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EXPLORING INTENSIVE READING INTERVENTION TEACHERS' FORMAL AND
PRACTICAL KNOWLEDGE OF BEGINNING READING INSTRUCTION PROVIDED TO
AT-RISK FIRST GRADE READERS

by

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A dissertation submitted in partial fulfillment of the requirements
for the degree of Doctor of Education
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Karen Biraimah
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ABSTRACT

This study was designed with two goals in mind. The first goal was to describe the formal and practical knowledge of intensive reading intervention teachers related to beginning reading instruction with at-risk first graders. A second goal was to understand any potential relationships between intensive reading teachers' practical knowledge and formal knowledge. These two goals framed the study's three research questions.

To answer these three questions, the study was conducted in two phases. Phase one included 32 participants, all of whom worked in the role of a K-2 intensive reading intervention teacher. Each of these 32 participants completed a background questionnaire and a paper/pencil Teacher Knowledge Assessment (TKA). The TKA measured participants' formal knowledge of beginning reading concepts. Participants' scores on the TKA were then rank-ordered from lowest to highest to help guide the selection of phase two participants. Eight teachers in all participated in phase two of the study dedicated to the study of teachers' practical knowledge of reading. Participants' practical knowledge of reading was explored through three activities including a semi-structured interview, a concept-mapping activity and a videotaped reading lesson.

Data analysis revealed several important findings. Intensive reading intervention teachers in this study's sample differed in their formal knowledge of reading, measured by the TKA, and in their practical knowledge of reading, explored through interviews, concept-maps and reading lessons. The TKA revealed that study participants' held more formal knowledge of concepts related to phonology and phonics and less formal knowledge of concepts related to morphology and syllable types. Related to practical knowledge, data analysis revealed that the teachers in this sample differed in their knowledge of beginning reading with subject-matter knowledge

accounting for most of the differences. These gaps in subject-matter knowledge also impacted this sample of teachers' use of instructional strategies and purposes of instruction. Data analysis also revealed insight into the relationships between this sample of teachers' formal and practical reading knowledge. In this sample, intensive reading intervention teachers with more formal knowledge of reading concepts as measured on the TKA demonstrated more evidence of these concepts within their instruction provided to at-risk first grade readers. The participants in this sample who had less formal knowledge of beginning reading as measured by the TKA demonstrated less evidence of these concepts within their instruction provided to at-risk first grade readers. Participants with less formal knowledge did accurately calibrate their knowledge of the concepts tested on the TKA but did not equate the lower scores to their practical knowledge and overall teaching efficacy.

The findings from this study added several important contributions to the literature on teacher knowledge and beginning reading instruction. First, the study was unique in its focus on intensive reading intervention teachers, thus contributing new findings related to a specialized group of teachers. Secondly, this study contributed descriptions of teachers' practical knowledge with regards to beginning reading instruction. These descriptions are relatively absent in the current literature on teacher knowledge. Thirdly, the results from this study supported earlier findings in favor of a specialized body of subject-matter knowledge, especially related to beginning reading skills and concepts. Finally, the results contributed insight into the relationships between teachers' formal reading knowledge and practical reading knowledge.

Dedicated to my girls…Brooke, Wren and our little munchkin that is on the way.

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If someone had told me that it would take seven years to earn this degree, I would have said they were crazy! Well, here I am seven years later and I am just now reaching the end of this journey. But as Dr. Beverly constantly reminded me, "It is your journey, no one else's." The road has been long and challenging so I would like to take a moment to acknowledge some people that made this achievement possible.

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LIST OF ACRONYMS

EIR	Early Interventions in Reading
ESE	Exceptional Student Education
FCRR	Florida Center for Reading Research
IDEA	Individuals with Disabilities Education Act
IRA	International Reading Association
IRIT	Intensive Reading Intervention Teacher
ISI	Individualizing Student Instruction
LPA	Learning Point Associates
NRP	National Reading Panel
NCLB	No Child Left Behind
RtI	Response to Intervention
TKA	Teacher Knowledge Assessment

CHAPTER ONE: INTRODUCTION

Background

The education profession is in a state of flux. Across the nation, school buildings are abuzz with talk about the common core standards, college and career readiness assessments, Response to Intervention and teacher evaluation reform. Although each of these initiatives is unique, two characteristics are common to them all. First, each intends to improve student learning. Second, each initiative places classroom teachers at the heart of the change process. It is precisely the teacher variable that may contribute most to the success or failure of each initiative considering research suggests that the single greatest variable upon student learning may be the quality of the teacher (Darling-Hammond, 1997; Darling-Hammond & Baratz-Snowden, J., 2007; Duffy, 2004; Marzano, Pickering, & Pollock, 2001; Rowan, Correnti, & Miller, 2002; Rowe, 2003; Sanders & Rivers, 1996).

In making such a claim, how then do we define quality? Past research has focused on a number of variables thought to be related to teacher quality. These studies explored proxy variables such as teachers' verbal abilities, certifications held, or years of experience (Ballou & Podgursky, 2000; Darling-Hammond, 2006; Darling-Hammond, Berry, & Thoreson, 2001; Goldhaber & Brewer, 2000; Greenwald, Hedges, & Laine, 1996). None of these variables emerged as strong predictors of teacher efficacy and enhanced student achievement. More current research into teacher quality suggests that teacher knowledge and how teachers act upon such knowledge in day to day teaching may matter most (Reutzel et al., 2011). As a result, "the debate about teacher quality has shifted from a focus on which teacher qualities matter to a

contemporary focus on how much and under what conditions teachers' knowledge enacted in classroom instruction affects student performance" (Reutzel et al., 2011, p. 186). It is exactly this shift in the research that guided the direction of this study.

Statement of the Problem

In the area of reading, researchers have had particular difficulty with the construct of teacher knowledge (Reutzel et al., 2011). Issues include the absence of an accepted theoretical model of teacher knowledge development, disagreements over what teacher knowledge is essential for effective reading instruction, difficulties in creating valid and reliable assessments to measure essential teacher knowledge, and challenges in linking teacher knowledge to students' literacy gains. In an effort to address some of these challenges, *The Primary Grade Reading and Writing Teacher Knowledge Project* was developed in 2005 (Reutzel & Dole, 2005). This multi-year project was charged with developing a comprehensive assessment system that measured primary teachers' formal or head knowledge related to the teaching of reading and writing as well as teachers' practical or enacted knowledge pertaining to what primary teachers do in the classroom specific to beginning reading and writing instruction (Reutzel et al., 2011). Based on this model of two types of knowledge, researchers honed in on two instruments. A paper/pencil multiple choice assessment tested teachers' content knowledge and pedagogical content knowledge about reading and writing. A classroom observation scale was used to capture evidence of teachers' enacted pedagogical content knowledge in the areas of primary reading and writing instruction (Reutzel et al., 2011).

In using these two instruments, researchers encountered a number of challenges, both conceptual and methodological. In response to these challenges, the researchers raised the following six questions:

1. What knowledge warrants measurement with regards to primary reading and writing instruction (Reutzel et al., 2011, p. 193)?

2. What evidence will be accepted as convincing evidence of primary teachers' knowledge of reading and writing (Reutzel et al., 2011, p. 195)?

3. What are the potential concerns related to the use of measures of teachers' knowledge of reading and writing instruction (Reutzel et al., 2011, p. 197)?

4. How should primary grade teachers' knowledge of reading and writing instruction be measured (Reutzel et al., 2011, p. 199)?

5. What special problems does the use of classroom observations present when measuring primary grade teachers' knowledge of reading and writing instruction (Reutzel et al., 2011, p. 201)?

6. Is there any predictive validity to teacher knowledge assessment (Reutzel et al., 2011, p. 205)?

For each of these six questions, the researchers discussed limitations of current research and possible directions for future research. Question one, which asked which knowledge we should measure specific to teachers' reading and writing instruction provided direction for the current study. In discussing this proposed question, researchers noted a current reliance on paper/pencil assessments to measure formal teacher knowledge. They went on to suggest the importance of enacted or practical knowledge as being potentially more important than formal

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knowledge traditionally assessed by multiple choice items. In making this claim, the authors suggested the need for additional research and the use of alternative research techniques such as those used in the field of psychology. The authors suggested that methods such as think aloud protocols "may provide further insight into the kinds of thinking teachers do as they think about and evaluate reading and writing lessons" (Reutzel et al., 2011, p. 201). Based on this recommendation and a thorough review of the academic literature, this study was designed and enacted.

Purpose of the Study

One purpose of this study was to describe the formal and practical knowledge of intensive reading intervention teachers related to beginning reading instruction provided to at-risk first graders. A second purpose was to understand any potential relationships between intensive reading teachers' practical knowledge and formal knowledge. The study's findings added descriptions to the literature of intensive reading intervention teachers' formal and practical knowledge related to beginning reading instruction. The findings contributed insight into the relationships between formal and practical teacher knowledge and the potential role of each type of knowledge specific to beginning reading instruction provided to at-risk first grade readers. These findings may help to inform the preparation practices for pre-service teachers, the professional development practices with in-service reading teachers and the evaluation of all teachers of beginning reading.

Research Questions

This research study was designed to answer the following three questions:

1) What is the formal knowledge of intensive reading intervention teachers teaching at-risk first grade readers?

2) What is the practical knowledge of intensive reading intervention teachers teaching at-risk first grade readers?

3) What is the relationship, if any, between intensive reading intervention teachers' formal and practical knowledge of beginning reading provided to at-risk first grade readers?

Overview of the Methodology

A mostly qualitative design was used to answer the study's three research questions. The study was conducted in two phases using a purposeful sample of K-2 intensive reading intervention teachers. Phase one of the study explored intensive reading intervention teachers' formal knowledge of beginning reading. Thirty-two participants (52% of the total population) completed a paper/pencil Teacher Knowledge Assessment (TKA). The TKA administered was originally developed for use in an earlier study of teacher knowledge and was designed to assess teachers' understandings of English phonology, orthography and morphology as well as concepts relevant to literacy acquisition and instruction (Piasta, Connor, Fishman, & Morrison, 2009). Permission to use the TKA for this study was secured from the developing author (Appendix A). Participants' results on the TKA were used to answer research question one which asked, "What is the formal knowledge of intensive reading intervention teachers teaching at-risk first grade readers?"

Participants' results on the TKA were also used to guide the selection of phase two participants. All phase one participants' scores on the TKA were rank ordered from lowest percentage of correct items to highest percentage of correct items. The four lowest scoring participants on the TKA that consented to participate in phase two of the study represented the Lowest Formal Knowledge Group and the four highest scoring participants that consented to participate in phase two of the study represented the Highest Formal Knowledge Group. Organizing participants into these two sub-groups enabled the researcher to better understand any potential relationships between teachers' formal and practical knowledge of beginning reading.

Phase two of the study, conducted with eight total participants, consisted of three specific data collection activities. Each participant engaged in a semi-structured interview conducted by the researcher (Appendix K), a concept-mapping activity (Appendix L), and a videotaping activity (Appendix M and N). The complete data set from phase two of the study included eight interview transcripts, eight transcripts of the explanations teachers provided for their concept maps, and eight transcripts of the conversations around each videotaped reading lesson. All transcribed data were first read to gain a holistic view of the data set and then specific analysis was conducted using the seven knowledge categories derived from an earlier study of practical knowledge (van Driel, Verloop, & de Vos, 1998). In this earlier study, researchers identified categories of knowledge related to a specific subject area (reading comprehension). As this study was also interested in teachers' practical knowledge related to a specific subject area (beginning reading instruction with at-risk first grade readers), the categories of practical knowledge supported by this earlier study were appropriate for the present study.

