating the study's importance and rigor and acting as a scaffold or schema. This aids a researcher in demonstrating transparency about why and how to study a topic (Ravitch & Riggan, 2017). "The conceptual framework draws on theory, research, and experiences and examines the relationship among constructs and ideas" (Bloomberg & Volpe, 2016, p. 10). The Cognitive Foundations Framework by Tunmer and Hoover (2019) provides a scaffold by which educators can visualize how the cognitive processes of reading interact and build upon each other. The conceptual framework includes the topic of interest and provides the study's "theoretical model and methodological basis for data analysis" (Bloomberg & Volpe,

2016, p. 10). The theoretical framework, Mezirow's Transformational Learning Theory, provides a scaffold upon which adult learning, the educator's own learning process, can be described.

Reading is a critical life skill through which knowledge acquisition, economic opportunity, and social and cultural engagement occurs. Educators, over the past decades, have been addressing student literacy needs with varying degrees of success. Unfortunately, literacy instruction has not kept up with the scientific research on how students learn to read (Kronbichler, L. & Kronbichler, M., 2018).

When students are less skilled in literacy, they are at a disadvantage not only in reading but also in other aspects of their lives. Low literacy rates are associated with poor physical and mental health and the probability of involvement with the criminal justice system (Graham et al., 2020; Gottfried, 2015). Illiteracy affects not only students but their community, their nation, and the world (OECD, 2016).

Cognitive Foundational Framework: Scaffold for Educators

Tunmer and Hoover (2019) expand upon the SVR and posit a cognitive foundational framework (Figure 1) that provides educators with an overview of the cognitive competencies required by students as they learn to read. Tunmer and Hoover (2019) believe that when educators have access to the cognitive underpinning of literacy, their instruction will be informed. Snow (2020) posits that the "framework offers a more detailed breakdown of the components underlying both elements of the SVR equation" (p. 8). The Cognitive Foundations Framework provides a parallel and layered approach in which the linguistic knowledge, comprising phonological awareness, syntactical awareness, and semantic awareness combine to influence a student's linguistic knowledge (Tunmer & Hoover, 2019). This is the language comprehension side of the SVR (Snow, 2020; Tunmer & Hoover, 2019). The word decoding

components as described in the SVR, the alphabetic coding skills, the underpinnings of mapping sounds to symbols, concepts about print, and letter knowledge as well as the phonemic awareness concepts are included (Snow, 2020; Tunmer & Hoover, 2019).

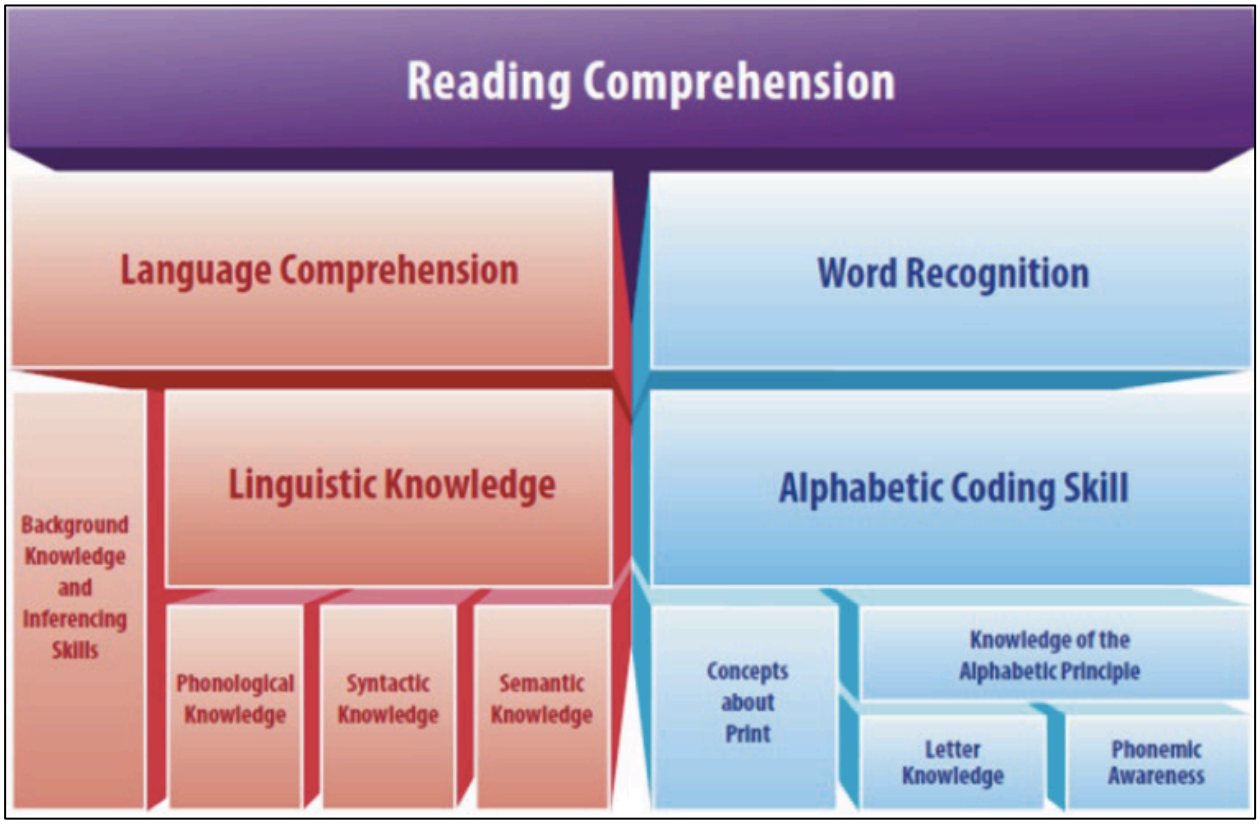

Figure 1. The Cognitive Foundations Framework (2019) reprinted with permission by Dr. Bill Tunmer and Taylor & Francis for use in a dissertation. Graphic Source: Hoover and Tunmer

An Expanded View of the Simple View of Reading: The Cognitive Foundations Framework

The Cognitive Foundations Framework expands upon the Simple View of Reading (SVR) (Gough & Tunmer, 1986; Hoover & Tunmer, 2018; Lonigan, Burgess & Schatshneider, 2018). The SVR theorizes that there are two cognitive capacities necessary for reading comprehension to occur (Lonigan et al., 2018; Tunmer & Hoover, 2020). The SVR, while not simple, explains that students gain meaning from text through two cognitive processes, language

comprehension and word recognition (Hoover & Tunmer, 2020; Joshi, 2019). Educators must understand that the language comprehension cognitive process is accessed through speech and linguistic knowledge, background knowledge and inferential thinking skills (Hoover & Tunmer, 2019). Word recognition skills are accessed through print, comprising the alphabetic coding skills (Castles et al. 2018). The following sections describe portions of the two cognitive processes and the "knowledge skill sets" (Hoover & Tunmer, 2020, p. 85) provide the scaffold for educators when learning about the reading process and how to teach reading.

Language Comprehension and Its Impact on Reading

Two cognitive capacities support the language comprehension domain of the Cognitive Foundations Framework: linguistic knowledge and background knowledge and inferencing skills (Hoover & Tunmer, 2020). The linguistic knowledge system underlies language and comprises the phonological, semantic and syntactical knowledge systems of language (Hoover & Tunmer, 2020; Snow, 2020). According to Hoover and Tunmer (2020), the language comprehension system represents "the ability to extract and construct literal and inferred meaning from linguistic discourse represented in speech" (p. 86). The background knowledge represents the understanding of the content as well as the context that enables readers and listeners to "go beyond the literal meaning of the discourse" (Hoover & Tunmer, 2020, p. 86). Educators who receive professional development in the underlying concepts of oral language, phonology, semantics and syntax are more accurate in identifying the areas in which students struggle (Castles et al., 2018; Folsom et al., 2014; Hoover & Tunmer, 2020).

Language comprehension, according to the model by Tunmer and Hoover (2019) comprises phonological knowledge and awareness, background knowledge, verbal working memory, syntax, and semantics. Each of the five components works collaboratively to inform

spoken language comprehension, the receptive language skills necessary to understand the speech. Students who do not have proficiency in the language components struggle to read with efficiency and proficiency (Castles et al., 2018; Moats, 2019; Tunmer & Hoover, 2019). Educators need training in the content of literacy instruction to understand how the cognitive skills underlying language inform how students learn to read.

Phonological Knowledge. Tunmer and Hoover (2019) view language comprehension through the speech model in which sounds are translated into phonemes representing the basic unit in language that delineate meaning. The importance of students' speech perception is critical as the complexity of understanding not only the sounds emitted through the use of lips, tongue, teeth and throat has to be translated by a student to the phonological knowledge in their lexicon (Moats, 2019; Tunmer & Hoover, 2019). The sounds /f/ and /v/ are made in a similar manner with the teeth and lips but the orthographical representation is different. Students who struggle with the orthographical and lexical representation will find reading challenging (Ehri, Nunes, Stahl & Willows, 2001; Ouellette & van Daal, 2017). Students must accurately identify the phonemes in spoken words as the misidentification results in different meanings or different syntax (Barnett, 2015; Moats, 2019; Tunmer & Hoover, 2019).

Phonological awareness and phonemic awareness instruction are key components in the initial stages of learning to read (Castles, et al., 2018; Huo & Wang, 2017; Leon et al., 2019; Kilpatrick, 2015; Rayner, et al., 2001). Researchers have found that an awareness of the phonemes within words and phonological skills are positively correlated with reading proficiency (Carroll, Gillon, & McNeill, 2012; Torgesen, Wagner, & Rashotte, 1994). Phonological awareness comprises five levels: rhyming, alliteration, sentence segmenting, blending syllables, and phonemic awareness (see Figure 2). Educators must be aware of the

underlying components of phonological awareness to provide instruction to meet individual student needs.

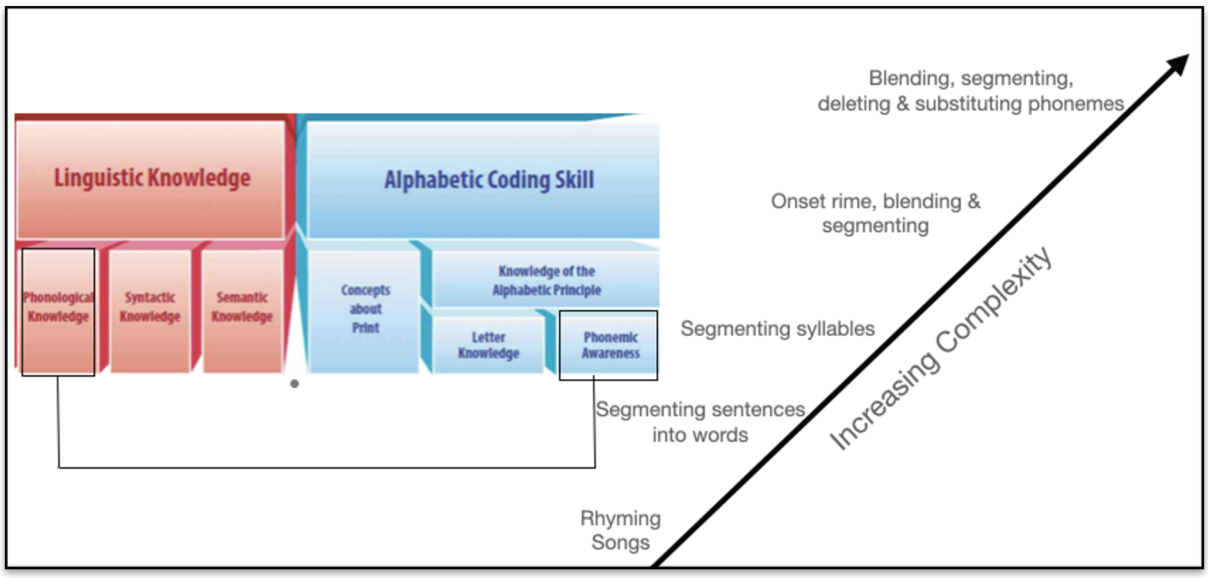

Figure 2. Phonological awareness and phonemic awareness

Carroll et al. (2012) highlight that phonological awareness at the phoneme level is not well known by educators. Carroll et al. (2012) examined the phonological awareness skills of 699 education professionals in New Zealand. Classroom educators only scored 43% when they had to correctly identify the number of phonemes in a given word in a study (McNeill, 2018). Data from this study indicate that expanding professional knowledge in the area of phonemic awareness is necessary. Leon et al.(2019), in their study of 267 students in public and private school settings, found that students' performance in their school type influenced the cognitive performance on tests of phonological awareness. Leon et al. (2019) found that the educators working with students require training as well as standardized data to aid in the identification of students who struggle with phonological awareness skills. The rationale is that phonological

awareness skills are a strong predictor of initial reading and writing literacy skills (Leon et al., 2019; Snow, 2020).

Phonemic awareness is an important underlying linguistic component, a building block of early literacy that is supported by cognitive science through advances in neural imaging (Castles et al., 2018; Carroll et al, 2012; Kilpatrick, 2015; Moats, 2014; Phillips, Clancy-Menchetti, & Lonigan, 2008; Shaywitz, S.E. & Shaywitz, B.A., 2008; Tunmer & Hoover, 2019). Multi-sensory based reading instruction in phonological awareness and phonics provides a sound basis for reading remediation for students who struggle with literacy as well as a necessary component of literacy instruction for emergent and novice readers (Castles et al., 2018; Kilpatrick, 2015; Moats, 2014; Phillips et al., 2008; National Reading Panel, 2000). Literacy instruction can be optimized based upon science, from both the cognitive and behavioral science fields (Black, Xia, & Hoeft, 2017; Graham et al., 2020; Ozernov-Palchik & Gabrieli, 2018). Unfortunately, while research indicates what effective literacy instruction comprises, effective literacy instruction has not consistently occurred across educational environments as evidenced by the literacy rate of fourth-grade students (Joshi, 2019; Moats, 2019; NCES, 2019). Educators, to improve efficacy, need to be taught the science behind teaching reading (Graham et al., 2020; NCTQ, 2020).

A gap continues to exist in educators' knowledge of the importance of phonological and phonemic awareness. In 2000, researchers identified and continue to corroborate the evidence indicating the importance of teaching phonological and phonemic awareness (Castles et al., 2018; Carroll et al., 2012; Kilpatrick, 2015; Moats, 2014; Seidenberg, 2017). This study explores how pre-kindergarten through grade three educators in a small public school describe

their experiences teaching phonological awareness as they pursue professional development in the science of teaching reading.

Overall, students who encounter difficulties in spoken language as well as the semantic understanding of how language is structured may experience challenges in their reading comprehension (Tunmer & Hoover, 2019; Gilakjani & Sabouri, 2016; Duff & Clarke, 2011; Wolf, 2008). Educators need instruction in the underpinnings of language comprehension, understanding how the component skills fit together to inform reading comprehension. This knowledge is important, as educators who cannot identify a linguistic concept are unable to effectively provide instruction in that concept (Joshi et al., 2016; Moats, 2014).

Word Recognition and Its Impacts on Reading Comprehension

Tunmer and Hoover (2019) define word recognition as automatic and accurate word reading. The automaticity reduces the reader's cognitive load; ensuring students are able to make accurate mental representations of the words read (Sweller, 1988; Tunmer & Hoover, 2019). Researchers describe the alphabetic coding skills necessary for students to learn to map the orthographical representations to the sounds they hear, the phonemes (Castles et al., 2018; Henbest & Apel, 2017). Numerous studies have demonstrated the importance of this explicit and direct systematic decoding instruction (Castles et al., 2018; Huo & Wang, 2017; Rayner et al., 2001).

Educators also need to be aware of students' needs in the area of explicit decoding instruction. Some students will quickly learn the mapping between sound and symbol and then extend their learning to other irregular orthographical patterns while other students will require significant and intensive explicit instruction to make the sound symbol connections (Castles et al., 2018; Henbest & Apel, 2017; Tunmer & Hoover, 2019). Students who do not learn to

quickly and efficiently associate sounds with symbols struggle to blend the sounds into words. This limitation impacts fluency that in turn impacts reading comprehension. A student's cognitive load is overtaxed as the student's working memory struggles to decode each sound, associating each symbol with the correct sound. Therefore, direct instruction in decoding is necessary to form the connection between the sound and the symbol, encouraging each student to integrate the alphabetic principle into their schema.

Phonology and Phonemic Awareness. The alphabetic principle relies on two underlying components: letter knowledge and phonological and phonemic awareness (Castles et al, 2018; Torgesen et al., 1994; Moats, 2019; Tunmer & Hoover, 2019). Letter knowledge is essential; students must learn to differentiate the orthographical symbols as well as associate each symbol with the sound, the phoneme that is represented by the letter or letter combinations (Castles et al., 2018; Moats, 2019; Tunmer & Hoover, 2019). Phonemic awareness, the ability to isolate and focus on the individual sounds in words, is important as students must be able to map the grapheme or symbol with the phonemic sound with which it's associated. McNeill (2018) found that pre-service educators with 10 hours of metalinguistic coursework were able to increase their knowledge of phonemic awareness and morphological awareness. These results were in line with the instruction provided to mid-career and in-service educators who received 30 hours of professional development (McNeill, 2018).

Researchers found that specific instruction in phonemic awareness has a positive effect on a student's ability to acquire early literacy skills in both reading and spelling (Blachman et al., 2019; McNeill, 2018). Ehri, Nunes, Stahl, and Willows (2001) found in their review of the National Reading Study report that instruction in phonemic awareness had an effect size (d=-.53) that was larger than their phonics analysis (d=.41). This combined approach of both phonemic

awareness and phonics instruction is necessary to aid students with deficits in their phonological processing (Blachman et al., 2019; Ring & Black, 2018).

Piasta et al. (2009) found in their study of 485 early childhood educators that the early childhood educators were observed to use more desirable classroom language when they had greater levels of content knowledge in how language works and in their pedagogical practices of teaching. Piasta et al. (2009) also found a positive association between educator knowledge and the student's concepts of print and phonological awareness. Educators with an understanding of the developmental progression of phonological awareness are more apt to make informed instructional decisions based upon student need (Barnett, 2015; Moats, 2004; Torgesen, 1998).

McArthur et al. (2018) in their meta-analysis of 14 studies with 923 subjects across Australia, Canada, the United Kingdom and the United States found that training in phonics probably improved outcomes in the areas of word reading accuracy and fluency. Two other meta-analyses also found positive effects of phonics training on word accuracy skills. Ehri et al. (2001), in their seminal meta-analysis research of 38 experiments, found that systematic phonics instruction improved student reading proficiency more effectively than no phonics instruction. Success rates were greater for students in early grades, before grade two, than in later grades.

More than Phonology and Phonemic Awareness. Reading is more than phonemic awareness and phonology (Castles et al., 2018). Orthographic depth, neural activation, and random access naming (RAN) are important in understanding how students learn to read in addition to phonemic awareness and phonology. While the National Reading Panel posits five reading domains: phonological awareness, phonics, fluency, vocabulary and comprehension (Ehri et al., 2001; Konza, 2014; Wright, 2015), the area of spelling, orthography, was omitted. Current research, however, highlights that phonological awareness improves spelling in students

in primary grades (Gentry, 2015; Moats, 2005; Willingham, 2015). Using functional magnetic resonance imaging (fMRI), researchers observed that effective spelling instruction has similar effects upon the brain's neural circuitry as instruction in phonological awareness (Long, 2015). Thus, spelling and decoding are necessary to strengthen readers' abilities. Georgiou et al. (2019) found in their study of 191 students in first and second grade that earlier reading and decoding ability had a predictive effect on spelling ability.

However, the language consistency, whether the orthographical system was deep or shallow, did not appear to have as great effect once the students mastered decoding. English is a deep or opaque orthographic language while Spanish is considered a shallow orthographic system. For example, the connection between phonemes in English is not one to one as English has over 40 phonemes representing 26 uppercase and 26 lowercase graphemes, while Spanish has a more direct one to one connection between phonemes and graphemes and is considered a medium depth orthography (Vivid Maps, 2020). Landerl et al. (2018) discovered in their longitudinal study of 1,120 students across grades one and two that phonological awareness is a predictor of reading differences in languages with deeper orthographical complexity while RAN appears to be connected to a language universal construct, independent of the orthographical depth.

Word recognition is critical for reading proficiency. Castles et al. (2018) describe the need for educators to understand concepts of phonological awareness skills as well as the orthographical mapping required for development of the alphabetic principle. The amount of explicit phonics instruction students require varies based upon the student and the knowledge of the educator (Tunmer & Hoover, 2019). The alphabetic principle relies upon a student's knowledge of letter names and phonemic awareness. Educators must understand the underlying

concepts that comprise literacy to better inform their instructional practices. Research into the importance of what is needed to teach early reading is considered settled (Castles et al., 2018; Chall, 1979; National Reading Panel, 2000; Seidenberg, 2017). Yet, educators are not fully embracing the science of teaching reading, specifically in the underlying foundational skills of literacy such as phonological and phonemic awareness.

Implications for Professional Development and Educator Beliefs

Tunmer and Hoover (2019) posit that educators with an understanding of the Cognitive Foundations Framework are able to more accurately identify the areas of need students experience as they are learning to read. Reading is dynamic in nature. Therefore, emerging readers demonstrate different needs at varying times. The underlying cognitive processes comprising literacy build upon each other. Tunmer and Hoover (2019) posit a parallel pathway that works in concert, but not necessarily in synchronicity. Tunmer and Hoover (2019) hypothesize that a deep knowledge of the underlying linguistic knowledge and alphabetic coding skills provides educators with the information necessary to assess, identify and target instructional methods to support reading instruction. This differentiation may be at the heart of effective literacy instruction (Tomlinson, 2017; Tunmer & Hoover, 2019).

Theoretical Framework

A theoretical framework is a guide and schema upon which the study rests. The theoretical framework aids in the understanding of how educational training may impact perspective in teaching phonological awareness. Transformational Learning theory provides the underlying theoretical construct for this study. Jack Mezirow's Transformational Learning theory is a constructivist psychocritical approach that posits how adults learn (Taylor, 2001; Kitchenham, 2008). Transformative learning provides two categories of learning, instrumental

and communicative (Calcutta, 2019). The instrumental learning focuses on the cause and effect relationships, the actual hands-on learning processes while the communicative learning focuses on the values, beliefs and ideals involved with the learning types (Mezirow, 1991).

Instrumental Learning. Kitchenham (2008) explains that in instrumental learning, learners are asking how they can best learn. It is the process by which knowledge is acquired, problems are solved, and procedural tasks are understood and implemented (Kitchenham, 2008; Kingman, 2018). Taylor (2008) posits that the Transformational Learning theory explains the process by which learners are able to construct, to assimilate and to revise their interpretations of meaningful experiences. Transformational Learning theory explains that learners must use their own interpretation of their life experiences to make meaning, integrating their new understanding with their prior understanding and redefining or transforming problems to achieve resolutions (Baumgartner, 2001; Kitchenham, 2008). Educators in instrumental learning expand or revise their current schema on how literacy is taught. An educator's beliefs, attitudes, and perceptions on how literacy is taught are explored to determine their current frame of reference, meaning schemas, and whether they are altered by their participation in professional development. The educator's underlying beliefs and philosophy of literacy instruction are explored. As educators experience literacy professional development, they construct new schemas about literacy education. Finally, through meaning transformation, it is hypothesized that educators will need to determine if their existing schemas and habits of mind need an altered frame of reference. It is through these learning processes, expanding existing schemas, creating new schemas, and creating new problem definitions that an educator's understanding of literacy instruction transforms. Mezirow's phase transformation process posits that learners use their experiential

knowledge, apply the critical reflection process and engage in rational discourse to integrate knowledge and transform their perspectives (Mezirow, 1991).

Mezirow's Transformational Learning theory reflects ongoing changes in theory incorporating the works of Thomas Kuhn, Paulo Freire, and Jurgen Habermas. Thomas Kuhn addresses three concepts that inform Mezirow's learning theory: meaning perspective, meaning schema and perspective transformation. Kuhn describes meaning perspective as the problem that needs to be solved (Kitchenham, 2008). Prekindergarten through grade three educators are becoming aware of the literacy achievement gap that is occurring across district, state and national levels (Castles et al., 2018; NCES, 2019; NH DOE, 2019; Schneider, 2019). The percentage of students reading below proficiency at the end of third grade remains relatively stagnant even though educational programs have changed (NCES, 2019; NH DOE, 2019; Schneider, 2019).

Kuhn's paradigm also posits that educators' schema, their own individual meaning schema, is important (Kitchenham, 2008). Educators' own perceptions and understanding of literacy instruction, the components that comprise reading and the process by which reading is taught needs to be clearly understood as educators do not have a deep understanding of the underlying processes that comprise literacy (Castles et al., 2018; Josh et al., 2016; Spear-Swerling, Brucker, & Alfano, 2005). While prekindergarten through grade three public school educators have a myriad of background knowledge and training and their own meaning schema, they do not always translate into improved literacy outcomes for students (Allen & Kelly, 2015). Experienced and mid-career educator training, according to researchers, has not kept pace with the science of teaching reading (Kennedy, 2016; Moats, 1994).