Therefore, all phase two data were coded and analyzed using the following categories: (a) knowledge of subject matter, (b) knowledge of general pedagogy, (c) knowledge of student learning and conceptions, (d) knowledge of purposes, (e) knowledge of curriculum and media, (f) knowledge of representations and strategies, and (g) knowledge of context (van Driel et al., 1998). These data were used to answer research question two which asked, "What is the practical knowledge of intensive reading intervention teachers teaching first grade readers?"

Research question three asked, "What is the relationship, if any, between intensive reading intervention teachers' formal and practical knowledge of beginning reading provided to at-risk first grade readers?" Both phase one data (TKA results) and phase two data were used to answer this question. During the videotaping activity, participants were presented with a blank copy of the TKA after jointly viewing the videotaped lesson with the researcher. The researcher asked participants to review each of the multiple choice questions (1-34) from the TKA and to note any connections between the content of the question and evidence presented in the lesson. The researcher recorded the participants' responses and then analyzed them for accuracy of the responses and the quantity of accurate connections (Appendix O).

Chapter three more fully describes the study's research design and methodology.

Conceptual Underpinnings

This study was supported by several important theoretical understandings well documented in the academic literature. First and foremost, the study builds upon the notion that knowledgeable and effective teachers matter most for student achievement (Anderson, Hiebert, Scott & Wilkinson, 1985; Chall, Jacob & Baldwin, 1990; Sanders & River, 1996; Scheerens &

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Bosker, 1997; Wright, Horn, & Sanders, 1997). The education profession as we know it is nurtured and sustained by this research-supported fact. Every facet of education - from federal policy to pre-service preparation programs to in-service professional development to teacher evaluation systems – stems from the core belief that quality teachers can best impact student learning. This understanding provided strong support for this study.

Teacher knowledge, one proposed variable of effective teaching, is also prevalent in the literature and can be historically traced over the past several decades (Calderhead, 1996; Carter, 1990; Darling-Hammond & Baratz-Snowden, 2007; McCutchen, Green, Abbott, & Sanders, 2009; Menzies, Mahdavi & Lewis, 2008; Shulman, 1986). Lee Shulman's (1986) now seminal work provided the field with a comprehensive model to capture the complexities of the knowledge construct. The model outlined seven dimensions of knowledge with the distinction of pedagogical content knowledge as new and significant. Pedagogical content knowledge, according to Shulman, is that knowledge necessary for teachers to effectively transmit content knowledge to learners. Prior to Shulman's work, this distinction between content knowledge and pedagogical content knowledge was absent from the literature.

Since Shulman's original model, several researchers including Shulman himself have extended this work. For instance, Shulman (1987) presented the model for pedagogical reasoning and action as a complement to his base model. This model included six components including comprehension, transformation, instruction, evaluation, reflection, and new comprehension. Wilson, Shulman, and Richert (1987) further explored Shulman's model of pedagogical reasoning and action through a longitudinal study of teachers transitioning from the pre-service environment to the classroom.

Other researchers extended Shulman's work but focused their efforts predominantly upon pedagogical content knowledge executed at the secondary school level or amongst undergraduate secondary level student teachers (Gudmunsdottir, 1987 & 1991; Thornton, 1993; Wilson & Wineburg, 1993; Vansledright, 1996). Shulman's model more recently guided The Primary Reading and Writing Teacher Knowledge Project (Reutzel & Dole, 2005).

Although significant, Shulman's (1986) theoretical model of teacher knowledge is not the only model that has informed research on teaching and teacher knowledge. Different theoretical models of teacher knowledge come from the works of Paris, Lipson, & Wixson (1983), Fenstermacher (1994) and Snow, Griffin & Burns (2005). Paris et al. (1983) delineated three types of knowledge including declarative, procedural and conditional. Within this model, teacher knowledge is best understood as a complex interaction of all three types of knowledge (Paris et al., 1983). Fenstermacher (1994) reviewed the research on teaching and distinguished two types of knowledge including formal knowledge and practical knowledge. Formal knowledge or "knowledge for teachers" is defined as knowledge produced and known primarily by researchers. Formal knowledge, he argued, results from scientific inquiry and is acquired through the "discourse of research" (Fenstermacher, 1994, p. 47). Practical knowledge is "knowledge of teachers" and is defined as knowledge known and produced by teachers as a result of their teaching experiences or the "discourse of practice" (Fenstermacher, 1994, p. 47). Practical knowledge is further described as personal, contextual, grounded in experience, tacit, content-specific and influential upon teacher practice (Meijer, Verloop, & Beijaard, 2001). Despite the personal nature of practical knowledge, some researchers argue that similarities do exist across teachers and classrooms (Carter, 1990). In arguing this point, these researchers advocated for the

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study of practical teacher knowledge to identify commonalities that may inform the practice of others. This premise supported this study's exploration of teachers' practical knowledge related to beginning reading instruction with at-risk first grade readers.

Snow et al. (2005) proposed another teacher knowledge model. Unique to this model is the notion that teacher knowledge is not static and should evolve over time. In this model, knowledge is categorized into five areas including declarative, situated, stable, expert and reflective. Snow et al. (2005) suggested that these various types of knowledge are distributed differently across a teacher's career. For instance, a pre-service teacher's overall knowledge base may be mostly comprised of declarative knowledge. Conversely, a master teacher's knowledge is most represented by high amounts of reflective and expert knowledge. Although insightful for considering how teacher knowledge changes over time, still unknown with this model is how to quantify these varying proportions of knowledge to then guide teacher preparation and teacher development.

Despite the presence of multiple theoretical models for the knowledge construct, Reutzel et al. (2011) suggested that these frameworks are "hypothetical at best and present a very preliminary understanding of largely complex and ill-defined categories" (p. 188). This claim provides a strong rationale for more studies of teacher knowledge as guided by theoretical models present in the academic literature.

Having explored the conceptual frameworks related to teacher knowledge research, it was important to review the literature focused on beginning reading instruction.The benefits of early reading success have been substantiated again and again (Jorm, Share, McLean, & Matthews, 1984; Juel, 1988; Lee, Grigg, & Donahue, 2007; McPartland & Slavin, 1990; Spria, Bracken, &

Fischel, 2005, Stanovich, 1986). Students who get off to a good start are far more likely to be

proficient readers later in their schooling careers whereas students who leave first grade as poor

readers are far more likely to have persistent reading struggles. Beginning reading then can be

defined as "the initial processes, activities or behaviors involved in learning to read" with the

goal of helping all children read well by the end of third grade (Glossary of Education, 2011;

IRA, 1998). For this study, the scope was narrowed even further to focus on the initial reading

processes common to first grade readers. The National Reading Panel (NRP) Report (2000)

reviewed research in five specific areas including phonological awareness, phonics, fluency,

vocabulary and comprehension. While all areas are crucial at all stages of reading development,

phonological awareness and phonics garner specific attention when discussing beginning reading

instruction at the first grade level. A number of studies have explored teachers' knowledge of

phonological awareness, phonics and general knowledge of the structure of the English language

(Bos, Mather, Dickson, Podhajski, & Chard, 2001; Cunningham, Perry, Stanovich, & Stanovich,

2004; Moats, 1994; Moats & Lyon, 1996; Spear-Swerling, Brucker, & Alfano, 2005) Using

paper-pencil tests, these studies tested teachers' formal knowledge. More recent studies include

the study of classroom practice along with tests of teachers' formal knowledge in an effort to

understand the link between formal knowledge, classroom practice and students' literacy gains

(Carlisle, Correnti, Phelps & Zeng, 2009; Cirino, Pollard-Durodola, Foorman, Carlson &

Francis, 2007; McCutchen et al., 2002a; McCutchen et al., 2002b; McCutchen et al., 2009; Piasta

et al., 2009)   This body of work suggests that many teachers lack formal knowledge of

phonological awareness and phonics. It is argued that without this formal knowledge, a teacher

will have difficulty instructing students in these critical skill areas (Piasta et al., 2009). This

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claim seems logical but more recent studies suggest that practical knowledge may be even more important than formal knowledge. Therefore, it was the premise of this study that formal knowledge may only account for a portion of a teachers' knowledge base important to the teaching of beginning reading, specifically phonological awareness, phonics and the structure of language. To explore this premise, this study measured participants' formal knowledge of phonological awareness, phonics and language using the TKA (Piasta et al., 2009) and also explored participants' practical knowledge of beginning reading instruction. Teachers' practical knowledge related to beginning reading instruction is less researched yet potentially more important than formal knowledge measured by paper/pencil tests.

As reviewed above, the academic literature provided a solid theoretical and conceptual rationale for this study. Each of the four proposed variables (effective teaching, teaching, teacher knowledge, beginning reading instruction, and at-risk readers) garner significant attention in the literature. However, to date, few studies have explored the relationship between these proposed constructs through the lens of Fenstermacher's (1994) definitions of formal and practical knowledge. Therefore, this study measured the formal knowledge of intensive reading intervention teachers, richly described the practical knowledge of intensive reading intervention teachers, and explored any potential relationships between teachers' formal and practical knowledge specific to beginning reading instruction with at-risk first grade readers.

Significance of the Study

This study was significant in its focus on two types of knowledge (formal and practical) given that earlier studies of teacher knowledge and beginning reading instruction have focused

primarily on formal knowledge. Secondly, the current study was unique in its use of data

collection techniques employed during phase two of the data collection process. Semi-structured

interviews, concept maps and stimulated recall methods via videotaped lessons aimed to uncover

and understand participants' cognitive processes and practical knowledge related to beginning

reading instruction. These design characteristics were deliberate in an effort to address current

gaps evident in the teacher knowledge and beginning reading instruction literatures.

In addressing these gaps, the results of this study added insight in to how teachers can be

better prepared and trained at both the pre-service and in-service levels. The results may inform

how teacher knowledge can be assessed and evaluated which is timely given the current

nationwide focus on teacher evaluation reform. The results of this study may elevate the

importance of practical knowledge with regards to effective beginning reading instruction.

Finally, this study may spark more widespread research into the exploration of practical

knowledge and the teaching of beginning reading to at-risk readers.

Limitations and Assumptions

This study was limited in several key ways. First, participants for phase one of the study

were drawn from a purposeful sample of intensive reading intervention teachers. These intensive

reading teachers are part of an early intervention project funded within a large, urban school

district in the southeast United States. The goal of the project is to provide ongoing, intensive

reading intervention instruction to students at-risk for reading failure in grades K-2. Currently,

the district's intervention project consists of 62 intensive reading intervention teachers (IRITs)

whom all work in the district's most economically needy schools. Despite establishing consistent

selection criteria for the intensive reading position, each teacher varies in her knowledge, experiences, and preparation and these differences contribute to her effectiveness as an intensive reading intervention teacher. Also, although each IRIT works within a Title One elementary school, each school is widely different with regards to student population, quality of classroom instruction, school culture, etc. These variables, which cannot be controlled, also impact each IRIT's overall effectiveness and consequently presented limitations to this study.

The study was further limited by the size of the samples in both phases one and two but particularly in phase two given the inclusion of only eight participants. These small numbers, however, were intentional so that the researcher could more deeply understand the practical knowledge base of intensive reading intervention teachers that held varying amounts of formal knowledge. Smaller numbers yielded more richness and understanding of the research questions but compromised the researcher's ability to generalize the results.

A key assumption of this study was that teacher knowledge does in fact play a significant role in effective teaching. Although researchers have thus far had difficulty connecting this construct to teachers' practice and to students' literacy gains, it was this researchers' assumption that this connection is viable.

Definition of Key Terms

At-Risk First Grade Reader – Any student who requires extra support to learn how to read is defined as at-risk for reading problems or an at-risk reader (Bursuck & Damer, 2011).

Beginning Reading – "The initial processes, activities or behaviors involved in learning to read" with the goal of helping all children read well by the end of third grade (Glossary of Education, 2011; IRA, 1998).