Kuhn's paradigm concept relies on the change that occurs when individuals critically reflect and form new perspectives that can occur through professional development, Kuhn's concept of meaning transformation (Kitchenham, 2008). Researchers indicate that perspective transformation occurs once educators experience the effects of their teaching pedagogy on student achievement (Joshi et al., 2016; Kennedy, 2016; Kitchenham, 2008). Allen and Kelly (2015) also found that, as the literacy training remains varied and lacking in content focus, it effectively ensures disparities in educators' abilities to effectively teach literacy. This study to explores educators' understanding of literacy instruction to determine if any transformation in their schemas and meaning perspectives occur.

Conscientization. Paulo Freire's concept of conscientization informs Mezirow's Transformational Learning theory specifically in the areas of disorienting dilemmas, critical self-reflection and critical discourse (Kitchenham, 2008). Risko and Reid (2019) argue that educators must "struggle with the uncertainties" (p. 425) that learning about the science of teaching of reading engenders. Educators provided with literacy professional development and training may experience cognitive dissonance, the perception that occurs when confronted with information that challenges long-held beliefs and their underlying literacy instruction schemas. Further, Mezirow (1991) posits that learners could only change their perspectives when they could critically reflect and question their beliefs, values and assumptions. Educators may experience cognitive dissonance when they encounter research and concepts about reading instruction that do not fit into the educator's prior schema. Educators may also experience dissonance when their newly acquired information conflicts with the way they've taught reading over the past twenty years. Experience and background knowledge impact how educators view the newly acquired information through literacy professional development.

Communicative Learning. Mezirow's Transformational Learning Theory posits the need for critical self-reflection (Kitchenham, 2008). Self-reflective learning is the process by which learners question why they are learning the topic. Through self-reflection, critical discourse, and experience, educators question why they are learning the literacy-based information especially when they have been teaching reading for many years or have attended institutes of higher education. This study includes professional development on the cognitive science of reading. The study explores whether educators will integrate and transform their meaning perspectives about how, when, and why reading instruction should be taught. It is through this self-reflection, a hallmark of Mezirow's perspective transformation, that educators will come to understand the philosophical and neurological underpinnings of literacy instruction (Castles et al., 2018; Kershner, 2019; Kitchenham, 2008). Learners are expected to find and construct their own meaning through connection, communication and social engagement with others (Kitchenham, 2008). It is through this critical discourse that the meaning of the information becomes salient and significant (Kitchenham, 2008). Educators may alter their perspectives and opinions as they learn about the science of reading. Mezirow (1988) theorized that, in order for learners to be able to think for themselves, they need to critically reflect on assumptions and to participate in communication with colleagues. Many researchers provide studies as to why literacy instruction is critically important (Castles et al., 2018; Folsom, Smith, Burk, and Oakley, 2017; Joshi, 2019; Moats, 2019). Research into the science of how people learn to read informs educators' perspectives, assisting educators in making informed decisions about literacy instruction (Castles et al., 2018; Folsom et al., 2017; Moats, 2019).

Critical Transitivity. Freire's description of critical transitivity suggests that when individuals think critically and reflectively, they can act as change agents individually and

globally (Kitchenham, 2008). Freire posited that once individuals reached the critical transitivity phase of development, mergers between critical thought and critical action occur (Kitchenham, 2008). Educators can become catalysts for change.

As educators experience professional development in literacy, through the critical transitivity process, the educators transform their meaning schemas and alter their perceptions about literacy instruction. It is possible that educators can transform not only their own meaning but also influence reading education at a local community and worldwide level. Castles et al. (2018) posits that, through evidence-based research and literacy professional development in specific skills, such as phonemic and phonological awareness, educators use their teaching pedagogy to improve student outcomes. This success will then engender further critical discourse and reflection. Risko and Reid (2019) posit that educators' critical discourse and critical reflection will then impact the transformation in the educators' meaning schemas, resulting in a change in teaching pedagogy. Educators, through critical self-reflection, are able to transform their teaching practice on a local and global level.

Perspective Transformation. Professional development must provide the necessary time for educators to critically reflect upon their current literacy schemas. It is through the reflection and supportively based feedback processes that educators integrate their new knowledge with existing knowledge, moving through the cognitive dissonance phase to the critical transitivity phase of professional development (Darling-Hammond et al, 2017; Kennedy, 2016; Kitchenham, 2008). Mezirow, in 2000, updated the learning types to include transforming points of view as it became apparent that learners can transform their point of view by exploring another's perspective (Kitchenham, 2008). Folsom, Smith, Burk and Oakley (2017) in their study of Mississippi's literacy program, share that educators and literacy coaches collaborated and

communicated as they engaged in literacy professional development thereby providing the time necessary for educators to transition and transform their belief structure and meaning schema through critical discourse, reaching critical transitivity. This study applies the Mezirow Transformational Learning theory to explain the process of perspective transformation that educators undergo as they participate in a multi-year literacy professional development initiative inclusive of workshops and online courses and using the Language Essentials for Teachers of Reading and Spelling (LETRS) professional development series.

Training Educators in Literacy

Researchers indicate teaching is one of the professions in which ongoing learning is necessary (Joshi et al., 2016; Kennedy, 2016; Moats, 2014; Ward Parsons et al., 2019). Quality education is necessary for educators as they learn how to teach reading (Joshi, 2019; Joshi, Washburn, & Kahn-Horowitz, 2016; Moats, 2019; Oliveira, Lopes & Spear-Swerling, 2019). Voluminous research indicates that having knowledgeable educators in a content area, specifically literacy, has a positive impact on students' literacy outcomes (Joshi, 2019; Joshi et al., 2016; Kennedy, 2016; Moats, 2019; Moats, 2009; Ward-Parson et al., 2019). It is the high-quality instruction that is considered key to ensuring that students are taught to read (Castles et al., 2018; Joshi et al., 2016). Joshi, Washburn and Kahn-Horowitz (2016) note the positive impact that knowledgeable educators can make on literacy acquisition, specifically for those students who struggle with the underlying early literacy skills such as phonemic and phonological awareness.

Researchers have explored the knowledge base of literacy educators, exploring their understanding of the five pillars of reading: phonemic awareness, phonics, vocabulary, fluency, and reading comprehension (Castles et al, 2018; Joshi, 2019; Joshi et al., 2016; Kennedy, 2016;

Moats, 2014; Ward Parsons, et al., 2019). Through literacy professional development, educators can improve their pedagogical practices in each literacy component such as phonemic and phonological awareness (Hoover, 2002; Moats, 2014). Folsom et al. (2017) found that educators experienced an increase in teacher knowledge and teacher competencies when they engage in literacy professional development. Training educators in the science of reading, specifically phonological and phonemic awareness, is one component to improving educator's knowledge base. Teacher education preparation programs and professional development opportunities provided by school districts to meet educator need are necessary. Guskey (2014), however, notes that professional development has a mixed success rate in education. Professional development for educators, designed by public school leaders, tends to fall into a pattern in which the activity is the important component, not the goal to be achieved, commonly referred to as an activity trap (Darling-Hammond et al., 2017; Guskey, 2014).

Educating Teachers in the Science of Reading

Institutes of higher education (IHE) traditionally provide instruction on the theoretical and practical aspects of teaching literacy (Gonsalves, 2015; Oliveira et al., 2019). Allen and Kelly (2015) posit that the lack of standardization in teacher preparation programs for "preservice or preparation" education is part of the problem. Educators who are prepared to teach in early childhood settings experience varied models of educational training (Oliveria et al., 2019; Whitebook, 2014). Criticized for inadequate literacy preparation for their educators, IHEs also experience wide variation within their own educational institutions and programs (Allen & Kelly, 2015; Gonsalves, 2015; IDA, 2019; National Center for Teacher Quality, 2016; Oliveira et al., 2019). The most effective teacher preparation programs have core content in the science of human development and reading (Allen & Kelly, 2015; Gonsalves, 2015). Additionally, the

programs have a field experience component in which educators are able to make authentic connections to what is taught in the college classroom to what they experience in their placements (Allen & Kelly, 2015; Gonsalves, 2015; IDA, 2019). Notably, lack of standardization exists in length of placements for field experiences, the type of supervision required, and what constitutes a successful field experience according to Allen and Kelly (2015). Another barrier is that educators may successfully complete a teacher education program yet demonstrate a lack of knowledge and understanding of the pedagogical strategies necessary to teach reading (Allen & Kelly, 2015; Moats, 2014; Oliveira et al., 2019). Direct systematic and explicit instruction in phonological awareness, decoding, morphology, vocabulary must be taught for all students to access literacy skills (Allen & Kelly, 2015; Castles et al., 2018; IDA, 2019; Moats, 2019; Neumann & Gambrell, 2013; Oliveira et al., 2019; Piasta, et al., 2009).

It is possible that educators, upon entry into the professional field, experience challenges that may be unrelated to beginning a new career. Their education preparation programs may have not adequately prepared them for their educational assignments. Each assignment varies by many factors from student need, setting, administrative demands, and the need for a broad and deep knowledge of literacy and its instructional implications (Castles et al., 2018; Gonsalves, 2015; Hikida, 2019; Neumann & Gambrell, 2013).

As the components of literacy instruction and how to teach reading and the pedagogy of effective literacy instruction are now clearer than ever, it is imperative that educators have the knowledge to teach literacy in their education programs or through professional development (Castles et al., 2018; Chall, 1979; Gewertz, 2020; Henbest & Apfel, 2017; Moats, 2009). Castles et al. (2018) cite research by Moats (2009), Seidenberg (2017) and the National Reading Panel (2000) that concludes a strong scientific consensus exists on the neurocognitive processes

involved in reading instruction. Snow (2020) explains that "while reading to children in the preschool years is important for vocabulary development, exposure to increasingly complex sentences and discourse genres, and acquisition of background knowledge is not enough to transition a child from being a good talker to a good reader" (p. 8). Reading instruction must be explicit and effective, teaching not only "the alphabetic principle but how phonemes and graphemes map to each other" (Snow, 2020, p. 8).

Rayner, Foorman, Perfetti, Pesetsky, and Seidenberg (2001) further demonstrated the need for direct explicit phonics instruction. Long (2015) and Kershner (2019) further supported the findings of Rayner et al. (2001) through the use of functional magnetic resonance imaging (fMRI) and other neuroimaging studies. Professional educators in the field require specialized training to support students' literacy development (Castles et al., 2018; Folsom, Smith, Burk, & Oakley, 2017; Gonsalves, 2015; Piasta, 2009). Henbest and Apel (2017) posit that highly trained educators with specialized knowledge of the alphabetic principle, specifically phonemic awareness and phonology, have more positive outcomes on student achievement. Henbest and Apel (2017) further explored the differences between two systematic phonics-based instructional pedagogies. They found that students who experienced educator-led direct instruction that included both forms of phonological instruction, synthetic and analytic, experienced greater gains in word reading ability (Henbest & Apel, 2017). Educators require a deep understanding of the science behind reading instruction.

Educational institutions such as public school districts turn to professional development to support the needs of their staff in training educators (Folsom et al., 2017). Yet, limitations exist in the effectiveness and quality of professional development (Darling-Hammond, Hyler, & Gardner, 2017). Oliveira et al. (2019) posit that professional development conducted with mid–

career educators are not “filling the gap between what educators know and what they need to know to teach reading effectively” (p. 317). Darling-Hammond, Hyler & Gardner (2017) indicate that during the 2002-2015 era when “No Child Left Behind” law was in effect, the workshop approach towards professional development was applied in which educators would receive less than eight hours of instruction or information in an after-school format. According to Spear-Sperling, Lopes, Oliveria, & Zibulski (2016), educators’ content knowledge about basic reading constructs such as the alphabetic principle, phonemic awareness and phonics was limited.

Therefore, variability exists among professional development programs, thereby impacting both instructional changes and student achievement (Desimone & Garet, 2015; NCTQ, 2020). Thus, it is critical for professional development and IHEs to provide not only underlying theoretical principles of learning and learner characteristics but also the specific content knowledge necessary to teach reading (Fullan, 2007; Oliveira et al., 2019). Content knowledge improvement requires content specificity and intensity to alter an educator’s pedagogical practices, school culture, and habits of practice (Fullan, 2007; Oliveira et al., 2019).

Improving Educators’ Knowledge through Professional Development

The purpose of professional development is to improve educators’ knowledge and skills resulting in changes in their pedagogical practices; thereby improving student learning outcomes (Basma & Savage, 2017; Darling-Hammond, Hyler, & Gardner, 2017; Guskey, 2014; Moats, 2019). Mid-career educators require effective professional development to improve their knowledge and skills in literacy (Castles et al., 2018; IDA, 2019; Moats, 2019; Tunmer & Hoover, 2019). Darling-Hammond et al. (2017) in their review of 35 studies found a “positive link between professional development, teaching pedagogy and student outcomes” (p. v). Seven

core features comprise effective professional development, according to Darling-Hammond et al. (2017). Effective professional development should be ongoing, provide opportunities for collaboration, feedback and reflection, provide coaching and expert supports, use models of effective instruction, incorporate active learning and be specifically content-focused (Darling-Hammond et al., 2017). Guskey (2014) posits that effective professional development regardless of format, in person or online starts with planning. One criticism of current professional development for mid-career educators has been that it does not have a specific focus or lacks coherence as part of a wider strategy (Darling-Hammond, 2017; Tooley and Connally, 2016).

Educators, when provided with the evidence of the effectiveness of professional development, can alter their pedagogical practices effecting improvement in student literacy outcomes (Gonsalves, 2015). Guskey (2014) suggests that providing practical, direct, hands-on practice after receiving initial professional training aids educators in making the connections necessary to build upon the relationships between new knowledge and background knowledge. Mezirow's Transformational Leadership Theory describes this as the instrumental learning phase. Educators work with their newly acquired knowledge, trying the concepts and ideas out to determine how best to integrate the knowledge into their existing schemas or by creating new schemas (Figure 3). The skills and knowledge that educators need require understanding both what they need to know as well as the why educators need to know it (Guskey, 2014).

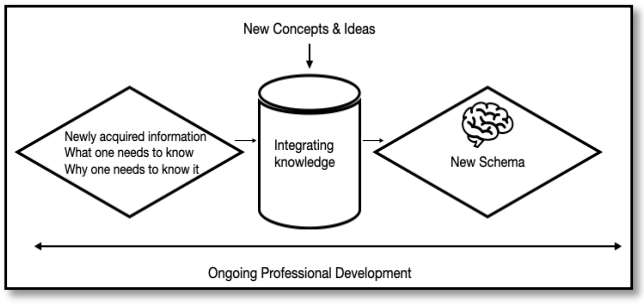

Figure 3. Instrumental learning

Educators need to develop a depth of knowledge in order to be able to implement the practices with any fidelity (Darling-Hammond et al., 2017; Guskey, 2014; Tunmer & Hoover, 2019).

Applying the Cognitive Framework to Increase Educator Content

According to Tunmer and Hoover (2019), a Cognitive Foundations Framework is one-way educators can achieve improved outcomes for students. The Cognitive Foundations Framework provides the underlying content necessary for effective professional development according to Darling-Hammond et al. (2017). The Cognitive Foundations Framework uses concepts of cognitive capacities that underlie how students learn to read (Tunmer & Hoover, 2019). This content-focused framework provides a depth of information on how students learn to read. Educators can then apply their understanding of the framework as a tool to aid in "determining the source of reading challenges, what assessment data to use, and where to focus instructional" resources (Tunmer & Hoover, 2019, p. 2). Educators with professional development in the specific content area of reading need to understand how each component, such as phonemic awareness relates to the other components or pillars of reading (Castles, et al., 2018; National Reading Panel, 2000). With this understanding, educators can use their knowledge to identify areas of need and provide appropriate remediation and skill development to enhance student outcomes.

Evidence of Effective Outcomes

Another method for improving student literacy outcomes is to provide educators with evidence of the effectiveness of their professional development (Gonsalves, 2015). Guskey (2014) posits providing practical direct hands-on practice after receiving initial professional training aids educators in making the connections necessary, building upon the relationships between new knowledge and background knowledge. Mezirow's Transformational Leadership

Theory describes this as the instrumental learning phase. Educators work with their newly acquired knowledge, trying out the concepts and ideas to determine how best to integrate the knowledge into their existing schemas or by creating new schemas. The skills and knowledge that educators possess require an understanding both what they need to know as well as why they need to know it (Guskey, 2014). Educators need to develop a depth of knowledge to implement the practices with any fidelity (Darling-Hammond et al., 2017; Guskey, 2014; Tunmer & Hoover, 2019).

Coaching. Gallagher, Arashan & Woodword (2017) provide a framework for literacy professional development that supports differentiation of instruction through the use of effective coaching, focusing on content over extended timeframes. Gallagher et al. (2017) in their randomized controlled trial study of the National Writing Project's College Ready Writers program (CRWP), found positive effects of student outcomes and educator change in instructional practice. Gallagher et al. (2017) explain in their three-pronged approach to professional development the causes for success. These include intensive content-driven professional development along with time for implementation, resource availability and formative assessment. Mezirow's Transformational Learning theory posits that critical discourse is necessary to transform educators' perspectives and to alter educators' meaning schemas (Kitchenham, 2008). Discussions along with effective coaching are the main components of effective professional development (Darling-Hammond et al., 2017). Literacy coaches provide the opportunity for content-related discourse. Coaching is variable in its effectiveness as coaches in the Language Essentials for Teaching Reading and Spelling (LETRS) program provide an observation and evaluative role and less of an engagement and interactive facilitation role

Kennedy (2016). The role of the coach is important when considering the effectiveness of professional development.

The professional development experiences in this study support the seven core features comprising effective professional development, according to Darling-Hammond et al. (2017). The LETRS professional development program provides the content-specific instruction in literacy in on-line or in-person training in an extended timeframe. Models of effective instruction are used in asynchronous video format and through in-person coaching. Education professionals are observed and provided feedback for critical reflection and recursive instruction. Educators are then expected to internalize and integrate their newly acquired content knowledge within their pedagogical practices. The ultimate goal is to increase student literacy efficiency, as educators will understand how students learn to read, thereby, reducing the educator's knowledge gap.

This study explores the perceptions, experiences, beliefs and attitudes about literacy professional development, specifically in learning about and teaching phonological and phonemic awareness. This study does not presume any correlation or causality of student outcomes based upon educators' beliefs and perceptions. However, educators, during and after this professional development, are expected to undergo some form of transformation in their perceptions, knowledge and teaching pedagogy with the ultimate objective of positively impacting student outcomes. This study aims to describe and to explain this transformation process.

The Need for Change

Students in a small New England elementary school, like students across the United States, struggle with literacy proficiency (NCES, 2019). Literacy proficiency remains a leading

cause of identification within the small public school district. Students who begin their educational experiences challenged with skill deficits in literacy tend to remain challenged over their educational careers. Stanovich, in 1986, described this effect, known as the Matthew Effect. This effect describes the phenomena that occurs when those students who do not start off reading well not only fail to catch up to their peers, but that the gap actually widens as they progress through their academic careers (Hempenstall, 2015; Pfost, Hattie, Dörfler, & Artelt, 2014). Students who read at or above proficiency as measured by oral reading fluency tend to acquire stronger and wider vocabularies, to increase their background knowledge, and to deepen their understanding of text structures (Castles et al., 2018; Hempenstall, 2015).

By contrast, students who are less skilled in literacy become further disenfranchised, demonstrating a reduced vocabulary and an impact on the overall intelligence over time according to Shaywitz et al. (1995). Protopapas, Sideridis, Mouzaki, and Simos (2011) dispute their findings, stating that the Matthew Effect does not widen over time for reading but remains constant. Pfost et al. (2014) found that the widening effect of achievement in literacy is not so simple. The conditions under which a Matthew Effect explains the achievement gap are multifactorial (Pfost et al., 2014). Pfost et al. (2014) indicate that the Matthew Effect appropriately describes the widening achievement gap of elementary school-aged students' decoding efficiency but suggest the factors are more nuanced.

The impact of the widening reading efficiency achievement gap on student achievement is important for educators to understand. Educators require the professional development in learning how to teach reading. The study explores educators' experiences and perceptions as they teach phonological awareness skills to early elementary students while they also undergo literacy professional development in the science of reading. The process through which educators

experience and describe the professional development is explored through the lens of adult learning theory.

Conclusion

Globally, literacy rates are steadily increasing (UNESCO, 2017). However, the rate of students reading at or below basic proficiency has stagnated over the past two decades with 65% of fourth-grade students in the United States performing at or below the basic proficiency level (NCES, 2019; Rothwell, 2016). Researchers indicate that students who do not read with proficiency by the end of third grade are less likely to close their achievement gap, encountering lifestyle and career challenges commensurate with poor literacy (Gottfried, 2015; OECD, 2016; Schenieder, 2019).

Research in literacy education conducted over the last thirty years identifies the necessary components for literacy instruction. The five pillars of reading described by the National Reading Panel (2000) and in research by the Rose Review in the United Kingdom and Australian DEST reports are further corroborated by the neurocognitive research conducted by neuroscientists across the globe (Black et al., 2017; Castles et al., 2018; Kershner, 2019; Ozernov-Palchik & Gabrieli, 2018). Students, however, continue to struggle to learn to read with proficiency. Multifactorial causes of this literacy problem exist; students may come from impoverished backgrounds, they may have experienced a lack of schooling or may not have had access to research-based literacy instruction.

Researchers have indicated that educator knowledge remains variable and inconsistent across the world (Blachman et al., 2019; Carroll et al., 2012; Fielding-Barnsley, 2010; McNeill, 2018). Educators, through the Cognitive Foundations Framework by Tunmer and Hoover (2019), can explore the underlying cognitive processes that inform literacy instruction. The parallel strands

of literacy, linguistic knowledge and word knowledge, provide educators with the necessary components of literacy that can be used as building blocks to build literacy in students (Tunmer & Hoover, 2020). Each literacy component is described with special attention to phonological and phonemic awareness. While researchers have settled the need for strong phonemic awareness and phonological awareness to build proficient readers, educators remain in need of the instruction of why phonological awareness and phonemic awareness are important to the reading process (Castles et al., 2018; Moats, 2014; Seidenberg, 2017). A knowledge gap exists between what researchers know about the science of teaching reading and mid-career or in-service educators' pedagogical practices. This is the research to practice gap (Moats, 2014; Quigley, 2020).

This study explores educators' perspectives and beliefs about teaching specific components of reading, specifically in the areas of phonological and phonemic awareness, as they undergo literacy professional development inclusive of the LETRS professional development series. Darling-Hanmond et al. (2017) indicate that the LETRS program has many components of effective professional development in that it is content-focused, promotes active learning, uses collaboration and models of effective practice, and provides feedback and coaching to support hands-on instrumental learning. Kennedy (2016) notes that the effectiveness of coaching is important. Kennedy (2016) hypothesizes that the time to make sense of the information presented within a professional development seminar is necessary for educators to integrate and assimilate it (Kennedy, 2016; Kitchenham, 2008).

Educators should become increasingly cognizant of the science of teaching reading and become proficient in the components that impact early literacy acquisition. Researchers as well as local legislatures are actively promoting educator training in the science of reading (Gewertz,

2020; Graham et al., 2020). Educators can make a difference in the literacy acquisition of early elementary school-aged students by providing types of instruction that meet students' needs. This study uses a case study format to explore public prekindergarten through grade three educators' perceptions, beliefs and experiences as they teach phonological awareness and phonemic awareness in a small public school setting. Three research questions regarding educators' experiences and perceptions are explored. Exploring the educators' experiences and attitudes may result in findings that lead to a reduction in student referrals for literacy needs as educators will have more knowledge about literacy development in phonological and phonemic awareness. Three data sources: interviews, journal entries, and educator-supplied artifacts were used to gather data regarding educators' experiences, beliefs and attitudes.

CHAPTER THREE

METHODOLOGY

A concern among educational practitioners is the lack of training and preparation they received during their educator training or professional development experiences. The educator's knowledge is also unevenly developed, with some educators understanding and teaching information about syllables yet struggling to teach literacy based on their knowledge of phonological awareness, phonemes, and morphemes (Joshi & Wijekumar, 2019; McMahan, Oslund, & Odegard, 2019). McMahan et al. (2019) also found that the educational degree attained was not predictive of how well educators understand the English language and how to effectively teach the English language using a test of knowledge in the phonological sensitivity, phonemic awareness, decoding, spelling and morphology strands of language. Cunningham, Perry, Stanovich, & Stanovich (2004) found in their study that educators experienced limited knowledge and understanding of phonemic awareness and phonics. In essence, educators are less well prepared to teach reading (Cohen, Mather, Schneider, & White, 2017; Cunningham et al., 2004; McMahan et al., 2019; Moats, 2020). Joshi & Wijekumar (2019) identify this as the Peter Effect explaining that educators are unable to teach what they themselves do not know.

Purpose of the Study

Over two school years, the knowledge gap that educators experienced was addressed by participation in literacy professional development comprised of day-long professional development seminars as well as weekly professional development webinars, along with in-person training. The literacy professional development offerings attempted to bridge the research to practice gap that exists in many elementary schools. This research aimed to add to the corpus of knowledge regarding educators' perceptions and changes educators experience as they learned

about the science of teaching reading, specifically phonological awareness. The study involved early elementary educational professionals within a small public school district as they experienced literacy professional development that was aimed to fill the knowledge gap between the science of teaching reading and the practice of reading instruction, primarily focused on phonological awareness and phonological automaticity.