Core Reading Instruction – The International Reading Association-IRA (2010) defines core reading instruction as "instruction that encompasses all areas of language and literacy as part of a coherent curriculum that is developmentally appropriate for preK–12 students and does not underestimate their potential for learning. This core instruction may or may not involve commercial programs, and it must in all cases be provided by an informed, competent classroom teacher" (p. 5).

Intensive Reading Intervention Teacher – Certified elementary teachers who provide daily reading instruction to first grade students identified as an at-risk reader. Each intensive reading intervention teacher provides instruction above and beyond the 90 minutes of reading instruction required by Florida's K-12 Comprehensive Reading Plan (FLDOE, 2011). Intensive reading intervention teachers utilize evidence-based intervention curricula as directed by the district's model for intensive reading intervention teachers.

Intervention Reading Instruction – Reading instruction that is more targeted, intensive and more closely matched to at-risk readers' needs. Intervention reading instruction is provided when students' fail to show adequate response to high quality core reading instruction (IRA, 2010).

Teacher Knowledge – Refers to two types of knowledge (formal and practical) as distinguished by Fenstermacher (1994). He defined formal knowledge as knowledge for teachers as determined by researchers and practical knowledge as knowledge of teachers and determined

by the experiences of practicing teachers. For this study, the exploration of both formal and practical knowledge was specific to intensive reading intervention teachers that provide beginning reading instruction to at-risk first grade readers.

Evidence-based reading instruction – Bursuck and Blanks (2010) defined evidence-based reading instruction as instruction that includes "complete coverage of the five areas of reading and is designed according to empirically based principles of instructional design" (p. 425). To that end, instructional design in reading is built around principles of big ideas, conspicuous strategies, mediated scaffolding, strategic integration, judicious review and primed background knowledge (Coyne, Kame'enui, & Simmons, 2001). Another useful definition comes from the IRA. In the position paper titled "What is Evidence-Based Reading Instruction" (2002), the authors defined this concept as "a particular program or collection of instructional practices that has a record of success. That is, there is reliable, trustworthy, and valid evidence to suggest that when the program is used with a particular group of children, the children can be expected to make adequate gains in reading" (p. 2).

Summary

This chapter outlined information pertinent to this study of intensive reading intervention teachers' formal and practical teacher knowledge and the teaching of at-risk first grade readers. The current landscape of the education profession, which includes revisions to national educational policy and a push for value-added teacher evaluation systems, provides a strong rationale for continued research focused on teacher quality variables such as teacher knowledge. While teacher knowledge research is abundant, many questions remain unanswered. As a field,

particularly in the area of reading, researchers are confounded by a number issues related to the study of teacher knowledge. These challenges were presented and discussed within the scope of this chapter. Sections included the following: a background, a statement of the problem, the purpose of the study, the three research questions, an overview of the methodology, the conceptual underpinnings, the significance of the study, study limitations/assumptions, and definition of terms. Chapter two includes a review of the related literature and is organized into four broad areas: beginning reading instruction including core and intervention instruction, teacher effectiveness research, teacher knowledge research, and literature devoted to the at-risk reader. Chapter three explains the research methods utilized in this study. Chapter four presents the data collected in connection with each of the three research questions and chapter five consists of a discussion of the study's findings, implications for these findings and avenues for future research.

CHAPTER TWO: REVIEW OF THE RELATED LITERATURE

Introduction

Hart (2007) suggested that a literature review is important for acquiring a deep understanding of a research topic including what research has already been done, how the topic has been previously researched and the current key issues surrounding the given topic. To accomplish the above goals for this study focused on the role of teacher knowledge and the teaching of reading to at-risk first grader, the review of the literature included published research, professional books, position papers, prior dissertations, online documents and correspondences with researchers who have conducted studies on this topic. EBSCOhost, PsycInfo, Web of Science, WorldCat and Linguistics and Language Behavior Abstracts were the primary databases used for the literature search. Keywords used to identify sources included: knowledge base for teaching, pedagogical content knowledge, teacher effectiveness, teacher characteristics, reading achievement, reading improvement, beginning reading, reading instruction, reading difficulties, and grade one.

The literature presented in the conceptual underpinnings section of chapter one was broadly summarized in the form of three tenets: the notion that knowledgeable and effective teachers matter most for student achievement (Anderson et al., 1985; Chall et al., 1990; Sanders & River, 1996; Scheerens & Bosker, 1997; Wright et al., 1997), the importance of teacher knowledge as a variable of effective teaching (Carter, 1990; Calderhead, 1996; Darling-Hammond & Baratz-Snowden, 2007; McCutchen et al., 2009; Menzies et al., 2008; Shulman, 1986), and the long term benefits of getting readers off to a good start in the primary elementary

grades (Jorm et al., 1984; Juel, 1988; Lee et al., 2007; McPartland & Slavin, 1990; Spira et al., 2005; Stanovich, 1986;).

This chapter more fully reviews and substantiates these three tenets and situates these factors within the literature on beginning reading instruction. The chapter begins with a review of the literature related to beginning reading instruction and includes literature related to effective core reading instruction as well as effective reading intervention instruction. The chapter continues with a review of teacher effectiveness research, followed by a review of the teacher knowledge research including theoretical models of teacher knowledge and teacher knowledge research specific to the area of beginning reading instruction. The chapter concludes with a review of the literature specific to at-risk readers and includes a focus on student characteristics as well as a focus on instructional programs used to teach at-risk readers.

Beginning Reading

Beginning reading can be defined as "the initial processes, activities or behaviors involved in learning to read" with the goal of helping all children read well by the end of third grade (Glossary of Education, 2011; IRA, 1998). Beginning reading can further be described as instruction that enables primary grade children to construct meaning from print, to have extended opportunities to read, to explore high frequency, regular sound-spelling relationships, to develop understanding of the alphabetic system and to understand the structure of oral language (Snow, Burns, & Griffin, 1998). As this study explored the role of teacher knowledge and the teaching of beginning reading to at-risk readers, a thorough review of the literature on beginning reading instruction was warranted. The literature on beginning reading instruction was subdivided into

two areas: effective core reading instruction and effective reading intervention instruction. Core

reading instruction refers to language and literacy instruction provided to all students in the

general classroom setting (IRA, 2010). Reading intervention instruction refers to more targeted

and intensive reading instruction that is in addition to core reading instruction. Students who fail

to show adequate progress with quality core reading instruction alone are provided reading

intervention instruction (IRA, 2010).

Effective Core Reading Instruction. Effective core reading instruction is represented in

the literature in a variety of ways. A historical trace, beginning during the 1960s, illustrates the

evolution of effective instruction research. During the 1960s and 1970s, methods research

dominated the literature (Bond & Dykstra, 1967; Foorman & Torgeson, 2001; Stallings, 1975).

The majority of studies explored the effects of a particular reading method upon student

achievement. A key finding during this era of research was that no single reading method or

combination of methods is best for teaching all children to read (Bond & Dykstra, 1967; IRA,

2000).

Gaps in reading methods research gave rise to effective instruction research encompassed

within the body of process-product research and the effective schools literature (Brophy & Good,

1984; Foorman & Torgeson, 2001; Levine & Lezotte, 1990; Rosenshine & Stevens, 1986;

Stebbins, St. Pierre & Proper, 1977). This line of inquiry focused upon process measures of

teaching to product measures of student outcomes and then situated these findings as one

characteristic among many that contribute to overall school effectiveness. This line of research

heightened attention to the overall school climate, the acquisition of essential learning skills, the

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monitoring of student progress, the importance of job-embedded and site-based staff development, the role of dynamic school leadership and parent involvement, and the need for high expectations of students, large amounts of academic engaged time, stellar classroom management and quality teacher-student interaction (Brophy, 1983; Brophy & Good, 1984; Foorman & Torgeson, 2001; Levine & Lezotte, 1990; Marzano, 2003; Taylor, Pearson, Clark, & Walpole, 2000).

One significant concept in particular that evolved out of the process-product research was that of direct instruction. Direct instruction garnered attention as both a method for effective classroom instruction as well as a model for school reform. Project Follow Through, a federally funded project, was charged with enhancing the education of low-income children in grades K-3 through the implementation of a number of instructional programs (Ryder, Burton & Silberg, 2006). Direct instruction was one such instructional program used in Project Follow Through sites. In the evaluation of 13 Project Follow Through models across more than 80 locations, sites employing a direct instruction curricula model had both positive and negative results. Researchers did conclude however that "direct instruction was unmatched among the other curricular models" (Ryder et al., 2006, p. 181). For example, students in direct instruction sites scored highest on average on the affective tests as well as other chosen measures and highest on the chosen measures when specifically comparing performance gains amongst students in the lowest income sites (Ryder et al., 2006). These findings coupled with findings from other researchers (Gage, 1978; Good, 1979; Medley, 1979; Rosenshine, 1979) seemed to suggest direct instruction as an effective way of teaching (Peterson, 1979).

While the Project Follow Through research provided one lens for examining the direct instruction method, this method was also well-represented within the broader process-product research. Direct instruction as a teaching method began with Brophy and Evertson's work (1974) and was extended by Rosenshine (1977). Rosenshine (1977) defined direct instruction as "high levels of student academic engaged time within teacher-directed classrooms using sequenced, structured materials" (p. 9a). He further suggested a number of instructional variables consistent with direct instruction including clear goals for student learning, sufficient amounts of engaged instructional time in teacher-directed lessons, questions of a low cognitive level allowing for a significant proportion of correct responses, and direct and immediate feedback on students' learning. To accomplish these goals, Rosenshine (1977) recommended teachers' routines to include daily review, presentation of new material, guided practice, corrections and feedback, independent practice, along with spaced reviews as often as weekly and monthly as these routines were positively correlated with academic engaged time and ultimately student performance (Rosenshine, 1977; Ryder et al., 2006).

Despite some seemingly significant findings resulting from process-product research and effective schools research, one criticism pointed to the lack of studies capturing the qualitative dimensions of effective instruction. Researchers sought to fill this gap in the literature by conducting more classroom based research which came to be known as "best practices" research and balanced literacy instruction (Allington, 2002; Foorman & Torgeson, 2001; Fountas & Pinnell, 1996; Morrow & Gambrell, 2000; Wharton-McDonald, Pressley, & Mistretta, 1998). Case studies were prolific during the best practices era. Researchers focused on the context of elementary classrooms in an effort to uncover the characteristics of exemplary teachers. Two

notable studies during this time were focused specifically on exemplary first grade literacy instruction (Pressley et al., 2001; Wharton-McDonald et al., 1998). First conducted by a team of researchers who studied literacy instruction in nine first grade classroom in up-state New York, this study was then replicated by a team of five researchers who studied literacy instruction in 28 first grade classrooms across five states (Pressley et al., 2001; Wharton-McDonald et al., 1998). Participant selection procedures were similar for both studies in that researchers asked language arts coordinators and/or building principals to nominate teachers who were considered exemplary in the development of first graders' literacy skills. From the original sample of exemplary teachers, researchers used observational data along with student data to identify the most effective and least effective literacy teachers. These most effective teachers and least effective teachers (of the original exemplary group) were studied to discern differences amongst the two cadres. Data analysis led to two slightly different but generally consistent conclusions about effective first grade literacy instruction. In the original study, the authors noted the following characteristics of exemplary literacy instruction: coherent and thorough integration of skills with high quality reading and writing experiences, a high density of instruction, extensive use of scaffolding, encouragement of student self-regulation, thorough integration of reading and writing activities, high expectations of students, masterful classroom management, and teacher awareness of their practices and goals underlying them (Wharton-McDonald et al., 1998).

In the replication study, researchers noted the following characteristics consistent with exemplary literacy instruction: high academic engagement, excellent classroom management, positive reinforcement and cooperation, explicit teaching of skills, an emphasis on literature, significant amounts of reading and writing, matching of task demands to student competence,

encouragement of student self-regulation, and strong cross-curricular connections (Pressley et al., 2001).

Richard Allington (2002), one researcher involved with the first grade replication study remained vigilant with his research focused on the importance of high quality teaching. In 2002, he published an article titled "What I have learned about effective reading instruction from a decade of studying exemplary classroom teachers." Allington's participation in the study of exemplary first grade classrooms as well as his research into exemplary fourth grade classrooms provided the research base for this summary article (Allington & Johnston, 2000; Pressley et al., 2001). He summarized the findings from these two research studies as the "six T's of effective elementary literacy instruction" including time, texts, teach, talk, tasks, and tests (Allington, 2002). With regards to time, he suggested that effective teachers use instructional time wisely and ensure that significant amounts of time are devoted to authentic reading and writing experiences. Children in the most effective classrooms read and write more and do so at high levels of quality and engagement as compared to students in less effective classrooms. In quantitative terms, students in the most effective classrooms read and write approximately 50% of each school day while students in the least effective classrooms may spend as little as 10% of the day engaged in reading and writing.

The second "T" referred to texts. Children in the most effective classrooms engage in more quality reading experiences throughout the school day than do children in less effective classrooms. Quality reading experiences are characterized by children reading texts at high levels of accuracy, fluency and comprehension. Quality reading experiences are essential for the development of confident and independent readers. Exemplary teachers know this and ensure

that children have access to books that provide exactly this level of successful practice (Allington, 2002).

Teach, the third "T", suggests that exemplary teachers artfully blend explicitly teaching of skills and concepts within meaningful literacy experiences. Exemplary teachers do not align themselves with one teaching model such as "Direct Instruction" or "Whole Language." Rather, these exemplary teachers embrace balance and are strategic in their use of approaches best suited for the instructional moment (Allington, 2002).

Talk, the fourth "T", is meaningful and plentiful within exemplary classrooms. Researchers noticed high quantities of teacher to student interaction as well as student to student dialogue. The tone of such talk was conversational vs. interrogational (Allington, 2002).

Tasks within exemplary classrooms are rich, integrative, capitalize upon student choice and typically extended over longer periods of time. Tasks in less effective classrooms are more isolated, disconnected from other content areas and often employ the use of lower-level thinking skills (Allington, 2002).

Finally, tests in exemplary classrooms are used as a measure of student progress and improvement rather than solely for achievement purposes. Exemplary teachers understand the role of assessment that drives instruction and informs learning and value growth over externally established benchmarks or criteria. Allington (2002) suggested that a number of the exemplary practices relative to testing often went against the "organizational grain" but these exemplary teachers were willing to take such risks because of their knowledge of what was best for the students within their classrooms.

These rich studies of elementary classrooms have a legacy that persists today despite being excluded from more recent reviews of the academic literature in the current era of "evidence-based research" or "scientifically based reading research" (Foorman & Torgeson, 2001; IRA, 2002; Lyon, 1999; NRP, 2000). In 2000, the findings of the NRP became the backbone of significant federal legislation known as No Child Left Behind (NCLB). Qualitative studies did not meet the inclusion criteria set forth by the NRP report (NRP, 2000). Conversely, only studies employing an experimental or quasi-experimental design with a control group or a multiple-baseline method were reviewed (Foorman & Torgeson, 2001; NRP, 2000). This methodological decision gave rise to "evidence based research" and consequently drew criticisms from some experts within the field of reading research (Allington, 2000; Coles, 2001, Cunningham, 2001; Garan, 2001; Krashen, 2001). Despite criticisms, the NRP report marked yet another turning point in the history of reading research and "evidence-based research" now helps to shape the fields' descriptions of effective literacy instruction. First, the NRP report (2000) found support for reading instruction that is both explicit and systematic. Explicit instruction involves the use of clear and concise teacher language relative to learning goals and consists of effective teacher demonstrations of reading skills and concepts. Systematic instruction is that which is planned and follows a logical sequence. Additionally, clear lesson objective, multiple opportunities for student practice, timely and appropriate feedback and diagnostic use of valid and reliable assessments are hallmarks of systematic instruction. Explicit and systematic suggests "how" to effectively teach reading and the "what" includes what is now commonly referred to as the "fab five." The Panel's review, while not exhaustive, illuminated five core areas deemed

important for reading development. These areas included phonemic awareness, phonics, fluency, vocabulary, and comprehension and each area is discussed below.

Phonemic Awareness is defined as an awareness that spoken words are made up of individual sounds that are then blended together into whole words (NRP, 2000). Research has shown phonemic awareness to be a powerful and consistent indicator of children's later reading success (Adams, 1990; NRP, 2000; Spear-Swerling, 2007). Knowing the importance of phonemic awareness, it would stand to reason that skilled reading teachers would possess great depths of knowledge relative to this critical reading area. For instance, knowledge might include an ability to define "phoneme", accurately identify/count phonemes within words, possesses knowledge of the various levels of phonemic awareness development beginning with phoneme isolation and increasing in complexity to phoneme manipulation. Next, knowledgeable reading teachers understand how phonemic awareness helps young children learn to read. The Panel cites the work of Linea Ehri (1998) and the four stages of reading development including pre-alphabetic, partial alphabetic, full alphabetic and consolidated alphabetic stage. An understanding of these stages coupled with an understanding of phonemic awareness seems critical to helping children learn decoding skills where phonemes are married to graphemes. Finally, the panel outlined research-based practices for the effective teaching of phonemic awareness. Learning Point Associates (LPA, 2004) and the NRP (2000) outlined important instructional principles including the use of assessment to guide teaching decisions along the phonemic awareness skill spectrum, the teaching of one-two phonemic awareness skills at a given time, the allocation of a reasonable amount of instructional time, an emphasis on segmenting due to empirical support for this specific phonemic task, the teaching of students in

groups of 3-5, the attachment of letters to phonemes during phonemic instruction, the connection

of phonemic awareness skills to reading and writing activities, the use of manipulatives such as

magnetic letters, the teaching of mouth position for correct pronunciation of sounds within the

regions of the mouth, and the use spelling to teach phonemes. Given that the above embodies the

core content relative to the area of phonemic awareness, it is understandable as to why this

content has been tested by previous researchers in an effort to connect this component of teacher

knowledge to students' literacy growth (Moats, 1994; Moats & Foorman, 2003; Piasta et al.,

2009).

Phonics can be defined as a "set of rules that specify the relationship between letters and

the spelling of words and the sounds of spoken language" (LPA, 2004, p. 12). Phonics rules,

although not completely consistent, are predictable and are important for young children learning

to decode (LPA, 2004; NRP, 2000). As a result of the Panel's review, support was found for

systematic phonics instruction (Adams, 1990; Beck & Juel, 1995; NRP, 2000). Systematic

phonics instruction includes both synthetic approaches emphasizing individual phonemes to

sound out and blend words and larger-unit approaches focusing attention to onsets, rimes and

larger spelling patterns. The Panel found support for both types of phonics instruction.

Regardless of the approach, systematic phonics produces substantial reading gains in children in

Kindergarten-6th grade with the most benefits occurring with young children (LPA, 2004; NRP,

2000). Additionally, systematic phonics is beneficial for students from diverse economic,

cultural, and linguistic backgrounds and can be equally effective across multiple grouping

formats (individual, small group, whole group) (LPA, 2004; NRP, 2000). Finally, systematic

phonics instruction when coupled with comprehension instruction produces even greater gains in

word recognition. Systematic phonics lessons include the teaching of the target phonics sound first in isolation then within decodable words, then sentences and finally within decodable text (LPA, 2004). The Panel underscored the importance of systematic phonics instruction within a balanced and comprehensive literacy program. Phonics instruction should not comprise a total reading program.

Fluency includes rapid word recognition along with meaningful phrasing to facilitate accurate and smooth text reading (Hudson, Lane & Pullen, 2005; LaBerge & Samuels, 1974; NRP, 2000). Fluent reading does not magically guarantee reading comprehension, however, fluent reading frees a readers' cognitive space in order to attend to the texts' meaning (Pikulski & Chard, 2005). On the contrary, disfluent readers spend inordinate amounts of cognitive space and effort simply decoding words making text comprehension nearly impossible and a students' attitude towards reading one of frustration (Hudson et al., 2005; Pikulski & Chard, 2005). While many researchers and practitioners advocate for significant amounts of independent reading to develop text fluency (Allington, 2000; Anderson, Wilson, Fielding, 1998; Taylor, Frye, Maruyama, 1990), the Panel was unable to prove that extensive reading leads to improved reading achievement. For this reason, the Panel encouraged the use of two other evidence-based practices along with independent reading practices. These two strategies include the use of repeated readings and guided repeated oral readings (LPA, 2004; NRP, 2000). Repeated readings allow for multiple opportunities for students to reread a passage or text. Guided repeated oral readings involve text/passage rereading with support or instructional guidance from the teacher, other adults or peers (LPA, 2004; NRP, 2000; Samuels, 1979). In a guided repeated oral reading lesson instruction begins with an introduction of the text and activation of students' background

knowledge, a read aloud by the teacher or adult to model fluent text reading, repeated

opportunities for the students to read the text while the teacher, adult or peer listens in and

provides feedback, and finally a discussion of the story to construct text meaning (LPA, 2004;

NRP, 2000).

Vocabulary refers to areas including speaking, listening, reading and writing. Vocabulary

is not only important to readers' word recognition but comprehension as well. As readers sound

out new words, approximations are confirmed or rejected based on representations within one's

oral vocabulary. Therefore, a child may be able to decode a word based on an understanding of

the alphabetic principle but without meaning of the word, comprehension is impacted. With

regards to vocabulary and comprehension development, the panel found support for two

instructional practices including ongoing, long-term vocabulary instruction and the teaching of

vocabulary words prior to reading assignments. Beyond these two practices, the panel further

recommended several guiding principles for the effective teaching of vocabulary. For instance,

vocabulary should be taught directly although we know that much of vocabulary development

occurs through implicit means such as wide reading, multiple exposures to new words is

essential, new words are best taught in context, restructuring tasks such as rewriting definitions

into one's own words facilitates word learning, and active engagement strategies are key (Beck,

McKeown & Kucan, 2002; Biemiller & Boote, 2006; NRP, 2000). In addition to explicit

instruction of vocabulary words, the panel cited evidence of vocabulary growth connected to

reading volume. The more students read, the greater the potential for more words to be learned.

The panel concluded with guidelines for determining words to explicitly teach. Teachers must be

prudent with their teaching decisions given that it is impossible to directly teach all vocabulary

words. Recommendations included the selection of words unknown to most students, words that are high utility and occur frequently across various contexts, words deemed most important and words that students would most likely not be able to figure out on their own (Beck et al., 2002; Biemiller & Boote, 2006).

Comprehension or the construction of meaning guided by print is why readers read (Perfetti, 1985). Proficient readers independently employ comprehension strategies and are metacognitive (Baker & Brown, 1980; Jacobs & Paris, 1987). Despite significant debate about the terms comprehension skills vs. strategies along with disagreements about what even qualifies as a strategy, the panel outlined the following strategies as having empirical support: comprehension monitoring, cooperative learning, using semantic and graphic organizers, answering comprehension questions, capitalizing upon student-generated questions, activating and utilizing background knowledge, and summarizing. When teaching these evidence-based comprehension strategies, it is important to do so at level of complexity appropriate for the age of the learners. This recommendation is quite different than the former line of thinking that viewed the reading process as linear and suggested that comprehension instruction be delayed until decoding skills were developed and secure. Quite the opposite is true even with the youngest of readers. Quality comprehension instruction at all levels begins with explicit teacher explanations for the target comprehension strategy coupled with powerful modeled examples. Explicit explanations are those that give developing readers insight into how skilled readers judiciously select and apply comprehension strategies to construct text meaning. Beyond direct explanations when initially teaching a comprehension strategy, readers must have immediate opportunities to apply the strategy as well as ongoing explanations and repeated practice over

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time. Assessment of students' knowledge and application of the comprehension strategies is important for guiding ongoing instructional decisions.