The purpose of this intrinsic study was to describe the experiences of pre-kindergarten through early elementary education staff in a small rural public school as they pursued and participated in professional development about the science of teaching reading (Baxter & Jack, 2008; Creswell & Poth, 2018; Stake, 1995). Professional development in reading was generally defined as foundational skill training with an emphasis on phonological awareness training. The study's central phenomenon was influenced by the research literature indicating that educators with all levels of academic attainment are under-prepared to teach reading to students specifically in the area of phonological awareness and automaticity (Cohen et al., 2017; Cunningham et al., 2004; Kilpatrick, 2015; McMahan et al., 2019). In this sample, educators were trained in the science of reading, specifically phonological awareness and automaticity. This study explored educators' experiences with and perspectives on their professional development and investigated the shared phenomena of learning information in a collaborative environment that occurred in the literacy professional development offered by the school system.

Research Design and Questions

The intrinsic case study research design was framed by the problem of practice, the research questions, and the purpose statement. This intrinsic case study was a study in which the subject itself, the educators are of importance and interest (Stake, 2006). An intrinsic case study approach was selected because the perceptions and experiences of the early elementary educators

were of interest to the researcher as well as the educational staff as they pursued further educational training to support their students. The results of this case study may not be generalizable to other case studies or lead to other theories. However, Stake (1995) argued that petite generalizations can occur from a single case study. Morse (1994) posited that the findings from a single case can be examined and extended to other case studies as individuals can relate to others' experiences. The study explored how experiences have impacted and shaped the educators' perceptions and practices. Baxter and Jack (2008) shared that the unit of analysis is the case itself, bounded by the literacy professional development offerings, and the participants receiving and engaging the literacy professional development in the science of reading, specifically phonological awareness. This case study occurred over four months in which participants reflected upon their literacy professional development in the science of reading, focusing their attention on specifically their understanding of phonological awareness.

Theoretical Basis

The intrinsically bound single case study was based on a transformational learning theory that, at its core, explored the perceptions bounded by the case realities as well as the disorienting dilemma that occurs as individuals learn information that was previously unknown, such as the Simple View of Reading or the Cognitive Foundations Framework (Stake, 1995; Taylor & Hamdy, 2016). The constructionist approach, according to Stake (1995), creates a better understanding of the realities experienced individually through individual sensory stimuli, the experiential occurrences as related to those external stimuli, and finally, the integration of the prior two stimuli.

Baxter and Jack (2008) state that constructivism is based on the social construction of meaning as "truth is relative and is dependent upon one's own perspective" (p. 545). The

educators' experiences as they learned about phonological awareness and how it fit into the science of reading, was at the heart of this study. Mezirow's transformational learning theory relies upon the social constructionist approach to learning in which individuals construct their learning through the use of context, personal, professional, and social, as well as reflection (Kitchenham, 2008; Taylor & Hamdy, 2016). A benefit of this case study approach was the collaborative nature between the researcher and the participant. The participants told their own stories and described their experiences and perspectives, while the researcher uncovered emic issues germane to the participants (Baxter & Jack, 2008; Stake, 1995).

Research Questions

To understand educators' experiences and perceptions while participating in the professional development process, the researcher addressed the following questions:

RQ1. How do early elementary educators describe their professional development experiences in the specific areas of literacy and phonological awareness?

RQ 2: How do early elementary educators in a small public school district describe any changes to their pedagogical practices as they've learned the science of teaching reading?

RQ 3: How do early elementary educators observe their students responding to their changed literacy practices in phonological awareness?

Site Information and Population

This researcher explored the perceptions of regular and special education early elementary staff as they pursued professional development in the science of teaching reading, specifically the area of phonological awareness. The study explored the educators' perceptions and experiences as they participated in and reflected upon their literacy professional

development experiences and trainings, exploring whether and how pedagogical practices were altered. This study added to the corpus of knowledge regarding how educators assimilate, integrate, and accommodate novel information and research into their pedagogical practices.

Two elementary school sites within one public school district were selected for the study. In one elementary school, students ranged in age from preschool through grade one while the other elementary school comprised students in grades two through five. Each elementary school site retained its own administrative staff, inclusive of a principal and a curriculum and Title I coordinator. The grade two through five elementary school site also had an assistant principal to support student and educational staff needs. Reading specialists and guidance counselors were also available at both school sites. A social worker was available at the upper elementary school site to support student needs. Small Public School (SPS) is a pseudonym for the small public school district located geographically within the New England (U.S.) region. The early elementary school site had an enrollment over 250 students while the second school, the upper elementary school site, had an enrollment over 650 students. Educational staff comprised over 70 professionals.

This site was selected because the SPS had initiated a multi-year-long professional development around the science of teaching literacy. All early elementary professionals were required to participate in specific professional development that explored the underlying neurological processes of literacy acquisition, as well as how individuals learned to read. This research focused specifically on the concept of phonological awareness and how educational staff altered their pedagogical practices as they learned more about the underlying foundations of literacy instruction. Nearly 19% of students within the SPS were registered economically disadvantaged across the District, and approximately 19% of the population receives free and

reduced lunch (NH DOE, 2019). Eighty-six percent of the student population identified as white or Caucasian with Black as a category of race second with 5.8% of the population. The attendance rate within SPS elementary schools was 95.7%, approximately the same as the state average (NH DOE, 2019). Both sites, eligible for Title I funding, provided services for students from lower socio-economic status and school districts with increased numbers of students facing particular challenges (NCES, 2019b).

The SPS community observed that literacy achievement scores had stagnated over the past three years at the third-grade level. This trend followed the national trend in which student results on the National Assessment of Educational Progress (NAEP), known as The Nation's Report Card, were lower for fourth-grade students in literacy than the 2017 assessment administration (NCES, 2019). According to The Nation's Report Card: 2019 NAEP Reading Assessment (NCES, 2019), 17 states and/or jurisdictions had decreases in fourth grade literacy achievement from the 2017 to the 2019 administration. Over 30 years of data indicated that the average reading scores for fourth grade is not significantly different compared to a decade ago but is higher than the first assessment in 1998 (NCES, 2019, p. 1). In 2019, 66% of fourth grade students achieved at or below the basic proficiency level, with 34% of these students achieving below the NAEP basic level (NCES, 2019). 31% of fourth grade students achieved at the NAEP basic proficiency level, 25% of fourth grade students achieved at the proficient level and 9% achieved the NAEP advanced level (NCES, 2019).

Creswell, J.W. and Creswell J. D. (2018) emphasize the importance of securing necessary permissions through the gatekeepers of any research site. Therefore, the researcher obtained approval for the project from the institution's administration and adhered to all institutional

review board requirements. Respect for daily operations was also maintained throughout the study, with interviews organized around the participants' convenience.

Sampling Method

Participants were recruited through a stratified, purposive sample of the early elementary staff at both SPS sites, the early elementary school site and the upper elementary school site. According to Etikan, Musa, and Alkassim (2016), purposive sampling is "typically used in qualitative research to identify and select the information-rich cases for the most proper utilization of available resources" (p. 2). According to Bloomberg and Volpe (2016), the objective behind purposive sampling is to provide insights and understanding of the phenomena that is being studied, in this instance, educators' beliefs, perceptions, and practices as they participate in professional development. The researcher used the stratified purposive sample to focus on the participants who were able to assist with the specific research, seeking to learn about participants' perceptions based upon their experiences (Etikan et al., 2016). The purposive sampling technique involved selecting participants that have knowledge, experience, and were able to participate and communicate their experiences and opinions regarding the specific phenomena, the early elementary staff's experiences while learning about the science of teaching reading. In this purposive sample, the participants were selected "based on the degree to which they have unique and rich information to add to the study" (Etikan et al., 2016, p. 4). The sample comprised volunteer participants with specialized knowledge and experience in the area of professional development under study, specifically phonological awareness instruction based upon the professional development experiences provided by the SPS. This framework aligned well with the conversation about focusing on the prekindergarten to third grade from one cohort of teachers.

A minimum of two early elementary educators in each grade, Prekindergarten, Kindergarten, First, Second, and Third grade were selected to participate in the research. A stratified sample of participants provided the opportunity for the researcher to find possible common themes as well as differences among cohorts, such as grade level, professional development training, or other experiential knowledge that became evident during the semi-structured interview process, review of journal entries, and artifacts. Early elementary educators who have had training in the science of reading or are currently undergoing training were invited to participate. The total number of participants in the study was 12, seven from the early elementary school site and five from the upper elementary school site.

The participants were invited to participate in the research process. An email was sent to 25 possible participants to determine interest in participating in the study. The volunteering participants were selected from both school locations. The volunteer participants were provided with an informed consent form, along with the purpose of the study and the ethical considerations inherent in the study. The researcher established times and opportunities for the participants to talk and ask questions. Once the participants had their concerns addressed and felt comfortable participating in the study, the researcher recruited 12 participants. The volunteers participated in a 4-month study that occurred from the end of the 2019-2020 school calendar year and into the first trimester of the 2020-2021 school calendar year.

Instrumentation and Data Collection

Three forms of data were collected to explore participants' perceptions and experiences. The researcher collected data from the following three sources: one interview, two journal entries, and artifacts related to the educator's pedagogical practices (Creswell & Poth, 2018; Merriam, 2009). According to Stake (1995), the importance of the interview is to determine the

meaning of the participant's experience, not the specific accuracy of their words. The researcher transcribed the audio-recorded interviews into text for member checking and coding for themes using NVivo 1.2 transcription software (Stake, 1995). Member checking within a timely manner was required to determine whether the accuracy of the meaning was captured as "direct transcriptions can dismay participants with the inelegance of their incomplete statements or thoughts" (Stake, 2015, p. 66). The researcher, through the use of the three sources, used triangulation of the data set, providing for credibility and dependability. The researcher used these sources to explore and understand educators' experiences and practices as they integrated new information about the science of teaching literacy into their daily lives.

Interviews

The researcher conducted one round of interviews to explore educators' perceptions, beliefs, and thoughts. According to Creswell & Poth (2018), interviews are a social interaction in which knowledge is constructed based on the dynamics between researcher and interviewee. Yin (2009) recommends that case studies apply a specific interview technique that meets the needs of the research design. Applying focused interview techniques, the researcher explored participants' perspective and experiences (Yin, 2009). The interview required carefully worded questions as well as interviewer skills to avoid corroboratory information while encouraging each participant to provide "fresh commentary" (Yin, 2009, p. 107). The goal of the semi-structured interview was to gather participants' perspectives and "points of view" (Creswell & Poth, 2018, p. 163). The focused semi-structured interview protocol contained specific questions in the areas of context, perception, and content, yet remained flexible, designed to explore other etic issues that arose from the interview process (Stake, 1995; Yin, 2009). The one on one semi-structured focused interview connected with the research questions as the researcher sought to discover, to

describe, and to understand the participants' unique perspectives and approaches to the phonological awareness and automaticity professional development.

The researcher elicited participation for the focused interviews through electronic mail and social media platforms such as Facebook© Messenger and text on a voluntary basis. The interviews occurred either on the telephone or through video conferencing software such as Google Meet or Zoom due to the COVID-19 global pandemic based on participant request. Handwritten notes, as well as auditory backup were collected for researcher referral, transcription, and coding of themes. Member checking of the interview responses occurred within 48 hours of the interview to determine internal validity and the validity and acceptability of the interviewee's narrative and information (Stake, 1995). The interviews were approximately 50-60 minutes in length and were recorded for transcription, summation, coding and member checking. Prior to the interview, informed consent was collected from participants. The informed consent included a research statement describing the purpose of the research, the projected length of the research, risks to participants, and the measures that were undertaken to protect and ensure the participants' privacy and confidentiality.

The researcher asked demographic questions at the initial interview inclusive of degrees or certifications earned, years teaching, professional development experience in the science of teaching reading, and grade level. Then, contextual and perceptual information interview questions were created and selected to address the educator's perceptions of the process of learning the teaching of phonological awareness, the skills themselves, and their perceptions as the educators learned to teach the skill to students.

Journal Entries

The researcher requested a maximum of two journal entries from the volunteer participants. One journal entry was requested after the initial member checking of the interview transcription and the second journal entry was requested within 4-6 weeks after the initial journal entry was returned to the researcher. Some participants requested both journal entries within a shorter timeframe due to external scheduling needs. As participants experienced the professional development and continued teaching early elementary age students, their perceptions and experiences, specifically regarding phonological awareness were considered important to gather and to document. This data source provided a richness of first-person experience that may not be captured during an interview. Typically, the interview is an exchange of perspectives and ideas (Bloomberg & Volpe, 2016). However, the journal entries provided additional narrative that educators may have felt more comfortable sharing in a written form rather than an in person or video conferencing interview. Twice during the study's duration, educators were provided with journal entry prompts to reflect upon regarding their current and past experiences teaching reading and incorporating phonological awareness for a total of two journal entry prompts. The objective was to encourage educators to open up and explore their own perceptions and experiences. Specific items for journal entry included the following:

- Reflect upon the literacy professional development. What professional development experiences have resonated with you? What has been useful in your educational practice? What has not been useful? Describe your thoughts and ideas about phonological awareness. Describe any experiences that you found confirming or challenging to your educational practices and beliefs.

- Describe what specifically you have you learned from professional development in phonological processing. Describe your successes and barriers that you would like to share as you have experienced professional development. Describe your educational practices and whether you have altered or amended your educational practice.

The journal entry items are intentionally written as a combination of statements to encourage participants to open up and explain their own perspectives without a potential fear that they need to answer questions that have a predetermined specific response as well as questions to guide their thinking processes.

Artifacts and Documents Related to Educational Pedagogy

Documents and any artifacts related to the education professional's teaching of phonological awareness such as lesson plans, notes, educator's observations and data are also included in this research. Merriam (2009) explains that these personal documents are a "reliable source of data concerning a person's attitudes, beliefs, and a view of the world" (p. 143). Yin (2009) also indicates that a strength of documents as a source is they are "stable, and can be reviewed many times" as well as "unobtrusive" as they were "not created as a result of the study" (p. 102). Documents as a data source provide broad coverage of a topic and can contain "exact" information regarding the event details (Yin, 2009, p. 102). The personal beliefs, opinions and perceptions are at this study's core. However, it is possible that participants will deny access to the materials or may no longer have access to the materials due to school building closures as a result of the global SARS-CoV2 pandemic.

Merriam (2009) reminds the researcher that ingenuity is needed in locating and accessing the documents as the documents and artifacts are not related to the research; and are independently generated for the educator's own use. Therefore, the researcher needed to locate

and analyze documents carefully as they were not generated for the purpose of this study. Yin (2009) mentions "biased selectivity," phenomena, in which the data collection may be incomplete based upon access to the data available. According to Merriam (2009), "documents of all types are emergent in design and inductive in analysis. Documents of all types helped the researcher uncover meaning, develop understanding and discover insights relevant to the research problem" (p. 163). The researcher built trust with the study participants to access the documents.

Pilot Study

A pilot study was conducted during the Spring of 2020. The pilot study field tested the research questions, using a sub-sample of the participants from the early elementary school. An initial letter of intent was sent to specific early elementary educators who had indicated a willingness to explore this research. Interview questions were formulated, and one on one interviews were established and conducted in the Spring of 2020. Hassan, Schattner, and Mazza (2006) recommended the use of a pilot study, as pilot studies are able to help identify possible challenges and deficiencies in method implementation. The pilot study assisted the researcher to test and to practice specific protocols created for interview questions. The pilot study comprised the following process:

1. The researcher invited two educational professionals from the early elementary school site. The researcher provided the potential participants with the overview of the study and its purpose. The researcher provided enough time for the participants to determine their willingness to participate. Once the volunteer agreed to participate, the researcher provided informed written consent and purpose of the pilot study once again. One

educational professional agreed to participate in the pilot study. This participant was not recruited to volunteer for the research study, as they participated in the pilot study.

2. Once agreed upon, the researcher established the interview date and time as well as the method of the interview. The interview took place using video conferencing software, Zoom. The researcher provided an agenda of the interview with semi-structured questions that were asked during the interview.
3. During the interview, the researcher asked demographic questions inclusive of years teaching, grade levels taught, educational background, and gender. The interview was separated into two sections: a) demographic information, and b) experiential and perceptual information. The experiential and perceptual information section contained items regarding teacher knowledge of the phonological awareness skills as well as open ended items regarding how participants felt and experienced the shift in learning and pedagogical practices as they assimilated, integrated and potentially embraced, or not, the professional development information.
4. The researcher transcribed the interview and drafted an analytic memorandum. The transcription results and analytical memo were sent to the participant for member checking.
5. The researcher gathered and managed data collection. The researcher used the pilot study to find the deficiencies in both the researcher's ability along with the need for further clarification of items in the interview questions while documenting the information presented.

6. The researcher began preliminary coding as an aid in practicing and refining coding techniques, data collection and documentation. The researcher was also able to practice interpreting the collected data set on a limited basis.

Data Analysis

This intrinsically bound case study compiled narrative information collected from primary sources. The interviews provided an opportunity for participant-researcher interactions while the artifact and document collection reflected a less interactive approach between the researcher and the participant. The rationale behind these methods involved the opportunity for the participant and researcher to discuss and to open up about their own perceptions and experiences through the interview and review of the artifacts. Journal entries provided a participant's own voice, enriching the data set and providing for contextual, background, and authentic experiences. Each data collection method had specific analyses unique to their method comprising a body of information that led to overall understandings and themes.

Member Checking: Transcriptions and Summaries

Following each round of interviews, the researcher transcribed the interview for review by the participant to ensure that the transcription encapsulated the perceptions, meaning, and experiences as described in the interview. Additionally, the researcher drafted a summary of the events that occurred in the interviews, noting relevant patterns as related to the research questions in this study. The summaries were distributed to the participants for member checking, aiding in the accuracy of data collection. The summaries contained information about the setting, the context within which the interview occurred, and the participant's responses about their feelings, perceptions, and experiences. The purpose of the data collection was to "find answers to the research questions" (Merriam, 2009, p. 176). These summaries were used to aid the

researcher in identifying segments in the collected data for the smallest unit that has meaning (Merriam, 2009).

These summaries also captured information about educators' perceptions and beliefs along with pedagogical practices as they participated in and reflected upon their professional development in phonological awareness and automaticity. These summaries allowed the researcher to make connections to the observations of participants' pedagogical practices as they incorporated the phonological awareness into their teaching. This round of data analysis, a comparative and inductive approach, required frequent and continual data analysis to aid in identifying themes (Merriam, 2009). While pursuing data collection, Merriam (2009) recommended that "rudimentary analysis" (p. 171) occur. The ten recommendations as described by Merriam (2009) were explored, specifically "narrowing the study's topic, writing comments and memos to aid in recall and reflection, and trying out new lines of inquiry" (p. 172) on other participants based upon prior data collection and emerging themes.

Coding Methods

The researcher transcribed into text the data from the interview's audio recordings. The interview transcriptions along with the journal entries were coded to identify and categorize themes and to determine patterns. The researcher conducted two cycles of coding (Saldaña, 2009). Each interview was transcribed within 48 hours to aid in recall and data collection techniques. Initially, the researcher applied an attribute coding method, for both the interviews and journal entries, to gather information about participants, providing "context for interpretation and analysis" (Saldaña, 2009, p. 56).

Interviews and Journal Entries. The researcher, in the first cycle of coding applied a descriptive coding approach that enabled the researcher to interpret and analyze participants'

change in perceptions or ideas over time (Saldaña, 2009). The researcher also applied an In Vivo coding to "honor the participants' own voice and to ground the analysis from their own perspectives" (Saldaña, 2009, p. 48). The researcher also applied a structural coding technique to "act as a labeling and indexing device" (p. 67). McQueen et al. (2008) as cited in Saldaña (2009) explained that this approach may "result in the identification of large segments of text on broad topics that can be used as the basis for in depth analysis" (p. 68). This approach aided the researcher in locating and identifying major themes and commonalities.

Additionally, the researcher used a values coding technique that reflects a "participant's values, attitudes and beliefs" of their own perspectives (Saldaña, 2009, p. 89). Values, attitudes and beliefs are the affective and indicate the importance with which participants place on something or some idea (Saldaña, 2009). The aim of this research was to understand and describe the participants' experiences, thus exploring the participant's own values, beliefs and attitudes. The researcher also applied a second cycle of coding that involved pattern coding to identify emergent themes (Saldaña, 2009). This approach allowed the researcher to discover any patterns and processes that arose during the first coding cycle.

Artifacts and Documents. The researcher applied a process coding method for the artifacts to aid in understanding the "complex interplay of factors that comprise the process" (Saldaña, 2009, p. 46). These codes assisted the researcher in understanding the events that occurred. The researcher, in conjunction with process coding, used descriptive coding to "aid in categorizing and compiling an index of data's contents" (Saldaña, 2009, p. 72). The researcher applied these two coding processes to aid in the understanding of the themes and topics emerging from the observation data set.

The researcher applied a second cycle of coding that involves axial coding. The axial code aided the researcher in categorizing and finding properties that can "let the researcher know if, when, or how and why" behaviors occur (Saldaña, 2009, p. 159).

Coding Summary

The researcher created a broad list of codes with the assistance of NVivo 1.2 coding software with the intent to reduce the data volume and to analyze the data using queries. The researcher used both the existing literature in the field, along with the data collected from participants and external documents to achieve a manageable data set. The researcher created and pursued ongoing journaling as well to aid in data reduction. The researcher concluded the data collection phase when saturation of categories occurred; the time when small increments of information were observed and learned as well as the time when new information learned no longer answered the study's line of inquiry (Merriam, 2009).

The theoretical propositions strategy shaped the data collection plan and concentrated the focus on how the participants described their experiences and beliefs. The researcher compiled the data sets from interviews, journal entries, and artifacts into a case study database (Merriam, 2009). The case study database was used to aid the researcher in organizing and recording the data for use during specific "intensive analysis" (Merriam, 2009, p. 203). Yin (2009) posited that novice researchers are likely to find the analysis of the raw information a challenging part of case studies and recommends that novice researchers begin with a single case study.

Analytic Techniques

The researcher applied "pattern matching logic to strengthen internal validity" (Yin, 2009, p. 136). The pattern matching technique enabled the researcher to compare predicted patterns with patterns collected from the data. The researcher also applied a time series analysis

in which the researcher reviewed the data collected to explore whether a "match between empirical trends and the theoretically significant trend prior to the study or other rival trend" exists (Yin, 2009, p. 145). The researcher, to aid in descriptive and explanatory analyses, used the patterns, themes, and descriptions, weighing them against themes from the theoretical framework.

The researcher was also prepared to conduct content analysis in which "situations, settings, styles, images, meanings and nuances are key topics" (Merriam, 2009, p. 205). The researcher used content analysis to describe and to understand that the communication of meaning is part of the analysis (Merriam, 2009). Inductive analysis was applied by the researcher to both simultaneously code the raw data and to create new categories that are reflective and capture the understanding of a study's topic (Merriam, 2009). The researcher applied the tentative explanations during the ongoing data collection to assist in finding the general overall themes related to the topic under study (Merriam, 2009).

Research Design Limitations

Limitations exist in any study. Stake (1995) posits that a "qualitative study is subjective" (p. 45) and it is this subjectivity that aids in understanding and comprehending the phenomena. Typically, qualitative studies seek "patterns of unanticipated and expected relationships" (Stake, 1995, p. 41). By seeking these patterns, the researcher needs to focus on the "centrality of interpretation" (Stake, 1995, p. 42). The case study methodology requires that the researcher focus on the challenges and limitations that can arise and provide approaches to reduce the impact of these limitations.

Some limitations focus on the access to the participants and the organization itself. Creswell and Poth (2018) discuss the limitations of a researcher when a site is selected in which

the researcher has a vested interest. The researcher recruited individuals from the two elementary school sites within the small public school district to be participants in the study by allaying their natural anxieties about sharing their perceptions, feelings, and experiences.

Additionally, the researcher must also have faith that the participants will use authentic and honest voices as they share their perceptions and experiences with the researcher, not just sharing with the researcher what they believe the researcher wants to hear. Bloomberg and Volpe (2016) explain that while interviews can be used to provide rich and thick descriptions, they can also be challenging as not all participants are "equally cooperative, articulate, and perceptive" (p. 155). The researcher needed to create a rapport and relationship with participants. The researcher strived to build trust through active engagement and listening to participants' voices. Through this researcher-participant rapport, the researcher encouraged openness of communication and encouraged rich descriptions of the participant's thoughts, experiences, and perceptions.

Another possible limitation is related to interpretation. The researcher's own "stance" (Creswell & Poth, 2018, p. 172) that blinds the researcher to different dimensions or interpretations of the collected data is a concern that must be addressed and managed. The researcher is an educator in one of the elementary buildings. Reflexivity was put into place to mitigate some of the challenges facing qualitative research (Attia & Edge, 2017). The researcher both consciously stepped back from the research to explore their own pre-understanding but also engaged in open dialogue and learned from participants, supporting researcher development and participant development through the etic issues that arose (Attia & Edge, 2017; Stake, 1995). The researcher needed to maintain a journal as well as interact with the research team to avoid conscious and unconscious bias from skewing the data set and interpretation.

Another limitation was the researcher's experience. This case study was designed and implemented by a novice researcher. Bloomberg and Volpe (2016) explain, "interviews are not neutral tools of data gathering" (p. 155). The interview reflects the interactions between the researcher and the participant. Thus, the quality of the novice researcher's interview skills is a limitation. Collaborative interviewing is used as a strategy to engage the participant (Creswell & Poth, 2018). However, the novice researcher required practice to learn how to pursue this interview strategy.