Although the findings of the NRP report (2000) have shaped both policy and practice for nearly a decade now, researchers identified gaps in this body of research. For instance, Allington (2005) suggested five pillars of effective literacy instruction that are absent from the NRP report. These essential elements of effective literacy instruction included access to interesting texts guided by student choice, matching students to texts of an appropriate level, connecting the reading and writing processes, balancing instruction to include both whole group teaching and small group instruction and providing expert tutoring to students who are struggling (Allington, 2005).

Michael Pressley (2002) also did not disagree with the NRP's findings but felt that the findings were narrow and ignored scientifically-validated findings. In his review of the research on effective beginning reading instruction, Pressley presented findings in support of professional development for changing teachers' practice, the use of community resources in promoting literacy skills, the use of whole language interventions, the value of literature-driven instruction in promoting autonomous reading and academic engagement. Allington (2005) and Pressley (2005) were most critical of research absent from the NRP report rather than that which was included.

In this present era of scientifically-based reading research, another group of researchers interested in the characteristics of effective core reading instruction conducted a large national study under the umbrella of school reform (Taylor, Peterson, Pearson & Rodriguez, 2002). While the larger national study focused on all aspects of school reform relative to students' academic

performance, these four researchers conducted a closer analysis of the data in an effort to describe teacher practices, to examine the relationship between teachers' practices and students' reading achievement and to provide thick descriptions of those teaching practices in action (Taylor et al., 2002). Participants represented eight high-poverty schools that were demographically and geographically diverse. From each of the eight research sites, two teachers per grade level (K-6) were randomly invited to participate in classroom observations. Students were identified for participation after teachers stratified their reading abilities into thirds (low, average and high). Two children from each performance third were randomly selected for further reading assessments. One hour classroom observations were conducted three times over the course of the school year and data were gathered through both quantitative coding methods as well as qualitative note-taking. A variety of reading assessments were administered in the fall and spring to analyze the students' reading progress in light of teachers' observed reading practices. Hierarchical linear modeling methods were employed to analyze the data and to answer the proposed research questions. Many findings from this study were consistent with earlier studies on effective core reading instruction. For example, a clear finding related to how teachers communicated information emerged from the classroom data. Essentially, the more a teacher told children information, the less the children grew in reading achievement (Taylor et al., 2002). This finding is consistent with several prior studies of effective core reading instruction (Taylor et al., 2000; Wharton-McDonald et al., 1998).

Another significant finding relative to first grade classrooms was that of passive vs. active responses to reading activities. Students who were actively engaged in actual reading or writing experiences demonstrated more reading growth than those students engaged in passive

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activities such as listening to the teacher or reading texts in the form of turn-taking (Taylor et al., 2002). Again, this finding is consistent with the studies of exemplary reading instruction. In exemplary classrooms, students spend significant amounts of time engaged in authentic reading and writing experiences (Pressley et al., 2001; Wharton-McDonald, et al., 1998).

In tracing the beginning reading literature across decades, one relatively consistent finding seems to emerge. Bond and Dykstra's research in the 1970s first suggested that no one instructional method was superior to another. This assertion was supported by Rosenshine's work in the process-product era and by the best practices research of Allington & Johnston (2000), Pressley et al. (2001), Taylor et al. (2002) and Wharton-McDonald et al. (1998). In suggesting that no one method is best, the research on exemplary core reading instruction found support for an artful balance between skills and authentic reading and writing instruction (Allington, 2002; Pressley et al., 2001; Wharton-McDonald et al., 1998) This suggestion of balance however still presents questions worthy of continued study. Thus, another recent line of research delved deeper into these questions around balanced instruction in the effective elementary reading classroom. Referred to as child x instruction interactions, this research has extended previous studies that focused more generally on the efficacy of one reading method versus another. The premise of child x instruction interactions research is that certain instructional methods or activities interact differently with students' learning depending on the students' academic profile and skill needs. Over the past decade, Carol Connor and her colleagues (2004a, 2004b, 2005, 2007, 2009, 2011) have conducted several child X instruction interaction studies specific to the elementary reading classroom. For instance, an early study focused on the interaction between first graders' fall vocabulary and decoding scores and

observed classroom practices on students' spring decoding scores (Connor, Morrison, & Katch, 2004a). Researchers conducted classroom observations and coded instructional activities as either teacher-managed or child-managed and explicit or implicit. Data analysis revealed that certain instructional activities differentially predicted students' growth in decoding skills. For instance, children with low fall decoding skills made greater gains in decoding when provided more teacher-managed explicit decoding instruction. In children with high initial decoding skills, the proportion of explicit teacher-managed decoding skills had no effect (Connor et al., 2004a). With regards to children with low initial vocabulary skills, children benefitted from less child-managed implicit instruction early in the year and more child-managed implicit activities as the year progressed. Children with high initial vocabulary scores benefitted from equal amounts of child-managed implicit activities throughout the school year. A critical finding suggested by this research is that effective core reading instruction may only be understood in light of children's individual learning profiles. What was once thought to "best practices" for all may only be best for some.

A similar study was conducted in third grade classrooms relative to students' growth in reading comprehension (Connor, Morrison & Petrella, 2004b). In this study, classroom observations were conducted at three points during the year and instructional activities were coded as teacher-managed reading comprehension instruction activities and child-managed reading comprehension activities. Data analysis revealed that children with low-average fall reading comprehension scores achieved greater growth in classrooms with more teacher-managed reading comprehension activities. Conversely, children with low-average fall reading comprehension scores achieved less growth in classrooms with more time devoted to child-

managed reading comprehension activities (Connor et al., 2004b). These findings, although focused on older children and a different reading skill, generally support the findings of the first grade study which suggested that effective instruction is not one size fits all (Connor et al., 2004a). Children's academic skills interact uniquely with various instructional activities and these interactions ultimately influence students' learning gains (Connor et al., 2004a; Connor et al., 2004b).

Given the promising findings of these two studies focused on child x instruction interactions, researchers continued to extend this line of research. Earlier studies were predominantly descriptive and correlational. To address this gap, a randomized control field trial was conducted across 47 first grade classrooms from 10 high-moderate poverty schools (Connor et al., 2009). Classroom observations were conducted at three different times over the course of the first grade year. Multiple dimensions of instruction were recorded and coded. Similar to previous studies, data were coded as teacher-managed or child-managed but was further coded as meaning-focused or code-focused. Additionally, data were coded according to the instructional format for a given activity including whole group, small group, or individual. In addition to coding multiple dimensions of instruction, schools were first paired based on similar percentages of students receiving free/reduced lunch prices. For each pair of similar schools, one school received the Individualizing Student Instruction (ISI) intervention and the other school served as the control and did not receive the ISI intervention. Based on previous research into the effects of certain instructional activities on students of varying skills and academic characteristics, teachers received professional development and training in how to individualize literacy instruction. Training and professional development for experimental teachers was grounded in the

Assessment-to-Instruction (A2i) Web-based software. A2i software incorporated algorithms that recommended amounts and types of instruction for students of varying literacy profiles.

Two important findings resulted from this study. It was observed that experimental teachers who received professional development more precisely individualized instruction congruent with the instructional recommendations outlined by the A2i software than did control teachers who did not receive targeted professional development (Connor et al., 2009). Secondly, students' literacy gains were most significant when instruction was well-aligned with the recommended amounts of instruction provided by the algorithms. These findings led authors to suggest further evidence in favor of child x instruction interactions relative to literacy achievement (Connor et al., 2009).

The 2009 first grade child X instruction interaction study was recently replicated in third grade classrooms (Connor et al., 2011). As in the first grade study, algorithms provided recommended amounts of instruction relative to students' literacy profile. Professional development was provided to support teachers in the individualizing of instruction based on the recommendations generated by the algorithms. Experimental teachers participated in the ISI intervention and control teachers provided a non-individualized vocabulary intervention. Classroom observations revealed, as in the first grade study, that experimental teachers were more likely to individualize instruction in response to students' literacy characteristics and students in the experimental group made greater gains on measures of reading comprehension than did students in the control group. The researchers concluded that child x instruction interactions likely contributed to experimental students' reading comprehension gains (Connor et

al., 2011). The child x instruction line of research holds promise for improving core reading instruction and improving intervention instruction which is discussed in the next chapter section.

Holistically, the body of research on beginning reading instruction provides insight into what content is essential (Adams, 1990; NRP, 2000; Snow et al., 1998) and how such content might be taught in the elementary reading classroom (Connor et al., 2011; Connor et al., 2004a; Connor et al., 2004b; Connor et al., 2009; Rosenshine, 1977; Taylor et al., 2000). The qualitative studies of elementary reading classrooms provided richness and insight into the daily rhythms of the most effective elementary reading classrooms (Pressley et al., 2001; Wharton-McDonald et al., 1998). It was this collective research base that provided the foundation for this present study focused on the teaching of reading to at-risk readers. Given that this study explored the knowledge base of intensive reading intervention teachers, it stood to reason that reading intervention teachers would possess knowledge consistent with the research on effective beginning reading instruction. Other researchers have suggested this reasoning to be true but have tended to test teachers' reading knowledge through paper-pencil assessments. According to Fenstermacher (1994), these assessments test formal knowledge only. Formal knowledge is defined as that knowledge produced and known primarily by researchers (Fenstermacher, 1994). Testing only formal knowledge presents limitations as it excludes practical knowledge or knowledge known and produced primarily by practicing teachers (Fenstermacher, 1994). In an effort to address this limitation noted in prior studies, this current study tested formal knowledge through a previously used teacher knowledge instrument but also explored teachers' practical knowledge through participant interviews, participant constructed concept maps and also through lesson analysis using stimulated recall methods (Calderhead, 1981). Data were analyzed using

data analysis procedures outlined fully in chapter three. These analysis procedures were guided

by the findings of the beginning reading literature reviewed in this section. The next section

includes a review of the literature specific to effective reading intervention instruction and was

important given this study's focus on at-risk first grade readers.

Effective Reading Intervention Instruction. In an effort to teach all students to read

successfully, reading intervention instruction has garnered the interest of researchers for decades

(Allington & Shake, 1986; Al Otaiba & Fuchs, 2002; Cavanaugh, Kim, Wanzek &Vaughn,

2004; Coyne et al., 2001; Lane, Pullen, Hudson, & Konold, 2009; Menzies, et al., 2008;

Torgeson, 2004). The research has converged on several key premises: high quality instruction is

the best preventive line of defense against later reading failure (Bos, Mather, Narr, & Babur,

1999; Juel, 1988; Mathes & Torgeson, 1998; Menzies et al., 2008), early intervention efforts are

more fruitful than later intervention efforts when students' learning gaps are more substantial

(Coyne et al., 2001), students can be adequately served in small groups of three to five students

and instruction can be intensified when delivered one-one (Hiebert & Taylor, 2000; Scammacca,

Vaughn, Roberts, Wanzek & Torgeson, 2007), instruction is often most accelerative when

grounded in research, is focused on the "big ideas" of reading including phonological awareness,

phonics, fluency, vocabulary and comprehension and is brought to life through sound

instructional techniques such as concise teacher language, appropriate scaffolding, sufficient

opportunities for student practice, reinforcement, and adequate pacing (Leslie & Allen, 1999;

NRP, 2000; Snow et al., 1998). There is also general support for enduring interventions that

occur daily over the course of months thus providing more sessions and more time vs. short term

interventions that persist over a series of weeks and include fewer sessions and less time (Harn, Linan-Thompson & Roberts, 2008; Vaughn, Linan-Thompson, & Hickman, 2003; Wanzek & Vaughn, 2008). There is general support for the use of ongoing data to drive instruction and to ensure instructional match congruent with the child's skill level (Vernon-Feagans et al., 2010). Finally, the research points to the academic benefits that may result from a positive and caring relationship between the teacher and struggling students (Hamre & Pianta, 2005).

Other factors relative to early intervention have been explored within the literature but the research is less congruent with regards to these areas. First, the research is divided as to whom is the best provider for early intervention. Some studies showed support for the use of "low cost providers" such as paraprofessionals (Jenkins, Peyton, Sanders & Vadasy, 2004; Scammacca et al., 2007; Vadasy, Sanders, & Abbott, 2008) while other studies suggest that the most at-risk students must be taught by the most highly skilled reading teachers in the school building (Allington, 2002). Research suggests that quality professionals with appropriate expertise may have the greatest impact upon student learning (Darling-Hammond, 1997; Darling-Hammond & Baratz-Snowden, 2007; Duffy, 2004; Marzano, 2003; Rowan et al., 2002; Rowe, 2003; Sanders & Rivers, 1996; Wixson, 2011). Thus, what may be more important than the categorical distinction between a paraprofessional and a certified teacher is the provider's knowledge and expertise. This notion is more fully explored in the upcoming sections devoted to teacher effectiveness research and teacher knowledge research.

While the literature generally agrees upon the content that should comprise early intervention lessons including an emphasis upon phonological awareness, phonics/word recognition, fluency building at the letter/word/text levels, encoding, vocabulary development

and comprehension strategy instruction coordinated within a consistent instructional sequence, the research did not establish one commercially available reading intervention program over another as being superior (Scammacca et al., 2007). This finding specific to effective intervention instruction is consistent with the literature on effective core reading instruction discussed in the previous chapter section (Bond & Dykstra, 1967; IRA, 2000). Additionally, the reading intervention literature is not absolute as to the proportionate amounts of instruction for each of these established reading components that yield the most substantial reading gains. As discussed previously, newer research is exploring this question in the elementary reading classroom specific to core reading instruction (Connor, 2011; Connor et al., 2004a; Connor et al., 2004b; Connor et al., 2009). The collection of child x instruction studies provides some support for specific types of instruction in light of students' reading profile. Additionally, these studies suggest how students' instructional needs and ultimately amounts of certain types of instruction change over the course of the school year. This line of research is attempting to not only affirm earlier studies that support balance in favor of polar positions such as whole language vs. direct instruction but go a step further by exploring the proportions of each type of instruction that may be best for individual readers within a primary classroom. These findings were relevant for this study given the focus on intensive reading teachers serving at-risk first grade readers. The at-risk students served in the district's early intervention project have specific weaknesses in phonological awareness and decoding as determined by the diagnostic reading assessments. This general student profile led program supervisors to prescribe the use of Early Interventions in Reading (EIR), a teacher-managed and code-focused reading intervention curriculum. This program also met the criteria of "evidence-based" as defined by Bursuck & Blanks (2010) and

IRA (2002). The program is comprehensive in its attention to all five areas of reading and EIR's record of success has been substantiated by several scientifically-based studies which are summarized by researchers at the Florida Center for Reading Research (FCRR). Jordan (2006) reported that all studies reviewed tested the reading growth of first graders who received the EIR curriculum (experimental group) and first grade readers who did not receive EIR (control group). In all studies, the mean reading scores of the students receiving EIR were higher than the reading scores of the students in the control groups as measured by standardized tests of reading performance. Based on this review, Jordan (2006) concluded that "the research base to support the use of SRA Early Interventions in Reading is very strong" (p. 5). There were limitations to these studies such as small group sizes but the research met the guidelines of scientifically-based research and demonstrated success. Given that all IRITs in this district's intervention program utilize an evidence-based, code-focused reading curriculum (EIR) with first graders that may have the greatest need for code-focused, teacher-managed instruction, the students' literacy gains differ. These differences may be explained by specific student characteristics and will be discussed more fully in the upcoming section devoted to the literature on at-risk readers. Or these differences may be explained by the effectiveness of the teacher, specifically her formal and practical knowledge base. This study explored this hypothesis.

Beyond the types and proportions of instruction that may be best for at-risk readers, the early intervention research is also not conclusive as to the instructional setting that may best support at-risk students' learning. With the advent of Response to Intervention (RtI) which was written into law with the 2004 reauthorization of the Individuals with Disabilities Education Act (IDEA), many schools are currently using a multi-tiered model for intervention delivery

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(Wixson, 2011). Tier One generally refers to core classroom instruction and is provided to all students within the general education setting (Fuchs & Fuchs, 2006). As outlined by the Florida Department of Education (FLDOE), Tier One includes a minimum of 90 uninterrupted minutes of reading instruction (2011). Instruction must be grounded in a research-based core reading program and the 90 minutes must include a blend of whole group lessons as well as differentiated small group lessons and independent reading activities (FLDOE, 2011). Students showing poor response to tier one supports as determined by appropriate curriculum-based assessments are then provided tier two supports in the form of more intensive and more targeted reading instruction. These guidelines are prescribed by the Florida Response to Instruction/Intervention (FL-RTI) model (2011). The third layer of the FL-RTI model is tier three which provides students' most at-risk for reading failure with the highest degrees of intensity by way of an even smaller instructional grouping, possibly one-to-one instruction, potentially a more supportive curriculum and more frequent progress monitoring (FL-RTI, 2011). This multi-tiered approach is being used to ultimately inform decisions about special education referrals and placements (Fuchs & Fuchs, 2006).

In utilizing a three-tiered model, schools have flexibility with regards to the delivery of intervention instruction. In turning to the research, two general options are described: pull-out instruction (lessons delivered in a setting separated from the general education classroom) or push-in instruction (lessons delivered within the general classroom setting). In a survey of both teachers and reading specialists, respondents were asked about the advantages and disadvantages to both delivery models (Woodward & Talbert-Johnson, 2009). Data analysis revealed that neither option surfaced as being preferred or more effective than the other. There were positives

and drawbacks to both models as reported by both classroom teachers and reading specialists. The results from this recent research begs the question: perhaps the focus should be less on the physical location of the intervention being delivered and more on the communication about students' progress that is or is not occurring between the intervention teacher and the general education teacher. When multiple providers are instructing the same students, several studies point to the importance of communication between providers to ensure aligned and curricular congruence (Allington, 1990; Deeney, 2008). This communication is crucial given that students' literacy gains can be compromised when intervention instruction is incompatible with the general classroom instruction.

Although the literature on effective reading intervention instruction is significant, gaps exist. While there is general agreement about the need for expertise and for quality professionals delivering instruction within a multi-tiered RTI model (Johnston, 2010; Wixson, 2011), current studies have not defined the formal and practical knowledge base of intensive reading intervention teachers. There are studies that have explored the contribution of formal knowledge relative to the teaching of early readers but these studies have mostly excluded practical knowledge and these studies have been specific to classrooms teachers providing core reading instruction. These studies are explored further in the chapter section devoted to teacher knowledge. Therefore, this study was not only unique in its focus on intensive reading intervention teachers but its focus on both formal knowledge and practical knowledge and the relationship between these two types of knowledge related to the teaching of at-risk first grade readers.

Teacher Effectiveness. "An indisputable conclusion of research is that the quality of teaching makes a considerable difference in children's learning" (Anderson et al., 1985, p. 85). This assertion begins the section headed "The Teacher and the Classroom" within the report titled *Becoming a Nation of Readers* (Anderson et al., 1985). This claim has been empirically documented through a number of significant research studies. For instance, Anderson et al. (1985) summarized several studies which collectively suggested that roughly 15% of variance in reading achievement can be attributed to the skill level and overall quality of the teacher. Using data from the Tennessee Valued-Added Assessment System (TVAAS) a number of studies provide support for teachers' impact upon students' academic growth (Sanders & Horn, 1998; Wright et al., 1997). To summarize, teacher effects were found to be the most significant factor in every analysis conducted (Sanders & Horn, 1998; Wright et al., 1997). Secondly, factors such as race, socioeconomic status or class size were found to be non-significant factors. Researchers found further evidence of residual effects of both effective and ineffective teachers on students' achievement (Wright et al., 1997). Essentially, students with similar baseline achievement levels can have vastly different learning trajectories based on the sequence of teachers over time. Data analysis suggested that an effective teacher could positively impact learning in students that had a previously ineffective teacher but residual effects of the year with the ineffective teacher were still evident over time. Establishing this claim that a quality teacher can have a profound impact upon student learning raises new questions related to the characteristics of quality teaching.

What factors then do correlate or contribute to quality teaching? The literature organizes itself around several common variables. In one line of research, it is suggested that teacher effectiveness is a function of verbal ability. Studies into this variable, however, have been mixed

(Greenwald et al., 1996; Hanushek, 1986). Research into the effects of teacher certification as an indicator of teacher quality is also prolific (Ballou & Podgursky, 2000; Darling-Hammond et al., 2001; Goldhaber & Brewer, 2000). Other proxy measures such as years of experience in education and qualifications have been explored but have not emerged as strong predictors of teacher efficacy (Connor, Son, Hindman, & Morrison, 2005). One line of research, however, that may prove to be particularly fruitful is the study of teacher knowledge as a critical determinant of teacher quality. Specific to the domain of reading, researchers suggest that a specialized body of knowledge about language and literacy concepts is critical (Snow et al., 2005; Moats, 1994, 1999, 2000; Moats & Lyon, 1996). For this reason, the role of teacher knowledge specific to the teaching of at-risk first grade readers was specifically explored in the present study. In the section that follows, teacher knowledge is first broadly reviewed and includes a discussion of theoretical models of teacher knowledge, various types of teacher knowledge and finally common approaches for measuring teacher knowledge. The review then shifts specifically to studies exploring the role of teacher knowledge in the domain of reading.

Teacher Knowledge. More recent educational policies such as No Child Left Behind have called for the placement of "highly qualified" teachers within today's classrooms (US Department of Education, 2001). Currently, the criterion for earning the status of "highly qualified" includes the holding of certain degrees and/or certifications. Such proxy criteria have not emerged as strong predictors of teacher efficacy with regards to increasing students' academic achievement (Connor et al., 2005; Goldhaber & Brewer, 2000). An area that seems connected with better teaching and better student learning is that of teacher knowledge. Yet

producing empirical support for this claim has proved challenging. Despite posing both conceptual and methodological challenges to researchers, this construct continues to receive considerable attention in the research literature. In organizing this review of the literature, the researcher turned first to the work of Fenstermacher (1994). He was interested in a review of the teacher knowledge research that would "facilitate epistemological scrutiny" (p. 3). He ultimately used four guiding questions to review the literature available at that time: (1) What is known about effective teaching? (2) What do teachers know? (3) What knowledge is essential for teaching? and; (4) Who produces knowledge about teaching? A question lacking from his review is related to the testing of teacher knowledge. Fenstermacher's original four questions along with the addition of the fifth question noted above helped to frame this present review. Given the current study's emphasis on reading, each of the five questions is discussed specific to the area of reading and not generally to teaching as in Fenstermacher's original work. That said, in the sections that follow, prominent theoretical models will first be discussed. Question three, "What knowledge is essential for teaching?" is addressed most robustly in the discussion of current theoretical models of teacher knowledge. Then question five is addressed with a discussion of approaches to measuring teacher knowledge. Following this section, the review specifically organizes itself around the second and fourth questions: what do teachers know and who produces knowledge about teaching? (Fenstermacher, 1994)? In posing these two questions, Fenstermacher (1994) differentiated between knowledge generated by university professors (formal knowledge) and knowledge generated by practicing teachers (practical knowledge). These two types of knowledge were most illuminating for the present study given the attention to both formal and practical knowledge possessed by intensive reading teachers who serve at-risk

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first graders. Question one, "What is known about effective teaching?" is not directly addressed in this section on teacher knowledge. Rather, the sections devoted to effective beginning reading instruction more fully answered this question given the study's focus on reading.