Creswell and Poth (2018) explain that the validation of qualitative research has multiple perspectives, with some researchers making connections between quantitative and qualitative terminology. According to Korstjens and Moser (2018), qualitative research uses a criterion of trustworthiness "to judge the quality of qualitative research" (p. 121). Creswell and Poth (2018) recommend the use of "naturalistic terms for internal and external validation, reliability, and objectivity" (p. 256) based upon the research by Lincoln and Guba (1985). This case study's researcher answered the question, "Can the findings be trusted?" (Korstjens & Moser, 2018, p. 121) through the following criteria: credibility, transferability, dependability, confirmability and reflexivity. This researcher applied multiple validation techniques and strategies to determine the trustworthiness of the collected data set (Creswell & Poth, 2018).

Credibility

Equivalent to internal validity in a quantitative study, credibility is the underlying construct that indicates, "whether a participant's perceptions match up with the researcher's interpretation and portrayal of the perceptions" (Bloomberg & Volpe, 2018, p. 162; Korstjens & Moser, 2018). Credibility is one construct at the core of qualitative studies as it determines how well the case study represents the situations and perceptions under study (Bloomberg & Volpe,

2018). The researcher must demonstrate and provide evidence that their descriptions and analyses represent the reality of the data collected. The researcher provided evidence by engaging in four strategies that aide in establishing data truthfulness: member checking, triangulation, persistent observation, and prolonged engagement (Bloomberg & Volpe, 2018; Korstjens & Moser, 2018).

Member Checking Procedures. This study sought an explanation about perceptions and experiences. The interpretative nature of the research necessitated that a participant verifies or affirms their perspectives and experiences, limiting the possibility of incorrect data (Bloomberg & Volpe, 2018). The researcher sought internal validity through member checking. The researcher transcribed the interviews and drafted a summary of the data collected. Then, the researcher sent the transcription and summary notes to the participant in a timely manner, through electronic mail. Typically, this occurred within 48 hours for participant review and their possible amendments. Lincoln and Guba (1985) as cited in Creswell and Poth (2018) explain that member checking is the "most critical technique for establishing credibility" (p. 261). The research participants played a "major role" (Stake, 1995, p. 115) and were involved in the editorial review and amendments to the interviews. Two participants reviewed the study findings to ensure accuracy and to ensure the confidentiality of the information.

Pattern matching was applied to the first research question, exploring whether pedagogical practices have altered. Participant reports, journal entries, and artifacts were used as confirmation. Yin (2009) explains that by comparing an empirically based pattern with a predicted one, such as changes in pedagogical practice, the "results can strengthen the internal validity" (p. 136) of the case.

Engagement. Merriam (2015) explains that "internal validity" (p. 214) can be considered one of the strengths of qualitative research. The proximity of the researcher to the participants through the use of interviews and observations created closeness to the data collected. The participants all had their own experiences, opinions, and interpretations of reality. The researcher is employed by one school site and has extensive knowledge of the informal and formal culture but needed to spend time talking with the participants at the other elementary site under study. The researcher talked with participants, meeting with and learning about the culture of the second elementary site prior to data collection. The goal was to familiarize the researcher with knowledge of the site's culture and internal processes (Bloomberg & Volpe, 2018). During this case study, the researcher asked questions and made field-based decisions as the participant and researcher spent time in discourse to establish that closeness to the data collection (Creswell & Poth, 2018; Kortsjens & Moser, 2018).

Collaboration with Participants. Creswell and Poth (2018) discuss the growing body of research in which researchers "involve participants in the data collection protocols, data analysis, and data interpretation" (p. 262). The researcher discussed data collection protocols with the participants. The researcher also took the participant's feedback under review, incorporating suggestions and ideas as appropriate (Bloomberg & Volpe, 2018). The collaboration with participants created the rapport and engendered a working relationship and built trust, thereby encouraging open communication and dialogue. By including participants in the process, the researcher was able to ensure that the participants' information represented their specific perspective and feedback. This connection to participants, the give and take between participant and researcher, provided the member checking and credibility necessary to ensure the validity of the study (Bloomberg & Volpe, 2018).

Triangulation. Merriam (2009) explains that the most widely known strategy used to bolster internal validity is triangulation. Triangulation refers to the use of multiple data sources, such as collecting data gathered at different times, space, and participants as well as method triangulation (Bloomberg & Volpe 2018; Creswell & Poth, 2018; Korstjens & Moser, 2018). The researcher applied three data methods: collecting one interview and two journal entries, as well as gathered artifacts to aid in "theme and perspective corroboration" (Creswell & Poth, 2018, p. 260). The researcher also varied the time at which the data sources were collected, exploring the perceptions of educators at both elementary sites to aid in interpretation and corroboration. The researcher used interviews and journal entries as primary data sources. By varying the data sources as well as the times of the data collection, the researcher was able to collect participants' perspectives across settings. Transformational learning theory involved the process of acquiring novel information and integrating the novel information into the participant's schemas through critical discourse and transitivity. The interviews and journal entry methods provided an outlet for participants to reflect upon and to process the information that they learned during the literacy professional development process.

Transferability

Transferability is the underlying idea that the case study research may be generalizable in some form. The researcher addressed the transferability limitation by asking whether readers see characteristics within this study that may be transferred to another setting (Creswell & Poth, 2018). The researcher increased the study's applicability and transferability by adding rich and thick descriptions. Stake (2010) as cited in Creswell and Poth (2018), explains that rich description comprises details about the theme as well as the "interconnections among physical, movement, and activity levels using quotations and action verbs" (p. 263). It is these rich

descriptions that allowed readers to decide if "they can transfer the shared characteristics found within this setting to other settings" (Creswell & Poth, 2018, p. 263) or whether the case study research is applicable to their own experiences and situations. Readers may "decide whether similar processes will work in their own setting" (Bloomberg & Volpe, 2018, p. 164). The researcher created rich and thick descriptions to explain, interpret, and encourage the reader to become immersed in the research, determining whether the experiences of the participants were applicable to their own settings and experiences.

The researcher described the participant experiences and the context in which the experiences occurred to create the rich and thick descriptions in the field notes, analytical memos and the research findings (Bloomberg & Volpe, 2018; Creswell & Poth, 2018; Korstjens & Moser, 2018). The rich and thick descriptions provided future readers with contextual and background information that can increase the feelings and perceptions of a "shared experience" (Bloomberg & Volpe, 2018, p. 164) that can enhance the transferability of the study's findings.

Reliability and Dependability

It is the responsibility of the researcher to create an opportunity and to "develop an understanding of when the findings are consistent and dependable with the collected data" (Bloomberg & Volpe, 2018, p. 177), creating dependability. The researcher applied two methods to increase dependability, creating an audit trail and recruiting a colleague to engage in coding an interview transcription.

The researcher created an audit trail of information that described the research steps that will be taken from the beginning "of a research project through to the development and reporting of the research findings" (Korstjens & Moser, 2018, p. 121). The researcher used this documentation as a validation strategy that an external auditor, with experience in the research

process along with the study's topic, reviewed for reliability and dependability. The researcher created and kept a complete set of notes inclusive of "decisions made during the research process, reflections, sampling, adoption of research methods and materials, the emergence of findings, and data management" (p. 122). The researcher created an audit trail to confirm the process made in the course of the study.

Confirmability

The researcher created, maintained, and used an audit trail to demonstrate dependability, (Korstjens & Moster, 2018). This audit trail allowed the researcher to focus their attention on interpretation and process analysis (Kortstjens & Moster, 2018). Confirmability, analogous to objectivity in quantitative analysis, meant that the findings of the study are the outcomes of the research and not the "biases or researcher subjectivity" (Bloomberg & Volpe, 2018, p. 177). Data inter-subjectivity was a concern; the researcher needed to guard against interpreting the data set based upon their perspectives and preferences. The audit trail comprised a set of field notes describing the different phases of the research process, the analytical memos, and the experiences and decisions the researcher undertakes as the research process unfolded from data collection, to analysis, to organization and storage. A third party was able to view this audit trail and use it as evidence that the study's interpretations are confirmable (Bloomberg & Volpe, 2018; Korstjens & Moser, 2018).

Reflexivity

Preconceptions and innate biases are limitations of research studies that researchers must address. The researcher worked to minimize their probability of bias and increased their confirmability and dependability of research findings by engaging in self-awareness and reflexive approach towards data design, collection, analysis, and interpretation (Bloomberg &

Volpe, 2018; Kortsjens & Moser, 2018). The researcher is an educator in one of the elementary school site buildings. Reflexivity was put into place to mitigate some of the challenges facing qualitative research (Attia & Edge, 2017). The researcher both consciously stepped back from the research to explore their own pre-understanding but also engaged in open dialogue, learning from the participants and supporting researcher and participant development through any etic issues that arose (Attia & Edge, 2017; Stake, 1995). The researcher engaged in both internal and external reflections about their role in the research process, the decisions that were made about the design, the implementation, the data collection, the interpretation, and the findings. The researcher created notes and an audit trail for confirmability. These notes described the context of the data collection method and the setting, the relationship between the researcher and the participants, as well as the researcher's own subjective thoughts and response that occurred during data collection, data coding, and data interpretation (Korstjens & Moster, 2018).

Ethical Issues in the Proposed Study

Ethical considerations must be recognized in research studies (Pietilä, Nurmi, Halkoaho, & Kyngäs. 2020). It is incumbent upon the researcher to acknowledge the ethical considerations that may arise in all aspects of a study as well as the issues that can arise from data collection, analysis and interpretation of findings (Bloomberg & Volpe, 2018). The researcher acknowledged the study's conflicts of interest. The researcher shared with the study's participants that the district also employed the researcher. This disclosure occurred to improve transparency and dependability. This transparency had the added benefit of engendering trust and collegiality. However, this transparency also had the effect of some volunteer participants deciding not to participate. Full disclosure of the researcher's role within the organization was provided in oral and written format prior to the participant volunteering for the study.

The protection of the volunteer participants' identity was paramount. Informed consent was provided to the participants prior to the research study's beginning. The volunteer participants had time to learn about the study's purpose, the study's scope, and how their data would be collected and stored to protect their identity. The researcher provided opportunities for questions, comments and concerns to be discussed in multiple formats, inclusive of individual conversations through telephone, electronic mail or video conferencing all designated to address the participant's concerns.

Ethical use of the data was a primary concern, and therefore incumbent upon a researcher to clearly outline the processes and steps taken to protect each participant's identity and their data. The researcher ensured participant's confidentiality as well as de-identifying the data collected. Participants needed to be aware that their information and their identifying characteristics were protected, from initial data collection, to credibility, through to storage (Bloomberg & Volpe, 2018). The researcher explained the accessibility of the identifying information and data to the participants prior to the study and upon any participant's request.

Researcher Bias

Inherent in any research design is researcher bias (Yin, 2009). As preliminary data was collected, the researcher is advised by Yin (2009) to test for "tolerance" and report on alternative explanations and suggestions for data collection (p. 72). Yin (2006) suggests that the researcher use the study's methodology to guide and organize the study. Educators' experiences as they pursued and integrated phonological awareness training into their pedagogical practices acted as the boundaries in this case. The research only focused on prekindergarten through grade 3 educators' experiences as they related to the study and the practice of phonological awareness. This boundary was intentional as one objective was to explore educators' experiences and

perceptions, possibly providing a blueprint for future professional development in literacy. The researcher attempted to mitigate limitations by maintaining focus on the study's purpose.

Every effort was made to protect the participant data and the case study school site and district. The researcher was the only individual who knew the identity of the participants. While this information collected should not adversely impact the participants, unanticipated consequences may occur. The information gathered was positive, negative, or neutral. Therefore, an aggregate of the data across multiple factors assisted in protecting participants' data. For example, aggregation of data of educators in the upper elementary school site was separated from the aggregated data from participants in the early elementary school site. This form of aggregation minimized the possibility of identification of any specific participant.

Informed Consent, Confidentiality, Risks & Benefits

All participants in this study received a study invitation along with the description of the study's purpose, the study's procedures, the limited personal risk factors, participants' rights, the researcher's contact information, and lead advisor as well as a $10.00 gift card for their participation. The consent form was reviewed by the participants, agreed upon, and signed.

Subject and Data Confidentiality

The principal researcher was the sole data collector for this study. The researcher only collected data from the participants who volunteered from the two elementary school sites. The data collected was coded by grade level. The information was presented with participants identified by alphabetical letters. The data was collected and maintained within the Google cloud, encrypted with a password and two-step authentication system, only accessible by the researcher and reviewed by the research committee. Back up of the material was maintained on a portable external hard drive secured within the researcher's home office within a locked lateral

filing cabinet. The field notes, audit trails, logs, reflections, and hand-written journal entries were maintained within a locked filing cabinet within the researcher's home office. All personally identifiable information was removed from the study prior to the dissertation completion. Upon completion, the identifiable data was removed from the locked filing cabinet and shredded for disposal at a secure site.

Potential Research Risk to Participants

The researcher made all efforts to protect participant confidentiality, individual classroom confidentiality and the case study school district. The principal researcher was the only person who knew the identity and location where the participants were employed. The researcher maintained participant confidentiality, keeping interview participants unknown to each other. The information collected should not pose any risk or hardship to the participant as the information was gathered and aggregated to protect identity. For example, while some information collection might indicate participants presented as negative or change averse, the overall questions focused on past, current and future practices and design. The researcher also aggregated the data to minimize the possibility of identifying participants affiliated with specific classrooms.

Conclusion

Literacy scores have stagnated or declined in the majority of the United States. According to the 2019 National Assessment of Educational Progress (NAEP), the average reading scores for grade four students are lower than the scores achieved in 2017 (NCES, 2019). Approximately 35% of fourth-grade students achieve scores at or above proficiency levels, while 33% of fourth-grade students are struggling to comprehend grade-level material (Joshi &Wijekumar, 2019). There are multiple reasons for this decline in reading achievement.

Educators consistently report having inadequate training and accessibility to information about the science of teaching reading (Binks-Cantrell et al., 2012; Joshi & Wijekumar, 2019; Moats, 1994; Poiner, 2018). The gap between what educators know, their pedagogical practices, and the research on how to effectively teach reading is impacting how educators teach students to read. Voluminous information is available on how to teach reading from an evidence and scientific base, however many teacher education programs are still not integrating these methods into their teacher training programs (Poiner, 2018). Therefore, education professionals are addressing this gap by providing training to in-service and veteran educators in the science of reading, specifically phonological awareness. The experiences and perceptions of these educators are important to explore as these educators learn about the evidence-based research that informs their practice as accommodating, assimilating and integrating new information is a learning process (Kitchenham, 2008; Merriam, 2004; Mezirow, 1991).

This study used a qualitative intrinsic case study bound by a single school district with two elementary school sites that aimed to explore how educators perceived and described their experiences as they reflected upon their professional development. The literacy professional development was designed to fill the research to practice gap by answering three research questions. 1) How do early elementary educators describe their professional development experiences in the specific areas of literacy and phonological awareness? 2) How do early elementary educators in a small public school district describe any changes to their pedagogical practices as they've learned the science of teaching reading? and 3) How do early elementary educators observe their students responding to their changed literacy practices in phonological awareness?

Participants were recruited through a stratified purposive sample of early elementary faculty. These participants had the necessary background knowledge, experience, and participation in the phonological awareness professional development that could be used to provide insights and understanding of the phenomena that is being studied (Bloomberg & Volpe, 2018; Etikan et al., 2016). The methods for the single case study included an interview, two journal entries, and the gathering of artifacts. Data analysis was conducted simultaneously during the data collection phase and the data analysis phase through the use of coding with the aid of NVivo computer analysis software. All participant rights and identity were protected, ensuring confidentiality. Data collected, such as field notes, audit trails, transcriptions, observation notes, and interview transcriptions results, were maintained in a secure location, both in a locked file cabinet as well within the Google cloud, encrypted with a password and two-step authentication system. Limitations of the study were acknowledged and anticipated through procedures designed to remediate and reduce the effects. For example, triangulation of data and member checking was applied to increase the trustworthiness of the data obtained during data collection and analysis.

This chapter discussed the methodology of the research case study. It included the problem, purpose, design, setting, participants, sample, data collection procedures, data analysis, limitations, and participants' rights and benefits of this qualitative case study. This study was concerned with the experiences of early elementary educators as they pursued training in and reflected upon phonological awareness. Chapter 4 presents the case study's findings gathered from the participants while Chapter 5 presents a research discussion, a brief overview of the findings, along with the implications and limitations of the study, as well as recommendations for further study.

CHAPTER FOUR

FINDINGS

This qualitative case study, intrinsically bound by the scope of the educators' experiences with professional development in the science of reading and phonological awareness training, explored how their experiences have impacted and shaped the educators' perceptions and practices. The central phenomenon is influenced by the research literature indicating educators are often less prepared to teach reading, specifically in the area of phonological awareness and phonemic automaticity (Cohen et al., 2017; Cunningham et al., 2004; Kilpatrick, 2015; McMahan et al., 2019; Moats, 2020). The research questions led to self-reflection and critical analysis of the participants' role in professional development, their ability to integrate and assimilate new information, and their capacity to make changes to pedagogical practices to improve student achievement.

During the 2018-2020 school years, participants, the early elementary educators, working in the early elementary school and upper elementary school from a small public school district in the New England region of the United States, participated in literacy professional development. Based on Mezirow's transformational learning theory, the study explored the educators' experiences as they constructed and explored their learning through their own schemas and contextual understanding as well as through critical self-reflection (Kitchenham, 2008; Taylor & Handy, 2013). The interviews encouraged the self-reflection process, asking educators to think critically about their experiences with literacy professional development, the process of teaching literacy, and whether their own experiences resulted in transformational change. The research questions addressed in the study were as follows:

RQ1: How do early elementary educators describe their professional development experiences in the specific areas of literacy and phonological awareness?

RQ 2: How do early elementary educators in a small public school district describe any changes to their pedagogical practices as they've learned the science of teaching reading?

RQ 3: How do early elementary educators observe their students responding to their changed literacy practices in phonological awareness?

This chapter describes the methods the researcher used to collect and analyze data, presents contextual demographic and academic data, and identifies five themes that resulted from data collection and analysis. The five main themes were a) Change, b) Collaboration, c) Confusion, d) Confidence, and e) Communication.

Analysis Methods

Creswell and Poth (2018) explain that a case study research design "explores a real life contemporary bounded system over time through in-depth data collection involving multiple data sources" (p. 96). This case study included participant interviews, journal entries, and artifacts provided by participants. Figure 4 illustrates the 4-month process from research application through analysis.

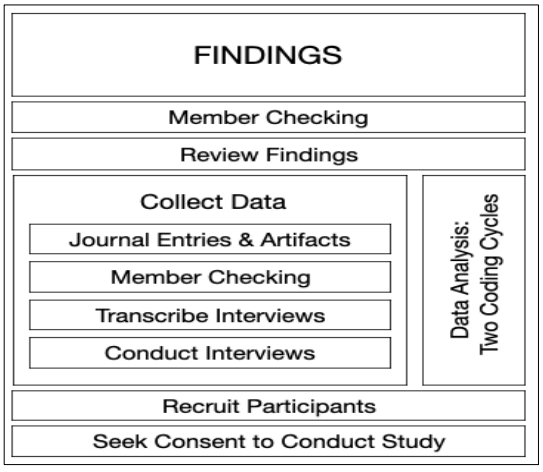

Figure 4. Research process

Data Analysis

Huberman & Miles (1994), as cited in Creswell & Poth (2018) indicate that data analysis is a process that is "custom-built, revised and "choreographed" and can be considered a "data analysis spiral" (Creswell & Poth, 2018, p. 185). This spiral involved "collecting and managing data, reading and reviewing data, creating memos to reflect emergent ideas about the data, describing and classifying codes into themes, developing and assessing interpretations, and representing and visualizing the data prior to documenting the findings" (Creswell & Poth, 2018, p. 186). The researcher applied the data analysis spiral, recursively and iteratively moving up and down to explore the emerging themes and subthemes, searching for patterns until data saturation occurred. By making sense of the voluminous data generated by the three research methods, interviews, journal entries, and artifacts along with researcher memos, the researcher captured the participants' perspectives and voices (Creswell & Poth, 2018). For example, Appendix C provides a list of respondents per theme. The following section provides the data collection methods and data analysis tools that comprise the information for generation of five themes.

Semi Structured Interviews

Upon receipt of the consent to participate forms from participants, the researcher established a time for the interview. This study involved twelve interviews, eight of which took place on the telephone and four of which took place using video conferencing software, such as Zoom or Google Meet based upon participant preference. In each interview, the researcher audio recorded the interview proceedings and uploaded the .m4a audio files to NVivo™ transcription 1.2, a web based confidential service for transcription services. The researcher reviewed the transcripts, making corrections as necessary. The files were converted into Microsoft Word and distributed to the participants within 48 hours for member checking through electronic mail. The

researcher made requested changes, noting any additional typographical or other errors. The files were then transferred into .pdf or .rtf files and uploaded into the NVivo™ for organization and coding. File names were altered to de-identify participants and review of the audio recording occurred to provide for accuracy of audio transcription.

Journal Entry Data

Upon receipt of the participant member checking data, the researcher distributed the first journal entry prompt through electronic mail format with a month-long timeframe for response. Once the first journal entry prompt was returned, the second journal entry prompt was distributed to the participant through the electronic mail medium for participant reflection and response. The researcher conducted two cycles of coding, with the intent to analyze, sort and synthesize the information provided by the participants. The researcher collected 16 out of a possible 24 journal entry prompt participant responses over the four-month study.

Artifacts

Finally, the researcher sought to triangulate the data set, providing for credibility and dependability, by requesting artifacts such as notes on instructional pedagogy. The object was to explore educators' experiences and practices as they integrated new literacy information into their daily lives. Two artifacts were collected from participants in the form of notes and educator-created materials.

Coding Process

The coding process is central to case study research and is necessary for a researcher to "make sense of the data collected from interviews, documents" (Creswell & Poth, 2018, p. 190) and other artifacts. According to Creswell & Poth (2018), the coding process involves "aggregating the data into small categories of information, winnowing the data into list of 25-30

tentative codes or categories of information" (p. 190). During the initial coding cycle, the researcher developed and applied several *a priori* codes related to the study's research questions, conceptual framework, and demographic information. This aligns with the recommendation by Saldaña (2009) to create some codes "beforehand to harmonize with the conceptual framework or research questions" (p. 49). Examples of the study's *a priori* codes included *years taught, degrees or certifications, grade levels taught* and *higher education*. The researcher provided opportunities for emergent inductive codes based upon the interview, journal entries, and artifact data. By leaving the initial coding cycles fluid, the researcher was able to apply not only a descriptive coding approach but also an In Vivo coding approach that "honored" the participants' voices (Saldaña, 2009, p. 48). The initial cycle of structural coding also provided for a labeling and indexing device; assisting the researcher in identifying large segments of the data across multiple participants for use in pattern matching and identifying of themes. The initial cycle of coding also provided for a values coding approach in which the researcher could code and reflect a "participant's values, attitudes, and beliefs" (Saldaña, 2009, p. 89) regarding their professional development. Pattern coding occurred during the second cycle of coding to identify emergent themes. Upon receipt of the artifacts, the researcher conducted a descriptive coding process, as a means to inventory and categorize the artifacts' contents" (Saldaña, 2009, p. 48). Then, an axial coding approach was undertaken during the second cycle of coding to determine whether the artifacts related to existing categories or sub-categories or were another opportunity for a new code (Saldaña, 2009).

Researcher Memos

Creswell & Poth (2018) and Saldaña (2009) recommend the creation and the use of analytic memos to reflect on the coding process and the code selection process, such as the

terminology selected, and the code description. Saldaña (2009) posits that these memos are a way "to document the inquiry process and emergent patterns categories, themes and concepts" (p. 32). Stake (1995) shares that the use of memos is a good research practice that can be considered good thinking" (p. 19). Dey (1993) as cited by Creswell and Poth (2018) explains that researchers need to "learn by doing" (p. 185). It is through this process that the researcher created analytic memos and field notes to process the collected participant data.

During each interview, the researcher took handwritten field notes regarding connections the participant may have been making between their perceptions and their experiences, and any general impressions of the interview. After the initial coding cycle, the researcher created analytic memos to reflect upon the semi structured interview question, using the memo process to "synthesize the data into higher level meanings" (Saldaña, 2009, p. 95). The researcher, in response to the participant journal entry prompts, also wrote analytic memos to reflect emergent ideas and to assist in the process of "thinking critically about what the researcher is reading and why" (Saldaña, 1995, p. 32).

The researcher created multiple types of memos: field notes, summative, and project memos.

Field Notes. Field notes and memos were written to capture the essence, insights and ideas for participant interviews and journal entries. These analytic memos described the researcher's impressions during the first coding cycle. This occurred as the participants' transcriptions and journal entries were reviewed. By creating these field notes, the researcher attempted to make the "data analysis process explicit" (Creswell & Poth, 2018, p. 185).

Summative Memos. As the participant data was collected, general concepts and ideas emerged indicating patterns in a participant's responses, thinking, and experiences. These general concepts and ideas were captured in a summative memo. Summative document memos

provided a way to "summarize and document code categories for themes and comparisons" (Creswell & Poth, 2018, p. 189) across multiple participant interviews and journal entries. The researcher moved through the data analysis spiral, moving cyclically, iteratively and recursively back and forth from initial code to general pattern and back again (Creswell & Poth, 2018).

Project Memos. The researcher created three memos, one for each research question in a Microsoft® Word document and then uploaded the memo into NVivo©. The research questions were linked to the corresponding interview questions to inform the analysis process. The semi-structured interview protocol comprised 13 interview questions. Of the 13 questions, the first three questions referred to general psycho-demographic data such as the number of years taught, the grade levels the participant has taught, and the participant's educational background. The next 10 questions related to the three research questions from various perspectives. All of the 10 questions have subcomponents for a total of 20 possible questions. Five out of the 10 questions related to Research Question one. Five out of the questions and sub questions focused on Research Question two and four sub questions related to the Research Question three.

Codes

During the initial cycle of coding, 182 individual codes were identified inclusive of the identified *a priori* codes. These codes were applied to both the interviews, the two journal entry prompts, and the collected artifacts. These codes were then sorted into 62 categories and then aggregated to 21 codes and then sorted into 14 subthemes and five themes. Nine of the initial 182 codes are related to the participant psycho-demographic features. Of the remaining codes, 78 of the 173 (45%) codes aligned with Research Question One, 45 of the 173 (26%) codes aligned with Research Question Two and 19 of the 173 (11%) codes aligned with Research Question Three. Thirty of the 173 (19%) codes were unrelated to the research questions but focused on

educational topics such as curriculum design and remote teaching and learning. These topics were outside the scope of this study.

Development of Themes

The researcher used an extraction of the In Vivo codes, analytic memos created from the research questions, summative document memos, and field notes, along with the initial code list and the code lists from patterns derived from the second cycle of coding. The researcher engaged in the data organization process. Patton (1980), as cited in Creswell and Poth (2018), was indeed correct and understated when positing that "I have found no way of preparing students for the sheer massive volumes of information with which they will find themselves confronted with when data collection has ended. Sitting down to make sense out of the pages of interviews and files of files notes can be overwhelming" (p. 186). Through continuous analysis of participant interviews, journal entry responses and other artifacts, the researcher was able to identify five themes and 14 subthemes.

The findings are presented in two sections. The Participants and Demographic Characteristics section describes the participant population, outlines the demographic characteristics, and provides information about the years taught across all educational levels. The Presentation of Thematic Findings occurs in the second section, describing the findings of the data and illustrating the themes that emerged during the study.

Participants and Demographic Characteristics

The researcher recruited participants who were employed as early childhood and elementary educators in grades prekindergarten through grade three from a small town in the New England region of the United States. The site included two public elementary schools within one public school district, the early elementary school and the upper elementary school.

Each site employs an administrative and educational staff to address student need. The researcher is an employee of the district as well as a participant in the literacy professional development at one of the elementary school sites.

During each interview, the researcher performed queries to collect data on demographic characteristics including the number of years taught, the degrees achieved, certifications or other credentials achieved, the school at which they work, the grade levels taught, and the name of the educational institution at which they attained their highest degree. The researcher also gathered information as to the type of literacy instruction they received at their higher education institutions. These attribute codes are a hallmark of "good qualitative data management and provide context for interpretation and analysis" (Saldaña, 2009, p. 56).

Based on the participants' responses, 8 of the 12 (67%) participants achieved at least a Master's degree in education (N =12). Interestingly, 7 of the 12 (58%) participants received their highest level of degree from the same institute of higher education and 8 of the 12 (67%) participants have attained some form of higher education degree from the same regional institution. Five of the 12 (42%) participants have a certification in early childhood education while 5 of the 12 (42%) participants have certification in K-8 education. Seven of the 12 (58%) participants have certification in general special education with 5 of the 12 (42%) participants dually certified in general and special education according to the state. Participant Demographics presents general information about participant's highest degree attained, certification type, years taught, and the grade levels taught.

Table 1.

Participant Demographics

Pseudonym	Degree Attained	Certifications	Years Taught	Grade Levels Taught
A	M.Ed.	1, 3	> 20 years	Preschool, Elementary
B	B.Sc.	1, 3, 4	> 10 years	Preschool, Elementary
C	M.Ed.	1, 3	> 30 years	Preschool, Elementary
D	B.S.	3, 4	< 10 years	Elementary
E	M.Ed.	3	> 20 years	Elementary, Secondary
F	M.Ed.	1, 3, 4	> 20 years	Preschool, Elementary
G	M.Ed.	2	> 10 years	Elementary
H	B.Sc.	2	> 10 years	Preschool, Elementary
J	M.Ed.	2	> 30 years	Elementary
K	M.Ed.	2	> 10 years	Elementary
L	B.A.	2	> 10 years	Elementary
M	M.Ed.	1, 3	> 20 years	Preschool, Elementary
Certifications: 1 ECE, 2 Elementary Education, 3 General Special Education, 4 Other				
Grade Levels Taught: Preschool (ages 3-4), Elementary (grades K-5), Secondary (grades 6-12)				

Presentation of Thematic Findings

The researcher found five themes and 14 subthemes during the data collection and analysis phase. While presented in a sequential manner in this chapter, the themes interconnect with each other and subthemes influence and are impacted by other subthemes based on the patterns that emerged from the data. As participants reflected upon their professional development and engaged in both instrumental and communicative learning, they made connections to professional development experiences, strategies, and the content of the material.

These reflections led to subthemes and other overall patterns within the data. Table 2 depicts the themes and subthemes and illustrates the interconnection among the subthemes.

Table 2.

Themes and subthemes

Themes	**Subthemes**
Change	Things I never learned Student achievement and assessment
Collaboration	Expertise
Confusion	Nomenclature Communicative learning and cognitive dissonance Critical discourse Critical transitivity
Confidence	Professional development experiences Participants' perception Process Instructional leadership expertise Time for implementation & reflection
Communication	Vision Professional development

Findings Introduction

"Time for training," says Anne as she pokes her head into Billie's classroom door. "More training?" questions Billie. "Yea, come on. I'll save us some seats" says Anne. "What's it on? Is it online or in person?" asks Billie as she gathers her pen and a pad of paper for notes. "I don't know. Something to do with literacy," says Anne as she shrugs and they both walk down the hall to the grade level classroom for the video conferencing training. "Is this something new that we have to learn? How do I fit this in with the rest of what we do? Do we have to implement this now? Where will we find the time?" asks Billie. "Great questions," says Anne as she shrugs and they take their seats.

Thus begins a day in the life of some educators who attend professional development experiences. In many cases, Anne and Billie are exposed to and presented with webinars, in person presenters who may or may not have access to an FM system, and an array of resources and materials. “Are there enough materials for all participants?” Anne and Billie wonder, “Do we have to share? Can you hear the presenter? Will others notice if I write my lesson plans for next week while I sit here and half attend to the presentation?” These questions have found to be common for those attending professional development.

Depending upon the professional development strategies and skills employed by the professional development presenter, Anne, Billie, and other participants may be engaged, motivated and inspired by the professional development. However, they may also feel as if the professional development content does not apply to them. How does it relate to their own practice? Does it change what they do every day in front of their own student population? Is this just another task that must be done? If so, how often, how will it be assessed, or if it’s ignored, will it just go away and be replaced with the next initiative?

The researcher found early childhood educators at a small public school in the New England region of the United States that participated in literacy professional development experiences in the science of reading during the 2018-2020 school years. As these participants experienced the literacy professional development they have been exposed to knowledge and skills that challenged their existing beliefs, perceptions and pedagogical strategies they used to teach reading to students. This information engendered ranges of emotions from self-doubt, anxiety and anger to cognitive dissonance, self-reflection and confirmation of knowledge.

While some participants experienced successes throughout the learning process, others continue to be challenged. Data analysis led the researcher to discover five main themes during

the data collection and analysis process: Change, Confusion, Confidence, Collaboration, and Communication. The researcher found that each theme is intricately tied to another, with participants' responses flowing effortlessly from confusion and confidence to the need for communication and collaboration among peers.

Mezirow's transformational theory posits that two categories of learning occur as adult learners integrate new knowledge into their own meaning perspectives and schemas: instrumental learning and communicative learning (Mezirow, 1991). The researcher found that the Change and Collaboration themes were most connected to the instrumental learning category. The communicative learning category of transformational learning theory was apparent in the other themes: confusion, confidence, collaboration and communication. Through all the themes participants engaged in collaboration to solve dilemmas with confusion and confidence and worked through communication challenges. While each theme is described in the following section, one participant's reflection articulated the transformational learning that they experienced. One participant, Participant D, described her educational background.

> In college, we did not focus on the building blocks of reading and reading instruction. Much of what I learned was from watching other teachers in their classrooms, the oral exchange of lesson ideas with other educators and from following the assigned lessons in my teacher manuals. I did not understand the science of teaching reading and phonics, and when my students had holes in their knowledge, I did not always have an accurate plan as to how I could fill those gaps in their learning. I relied upon Teachers Pay Teachers to help me problem solve, believing that if something was "fun" and "colorful" my students would be more likely to understand the skills that I was teaching if I implemented the lesson with enough repetition. As I began to participate in professional

> development, I saw the error of my ways. I began to see a pattern in the breakdown of instruction, and I learned how each skill builds upon the next. If students have academic holes, these holes should be diagnosed with a formal assessment in order to create tailored plans for the student in question.

This participant's reflection illustrated several of the major themes found within this case study. Through collaboration and communication, the researcher found that participants are seeking to fill the gaps in knowledge and gaps in practice that have occurred in their educational training (NCTQ, 2020). The participant relied upon the reciprocal nature of student outcome and student achievement to inform the pedagogical changes they had made. Changing instructional practice resulted in changes in student achievement, and reflexively through the reciprocal nature of student achievement and instructional pedagogy, the participant received feedback that encouraged them to continue the instructional practices that met student needs.

Theme 1: Change

Mezirow's transformational learning theory posits that instrumental learning occurs when educators interact and work with their newly acquired knowledge, practicing and trying out the concepts and ideas, determining how best to integrate the newly acquired knowledge into their existing schemas or by creating new schemas (Mezirow, 1991). Eight of the 12 (67%) of participants shared that they made changes to their instructional and pedagogical practices based on various rationales. Whether mandated from an external source, encouraged by a trusted colleague, or activated by a need to find out more information to meet student needs, participants were inclined to attempt something if they had a clear understanding of what the practice was, how to do it, and why it was important. Once participants observed a benefit for the instructional change, such as student engagement and student achievement outcomes, the participants were

more inclined to continue with the practices. The instrumental learning, the 'how do I do this' aspect of teaching was important to the participants. Participants were willing to attempt tasks and changes to their practice if they knew the 'how' of what they were doing.

The researcher found that 9 out of 12 (75%) of participants reflected upon their gaps in knowledge and gaps in practice specifically in the area of phonological awareness. These participants adopted pedagogical changes and subsequently observed changes in student achievement and performance. This reciprocal relationship between student achievement and a participant's change in instruction resulted in a critical self-reflection process; aiding in on-going meaning perspective transformation and instrumental learning (Joshi et al., 2016; Kennedy, 2016; Kitchenham, 2008). Gonsalves (2015) posited that the educators, once exposed to the effectiveness of their pedagogical practices, would observe the benefits of the professional development, impacting student outcomes. Figure 5 depicts the instrumental learning process as theorized by Kuhn and incorporated into Mezirow's transformational learning theory.

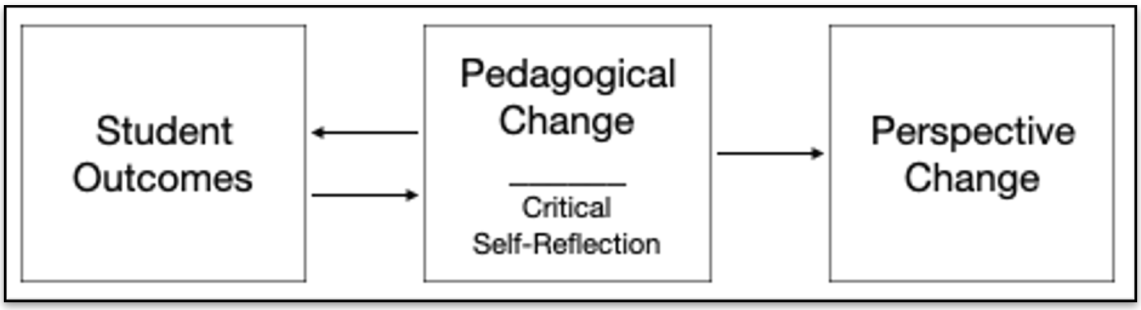

Figure 5. Instrumental learning process

Change: Things I Never Learned & Critical Reflection. The participants in this case study, as they reflected upon their professional development shared that they needed to know not only what to teach but how to teach the underlying concept, phonological awareness.

The hands-on problem solving learning process is a critical component of the instrumental

learning process, the process the participants used to alter their meaning schemas (Kitchenham, 2008, Mezirow, 1991).

According to 8 of the 12 (67%) participants, their participation in literacy professional development provided them with unfamiliar brain research about how students learn to read. One participant shared, “I never learned this in college.” One early elementary school participant reflected, “people were like, why are we, uhm, why are we asking children to do this, you know, and then, through training and all of that, we see, you know, the brain research.” Yet another participant shared that they had only learned about the Hollis Scarborough reading rope through the professional development they experienced. Another participant shared their critical reflection about their learning about the Hollis Scarborough reading rope and stated,

> I think it's really important that in all students, particularly in the younger grades, have the same exposure to good basic phonics instruction. And, as I'm learning through LETRS, you have to tap into it, and, I'm not going to have all the words. But, you know, it can't just have the sound-symbol and the this and the that. But if we don't go back to the end, you'll never get to where they meet. So if, and for those kiddos that don't have that foundation, somehow we have to find a way because we all know they come in with all different experiences and you'll never totally level the playing field. But how can we get it to be part of their schema?

Another participant explained that they had no exposure to the Simple View of Reading (SVR), the underlying structure of the Cognitive Foundations Framework, this study’s conceptual framework. All participants knew about teaching phonics, one of the five pillars of literacy instruction, from their training in specific programs such as Project READ© or FUNdations®. Participants at the early elementary and upper elementary school sites spoke in

glowing terms about the level of training they had received from FUNdations® and Project READ©. Yet, participants did not have the training and understanding in how the components of learning to read were integrated and connected to each other as depicted in the cognitive foundational framework by Tunmer and Hoover (2019), an expanded SVR perspective.

Participants described how they have learned programs in isolation and how they taught reading in discrete components from vocabulary to phonology to reading comprehension strategies. The integration of the skills and how they fit together was not taught in their educational training. Shulman (1987) as cited in Peltier, Washburn, Pulos, and Peltier (2020) explained that educators require pedagogical knowledge that is flexible, enabling participants to think and to act for the benefit of their students. The participants reflected that they scheduled their literacy instructional time in blocks, isolating skill work such as phonics from other literacy-based work such as vocabulary. Participants wondered aloud if there should be more integration across literacy instruction and how to change their pedagogical practices to reflect their newly acquired information gained from the professional development.

One participant shared in their journal entry, “having never participated in such learning, I have learned a great deal about how the brain receives, stores and manipulates phonemes. I have much more to learn.” The participants then extrapolated out how the knowledge would impact their own pedagogical practices. One participant, reflecting on learning about phonological awareness and phonological proficiency, shared, “I'm more aware of the brain science behind it and why we have kind of… to teach reading, to teach it. To teach reading, you know, through certain steps so, you know, that kind of thing. And so I just I'm much more cognizant of it when I'm teaching.”

Another participant shared,

> Uhm, two years ago, the whole thing with LETRS changed my perspective a little bit. Actually, quite a bit, about how children become fluent readers. That's the basis or the good foundation for kids~is to learn to have a really strong phonological awareness. You have phonemic awareness, rhyming, being able to isolate phonemes, reverse phonemes. All this stuff about sounds. Like, it sounds good, so OK, well, I'm going to try this.

As one early elementary school participant described, "before training, I was always a little confused. I knew about first sounds, last sounds, but it was difficult to teach and I wasn't too sure how to go about it." The understanding of the problem along with the how to information aided the participants' perceptions of competence and encouraged their risk taking for trying something new.

Try Something New. Thus, 8 of the 12 (67%) participants implemented a phonemic awareness curriculum to address phonological awareness and phonological processing student needs. The early elementary school site was provided with the Heggerty© phonemic awareness curriculum during the latter half of the 2019-2020 school year. Participants shared that they were provided with the manuals yet were uncertain of how they received program training. Some participants reflected that they were instructed to watch some videos but other participants are unable to recall the sequence of events. Most participants shared that they watched webinars online and the early adopters implemented the program on a limited basis. This aided participants in making the connections necessary and building upon the relationships between new knowledge and background knowledge (Guskey, 2014).

Participants shared that the phonological awareness instruction was different than anything they had previously tried. Based on the unanimous response from these participants, those participants who attempted the Heggerty phonemic awareness curriculum uniformly loved

it. Most participants who had access to the Heggerty phonemic awareness curriculum stated, “I love it. The kids love it. It’s easy to implement, five to ten minutes at a time.” An enthusiastic study participant shared, “Heggerty©, This is my favorite new literacy tool to teach phonological awareness. Quick, easy and fun! The students love it!” One participant stated,

> Again, I'm just going to go back to the Heggerty©, the Heggerty© was hugely helpful at the beginning of the school year. I did not think it was going to... I thought it was above their heads. But I noticed as we continue to progress that we were doing it every day and it was becoming routine. They were starting to catch on and using the LETRS too we focused a lot more on rhyming and different lessons that could help teach rhyming that was helpful too.

Other participants shared that, after their professional development in the science of reading and receiving the Heggerty phonemic awareness curriculum, “I began to see the importance of teaching syllables in my classroom.” As participants reflected upon the success of the implementation, they shared their knowledge with other colleagues.

Other participants began implementing other phonological awareness activities into their instructional practices inclusive of adding sound walls to their practice, incorporating images of the children’s mouths articulating a specific sound, and adding mirrors for student use. The literacy professional development provided some participants with the ability to take instructional risks. One early elementary participant shared that once they felt empowered to change their instructional practice, they added images of children’s lips as they articulated specific sounds using the Kid Lips® instructional cards into their pedagogical practices. Prior to this change, the participant was using a different program and felt constrained by the program, yet unsure on how to effect change in student outcomes. Once they had received training in the

science of reading, specifically the section on phonological awareness and phonetics, one participant shared

> After the [literacy] training, everybody was switching, [I] know all the teachers were switching to the lips pictures as well. I felt it gave me that permission, you know, to switch and so, you know, what I do is I start off with one or two sounds and give them each a mirror, which they love, tapping and mirrors. They are fully engaged. And so I'd show them the picture. And we practice making the shape with their mouth and making the sound and they really enjoyed it. I think they enjoyed it more because it was personal to them. They had to look at their mouths. They had to really watch what they were doing to be able to form their mouth correctly.

This participant observed the evidence of their practice's effectiveness in their students' achievement and engagement. Participants shared they were more likely to implement or try something if it had a scope and sequence to it, a prescribed system that they could attempt without pressure to see if it would work. Once participants began to see evidence of effectiveness, they shared that they were more willing to take risks, trying more, filling in the gaps of practice and cycling through the critical reflection process, each cycle affirming or altering their meaning schema. Student outcomes and student achievement only reinforced the transformational learning process.

Change: Student Achievement & Assessment. Participants who implemented a phonemic awareness curriculum, such as the Heggerty© phonemic awareness curriculum, observed changes in some student's performance. What one participant shared was that they "really found as the year progressed that they [the students] became strong in phonics and phonemic awareness. I felt like, hmm, later in the year they were all starting to spell." Another

participant shared that “While phonological awareness was a bit challenging for my students at first, they began to hear syllables in words, and could orally tell me the syllables that they could hear in words over the course of time. I found that their knowledge of syllables did not impair their understanding of first sound fluency in the slightest. In fact, I found that by teaching syllables, my students could more readily isolate sounds in words, particularly when I began teaching PSF [phoneme segmentation fluency]. I believe that they could hear the sounds in words and isolate them with greater ease as they were accustomed to listening for the sounds in words due to the syllables lessons that began at the start of the school year.”

Participants shared that they used the Acadience Phoneme Segmentation Fluency (PSF), Nonsense Word Fluency (NWF), and Oral Reading Fluency (ORF) assessments for monitoring student outcomes and achievement. Participants also used the LETRS spelling inventory, NWEA Measures of Academic Progress (MAP) along with the Quick Phonics Screen (QPS) and the Phonological Awareness Screening Test (PAST) tools to monitor and to assess student progress and outcomes. Participants reflected that they had access to the Phonological Awareness Screening Test (PAST) a screening tool used to identify and monitor phonological awareness and automaticity. One participant shared that “We were also provided with instruction on how to administer the PAST assessment which is a wonderful diagnostic assessment tool to have for those children who are struggling with read.” Another participant shared, “They had us do the Fast, no, not the FAST, the PAST. So I did attempt that with a couple of my students, I was able to practice on that.”

Reflection. The participants critically reflected upon the connections between what they had learned in the professional development training, student performance, and the changes of pedagogical practices that they implemented. One participant shared, “I see how it helps kids in

my classroom to get to the decoding piece. I'm more aware of the brain science behind it. I understood the importance of it but I don't think I internalized how important it is, so I was yeah, I'll do that. This is in my book. But now, I just know that it's so important that I try to do it whenever I can." An early elementary school participant shared, "As a result of this training, and the change in my instructional practice, I also found that a number of my students were ready to begin sounding out and spelling words much earlier in the school year when compared to previous years." These reflections demonstrated a shift in meaning perspective and evidence of instrumental learning, part of Mezirow's transformational learning process (Mezirow, 1991). Nine of the 12 (75%) participants who engaged in instructional pedagogical changes were able to critically reflect upon their own teaching practices. According to Kitchenham (2008), in instrumental learning, learners ask how they can best learn. It is through this process that participants acquired knowledge, confirmed what they knew, solved problems and furthered their own understanding of procedural tasks (Kingman, 2018; Kitchenham, 2008). It is through this process that participants are transforming and revising their own interpretations of their experiences and altering their own meaning schemas (Taylor, 2008).

Change: Summary. The Change theme occurred frequently throughout participants' responses to interview questions and in their journal entries. The pedagogical shifts that participants made was reflected in the addition of new curricular materials such as the Heggerty© phonemic awareness curriculum and the addition of specific tools such Kid Lips® and mirrors for oral mouth movements. The participants found the literacy professional development was beneficial when they had a clear understanding of what to do and how to do it. When a new program had a scope and sequence to it, early adopter participants felt confident in its implementation. Then, when participants observed student engagement and student outcomes

altering, these participants made additional instructional decisions based on those observations. The reciprocity between student outcomes and pedagogical changes informed not only the instructional decision making but also the instrumental learning and meaning perspective shift for the participants. Instrumental learning took place when the participants had a hands-on active role in solving problems, trying something new, altering their existing practices or procedures, or confirming participants' existing meaning schemas (Kitchenham, 2008; Kingman, 2018).

Theme 2: Collaboration

All participants reflected upon the positive relationships that they had with their colleagues and peers. This trust and collegiality was a critical factor during the reflection process. When participants encountered confusion, cognitive dissonance, or gaps in their knowledge and gaps in their practice, they frequently reached out to trusted colleagues to provide the clarity and information that met their individual needs and answered their questions and concerns. Eleven of the 12 (92%) participants shared, "our team is really great" or, "we're lucky to have peers and people in the building to go to ask for help" and "I feel really good about the team… lots of that knowledge. They are certified in regular and special ed., so I was able to kind of go to and bounce ideas. You know, we really were invested."

Collaboration: Expertise. One participant shared, "I didn't have phonology training so I learned from colleagues at a prior school district who worked after school teaching new teachers the programs they had at the previous school… I learned from peers as I did not learn this information in college." Other participant shared that "I think part of the problem is, and it goes back years and years is when I got my degree. They didn't teach you how to teach reading per say. It's like, oh, just tell them to look at the words and around the words or that whole language stuff. And we all now know that that's not horrible, but it clearly cannot be the whole thing."

Participants were critically reflecting upon their practice and their knowledge and realized that they had gaps in their knowledge as well as gaps in their instructional practice.

Other participants would state that they talked with peers who

> . . . had so many wonderful ideas on how to teach that comprehension piece and kind of build that in. You know, also having the LETRS piece and then her [trusted peer] coming in and saying, OK, this is what I'm asking, like how do I teach this? How do we break this skill down to really build it up? Because the students aren't working at grade level, like, you really have to bring the basics and build on that. She [trusted peers] has been really able to help me figure out like the steps and how to break that down and build that up the skills.

As participants critically reflected upon their own knowledge and their own pedagogical practices, they noticed gaps in their training. Nine of the 12 (75%) participants shared that they were trained in a whole language approach in their formal education, regardless of degree attained. Participants then, over the years, found ways to access the training necessary to meet student needs. One participant shared,

> You know, I'm a big whole language person because I just didn't have the background in phonics. A colleague used to laugh, she said, think of how much your teaching has changed over these years, the fact of how much writing I used to do with students, how much project based I used to do with students because I used to incorporate the literature, everything in it, but I always thought there was something missing. I knew there was something missing because I knew that I was not doing enough for students that were struggling with their reading. And the biggest eye opener for me was when I got trained in Project READ©. That

> filled in the missing pieces. I also feel that I'm lucky because I have another colleague, who has such a huge background of all the programs that I can ask, and she'll help me with it. And certainly, if I have kids that are struggling, then I could have used her as a resource.