In asking the question, "What knowledge is essential for teaching?" Shulman (1986) offers the field some possible answers. Shulman's (1986) seven category framework is perhaps the most comprehensive model of teacher knowledge. The model was designed to capture what teachers need to know in order to teach effectively. The seven categories include: (1) content knowledge or disciplinary knowledge, (2) pedagogical knowledge including general teaching knowledge such as classroom management, (3) curriculum knowledge pertaining more specifically to the content expected to be taught within a particular discipline, (4) pedagogical content knowledge referring to the knowledge necessary to actually transmit or convey content knowledge to learners, (5) knowledge of learners including cognitive, emotional, social characteristics of students' at a given chronological age, (6) knowledge of learning contexts including the school or classroom environment, (7) knowledge of teaching and learning situated within a larger social context such as the community or the broader society. To this day, Shulman's model is one of the most notable models and inspires much current work around the knowledge construct (Reutzel et al., 2011).

Although the impact of Shulman's model has been significant, it is not the only model present in the literature. Paris et al. (1983) along with Peterson and Comeaux (1990) conceptualized teacher knowledge differently than Shulman (1986) but still addressed the same question, "What knowledge is essential to teaching?" Essential teacher knowledge is represented in a three-category framework including declarative knowledge (knowing that), procedural

knowledge (knowing how to) and conditional knowledge (knowing when and where) (Paris et al., 1983; Peterson & Comeaux, 1990). To apply this thinking to a teaching scenario, a teacher must know that first grade students need skills to blend simple words (declarative knowledge), she must know how to effectively teach blending to her students (procedural knowledge) and she must know when and where it is appropriate to teach this skill (conditional knowledge). The premise behind this model is that successful teaching and learning result from the interaction of these three types of teacher knowledge.

A more recent model comes from Snow et al. (2005). This model, although different from the two previously summarized, also addresses the question, "What knowledge is essential in teaching?" This model is unique in that it accounts for changes in teaching knowledge over time. It seems reasonable to suggest that teacher knowledge should not be static over the course of one's teaching career. Based on this premise, Snow et al. (2005) suggest five categories for teacher knowledge including declarative, situated, stable/procedural, expert/adaptive, and reflective/organized/analyzed knowledge. To elaborate, they argue that declarative knowledge primarily occurs during a pre-service teachers' certification program. Declarative knowledge results from coursework, lectures and it is in this stage of knowledge development that the teacher acquires a foundation of disciplinary knowledge (Snow et al., 2005). Situated knowledge or "can-do" procedural knowledge refers to the ability to "function effectively in a relatively simple situation" (Snow et al., 2005, p. 8). A relatively simple teaching situation might be described as a small, homogeneous group of children or a situation with high amounts of scaffolding by an expert supervising teacher. Stable procedural knowledge, according to Snow et al. (2005) is what every well prepared first year teacher should have, coupled with enough

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declarative knowledge to support teaching under "normal circumstances." Specifically, in this stage, the teacher possesses stable procedural knowledge to plan instruction to meet most students' needs in the class, to manage the classroom efficiently, to assess students' progress, and to adapt instruction to a degree, excluding extreme cases of need. The next stage, expert, adaptive knowledge, is consistent with the successful experienced teacher. Possessing this type of knowledge allows a teacher to meet a wide array of instructional challenges, to seek new research-based knowledge to address new problems and to incorporate that new knowledge into his/her existing knowledge structures. The final stage of knowledge development is reflective, organized and analyzed knowledge. This type of knowledge is consistent with the master teacher. At this stage of knowledge development, a teacher is able to analyze what he/she has learned and evaluate the worthiness of such information. According to Snow et al. (2005), the teacher with significant amounts of expert, adaptive knowledge should be serving as a teacher leader in his/her respective school and in leadership capacities that extend beyond one's own school. In thinking holistically about this model of teacher knowledge, Snow et al. suggest that these are not isolated stages. Rather, "these represent points on a trajectory during which knowledge becomes increasingly differentiated and subject to analysis" (Snow et al., 2005, p. 9).

Pearson (2007, p. 6), another researcher at the forefront of the discussion of teacher knowledge claims, "It is the solemn responsibility of any profession to monitor the professional knowledge of its members." With this belief as a guiding principle, Pearson extends thinking around Snow et al. (2005) theoretical model that begins to consider changes over time in teachers' knowledge. In thinking of the five knowledge categories, he suggests the need for a model that more precisely captures teacher knowledge development over time. For example,

what might the distribution across the five knowledge categories look like for a pre-service teacher? How might the distribution of knowledge change for a third year teacher versus a teacher with ten years of experience? The Snow et al. model helps us to ask these questions but does not provide the answers. Therefore, Pearson (2007) advocates for a more comprehensive theoretical model that describes the types of knowledge, suggests how knowledge changes over time, captures how one would know such knowledge is changing and the differences resulting from such changes (Pearson, 2007). In addition to these goals he suggests that the field is also in need of a model that explains the relationship between teacher knowledge and student achievement. To date, there is no one theoretical model that defines important types of knowledge, describes critical changes over time in teacher knowledge development and directly connects developments in teacher knowledge to improvements in student learning. These gaps continue to spark much of the current work happening in the area of teacher knowledge research with this study as one example.

Another model for teacher knowledge comes from The National Academy of Education's Committee on Teacher Education as edited by Darling-Hammond and Baratz-Snowden (2007). Although proposed with pre-service teachers in mind, the model captures essential aspects of teacher knowledge equally important to in-service teachers. The model situates teaching within the larger context of the learning community (Darling-Hammond & Baratz-Snowden, 2007). Within this learning community are five specific characteristics of good teaching. First, effective teachers possess knowledge of content, pedagogy, students and social contexts. Secondly, effective teachers possess a repertoire of instructional practices that are employed in relationship to teachers' knowledge of such content, pedagogy, students and contexts. Practices are mediated

by tools including both conceptual resources such as learning theories and practical resources such as textbooks, curriculum guides, etc. Interacting with tools are teachers' dispositions or "habits of thinking" towards the teaching of students (Darling-Hammond & Baratz-Snowden, 2007, p. 121). Teachers' dispositions are further influenced by knowledge of content, pedagogy, students and contexts. This complex and dynamic model situates teachers' knowledge, practices, use of tools and dispositions within the wider learning community and places the concept of vision at the heart of the entire. Vision is defined as "images of good practice that guide teaching" and at the core of teachers' knowledge, practices, tools and dispositions (Darling-Hammond & Baratz-Snowden, 2007, p. 121).

These theoretical models provide possible answers to the question "What knowledge is essential to teaching?" A brief discussion of methods for assessing such knowledge follows. Historically, the methods used to assess formal teacher knowledge have included a reliance on paper/pencil assessments. This is particularly true in the area of reading. Perhaps one of the best known attempts was a 97-item *Teacher Knowledge of Reading Test* developed by Artley and Hardin (1975). Several validation studies of the 1975 version of the *Teacher Knowledge of Reading Test* were conducted (Ellsworth & Miller, 1980; Kingston, Brosier, & Hsu, 1975; Rorie, 1978). Each of these studies of the Artley & Hardin (1975) Teacher Knowledge of Reading Test was significant in that each was enacted in response to a clear gap in the literature with regards to a lack of reliable and valid measures for the assessment of teacher knowledge in the area of reading. Findings from this collection of studies, however, left researchers still puzzling over issues related to the measurement of teacher knowledge as well as the contribution of teacher knowledge to student learning (Ellsworth & Miller, 1980; Kingston et al., 1975; Koenke, 1975;

Narang, 1977;). Fast forward three decades and researchers are still grappling with many of the same questions.

In 2005, The Primary Grade Reading and Writing Teacher Knowledge Project received funding by the Institute of Education Sciences. This 4-year project was charged with developing a comprehensive assessment system that measured primary teachers' inert or head knowledge related to the teaching of reading and writing as well as teachers enacted knowledge pertaining to what primary teachers actually do in the classroom relative to the teaching of reading and writing (Reutzel et al., 2011). Based on this model of inert and enacted knowledge, researchers honed in on two instruments including a paper/pencil multiple choice assessment surveying both teachers' content knowledge and pedagogical content knowledge about reading and writing along with a classroom observation scale aimed at capturing evidence of teachers' enacted pedagogical content knowledge in the areas of primary reading and writing instruction (Reutzel et al., 2011).

Through the course of their work, researchers encountered a number of perplexing issues. The authors outlined and discussed the six most salient conceptual and methodological issues within the scope of their recent article. These issues are outlined as follows: (1) What knowledge warrants measurement with regards to primary reading and writing instruction? (2) What evidence will be accepted as convincing evidence of primary teachers' knowledge of reading and writing (3) What are potential concerns related to the use of measures of teachers' knowledge of reading and writing instruction (4) How should primary grade teachers' knowledge of reading and writing instruction be measured? (5) What special problems does the use of classroom observations present when measuring primary grade teachers' knowledge of reading and writing

instruction? (6) Is there any predictive validity to teacher knowledge assessment? These six questions will most certainly guide future work into the understanding of teacher knowledge.

Although launched seven years ago, this project was significant in that it attempted to differentiate between the assessment of inert and enacted knowledge. This distinction can be likened to Fenstermacher's (1994) earlier differentiation between formal and practical knowledge. Considering those interested in assessing teacher knowledge are currently looking at multiple types of knowledge (formal and practical or inert and enacted) it would stand to reason that studies attempting to describe these types of knowledge would be prolific. The converse however is true and this gap is clarified further in the sections that follow.

Summarized below are studies aimed at answering Fenstermacher's (1994) second question which asks "What do teachers know?" Using a variety of methods and various forms of data collection, these studies show that many teachers lack knowledge of language and literacy concepts deemed important for early reading instruction (Bos et al., 2001; Moats, 1994; Moats & Lyon, 1996). Additionally, a number of studies have found that teachers have difficulty calibrating their own knowledge (Cunningham et al., 2004; Spear-Swerling et al., 2005). Nearly every study reviewed, however, makes such claims about teachers' knowledge based solely on the assessment of formal knowledge (Fenstermacher, 1994). Very little attention has been given to the understanding of teachers' practical knowledge and this is particularly true for the area of beginning reading instruction. This claim is substantiated by a review of existing studies focused on the construct of teacher knowledge.

In asking the question "what do teachers know" a number of studies suggest that teachers lack understandings of basic language concepts. The literature on beginning reading instruction

establishes support for the explicit teaching of phonological awareness and phonics (Adams, 1990; NRP, 2000; Snow et al., 1998; NRP). Researchers reason that to teach these critical skills to early readers, teachers of beginning reading must possess a specialized knowledge of language and print structures (IRA, 2000; Moats, 1994, 1999, 2000; Moats & Foorman, 2003; Moats & Lyon, 1996; Piasta et al., 2009). It is this claim that sparked the development of one of the earliest surveys of teachers' formal knowledge of language and print. In 1994, Moats developed *The Informal Survey of Linguistic Knowledge* to assess teachers' awareness of language concepts such as phonemes and morphemes and of to assess teachers' knowledge of how these elements are represented through sound-symbol correspondences. The instrument was administered to 89 in-service teachers of diverse backgrounds such as speech pathologists, graduate level students, general and special education teachers. Data analysis indicated that although participants were literate and experienced teachers, most lacked a sufficient grasp of the spoken and written language structures critical to the teaching of beginning reading. These findings sparked continued research into teachers' knowledge of language concepts as well as other aspects of essential teacher knowledge.