Additionally, another participant reflected that the expertise of colleagues was

> . . . so so helpful. [They] always had so much insight when it came to, you know, with the kids who struggled the most. You know, I've had kids over the years, like I had a kiddo and I thought, he is working so hard and he's just not getting it. And I thought, you know, it was more than just reversals. You know, it was more than the B and the D. It was it was more than just, you know, writing from right to left or left to right and not having any awareness. You know, I'm concerned that he has dyslexia. He is an eager learner. He's a good kid. He wants to know it. And I just felt like he is so struggling right now. He's so struggling. And I, I actually remember going to a colleague and saying, you know what? They ended up helping me because I knew that she would know where to go from here.

The use of credible expert resources supported the participants' needs, filling in the gaps of knowledge and gaps of practice that occurred through lack of training in specific areas and domains such as phonology and phonological awareness.

Collaboration: Summary. Collaboration occurred throughout the transformational learning process. This theme resonated throughout each of the four themes, Change, Confidence, Confusion and Communication as well. Participants unanimously discussed their relationships and collaboration with their colleagues regardless of their cohort or site location, the early elementary school or upper elementary school site. All participants discussed how they reached

out to and relied upon these relationships in times of confusion. Participants reflected that they reached out and relied upon colleagues to fill gaps in knowledge, gaps in practice and to meet resource needs. It is through this critical discourse and collaboration with peers that participants critically reflected upon their own beliefs and pedagogical practices and began to transform their underlying approaches to teaching literacy (Mezirow, 1991),

Theme 3: Confusion

The researcher uncovered an ongoing theme of confusion during the pattern matching coding process for both the interviews and journal entries that were received from the participants. The researcher found that some participants may have heard about the linguistic concepts of linguistic knowledge, the five pillars of literacy, the Simple View of Reading, phonological knowledge and letter naming and phonology. However, upon discussion participants found that when discussing these concepts, the terminology was confusing. “I don’t know the correct terms or words,” shared one participant. This confusion of nomenclature, vocabulary, and the underlying constructs of what the terminology meant is part of the transformative learning process. It’s part of not only the instrumental learning process but the communicative learning process in which participants engaged in the disorienting dilemmas and ambiguity that comes with the learning process (Kitchenham, 2008). The researcher found that the theme of confusion directly related to Research Question One. How do early elementary educators describe their professional development experiences in the specific areas of literacy and phonological awareness?

Mezirow’s transformational learning theory is informed by Paulo Freire’s concept of conscientization (Kitchenham, 2008). In addition to the disorienting dilemmas, the critical reflection and critical discourse that is part of the communicative learning process occurred

during the literacy professional development experiences both at the early elementary school and the upper elementary school sites. Risko and Reid (2019) referred to the “struggle with the uncertainties” (p. 425) that can occur when participants are learning about the science of teaching of reading. Mezirow (1991) believed that learners could only change their perspectives when they could critically reflect and question their beliefs, values and assumptions. The pattern of communicative learning was a sub theme that emerged from the participant interview and journal entries.

Confusion: Nomenclature. The researcher found that over one third of the participants remained confused about the vocabulary and the underlying definitions of specific concepts, specifically those terms that begin with the ‘ph’ graphemes. Carol Tolman Ed.D. in her PHocus on Phonology webinar presentation, explained that the concepts of phonological awareness, phonemic awareness, phonetics and phonology can be confusing terms (Tolman, 2020). The findings held true as many participants, when discussing their pedagogical practices and their approach to literacy, frequently misapplied terms when discussing the underlying concepts and activities they implemented with students. Over half of the participants used the concepts of phonology and phonological awareness interchangeably when discussing their conceptual understanding. Artifacts gathered demonstrated an awareness of how to measure phonics skills.

When describing a specific phonology program used, one participant shared,

> I actually kind of learned that it was right for letter naming, but it really doesn't focus on the phonics. It's really lacking that phonics piece. So, especially with the younger grades, there are little activities to do, touch on rhyming, read like a rhyming story or you're supposed to read them an alphabet book. But it's not strong in the phonics as some of the letters activities or the activities we were doing with Heggerty©.

This participant was reflecting on the gaps in program that they observed based on their training but experienced ambiguity with the use of terminology, confusing the need for supplemental support for a phonology program, with the use of the Heggerty© phonemic awareness curriculum. Another participant, when asked about their experience with phonological awareness instruction and phonology instruction, asked, "aren't they the same thing?" Another participant shared that they appreciated the phonological processing training as it provided the "scope and sequence of how to teach kids; it helped with the rules and the patterns of language."

Confusion: Communicative Learning and Cognitive Dissonance. The researcher found two patterns of thought emerging from participants. Participants, when provided with the literacy professional development and training, found either confirmation in their knowledge or struggled to integrate their new experiences into their existing schemas, experiencing the ambiguity that came with disorientation. As a result, cognitive dissonance, the perception that occurs when confronted with information that challenges long-held beliefs and their underlying literacy instruction schemas, occurred.

The researcher found participants expressed their cognitive dissonance in different ways based upon their own interpretation of their life experiences and their prior understanding (Baumgartner, 2001; Kitchenham, 2008). Some participants felt they had a good understanding of the science of reading research and could integrate what they learned easily with some changes for terminology. "I just didn't know what it was called. This is what I do." The participants felt that their confusion was cleared up once they learned the vocabulary, the nomenclature, and conceptual understanding to attach to their approach to teaching literacy.

Other participants expressed frustration with the professional development, wondering what the purpose behind the professional development was while other participants expressed

anxiety as they were uncertain about the expectations. Participants wondered about what they needed to do, how they would add the new knowledge to their current literacy instruction, whether it would be evaluated and assessed and when they needed to know everything. Using the Mezirow's transformational learning theory, the participants, upon encountering this information, relied upon their own background knowledge and experiences, as well as their own interpretations of this knowledge. Then the participants created a newly developed understanding of how literacy is taught using the science of reading literacy professional development as a foundation.

Confirmation of Knowledge. The researcher found that other participants were still unclear on how the pillars of literacy instruction fit together, spending time reflecting on their own experiences of how they learned to read. At both the early elementary and upper elementary school sites, participants shared, "Oh, I've been doing that for you know 20+ years and now I know what it's called. But now I know more of the science behind it or the brain research behind it." or "I think it reassured what I was doing was correct." Other participants shared, "Well, I think, the thing is, I say, this is the large majority of our best practices that we already did." This confirmation of knowledge aided in anchoring the new knowledge to existing schemas that participants already had in their literacy knowledge and pedagogical and conceptual understanding toolbox.

Critical Reflection or How I Learned to Read. During the critical reflection process, one participant shared that the interviews were like therapy and they "do not remember how I was taught to read. I know my mother taught me to identify letter names and sounds and I believe I went to kindergarten on the cusp of reading." Participants reflected on their own love of literacy, how it felt to be read to aloud in elementary school and how they wanted to foster that love of

literacy in their students. Other participants reflected on their initial training in literacy and being taught in a rote learning, memorization or sight word approach to learning how to read. Several participants shared that they struggled "big time with reading …struggling painfully while they had to independently read a page on a little piece of card stock with a story on it and struggling. It was painful for me." Another participant shared, "reading was hard. My family had me evaluated and nothing came of it, but I recall how hard reading was." These participants were in tune with their emotions and affective responses on learning how to read as children. They explained their affective responses many years later and how they did not want that to be the case for the student with whom they taught reading.

Over half of participants reflected on early literacy instruction as one that focused on letter recognition, letter naming and associating letters sounds. Some participants discussed the sound symbol correspondence and alphabetic principle but then quickly pivoted to the need for vocabulary, fluency and reading comprehension strategies. The ongoing gaps in participants' knowledge were reflected in their connection between foundational skills, phonological awareness, phonology and orthographic mapping as described by Seidenberg's four part processing model of word recognition (Seidenberg & McClelland, 1989). A separation between upper elementary school participants and early elementary school participants was reflected in participants' reflection on the need for fluency, vocabulary and comprehension instruction, while early elementary school participants reflected on the need for foundational skills, focusing on the phonological awareness and phonology strands of literacy.

Instructional Time Spent and the Five Pillars of Literacy. Participants described how much time they allocated to specific components of literacy instruction. However, the degree to which the instruction occurred varied per participant, per grade level taught and by participants'

own comfort level. Some participants at the upper elementary school site mentioned a specific amount of time spent providing instruction in phonology based upon an externally established top down mandated schedule. While other participants reflected that they could have spent more time on a specific domain, based upon student need. “So we personally had about a half-hour dedicated to the core reading program and honestly, I didn't have phonological awareness time, I didn't have like a half hour of it here or there.” Another participant shared that they spent the bulk of their instructional time on the reading comprehension pillar of literacy instruction. A concern some participants shared was that they felt the time available for literacy instruction was mandated from external sources and they did not feel that they could make alterations or changes to the structure. This caused these participants anxiety as they felt that in some cases, not all, they were not providing the optimal instruction to meet the needs of all their students.

As a counter to those participants’ anxiety about time, other upper elementary school participants reflected that the amount of time they gave to foundational skills, phonological awareness and phonology changed and responded to student need during the year. For example, one upper elementary school participant shared

> I think during the beginning of the year, depending on the group of students I have, it should be more heavily on those core skills of phonics and phonological awareness. And then I think as the year progresses, the percentage of that should go down, especially for third graders and focus more on kind of understanding what they're reading in the vocabulary and then hopefully working towards writing about it.

The researcher found that all participants were eager to discuss and reflect on their instructional practice and the amount of time allotted for instruction. Many participants felt comfortable with the allotted time for phonics instruction but struggled to meet student need

when student outcomes indicated that further instruction was necessary. Participants wondered about resource allocation, the availability of staff and materials to provide the deeper instruction some students required to acquire specific skills, such as phonics skills. The participants, upon receiving the literacy professional development, explained that they were frustrated anew as they observed student need and felt challenged in providing these resources, such as instructional approaches, time, and materials, to meet student need.

Acknowledgement of Gaps in Knowledge and Training. The researcher found that participants observed that they had ongoing gaps in knowledge and gaps in training. The literacy professional development highlighted not only the missing pieces but also educators' own confusion and anxiety over instructional leaders' perceptions of educators' expertise. During the critical reflection process, participants described their lack of training or gaps in knowledge especially if they as participants have changed educational assignments moving from grade to grade. One participant shared,

> So you don't get trained in phonics. You don't get trained in, you know, phonological awareness. You don't get trained in any of that because they are hoping that the students already have that solid by the time they get to you. So then you can jump off and go to the next levels. But as you know, that's not true. And these kids don't have the skills. Moving grades, I was never trained on FUNdations® or anything like I that.

The participant reflected upon their own gap in knowledge and gap in training when teaching one of the five pillars of early literacy, the phonics strand as evidenced by the National Reading Panel report (2000) and reflected in literacy research. Eight of the 12 (67%) participants reflected upon their instrumental learning, their procedural skill abilities, to teach reading comprehension,

vocabulary, and grammar. They lamented that they were teaching concepts in silos or in isolation: vocabulary, phonics, phonological awareness, writing, and so on.

***Something is missing*.** Participants, after receiving literacy training also shared that they saw the value in professional development but were as yet unable to make the connections between what they were learning and their own pedagogical practices, the current menu of reading programs and interventions and student achievement. What participants noticed was that "something is missing." Students who had received phonics instruction for many years were still unable to internalize and apply concepts. The students were still struggling and participants noticed and shared, "Well, and where is that piece missing to get them from here to here? I still need help for the tools. What would be the best tool if this is what I see to get them from point A to point B?" This participant reflected upon the confusion that continues to exist in participants' minds as they reflected upon the new knowledge attained and how to apply it across multiple situations. Eighty percent of the upper elementary school participants reflected that they needed more information on how to apply their knowledge across situations and problems. For example, when a student demonstrated challenges in spelling, some of the participants administered the LETRS Spelling Inventory. Yet, many of the upper elementary school participants were unclear about what came next. This led to uncertainty, ambiguity, more confusion, and more cognitive dissonance. Some participants focused on phonics instruction as the area of need, other participants focused on the visual, seeing letter patterns, and others sought other opinions from trusted colleagues and expert opinions.

Confusion: Critical Discourse. The researcher found that relationships were a key sub theme that emerged in all areas of this study. These relationships were critical. All of the participants mentioned expert colleagues, those trusted colleagues with expertise or experience in

specific skills, such as phonology or data analysis. At both school sites, the early elementary school and the upper elementary school, participants reflected on the ability to seek out a trusted colleague who provided non-judgmental coaching and instruction that provided the information that filled in the gaps of knowledge or gaps in experience. Over half of the participants shared that the expert colleague who provided the insights, knowledge, and critical listening role necessary aided in participants' making pedagogical changes, altering their perspectives about literacy instruction, as well as providing the freedom to take risks. Participants used the following language when speaking about expert colleagues,

> … listened, … kind of gave me the pros and cons, like you did this great, but have you thought about this" or "she would stay after school, sometimes at six o'clock at night and we'd go over the data. I'd say what I thought. She would listen and offer thoughts but never did she look at me like what do you mean you don't know this.

The trusted and expert colleague provided the opportunity for open and collegial discourse in which participants felt they had the time, opportunity and freedom to take risks, making connections to their knowledge and enabling transformational thinking.

Participants shared that they found when they were more in communication with colleagues they were able to discuss the challenges students faced as well as the challenges they faced. This collaboration between educators had a huge impact on participants' efficacy and ability to acquire, assimilate, and integrate knowledge. Forty percent of upper elementary school participants reflected in interviews that when the connection to teaching literacy affected them personally, they truly began the deep dive into understanding how complex learning to read really was changing their perspectives when they fully questioned their own beliefs and perceptions (Mezirow, 1991). Two of the participants reflected upon how learning to read made

them feel personally, and this impacted how they approached teaching to read today, especially if it was, as one participant shared, “not the easiest thing.”

Half of the participants reflected upon their instructional practices and their own background knowledge. They spoke about talking with colleagues about making changes across all grade and educational levels. All of these participants reflected that the science of reading, the fundamentals of how people learn to read, should be information that all educators know. One participant mentioned, “Yeah, I think, you know, something like that really should be taught as a teacher to understand how the brain works . . . and understand how students learn to read. It just makes sense and I just think reading is such a need in any subject you teach. I think that everybody needs to understand that.” As participants reflected and discussed their perspectives and beliefs, transformation occurred at least at the instrumental level. At both school sites, participants reflected that they wanted to learn more, to assist others, to effect change, and engage in the critical transitivity process.

Confusion: Critical Transitivity. All of the early elementary school participants who participated in the professional development experiences found that they would reflect upon what they had learned and altered their instructional practices, at least at the instrumental learning level. One participant stated,

> I feel the structured training or professional development that I've had really changed my practice. I've thought a little bit more about how I can help students read, because in the beginning, a lot of times my students never were able to like identify letters. I mean, I have some kids that are still working on letters but understanding that they can be exposed to those other things and gain and get meaning from those other things as well. And then eventually, hopefully it will help them as they move forward.

Yet another participant then goes on to indicate that they would like to affect change on a larger scale. “I really like to become some sort of an administrator…just an ability to, to affect more change in practices for other people.”

According to Freire’s “critical transitivity” (p. 108) hypothesis, part of Mezirow’s transformational learning theory, when individuals think critically and reflectively, they may seek to act as change agents individually and globally. This participant has transformed their meaning schema and altered their perceptions about literacy instruction. The participant is now engaged in influencing literacy instruction at both individual and local levels and seeking to expand their reach and advocacy across their sites.

Participants at both school sites reflected on their need to impact literacy professional development across not only their grade level but across elementary and secondary levels. They discussed conversations with colleagues at both peer and administrative levels, sharing that they were able to explain their own understanding of how to teach literacy. The participants discussed their ability to provide the evidence-based research along with their increased knowledge base. The participants explained that they felt more capable of sharing their knowledge about how to teach reading as well as best practices across multiple grades and educational levels, elementary through secondary.

Another participant discussed their reflection during their professional development. This critical reflection process became a request for more information and more in-depth training as they discovered their gaps in knowledge and gaps in practice. The participant shared about what they saw as a need,

> But, you know, quality, rich, professional development that gives us all the background knowledge that we need and gives us the strategies and tools to help

> us all improve. Because, I mean, maybe I just speak for a select few, but I want to be the best teacher I can be. And I'm not in this just to do the same thing year after year. So, I want to improve. I want to know what is the best approach? Strategies, skills, programs. Anything that I can use to help these kids be successful. I wouldn't mind being that person that people come to and asked for strategies or help. I need to have that background.

This participant reflected the need to effect change within their sphere as well. The participant experienced the critical transitivity process, changing not only their own meaning schema but transforming their teaching practice on both a local and larger level (Kitchenham, 2008; Risko & Reid, 2019).

Confusion: Summary. From participants who were just beginning the process of critical discourse to others who had transformed their perspectives on how to teach literacy, all participants reflected on their existing knowledge and what they still wanted to learn. All the study participants fell along a continuum of communicative learning regardless of the number of years teaching. The participants reflected upon their literary professional development and engaged in critical discourse with their trusted colleagues, articulating that they "struggled with the uncertainties" (Risko & Reid, 2018, p. 425). Depending upon the level of integration and assimilation that occurred while participants learned about the science of reading, 7 of the 12 (58%) participants altered not only their pedagogical practices but their beliefs and understanding of how people learn to read. Participants would frequently comment that they had never been taught the brain research before or didn't know how important sounds were to learning how to read (Castles et al., 2018; Moats, 2019). Through communicative learning, the

participants transformed their meaning schema and integrated new perspectives. The study participants demonstrated openness to new learning.

Theme 4: Confidence

The researcher found that participants, during their participation in the literacy professional development, as well as during their reflection phases of meaning transformation, frequently struggled with concepts that could be classified and categorized as confidence. Participants undergoing cognitive dissonance described emotions such as self-doubt and confusion. Some participants shared that they were frustrated or disappointed. The range of emotions participants articulated crossed a broad spectrum, from happy and beneficial to overwhelmed or defeated. These characteristics reflected the changing perceptions through which meaning transformation occurs according to Mezirow's transformational learning theory (Kitchenham, 2008; Mezirow, 1988; Risko & Reid, 2018). These emotional responses were in response to multiple factors inclusive of their experiences with professional development, their perceptions about their value and worth as education professionals, the professional development process itself, the expertise of the instructional leadership, the time allocated for pedagogical practice implementation and self –reflection. The following section describes participants' reflections.

Confidence: Professional Development Experiences. Those who participated in the literacy professional development had various comments about the process that were as multifaceted as they are themselves. Many participants discussed the value they saw in the literacy professional development. On participant shared "training has provided me with the confidence that I have the technical knowledge of what I'm teaching in literacy and some of the methods to understand but not to assume students have the knowledge. I cannot assume that they

just automatically should catch on. A lot of it needs to be explicitly taught." Another participant, while discussing the literacy professional development, shared, "LETRS was most beneficial professional development experience recently but overall its [literacy professional development] been really poor." One participant shared, "You know, I think there were some elements that were good and we actually took a lot away from it."

Participants at both the early elementary and upper elementary schools reflected that the phonics professional development such as Project READ© and FUNdations® were highly beneficial but also explained why they thought it was beneficial. Participants reflected that it was the most beneficial when the professional development experiences were combined with evidenced-based instructional strategies that involved coaching, providing sample lessons, modeling, and giving immediate feedback from a credible expert whom the participants trusted. Participants shared they were most affected and impacted by the in-person instruction while experiencing literacy professional development.

At both elementary school sites, participants reflected upon the in-person instruction provide by Carol Tolman, Ed.D., one of the co-authors of the LETRS program. One participant reflected that "she [the presenter] was able to pull out bits and pieces of some of the information from the LETRS manual and that was advantageous for us to have...it was absolutely great…giving us training on the sound wall…those types of things were good and we actually took a lot away from it."

Credible Presenters. Two of the 12 (17%) participants reflected on the advantages of having credible presenters who were able to make connections between the participants' knowledge and new information. These presenters knew how to bridge the research to practice gap. They shared, "Now, when Carol [Tolman] came in and presented and she was able to pull

out bits and pieces of some of the information from the manual that was advantageous for us to have...absolutely was great. And then, gosh, there was another lady who had come in too and given us training on like sound walls and those types of things. You know, I think there were some elements that were good and we actually took a lot away from it." One participant from the early elementary school shared, "in person training had the biggest impact with Carol Tolman and Pat Johnson." Participants reflected that these credible experts provided the value added needed to make visible the connections among what participants were reading and watching through the literacy professional development webinars. Otherwise, participants shared that they felt that the professional development was occurring in silos or isolation or that it was piece-meal. Participants shared that they had challenges integrating the information they learned across different domains and subjects.

Confidence: Participants' Perceptions about Their Value. A concern that some participants at both the early elementary and upper elementary school sites shared was their perception that their knowledge about teaching reading was not acknowledged by others. Some concerns participants shared included,

> …requiring teachers to do certain things…felt like we already do this. Why are we just? . . . And again, I felt like it was a lot of like ...pause...Teachers are just not doing their job. They're not doing it well enough there. I thought we had amazing teachers doing phonics. I didn't really… I don't know if there was a reason for this LETRS training district wide. Now, I will say that I feel like the majority of my team, all of my team are very well versed in how to teach children how to read…the bulk of the training was wasted. The training was redundant, we know how to teach that. I could understand if you were a

business major in school, but our team understands this already… this just isn't a productive use of the time.

Alternately, participants wondered aloud, "this LETRS training where, yes, it's interesting. But, I personally have found after every training that we've had, that there's not a whole lot that I can really like incorporate in my lessons, there are not really a whole lot that's necessarily that different from what we were already doing. What do they want from us?" Participants in professional development have been used to attending to learn something to do, the instrumental learning part of transformational learning (Mezirow, 1991). Many participants responses that connected with the confidence theme reflected the confusion as to the purpose of the professional development as well how it made them feel, under confident, frustrated, and uncertain. This participant's query also reflected the communication theme that emerged in the study's findings. Participants' comments reflected the gap in understanding about the purpose of the literacy professional development. This contributed to the cognitive dissonance and confusion that participants experienced during the training, impacting the transformational learning process.

Process. During the interview and the journal entries, participants reflected on the professional development process. Some participants reflected that they were appreciative of the frequent trainings and the support provided by administration. Participants also reflected upon the types of professional development they experienced, explaining that webinars were helpful but the in-person experts were considered highly beneficial. Over half of the participants who reflected upon the process of professional development shared that it was the in-person experts who truly aided in the implementation process of some of the strategies and skills, bridging the gap between research and their instructional practices.

***Resource Allocation*.** Eight of the 12 (67%) participants shared that instructional leaders provided support for managerial tasks, such as ensuring supplies were ordered and available. The participants felt confident that the physical resources could be obtained. Additionally, participants expressed their appreciation of the resource allocation process, sharing that they were provided with the physical resources, the material and the tools necessary for instruction. At the upper elementary site, some participants reflected that they also felt appreciative of the material and supplies, yet felt out of the informational loop, registering confusion. "But I feel that I'm disappointed… the fact that we certainly knew nothing about Heggerty© and I would like to know more about that … Knowing that I know nothing about it. It's hard when [students transitions] come up, … because I do like the background of what they're using." Participants experienced confusion and wondered about why the distribution process for materials was different at each site and how to bridge the gap between knowledge and practice.

Confidence: Instructional Leadership Expertise. Participants also wondered about the depth of knowledge of instructional leadership. At both school sites, participants shared that they felt instructional leaders should also have a background in the science of reading, learning about the information participants had acquired to better support students, especially when challenging situations arose. As the participants learned more about the science of reading, they integrated their emerging knowledge into their own schemas and experiences.

With this newly found meaning perspective, the participants perceived that the recommendations made by instructional leaders seemed to be contrary to their own newly acquired information. This resulted in what Paulo Freire called 'disorienting dilemmas' as well as feelings of cognitive dissonance as participants reflected on the resource allocation process, the professional development experiences, and instructional leaderships' ability to provide

guidance and problem solving (Kitchenham 2008). One participant articulated, “The most challenging educational practices I have come across would be when the administration doesn’t understand the science behind reading and they have an expectation of moving on - keep moving on. That is something I dig my heels in and do what is best for the children.” Participants at both sites shared their ongoing concerns about the need for more leadership and guidance on how to solve problems. A participant stated their appreciation and understanding of how hard it is to be a leader and shared,

> it puts … they [instructional leaders] need to know a lot and be able to do a lot. But there also need to be some sort of resource for us or they need to be able to point to somebody who can be a resource for us. I mean, just thinking of, OK, if we have a concern about a student, we would call them up to SST [student study team], as but you know, as educators, we we've already done so much prior to either pulling them to SST so to have to have somebody in that meeting like the principal who's going to be there or the assistant principal have that, you know, reading background or that curriculum background. To be able to help us would be monumental because at this point they're just kind of sitting there like, I don't know how I can help you.

Participants reflected that they felt a lack of confidence in how to proceed but expressed anxiety, commiseration with leadership’s role, discussing how hard the leadership role was, but articulated a concern about instructional leaderships’ ability to problem solve. The participants felt that if instructional leaders had more knowledge about the science of reading, their perspective and ability to support student outcomes would also change.

Confidence: Time for Implementation and Reflection. The implementation process for the professional development also caused concern and anxiety among participants. One

participant reflected, “We don’t ever get time to soak anything up and practice it.” While another participant reflected, “we’ve had no training in Heggerty© so was I was under-confident in teaching it remotely, I had cards but didn’t know how to implement it. With COVID 19 and remote teaching, I did not attempt it.” An upper elementary school participant shared that what they really were seeking was more guidance for themselves and for their colleagues. “So I would prefer more guidance…one concern I have is that educators may believe students are not achieving in literacy due to motivation, that is not the case, it’s not that they are not trying hard enough.” Participants wonder about the process of professional development and how to aid their colleagues in the transformational learning process.

Pressure. Additionally, participants’ experiences about the pressures they felt as they implemented different literacy approaches varied. One participant shared that they did not feel any pressure to implement the strategies learned. However, another participant shared they felt pressure as they were being observed by instructional leaders and were expected to have materials displayed in their classrooms in a short period of time or had to demonstrate proficiency and mastery levels of newly acquired knowledge. This resulted in confusion and under-confidence in their pedagogical practices as well as resulted in a crisis of confidence in their understanding of what the expectations for practice were.

Relationships. Participants, during interviews, frequently espoused their confidence in trusted peers and colleagues. At each grade level and both building sites, the participants would reflect on who they would seek out if they had questions, concerns, or were experiencing confusion or at a loss on how to proceed or how to support a student’s need. From, “I would seek out a grade level colleague” to “I would just go see [colleague] and she would give me pointers and we built some in there,” participants discussed how they leaned on, learned from, and

influenced each other. This connection to peers was strong, with every participant naming someone with whom they trusted to work through challenges, concerns, or problems. Upper elementary participants reflected that they would meet to "make instructional changes or help with anything needed… So, the entire time I was in fourth grade, [colleague's name] and I worked really closely together to figure out the best use of our time for our kids." A participant reflected that it was important for them to have their voice heard in an unconditionally accepting environment. "I think you start off that you feel intimidated to ask." Participants shared that it was critically important for them to feel that they could articulate what they knew yet also share their struggles, challenges, and I wonder with in a supportive environment. At times, participants reflected that, "I feel like there is a lot of frustration because I feel like lots of times our concerns for students don't go anywhere or are shut down."

Participants overall reflected a need for trusted colleagues and peers with whom to engage in collaboration and conversation. The challenges of confidence in the professional development process, participants' perspectives about their own value as educational leaders, as well as perspectives about instructional leaderships' expertise articulated by participants resulted in an ongoing need for colleagues and peers to rely upon their relationships to meet their personal and professional needs. Participants reflected that when they did not have the information necessary they would seek out the relationships that could meet their needs. Trusted peers and colleagues provided this supportive environment in which to problem solve and engage in critical discourse that led to meaning transformation as well as increased instrumental learning.

Confidence: Summary. Some participants reflected upon their confidence in their ability to teach reading. Yet, upon experiencing literacy professional development over half of the

participants reflected that they had not been taught how to teach reading. Therefore, the professional development provided the confidence necessary to understand what students needed. Participants discussed the types of professional development that resonated and informed their practice, focusing on expert credible presenters who could help bridge the research to practice gap. Participants demonstrated confusion and a feeling of under-confidence as they perceived that the professional development was due to job performance. Alternatively, participants reflected concern over leaderships' expertise in how to teach reading. As participants acquired more information, they were appreciative of the physical resources that they were able to access but were concerned over the level of understanding that leadership had when it came time to help problem solve or support them at a conceptual level.

Theme 5: Communication

Intricately tied to the confusion and confidence themes is the theme of communication. Participants tended to respond to interview questions about professional development with many disparate answers such as "is it just one more initiative, things get muddy when there are too many initiatives," and "why are we changing everything again?" Other participants shared that professional development experiences were "a mish mash, so I guess if we could just find one thing and stick to it. I guess we don't get really good at one thing as there is no time. It would be better than just trying to do all these different things at one time."

Participants discussed that it appeared that every year there would be another initiative and they were not given enough time to get good at anything. From one year to next, participants shared that the professional development changed from instruction in LETRS to learning a new literacy program, to other district wide initiatives. "We have a lot of initiatives and I think, you know, and they give us a lot of training, but it's a lot of one-off training. And then we have, we

never get to come back to it or they give you a book and say learn this right away" explained some participants. The participants reflected that they were confused as to the meaning and purpose of all the professional development. They were appreciative of the information but were unclear on its purpose. Participants' overarching responses regarding professional development was myriad and one of confusion and lack of clarity in the purpose of the professional development. The researcher found that participants requested that administrators "listen to their teachers," and "let staff know what the outcome should be and change one aspect of reading, (e.g., vocabulary or comprehension strategies) and then provide PD in that area… you cannot throw it all at us in one year, so you can't do it all well."

All participants shared their willingness to participate in the professional development, explaining that they listened with an open mind and found key take-aways in the literacy professional development that could be applied within the classroom in an instrumental learning manner. Yet, participants still articulated that they were fuzzy on the purpose, the vision, of the professional development. According to Allen and Kelly (2015) literacy training that is varied and lacking in content focus effectively ensures disparities in educators' abilities to effectively teach literacy.

Communication: Vision. The researcher asked participants what was important to the educational community inclusive of administration at the site and district level. Again, participants' responses were as myriad and various as the participants themselves. Participant M made connections to the strategic plan, referencing the Portrait of Graduate plan articulated by the district but was unclear on how to operationalize it and make the connections between the professional development teaching in the classroom and the vision. Five of the 12 (42%) participants shared that they thought that administrators expected students to have a "love of

literacy," "to have students read fluently and understand the structures of nonfiction, to be able to read more books, or to be able to functionally read before they move to middle school."

These disparate and various responses demonstrate a gap in knowledge about the purpose of professional development as well as how it was meant to close the research to practice gap that exists among educational professionals. Some participants shared that the professional development didn't fit their needs. "So there are pieces of it that, again, I feel like the PD doesn't really they don't really bring it down to my level," said one early elementary school participant. During the professional development, some presenters encouraged participants to "make it work for yourself" or shared with participants seeking assistance, "I'm not really sure how to support that." This led a feeling of under-confidence in not only the presenters but the professional development process. Participants also shared that they did not have as much confidence in the professional development experiences if the presenters did not appear to have an understanding of students. In one situation, the participant shared they were told "it was okay if students cried because it was too hard," shared one participant. The participant wondered aloud how to integrate their knowledge of Vygotsky's zones of proximal development with the presenter's remark about things being too hard (Vygotsky, 1978). The participant shared that this language had the effect of making them question the entire program and the information they were learning in the professional development.

During the course of their educational experiences, 10 of the 12 (83%) participants were taught using a whole language approach in their higher educational courses. Five of the 12 (42%) participants shared their appreciation and their understanding of the need for a

> . . . logical progression of skills and continuity~what is occurring district wide from all perspectives, not only literacy…What is good is that the trajectory, that is the upward

slope from K to 12th is good so if students are expected to be exposed to XYZ in grade five, sixth grade can build upon that. The continuity is appreciated.

Additionally, four of the 12 (33%) participants felt that the professional development they received in the science of reading "just kind of refreshed everything I knew; that was my real take on it." "It kind of confirmed everything I knew," echoed 3 of the 12 (33%) participants. These participants became aware of the gaps in some of their knowledge but remained unclear and confused as to how the professional development provided the supports and filled those gaps in practice. Therefore some participants were unable to fully engage in the transformational learning process.

Kotter (2012) articulates the eight-stage change process when he discussed leading change. Within the top four stages are developing the sense of vision and strategy and communicating the change vision (Kotter, 2012). The purpose behind the professional development was not apparent to the participants as evidenced by their various responses to the interview questions. The participants are unaware of the underlying sense of urgency, the ongoing literacy crisis as evidenced by the NAEP results and economic and social costs to the country. Participants espoused feelings that the professional development was "one more thing to do," the "hot topic," or "not relevant to what I do" and therefore were unsure of its importance. Kotter (2018) recommended creating a guiding coalition of stakeholders who could lead the change and increase buy-in from the participants, role modeling the expected behaviors related to the change. However, without a clear vision, participants were left with mixed messages and uncertainty. Critical discourse among participants may or may not advance the message as the overarching vision remained unclear which only obscured the overarching vision.

Eleven of the 12 (92%) participants all had ideas and thoughts about what they wanted or expected from professional development experiences. They all wanted a voice and to be heard by administrative leaders. Yet, many articulated that they were wary of risk-taking and applying non-traditional ideas and actions as they continued to be uncertain whether these ideas would be appropriate (Kotter, 2012).

Communication: **Professional Development**. Participants, when asked about their professional development and what they thought the educational institution was seeking, they tended to respond with ideas and suggestions of what they would like to see in professional development for themselves and for their community. During the interview, one participant shared, "this is like therapy (laughter)." Upon their self-reflection, one participant shared their thoughts regarding early literacy professional development, sharing

> The district needs to be more focused on having a curriculum that really reinforces everything we know about phonological awareness and a program that teaches all these skills and having decodables to go along with it or follow along in the same letter sequence as FUNdations®. I think that we need to have enough thought put into it, into the overall picture of our literacy instruction and the literacy curriculum they buy us as it seems arbitrary at times, what is the program targeting? We need something that encompasses everything so that kids that are going to have trouble making those connections can see them more clearly.

Other participants expressed a need for "consistency of PD to educational staff…let's get started with what we've got and learn how to help each other" and "focus on instruction on Tier One. Right now, the tier one part of the triangle is the smallest and it needs to be larger."

Participants saw the need for professional development to be designed and delivered in a more differentiated and nuanced manner. They thought professional development should be tailored and differentiated for each participant's need. Participants reflected upon their professional development that they had experienced over their course of their careers and were able to connect to the strategies and approaches that worked well for them.

Participants, as they reflected upon their own learning and how changing instructional practices impacted student outcomes, also reflected upon what types of instructional strategies worked for them as learners. Over half of the participants reflected upon the professional development strategies and approaches that had the most impact on their learning and pedagogical practices. Clarity of purpose, the reason for the professional development, along with instructional strategies that work well and are evidence based are frequently cited by participants as to what will work for their own learning. Nine of the 12 (75%) participants reflected that time was a critical component of professional development. One participant shared,

> Unfortunately, my brain needs, we don't ever get time to soak anything up and practice it at the next layer. We're just not afforded that time and unfortunately, that's how my brain works. You have to give me a little, give me more than a little…Let me think about it. But then give me a layer and let me go digest that layer. Then put the next layer on and then I can put the two together.

Several other participants reflected that if they could "go low and slow." This participant again reflected in response to her own professional development needs, "I can do it at my pace and in rigor and then regurgitate it and then move forward very slowly in my own time."

Some participants shared that they needed the gradual release of responsibility approach, "the I do, We do, You do coaching and modeling approach to really integrate and assimilate the

new knowledge that was learned in the literacy professional development." Participants reflected that the type of professional development, the manner in which it was presented, and the presenter approaches were critical to the accessibility of information. This subtheme is integrally connected to the Communication theme.

Related to the gradual release of responsibility approach was the coaching, modeling and immediate feedback approach to professional development that participants found to be particularly useful and meaningful. An upper elementary participant reflected that the FUNdations® trainings that were offered provided a modeling, coaching and feedback approach in which the trainer

> would model lessons and she would watch us, observe us and give us feedback. So you were able to see the pacing of what FUNdations® was like. My expectations, what I was going to have to do in the classroom. And then she, other times, she would come and watch us and give us feedback and I really found it very helpful because this was the first time I'd had that she would observe the lesson. And then directly after the lesson, someone covered my class and I met just with her one on one and she kind of gave me the pros and cons like you did this great but focus on this. So it was really awesome to have that right after I taught the lesson because it made it easier for me to relate back to what I literally had just done. Like, Oh yeah, I choose, You could try doing it this way or you could speed up and not do so many review cards or something.

This differentiated approach to professional development provided the participants with critical support along the way, encouraging both instrumental learning, the how of teaching a skill or topic as well as the communicative learning, providing opportunity and time for critical reflection and critical discourse (Joshi et al., 2016; Mezirow, 1988). Participants were then able

to integrate their knowledge and make effective changes to their instructional pedagogy specifically in the area of phonology instruction due to the training approaches used, according to the participants.

Interestingly, when provided with the Heggerty© Phonemic Awareness curriculum manuals and given underlying foundational literacy professional development, participants were empowered to discover webinars and outside training to aid in the phonological awareness and phonemic awareness curriculum implementation. Participants observed how to implement the lessons through observation. However, all participants reflected that they preferred sample lessons, coaching and immediate feedback. The professional development that worked well for them helped them to truly understand the expectations of what they needed to teach. Participants reflected that they needed the 'how' and 'what' to teach; the hands-on processes (Mezirow, 1991).

Communication: Summary. The communication theme reflected the participants' perspectives about the purpose of the professional development, the why. Participants shared their ambiguity as to the vision of not only the professional development but what is important to the district and building level administrators. Each participant reflected that they believed assessment scores were important or that a love of literacy was important or alternately the vision was to fulfill the strategic plan. Yet, participants did not reflect a consistent message or vision. Additionally, participants reflected on the need for professional development that was differentiated to meet their individual needs, from a specific content base such as the science of reading overview or the specifics of how to teach a specific program such as Heggerty©. However, participants shared that they also needed the professional development to include best

practices for professional development such as the gradual release of responsibility, coaching, modeling and sample lessons.

Findings Summary

"Anne, I lost sight of you after lunch," says Billie as they end their day's professional development. How did it go?" "It was great" shares Anne. "I learned more about how the brain learns to read, something I don't remember learning in my graduate program. I was taught a whole language developmental approach to reading. I think that's the way I learned to read. Maybe that's why it was challenging for me. I don't recall. I now need to find out more about what I don't know and try to implement some of these ideas. I just don't know how to do it or where to fit it into our existing literacy curriculum. Where will it fit in I wonder? Do I remove some of the things I'm doing, add others, I'm a bit confused. What about your day?" asks Anne. Billie sighs. "I'm a little confused and anxious too to be honest. I don't know what I'm supposed to do with this information. I loved the brain research but I'm pretty sure I already do everything that this training recommended. I guess I am still unclear on its purpose. What is expected of me? Are we expected to implement all of this information and if so when? I guess I have more questions. Who do we ask and do they know how to help?" confides Billie. Thus both Billie and Annie have begun the process of transformational learning as espoused by Mezirow's transformational learning theory. Each character, in this hypothetical scenario, relied upon their individual background knowledge and educational experiences to begin the process of meaning transformation and perspective transformation. While Anne is hopeful about the future, she acknowledges the gaps in her knowledge and questions how to implement the newly acquired information into her existing pedagogical practices. Billie also registers confusion, seeking

guidance about where the information acquired fits into the overall vision of what they are supposed to do and the ambiguity of to whom they go for guidance and assistance.

This scenario reflects the five themes discovered in this research study: Change, Collaboration, Confusion, Confidence and Communication. The fictional character Anne discusses the change that she wants to implement in her pedagogical practice. Through collaboration and discourse with Billie she articulates her confusion over the expectations as well as her confidence in being able to make these changes. She is unclear of the purpose of what she has just learned, requiring communication with educational leaders to guide her in her understanding of her role and the role of professional development in teaching students.

Billie also articulates the change theme by wondering aloud about how to implement the information the two had learned in their professional development. However, Billie articulated language related to the confusion and confidence themes. She did not appear to know the purpose of the professional development and felt she was already informed on the underlying concepts and instructional practices but was still seeking clarity and communication on the professional development's purpose and vision.

Thus, this scenario reflects the ongoing themes found within the case study. Each character reflects the Change theme, trying to integrate their background knowledge with newly acquired knowledge. The conversation between Anne and Billie, although fictional, reflects the collaboration and collegiality that they feel necessary to support and aid each other. The theme of confusion occurs in both participants at they acquire new information or try to integrate information they acquire into their existing schemas. They are also confused as the logistics of how to implement the new practices, from whom do they seek guidance, to what was the overall vision and purpose of the professional development. The theme of confidence, one in which the

characters either feel confident in their knowledge or acknowledge the gaps in their existing knowledge occurs along with the need for expert and credible sources to respond to questions and provide assistance. The communication theme reflects the lack of understanding the characters had in the why behind the information presented as well as the search for guidance for further support. This scenario reflects the five themes that emerged from the participant interviews, journal entries and artifacts.

CHAPTER FIVE

CONCLUSIONS

The researcher began the exploration of literacy professional development when it became apparent that many students, despite extensive hours of intervention, were not achieving proficiency based on observation, assessment, and experiences. The researcher found that educators were unaware of the literacy gap that exists within the United States, that only 33% of fourth grade students are reading at or above proficiency (NCES, 2020). Compounding this knowledge gap was educators' own understanding and training about how to teach reading.

The Cognitive Foundations Framework, based on the SVR, was less known to educators. This framework provided a scaffold explaining how students learn to read (Tunmer & Hoover, 2019). The authors in the literature explained the inter-related concepts of language comprehension and word recognition and their importance to learning how to read. Voluminous research found that phonological awareness and phonemic awareness are key components in the initial stages of learning to read and write (Carroll, Gillon, & McNeill, 2012; Castles, et al., 2018; Huo & Wang, 2017; Leon et al., 2019; Kilpatrick, 2015; Rayner, et al., 2001). However, many educators had not been trained in the principles of literacy instruction during their teacher education programs (NCTQ, 2020).

This case study re-confirmed the premise that educators have reported having inadequate training and accessibility to information about the science of teaching reading (Binks-Cantrell et al., 2012; Joshi & Wijekumar, 2019; Moats, 1994; Poiner, 2018). Educators' pedagogical practices and their own perceptions and beliefs impacted how reading instruction occurred. Professional development in the science of reading occurred through the 2018-2020 school years to address the knowledge and practice gap. Educators' experiences and perceptions were

explored to discover how it informed their practice as accommodating, assimilating and integrating information is a learning process (Kitchenham, 2008; Merriam, 2004; Mezirow, 1991). Mezirow's transformational learning theory acted as the theoretical framework, explaining how educators as adults learn information (Taylor, 2001).

The qualitative intrinsically bound case study proposed three questions that were framed by the conceptual framework and the theoretical framework. They explored participants' perspectives as they made changes to their pedagogical practices and their own meaning schemas. The questions included the following:

RQ1: How do early elementary educators describe their professional development experiences in the specific areas of literacy and phonological awareness?

RQ 2: How do early elementary educators in a small public school district describe any changes to their pedagogical practices as they've learned the science of teaching reading?

RQ 3: How do early elementary educators observe their students responding to their changed literacy practices in phonological awareness?

Summary of Responses

During the study, educators reflected upon and described their professional development experiences. These educators reflected upon how they learned new knowledge, integrated it into their own existing, underlying belief system, and how they made changes to their educational practice. Chapter Four described the data analysis and findings resulting in five overarching themes from the early elementary educators' experiences. Tables and figures were included to visualize the data analysis process as well. Chapter Five provides information on the conclusions and recommendations for this study. The five major findings uncovered by the study were

a) Change, b) Collaboration, c) Confusion, d) Confidence, and e) Communication. The following section provides a brief summary of the findings.

Change

Educators reflected that they altered their pedagogical practices as a result of their professional development. When the professional development's goals were clear and explicit, and the educators understood the underlying need, early adopters were willing to attempt novel tasks, providing direct instruction in phonological awareness through phonemic awareness activities inclusive of alliteration, rhyming, blending and segmenting. Through critical self-reflection and observed evidence of increased student performance, educators found they were willing to make more pedagogical changes to their instructional practice.

Collaboration

Educators unanimously discussed the importance and reliance on collaboration and critical discourse with colleagues. At both sites, educators expressed their need to reach out and to connect with colleagues to fill in gaps in knowledge, training, and pedagogical practices, as well as address resource needs. Educators explained that when they required resources or support, they sought a trusted colleague for assistance and confirmation of knowledge. It was through this critical reflection and collaboration that educators found the support structure and confirmation necessary to make changes to their instructional practice and approaches.

Confusion

Confusion was a hallmark finding of the study. Educators at both sites experienced confusion with the terminology of phonological processing, phonological awareness, phonemic awareness, and phonology. Additionally, many educators experienced cognitive dissonance when what their learning came into conflict with their existing and underlying pedagogical

practices. Some educators were able to add to their corpus of knowledge, while other educators wondered how the information they were learning fit into their existing practice or whether instructional leaders were questioning their educational practices and effectiveness.

Confidence

Educators' confidence in their instructional practice was influenced by the perception that educational leaders did not value their knowledge or pedagogical approaches. Educators experienced cognitive dissonance, wondering about the purpose of the literacy professional development. Educators expressed confidence in their own ability to teach reading, explaining that program-based professional development provided the necessary tools. Educators explained that the professional development approach inclusive of coaching, timely feedback, sample lessons, modeling, and the use of credible, expert presenters was a good method to bridge the research to practice gap. Educators also expressed under confidence in resource allocation and availability; educators were unaware of phonological and phonemic awareness resources.

Communication

The communication theme persists throughout the study, impacting the preceding four themes. Educators were unaware of what was important to the building or district regarding literacy. All educators supplied their own perceptions of educational leaders' expectations, resulting in miscommunication between educators and educational leaders. Educators were consistent in communicating their need for personalized professional development to meet their own unique needs, whether content based or general conceptual understanding. Educators considered it to be necessary in furthering their own pedagogical practice and effectiveness, and to reduce their cognitive dissonance regarding literacy outcome expectations.

Findings Interpretation and Literature Alignment

The findings of the case study reconfirm that transformational learning occurs through critical self-reflection and discourse. Educators' responses to interview questions and journal entry prompts coalesce into five major findings, reflecting the discourse and vocabulary terms the educators used to describe their experiences as well as the changes they made to their pedagogical practice. Finally, educators articulate their observations as students respond to the instructional changes they have incorporated into their pedagogical practices.

Research Question 1: How do early elementary educators describe their professional development experiences in the specific areas of literacy and phonological awareness?

Communicative learning occurs through the critical self-reflection and critical discourse of Mezirow's transformational learning theory (Kitchenham, 2008; Mezirow, 1991). The Collaboration, Confusion, Confidence and Communication findings are prevalent in the interview and journal entry prompt responses, aligning with Research Question one.

Collaboration. Collaboration among peers and their critical discourse aided the educators to fill in the gaps of knowledge and training (Kitchenham, 2008; Mezirow, 1991). Relying upon this collaboration enabled educators to bridge their understanding of the research to practice gap; helping them make the connections between the conceptual basis of the cognitive foundations framework and their own pedagogical practices. As Fullan (2001) states, when attempting to influence change, "it's the relationships that make the difference you can't get anywhere without them" (p. 51).

Confusion, Confidence, and Communication. When educators participated in literacy professional development, they experienced confusion over what to do. This led to questioning the purpose of professional development itself. Both the "what to do," the instrumental learning

process, and the "why" or the professional development's purpose are part of Mezirow's transformational learning process (Kitchenham, 2008).

The ambiguity, resulting from a lack of clear communication, had the reciprocal effect of increasing educators' confusion and promoting a lack of confidence in pedagogical practices. Lewin and Regime (2000) explain that "most people want to be part of their organization, they want to know the organization's purpose; they want to make a difference" (p. 27). "Information is only valuable in a social context" (Fullan, 2001, p. 78), and without the contextual basis for the information, educators struggled to alter their own meaning schemas. It is through the connection among educators and their own social engagement, that educators can begin to reflect on their own philosophies and practices and make changes (Kitchenham, 2008; Mezirow, 1998). Therefore, clear communication can reduce educator confusion and increase confidence in understanding the professional development purpose. Brown and Duguid (2000) posit that "for all information's independence and extent, it is people in their communities, organizations, and institutions who ultimately decide what it all means and why it's important" (p. 18). Through this communication, critical discourse and collaboration, change in meaning schema and pedagogical changes occur (Mezirow, 1991). Educators experienced conflicting emotions when presented with information that was either novel or challenged their existing schemas. Educators' subsequent behaviors were influenced by the community culture and instructional leadership.

Research Question 2: How do early elementary educators in a small public school district describe any changes to their pedagogical practices as they've learned the science of teaching reading?

One of the singular components of Mezirow's transformational learning theory is instrumental learning. This is the cause and effect relationship, the hands-on learning process

(Mezirow, 1991). Research Question two aligns with the study's Change, Collaboration, Confusion, and Confidence findings.

Change and Confidence. Pedagogical changes occurred when educators had a clear understanding of the procedural process. Perceptual shifts occurred once these changes were implemented. There is an interconnection between making pedagogical changes and increasing confidence in the process. Educators were able to integrate phonological awareness and phonemic awareness activities into their pedagogical practices with more depth of knowledge and understand how the component cognitive constructs are integrated, thereby increasing confidence (Hoover & Tunmer, 2020). Once educators made changes to their practice, and observed the effects of the change, they were willing to engage in perspective transformation (Kitchenham, 2008).

Change and Transformational Learning. Critical transitivity, according to Freire, is the process by which educators, when engaged in critical self-reflection, may transform their meaning perspective and seek to act as change agents (Kitchenham, 2008). Educators sought to effect transformation across buildings and the district as they became more confident in their ability to apply the transformational learning process, both communicative and instrumental constructs (Kitchenham, 2008; Mezirow, 1991; Tunmer & Hoover, 2019).

Collaboration and Confusion. Exposure to how the cognitive components of reading instruction are integrated has been limited, as specific program training has provided isolated skills and instrumental learning and procedural knowledge. Confusion and disorientation occur as literacy professional development builds upon and comes into conflict with existing schemas (Kitchenham, 2008; Tunmer & Hoover, 2019). Risko and Reid (2018) describe these as uncertainties that educators must experience as they learn how to integrate the new knowledge

into their meaning schemas, meeting their own expectations of how to teach literacy. Educators address this confusion by engaging in peer-to-peer collaboration and critical discourse, delving deeper into the conceptual as well as the procedural knowledge, ensuring that the newly acquired information becomes salient and significant to their pedagogical practices (Kitchenham, 2008).

Research Question 3: How do early elementary educators observe their students responding to their changed literacy practices in phonological awareness?

The literacy professional development provided the specialized knowledge educators required to connect the phonological and orthographical nature of reading; resulting in a finding of Change (Castles et al., 2018; Moats, 2014; Piasta et al., 2009; Rayner, Foorman, Perfetti, Pesetsky, & Seidenberg, 2001). Educators observed how the cognitive components of phonological knowledge and phonemic awareness impacted the other areas of reading, such as phonics (Kilpatrick, 2015; Moats, 2020; Tunmer & Hoover, 2019). By integrating phonemic awareness instruction, educators observed student progress and engagement, reflecting the reciprocal nature between educators' pedagogical practices and student responses. With this observational evidence, pedagogical teaching perspective was transformed (Joshi et al., 2016; Kennedy, 2016; Kitchenham, 2008).

Findings and Implications

Educators' responses resulted in five findings. Each finding is interconnected with the overarching Communication theme acting as both a process and structural component. Two findings, Change and Collaboration are active processes in which educators engaged while the other two themes, Confusion and Confidence describe the perceptions educators experience while participating in the professional development. Figure 6 depicts the interrelations among the study's five findings.

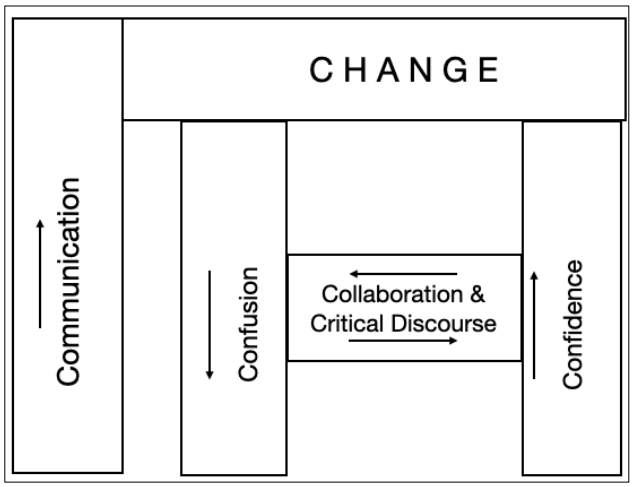

Figure 6. Findings structure and process interaction

Change: Instrumental Learning in Action

The finding of Change occurred in response to Research Question Two. Educators explained that with clear expectations, procedural knowledge and a scope and sequence, they were willing to take risks, attempting new pedagogical practices or altering their own meaning schemas and implementing a phonemic awareness program (Hoover & Tunmer, 2020; Kilpatrick, 2015; Kitchenham, 2008). These educators explained that when they were able to connect their existing knowledge to their newly acquired knowledge, and they felt supported in attempting these pedagogical changes, they were more open or able to alter their meaning perspective and change their pedagogical practices (Kitchenham, 2008; Guskey, 2014). The implication was that educators felt more successful when they were able to attach their existing prior knowledge with new knowledge along with their procedural knowledge.

Additionally, when educators felt they had the time and opportunity to try new practices and approaches without pressure, they were able to pursue pedagogical change. The freedom and opportunity to practice, to observe results, and to make instructional changes aided the educators in altering their instructional approach towards teaching phonemic awareness. When educators

felt constrained or felt a lack of confidence in their own abilities and access to materials, they were less inclined to attempt novel approaches.

Some educators also shared that when they had a deeper conceptual understanding of the components of literacy instruction based on prior phonics program training or other literacy program, they had an easier time making incremental changes to their pedagogical practices. Educators articulated that they thought it was important for all educators to understand how the brain works and how individuals learn to read. This information provided a scaffold and structure for their own understanding of how individuals learn to read. By providing this basis for understanding, some educators shared their own confidence level changed.

Other educators also shared they had learned some components of the SVR in their educational training but these educational experiences varied considerably, depending upon their prior higher education training. While some educators who graduated in the early-2000s did not have a background in the science of reading, other educators who received further training post-2010 did have some background knowledge in SVR and the science of reading. This instructional variability in how to teach literacy impacted the educator's own knowledge and literacy pedagogical practices. Educators' perspectives altered by the further literacy professional development training. Thereby, impacting the way in which they approached literacy instruction. Educators, to transform their own perspective on how to teach reading, need to know not only what to do, but also the purpose and why they are making these pedagogical changes.

Collaboration

When confronted with their own gaps in knowledge and training, educators reached out to peers to meet their own training needs and the needs of their students. This Collaboration finding aligns with the critical discourse and critical reflection as described in Mezirow's

transformational learning theory. Educators relied upon each other to make sense of the information with which they were presented, reducing or amplifying the findings of Confusion and Confidence. Mezirow (1991) explains that meaning perspective transformation can occur through this collaboration, the critical discourse. Educators require this time and opportunity to collaborate, building upon each other's expertise and experience, thereby creating collective capacity to teach reading. One implication is that by providing this time and by giving it legitimacy, educators are able to form the guiding coalitions which can in turn, empower others to make meaningful perspective change in their pedagogical practices (Kitchenham, 2008; Kotter, 2012). Therefore, educators will begin the process of transforming their own pedagogical practices and then share their successes and knowledge with colleagues. Educational leaders need to create the opportunity and time for this critical discourse, making use of the natural experiences that educators are already applying and requesting. Another implication is that differentiated and tiered professional development can be established based upon an educator's prior knowledge and expertise.

Confusion and Confidence

Educators shared their perceptions about the professional development process. The frequent and changing professional development topics, the need to implement these topics, and their own perceptions that educational leadership did not acknowledge their own expertise led to the findings of Confusion, Confidence, and its counterpart under confidence. These educators then reflected upon their own understanding of how individuals learn to read and through reflection process, acknowledged their gaps in knowledge and in their training. The educators shared their own confusion about the process of how individuals learn to read, explaining that they had not been taught this information in their own educational training. This led to

descriptions of wonder and amazement as they learned new information. Yet, it also led to expressions of uncertainty, ambiguity and more confusion as educators explained that they did not know how to integrate this new knowledge into practice especially across novel situations.

Time as a resource influenced educators' perceptions of anxiety and confidence in their own abilities to implement newly acquired pedagogical approaches, such as phonemic awareness skills (Hoover & Tunmer, 2020). Educators felt pressure to not only participate in the professional development but the expectations to implement the processes and procedures immediately. Overall, educators experienced confusion due to the presentation of novel information that was in conflict with their understanding of how to teach reading. This impacted their confidence in their own pedagogical practices. Through collaboration, reflection, and discourse, these educators were able to make pedagogical shifts, transforming their perspectives.

The implication is that educators' perceptions of the professional development purpose, the instrumental and communicative learning that is expected to occur, needs to be clearly communicated to address and acknowledge educators' feelings, the confusion and the crisis of confidence. Through collaboration, reflection, and discourse, these educators were able to make pedagogical shifts, transforming their perspectives about literacy instruction and increasing their own confidence in their approach to teaching phonological awareness and phonemic awareness.

Communication

Educators reflected ambiguity, expressing their uncertainty about the purpose behind the professional development. Educators, while participating in the literacy professional development indicated that they were learning concepts they had never learned in their prior training. Yet, these educators were expressing confusion and anxiety regarding the purpose of the professional development and whether their own skills were under question. A disconnect

occurred between the novel information presented and the affective expression of confusion as to why the information was presented, leading to feelings of confusion and ambiguity. These educators wondered if their own pedagogical practices were under question or whether the professional development was just another initiative, leading back to the Confusion and Confidence findings. Due to the educators' gap in knowledge or their misunderstanding behind the 'why' of professional development, educators experience challenges with the communicative learning process as described in Mezirow's transformational learning process (Kitchenham, 2008; Mezirow, 1991). The implication is that clear consistent communication about the professional development's purpose, the acknowledgement of the skills many educators already had, as well as the role of the professional development in improving educational outcomes for students would assist educators in transforming their meaning perspective and engage in pedagogical changes.

Recommendations for Action

The aim of this intrinsic case study was to understand how educators process and experience their own knowledge and affective experiences while they learned, integrated, and assimilated the science of reading research. This research was integral to the school site as research literature indicates that educators with all levels of academic attainment are often less prepared to teach reading to students specifically in the area of phonological awareness and automaticity (Cohen et al., 2017; Cunningham et al., 2004; Kilpatrick, 2015; McMahan et al., 2019; Moats, 2020; Snow, 2020). The researcher, through data analysis, found that educators shared their own recommendations and considerations for literacy professional development. Such recommendations can serve to enhance the training of educators within a school.

Educators described their experiences in myriad ways, expressing challenges to their pedagogical practices and underlying perceptions and beliefs. Educators explained that they needed more information and the professional developments purpose to make informed decisions. In most cases, the professional development experiences were received positively but a lack of clarity hampered the transformational change process. This resulted in confusion and lack of confidence in the process and the instructional approach.

The case study provides some recommendations to address the ambiguity and challenges educators articulated during the data collection process. Research Question One aligns to all the recommendations as it relates to the perceptions and experiences of the educators as they participated in the literacy professional development. Research Question Two aligns to the second and third recommendations as these relate to the instrumental and communicative change that occurs when educators alter their meaning perspective and achieve critical transitivity (Kitchenham, 2008; Mezirow, 1991). Research Question Three is tangentially aligned to the third recommendation as it relies upon the application of instrumental learning and observation of student outcomes and behavior. Table 3 provides an overview of the recommendations and their connection to the themes that emerged from educators' responses.

Table 3.

Recommendations for action

Recommendations	*Change*	*Collaboration*	*Confusion*	*Confidence*	*Communication*
Provide clear and consistent communication		x	x	x	x
Provide differentiated professional development	x	x			x
Provide time for increased collaboration, knowledge building, reflection, and application	x	x	x	x	

Recommendation 1: Clear Consistent Communication

Educators shared their lack of clarity and confusion about the purpose of the literacy professional development at the district wide, school level and building level. The educators espoused many different perspectives, resulting in a lack of confidence in the process, resulting in expressions of self-doubt and confusion. To reduce confusion and increase confidence, educational leaders could provide a clear vision behind the 'why' literacy professional development is important for all educators. The confusion experienced by educators promoted critical discourse and collaboration but, as the vision remained unclear, the educators continued to act as their own problem solvers, transforming their learning primarily through instrumental learning (Baumgartner, 2001; Kitchenham, 2008).

One recommendation that aids in reducing the confusion is to create the vision and strategy as well as establish a sense of urgency (Kotter, 2012). The educators should understand the need for literacy professional development and how students across the industrialized world are struggling to learn to read (NCES, 2019; Snow, 2020). Creating a change plan, such as the eight-stage process by Kotter (2012), could provide a framework to follow. Once a sense of urgency is established, key stakeholders, the innovators and early adopters according to Roger's Diffusion of Innovation theory (2003), could act as the inspirational and expertise driven advocates for change. This group of key stakeholders acting as a guiding collation, could aid in vision and strategy communication of the 'why' behind the professional development (Kotter, 2012). When educators understand the purpose and rationale of the professional development, the decrease in confusion may aid in communicative learning (Mezirow, 1991).

Recommendation 2: Provide Professional Development Tailored to Educators' Needs

Just as students need differentiated instruction, educators also require tailored professional development based on the content and purpose of the professional development and educators' background knowledge and experience. Educators as adult learners have different needs than students due to their background knowledge and experiential knowledge. Research indicates that educators, as adult learners, must have professional development that is relevant to their existing roles and provides real value to their practice. According to Kalyuga, Ayres, Chandler and Sweller (2003) it's the educators' level of expertise that is the "critical factor in determining relevance and attention" (p. 24).

Kalyuga, Ayres, Chandler and Sweller (2003) explain that the more expertise an educator may have, the easier it is for them to associate the professional development knowledge with an existing schema, "recognizing patterns, and acting on the information as a single unit" (p. 24). However, novice learners, those educators unfamiliar with the information, must apply their working memory to organize the information and thus will require instructional guidance to assist in reducing the working memory load (Kalyuga, Ayres, Chandler & Sweller, 2003). Direct explicit instruction, along with strategies that engage the educators in the content, provide meaningful and useful connections. These provide for reflection and collaboration and support for educators who may have limited exposure to the concepts under study.

The educators in this study shared that the professional development opportunities that provide short convenient and accessible content are highly useful and meaningful. Then, professional development that provides sample lessons along with coaching, observation and immediate feedback aided the educators in implementing and applying new tasks, skills or

strategies in a supportively based collegial environment. Collaboration and relationships are one aspect critical to the success of the professional development as the educators can share and learn from each other, building upon each other's knowledge and expertise and "establishing program coherence" (Fullan, 2001, p. 65) across the current silos and isolated skills currently implemented.

Tiered and Differentiated Professional Development. Educators unanimously felt that meaningful professional development was necessary to improve their instructional practices and to improve student outcomes. Canlé (2020) articulates that educators feel that some "training lacks relevance to their practice" (p. 2). In this study, educators advocate for differentiated professional development that connects to each educator's interests and needs, designed to bridge the gaps in knowledge and practice. Foster (2016) discusses an approach that was posited by Bull and Gilbert in 2012 in which

> Teacher development programs could be created to support all teacher's professional growth while at the same time establishing clusters of experienced teachers who could work across school sites or online to develop systems that better meet the needs of today's students. This approach could provide teachers with opportunities to grow, develop and keep up with the best practices while simultaneously building in processes and systems that encourage and sustain innovation and differentiation across the educational system. (p. 8)

All the educators espoused a passion to meet student needs, reflecting they occasionally experience a misalignment between resource availability and knowledge to meet student need. It is through professional development that educators "discover meaning and build capacity" (Canlé, 2020, p. 1), thereby transforming their meaning perspectives. By altering their

perspectives, educators are able to integrate, assimilate and make changes to their instructional practices (Kitchenham, 2008; Mezirow, 1991). Thus, professional development provides the resources to bridge the knowledge gaps and increase educator's ability to fill many of those gaps.

Professional development could be organized into multiple domains, one for the whole district that provides general base level of knowledge to ensure the consistency and alignment across educational staff and grade levels; one that provides content based or program based knowledge for each level, elementary, middle and secondary, and one approach that makes use of educator or other experts who can use the existing expertise within the organization to ensure all educators are learning and being exposed to best practices in their specific domains. The goal would be to create opportunities for educators to "work together in communities of practice, in which professional development's vision and purpose is to deepen and expand educators' collective knowledge of their shared endeavor through ongoing peer and collegial iteration" (Bull & Gilbert, 2012, p. 7). Additionally, educators could also work in learning communities, such as the personal learning communities, in which change would be their central purpose and vision (Gilbert & Bull, 2012). Educators "could work together to create solutions and new ways of being, learning how to approach assumptions" (Gilbert & Bull, 2012, p. 7) and challenges, and creating new opportunities for pedagogical practice.

To address the professional development challenge and to make the professional development more meaningful, educators can become catalysts for change by taking charge of their professional development. Administrators can create tiered professional development opportunities that are tailored to the individual educators' needs. Administrators can create a forum for educators to articulate what they require in professional development, such as anonymous surveys (Canlé, 2020).

Then administrators could create professional development opportunities that affect all educational staff, such as the underpinnings of how students learn to read or health, safety and wellness professional development. This would be analogous to the Tier I instruction provided to all students in an elementary setting, the core curriculum as it were in a multi-tiered system of supports. Then, using the anonymous surveys, administrators can create a cadre of professional development opportunities for a specific cohort of individuals. Educators would then pursue and participate in the professional development that meets their individual needs.

Recommendation 3: Provide Time for Collaboration, Knowledge Building, & Application

Educators reflected confusion and under confidence in their pedagogical practices, requesting more guidance on how to approach specific situations. Educators explained that while they have learned more about how the brain learns to read and are incorporating more phonological processing and phonological awareness skills into their pedagogical practice, they required more information about how to understand and to apply the results of the phonological skills assessments to meet student needs.

The educational system could create a scaffold and process in which trusted expert educators could mentor and assist other educators to fill in the missing pieces in their knowledge or training; providing the time to practice and apply their newly acquired knowledge. This time for learning could make use of the natural connections between colleagues; aiding each other and the elementary schools in building capacity on how to teach phonological awareness skills.

Educators could demonstrate their own critical transitivity and act as catalysts for change by presenting their own expertise and knowledge to others (Canlé, 2020; Kitchenham, 2008; Mezirow, 1991). Through an expertise driven approach, educators can share their own knowledge and expertise with colleagues who require the knowledge and information. For

example, book studies, short nuggets of topical professional development that address the gaps in knowledge, along with the time to reflect, and implement the strategies can aid educators in sense making in a supportively based culture. The peer-to-peer expertise approach relies upon the strong collegial relationships among educators, making use of the innate trust and confidence in not only the knowledge but the presenter as well.

Aligned with the time for reflection and the clear, consistent communication recommendations, the organization could develop a strategy that articulates what needs to be accomplished both in the short and longer term, establishing both milestones and the tasks to achieve those milestones (Kotter, 2012). Linking the strategy to the vision, educators would then be able to see both the big picture as well as the roadmap of how to achieve the big picture. Achievable goals, such as implementing a phonological awareness activity daily, could occur, thereby, reducing an educator's anxiety and confusion about how to implement the process.

Recommendations for Further Study

During the research and data collection process, several questions arose outside the scope of this study. This section contains potential recommendations for further study. Three recommendations for further study are described below.

Recommendation for Further Study #1

Educators reflected on their knowledge base, connecting their educational training with the literacy professional development received. The researcher and the educators wondered to what degree an educator's background knowledge and experience impacted their engagement in the professional development process and meaning transformation. An educator shared their background knowledge in the science of reading. They then used this information to assist peers and administrators in their own understanding. Further studies could explore whether the

educators' years of experience, background knowledge, or the individual's own inclination to adopt change impact how quickly one would engage in both instrumental and communicative learning (Rogers, 2003; Sahain, 2006).

Recommendation for Further Study #2

Educators discussed the training they had received in their educational programs. Seven of 12 of the educators received one of their educational degrees from the same regional institution in early childhood education, elementary education, or human development. The decade in which educators received their training did not correspond to their literacy background knowledge. Most educators shared that they had not been exposed to the SVR or phonological awareness. An interesting question would explore the specific coursework involved in each of these programs and would help to differentiate the professional development needed by educators hired by employers.

Recommendation for Further Study #3

Phonological processing involves phonological memory, phonological awareness and phonemic awareness abilities and a student's ability to associate the phonemes with the grapheme, phonological retrieval (Wagner & Torgesen, 1987). As educators become more confident in their understanding of phonological processing, they may alter their pedagogical practices, incorporating phonemic awareness activities into their lessons. While educators shared how much they enjoyed the phonological and phonemic awareness activities included in their lessons, the next step will be to determine if a quantifiable change occurs in student outcomes.

Summary

This qualitative intrinsic case study aimed to describe and to understand how early elementary educators processed and experienced their own knowledge and affective experiences

as they participated in literacy professional development. This study explored the gap that exists in the knowledge between what researchers know about the science of teaching reading and educators who may be inefficiently implementing the reading components through lack of knowledge, ideological differences or other factors outside of the educator's control. This study applied two underlying theoretical frameworks to document the educators' understanding of the science behind literacy instruction and connected their own learning acquisition and processes. Influenced by the research literature indicating educators with all levels of academic attainment are often less prepared to teach reading specifically in the area of phonological awareness and automaticity 12 early elementary educators participated in the case study. Three research questions directed the study and explored this central phenomenon.

The early elementary educators shared their perceptions, frustrations, successes, and experiences with the researcher through the data collection process that included interviews, journal entries, and artifacts. The data collection process is described in Chapter Three. Through data analysis and saturation, the case study findings resulted in five overall findings: Change, Collaboration, Confusion, Confidence and Communication.

Early elementary school educators within the case study were able to alter their meaning perspective and change their pedagogical practices when they felt they had a specific task or a program's scope and sequence to follow. This instrumental learning approach, the "how to," confirmed what some early elementary educators already knew and some had used, but they did not have the language or terminology to attach to the concepts they were teaching. Other educators at the Upper elementary school remain under confident or confused about the concepts and have asked for further clarification and training.

Educators' communicative learning remains an ongoing process. Educators continue to process the professional development in their own way. The Collaboration, Confusion, Confidence, and Communication findings were apparent as educators described their struggles with vocabulary, their anxiety over the meaning, the why, of the professional development, and their underlying beliefs and assumptions as to how students learn to read. Four of the 12 (25%) educators described their critical reflection and how they transformed not only their own meaning schemas but have a strong desire to aid colleagues and educational leaders in their own transformational change. These educators articulated a desire to act as change agents and could be leveraged as part of a guiding coalition to lead the transformational change in literacy at the elementary school level (Kitchenham, 2008; Kotter, 2012).

The researcher found the study to be a transformational learning experience. The instrumental learning experiences found within the research while overwhelming from an organizational perspective was gratifying and satisfying when a process was completed. The communicative learning process involved in the transformational learning process continued to evolve as the researcher continues to delve deeper into the science of reading, exploring current research and encouraging further differentiated and tailored professional development to meet the needs of educators, educational leader and ultimately students. Through the critical reflection process, journaling and memo writing, the researcher uncovered connections in themes and hidden assumptions. These assumptions can be explored and addressed to determine if they hinder or further literacy instruction for students.

The findings from this study contribute to and align with the existing literature on the science of reading, phonological awareness and teacher preparation. Additionally, three recommendations for action are described in this chapter. Suggestions for future research

endeavors include, providing time for educators to connect to the content, to studying educator preparation coursework at higher institutions, and to studying student outcomes based on pedagogical change. By increasing educators' understanding of how to teach reading, educators can make pedagogical changes that impact students' ability to learn to read.

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APPENDIX A

DATA COLLECTION INSTRUMENTS FOR SEMI-STRUCTURED INTERVIEW

Researcher: Thank you for participating in today's interview. A series of questions will be asked as well as potential follow up questions to promote discussion around your participation in the literacy professional development study. These questions will serve as a guide to promote discussion as this interview is in a semi-structured format. The interview will be conducted over a one-hour period and will be recorded using the researcher's iPhone. The content of the interviews will be transcribed and the notes will be kept confidential through the collection and analysis process. Please note that you will be provided a copy of the transcribed research notes to check for accuracy. Do you have any questions before we begin?

This interview contains two types of queries: a) demographic information and b) experiential and perceptual information.

General Demographics

1. How many years have you been teaching?
2. What grade levels have you taught?
3. What is your educational background?

a. Do you have any degrees, trainings, or certifications? If so, in what?

If you feel comfortable answering, how do you self-identify? (gender, race, ethnicity?)

Experiential and Perceptual Information

4. Tell me about your approach to teaching literacy?

a. What skills do you think are important ?

b. How do you structure your instructional time? (percent allocated towards the five pillars of reading)?

5. Describe your literacy professional development experiences, either recently, or in the past?

a. Are there any trainings, books, conferences, or professional development workshops that have been particularly influential on you as a teacher?

6. How have they influenced your instruction?

a. Can you be specific? Or what does that mean in terms of instruction?

7. Can you describe a recent student who struggled with learning to read? Can you describe how you supported that student?

8. Let's talk about the students who are doing well in reading, why do you think they are doing well?

9. How do you know if a student is at benchmark in reading? (If not at benchmark, tell me what you use to figure out why the student is struggling)

10. Describe a situation in which you tried a new approach for teaching literacy or a time when you felt confidence in your teaching approach? Where did you learn about these approaches?

11. How has training in phonological processing, awareness and proficiency or other pillars of reading influenced your teaching practices? Your student's achievement?

12. When it comes to reading achievement, what do you think is important in your district? (to your principal?) How does administration support you in these efforts?)

13. What do you know now you didn't know before? Or alternately, can you describe your goals or aspirations for your instructional practice in future?

Researcher: Thank you very much for your participation in the interview. You will be provided a copy of the transcribed notes within a 48-hour period to check for accurate depiction of your thoughts and reflections through this interview protocol.

APPENDIX B

DATA COLLECTION INSTRUMENT FOR JOURNAL ENTRY PROMPTS

Journal entries prompts are provided to the participants. These journal entries provide the opportunity for the participants to reflect on the literacy professional development, their own experiences, the challenges, and the successes. The prompts provide a starting point for a conversation, one that participants may feel more comfortable using to describe their perceptions and experiences as they have participated in literacy professional development.

Journal Entry Prompts One

Reflect upon the literacy professional development. What professional development experiences have resonated with you. What has been useful in your educational practice? What has not been useful? Describe your thoughts and ideas about phonological awareness. Describe any experiences that you found confirming or challenging to your educational practices and beliefs.

Journal Entry Prompt Two

Describe what specifically you have learned or take away from professional development in phonological processing. Describe your successes and barriers that you would like to share as you have experienced professional development. Describe your educational practices and whether you have altered or amended your educational practice.

APPENDIX C

RESPONDENTS PER THEME

This chart describes the percentage of respondents (N=12) who expressed perceptions, values and beliefs in relation to the themes and subthemes uncovered in this study.