In 2001 (Bos et al.), a similar study was conducted and included both pre-service and in-service teachers. The 293 pre-service teachers had completed all undergraduate coursework and were in a final student teaching internship. The 131 in-service teachers all taught an early elementary grade (K-3) and possessed teaching experience in the range of 11-20 years. Teacher data were collected using two measures including a perception survey based on the work of DeFord (1985) as well as the *Teacher Knowledge Assessment: Structure and Language* (Bos et al., 2001). Analysis of the data led researchers to suggest that overall in-service teachers were

more knowledgeable than pre-service teachers about language and print structures (Bos et al., 2001). Neither group, however, obtained high scores on the assessment. The mean score for pre-service teachers was 50% correct and 68% correct for the in-service teachers (Bos et al., 2001). These findings were similar to those reported by Moats' (1994) earlier study and led researchers to call for changes in teacher preparation and professional development to ensure teachers have access to the knowledge to effectively teach beginning reading (Bos et al., 2001).

Another study interested in assessing what teachers know in three areas (phonological awareness, phonics and children's literature) also assessed teachers' abilities to calibrate their own knowledge in these areas (Cunningham et al., 2004). The sample included 722 K-3 teachers. The three knowledge domains were assessed in the following ways: knowledge of children's literature was assessed using a *Title Recognition Test*; phonemic awareness knowledge was assessed using a portion of Moats' (1994) instrument, and phonics knowledge was assessed using a task focused on regular/irregular spelling patterns and a multiple-choice task focused on explicit knowledge of the rules and conventions of the English language. To assess teachers' knowledge calibration in the three areas, participants were asked to rate their current knowledge or level of expertise in each of three tested domains. In analyzing the data, researchers reported the following findings: 90% of participants were not familiar enough with the most popular children's titles, less than 1% of all participants correctly answered all eleven items focused on the identification of phonemes in words; phonics knowledge was poor as well with less than 1% of participants answering all items correctly (Cunningham et al., 2004). Such results led researchers to conclude, consistent with earlier studies (Bos et al., 2001; Moats, 1994), that the "knowledge base of many K-3 teachers is not aligned with the large and convergent body of

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research demonstrating the key role that component processes play in learning to read" (Cunningham et al., 2004, p. 161). Additionally, many teachers incorrectly calibrated their own knowledge especially in the areas of phonemic awareness and phonics. If the field accepts the assumption that teachers more readily learn new information when better calibrated about their current knowledge level, then there is a strong rationale for improvements in professional development around the areas of phonemic awareness and phonics especially (Cunningham et al., 2004).

Spear-Swerling et al., (2005) further delved into teachers' abilities to calibrate their own literacy knowledge. The study included 132 participants, all of whom were graduate level students at a local university as well as certificated teachers.. Data were collected using a variety of instruments. First, participants rated their own knowledge in three reading areas using a five-point scale. Then, participants' actual knowledge in these three areas was assessed using knowledge tasks. Data analysis suggested background variables including teachers' levels of preparation as well as experiences influenced perceptions and knowledge. Teachers' background and experience interacted differently however with different reading areas assessed. These findings seemed to suggest a "slightly more optimistic view of the accuracy of teachers' perceptions" (Spear-Swerling et al., 2005). Additionally, these findings seem to be in contrast with findings that suggest a weak correlation between teachers' preparation and years of experience (Connor et al., 2005).

All of the previously reviewed studies share several common factors. First, they attempt to establish what teachers know about essential reading concepts, particularly early reading instruction. In doing so, these studies suggest that many teachers lack knowledge of these

essential reading concepts. In suggesting this finding, however, two gaps are evident. None of the studies included actual classroom observations of instruction or measures of student performance in an effort to link teacher knowledge to quality teaching and student learning. Also, all studies measured formal knowledge only, knowledge known and primarily produced by researchers (Fenstermacher, 1994). To address one of these gaps, a number of studies have extended earlier studies by including classroom observations and/or measures of student performance.

In 2002, one such study explored the links among teacher knowledge, teacher practice and student learning (McCutchen et al., 2002a). The study included 44 teachers (kindergarten and grade one) representing 40 different elementary schools within a large metropolitan area in the western United States. Of the 44 participating teachers, 24 teachers comprised the experimental group and the other 20 formed the control group. Teachers in the experimental group received professional development in the structural aspects of language, specifically phonology and its link to orthography. Professional learning occurred in the form of a two-week summer institute and was ongoing throughout the school year. Data were collected in a variety of ways. Teacher knowledge was assessed using the *Informal Survey of Linguistic Knowledge* developed by Moats (1994) Teachers in the experimental group took the survey both prior to the professional development course (pretest) and an alternative version at the conclusion of the course (post-test) (McCutchen et al., 2002a). Teachers in the control group only completed the test once. Because Moats' survey is specific to linguistic knowledge, researchers also assessed participants' general knowledge using a 45 item cultural literacy test developed by Stanovich and

Cunningham (1993). This assessment was used given that it had been previously found to correlate with Hirsch's (1987) measure of cultural literacy.

Instruction was studied through classroom observations. Data were collected in the form of field notes which were coded and comprised four broad categories including knowledge affordance, literacy activity, the textual context and the group context. Student learning was assessed at multiple times during the school year in both experimental and control classrooms using a variety of reading measures. Data analysis revealed three primary findings. First, researchers concluded that teachers' knowledge of phonological awareness can in fact be deepened through professional development (McCutchen et al., 2002a). Secondly, teachers can use that knowledge to change classroom instruction and third, changes in teacher knowledge and teacher practice can change student learning. Students in the experimental kindergarten and first grade classes showed significantly better achievement results than control students in phonological awareness, oral reading fluency, reading comprehension, spelling and compositional fluency (McCutchen et al., 2002a).

Extending the work from the previously summarized study is another study focused upon the relationships between reading teachers' content knowledge, philosophical orientations towards reading instruction, classroom reading practices and students' learning (McCutchen et al., 2002b). Participants included 24 kindergarten teachers and 27 first grade teachers and 8 special education teachers for a total of 59 in the sample. Teachers' reading content knowledge was assessed in two ways: knowledge of children's literature and knowledge of phonology. Knowledge of children's literature was assessed using three title-recognition tests validated by Cunningham and Stanovich (1991) as being consistent correlates with children's literacy

achievement across the elementary years (McCutchen et al., 2002b). The basic premise of the title recognition test is that more knowledgeable teachers will more readily identify titles of appropriate children's books for various levels of students. Of course, recognition of titles does not guarantee effective teaching but the authors assumed it would be unlikely for a teacher to have a rich knowledge of literacy concepts and no knowledge of well-known children's literature titles (McCutchen et al., 2002b).

As in the previous study, teacher knowledge of phonology was measured using the *Informal Survey of Linguistic Knowledge* (Moats, 1994) and general teacher knowledge was assessed with the cultural literacy test (Stanovich & Cunningham, 1993). Philosophical orientation was measured using DeFord's Theoretical Orientation to Reading Profile (DeFord, 1985). This questionnaire represented three theoretical orientations including phonics, skills and whole language (McCutchen et al., 2002b).

Classroom practice was observed multiple times throughout the school year and data were collected and coded. Coding schemes included four broad categories: knowledge affordance, literacy activity, textual context, and group context. Data analysis revealed the following conclusions: teachers' philosophical beliefs had little relation to their classroom practices. Rather, classroom practices were influenced by teachers' phonological knowledge and a relationship was further observed between teachers' practices and kindergarten students' end-of-year word recognition abilities. This correlation between teacher knowledge, teacher practice and student learning did not, however, hold for the first grade sample. In response to this finding, the authors suggested "perhaps we should not be surprised that as literacy practices become more

complex, isolated aspects of teacher knowledge and brief observations of classroom practice become less able to account for student outcomes" (McCutchen et al., 2002b, p. 223).

Following these two studies published in 2002, Moats and Foorman (2003) published the findings of a longitudinal, five-year study of teachers' knowledge, reading instruction and classroom reading achievement levels. The study was conducted in high poverty, urban public schools serving diverse student populations. At the outset of the study, a number of interventions were prescribed including the use of a comprehensive, core reading program in each of the study classrooms, participation in professional development institutes, courses for both teachers and principals, classroom observations on a bi-monthly basis, and monthly visits from national consultants. With these interventions in place, data were gathered through a variety of sources including a teacher knowledge survey, recorded teacher interviews, classroom observations, and repeated measures of students' reading growth as they progressed from kindergarten to fourth grade. It was during the fourth year of the study that researchers looked closely at the relationships between teachers' content knowledge in reading, teachers' overall teaching effectiveness, and students' literacy outcomes. Analyses revealed significant but modest relationships between teachers' overall effectiveness as determined by the classroom observation protocols and students' reading outcomes. Reported effect sizes for this analysis were .046 and .049 (Moats & Foorman, 2003). Scores on the teacher knowledge survey predicted students' reading achievement scores in one of the research sites but not the other. The findings from this study, suggesting only a modest relationship between teachers' reading content knowledge, teaching effectiveness and reading outcomes of students in grades three and four, are consistent

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with other studies exploring the relationships between similar variables (McCutchen et al., 2002a; McCutchen et al., 2002b).

Given the lack of consistent evidence connecting teacher knowledge to student outcomes, Cirino et al. (2007) explored teacher knowledge as just one characteristic of teacher quality. In addition to teacher knowledge measures, teacher characteristics were studied using observational measures of teachers' oral language proficiency, measures of classroom quality to explore the effect of these variables on student outcomes in bilingual kindergarten classrooms. Participants included 141 teachers representing thirty-five schools across four linguistically and culturally diverse research sites. Data were collected from three groups of measures: two for teachers and one for students. Teacher data were collected in the form of observational measures and questionnaires. Student measures consisted of language and achievement outcomes for bilingual kindergartners. Classroom observational measures of instruction led to the assignment of an overall quality score for each participating teacher. Data analysis led to the following findings: teacher quality but not teacher knowledge was positively related to student engagement, teacher quality but not teacher knowledge was negatively related to time spent in non-instructional activities. Student outcomes were predicted by baseline student and classroom performance levels, language of instruction and of outcomes and the teachers' oral language proficiency level in both Spanish and English. Teacher quality was less related to student outcomes and teacher knowledge was consistently not related to student outcomes (Cirino et al., 2007).

More recently, another study explored teacher knowledge at the upper elementary levels (McCutchen et al., 2009). Participants included 30 teachers in grades three, four and five representing 17 different elementary schools from the northwestern area of the United States

(McCutchen et al., 2009). Experimental schools were paired with control schools based on demographic similarities. The result was 14 teachers in the experimental group and 16 teachers in the control group. Teachers in experimental schools received the professional development support in year one and teachers in the control schools received it the following year. Professional development consisted of an intensive 10 day institute devoted to deepening teachers' linguistic knowledge and literacy instruction (McCutchen et al., 2009). Data for each study variable were collected in a variety of ways. Teacher linguistic knowledge was assessed by Moats' (1994) *Informal Survey of Linguistic Knowledge.* Experimental teachers completed the survey both as a pretest, prior to the professional development course, and as a posttest after the course (McCutchen et al., 2009). As in the prior studies (McCutchen et al., 2002a; 2002b), instruction data were gathered in the form of field notes and coded according to four broad categories including knowledge focus of the literacy activity, context of the instruction such as teacher-focused, the text involved, and the group size for the activity (McCutchen et al., 2009). Student data were collected during the fall and spring across several reading areas including vocabulary, comprehension, spelling, and writing fluency.

A hierarchical linear model was used to test for teacher effects on students' literacy outcomes (McCutchen et al., 2009). Data analysis revealed a relationship between teacher knowledge and student gains. An average effect size of .89 was reported for lower-performing students in the experimental classrooms over the control classrooms. The effect size was smaller for class-wide analyses of the data (.54) but students in experimental classrooms still outperformed peers in control classrooms. These findings led researchers to conclude that the professional development intervention not only had positive effects for all students in

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experimental classrooms but substantial benefits for the lowest-performing students in experimental classrooms. One compelling limitation to this study resulted from lack of time for observing classroom instruction. Observations occurred only three times during the year and each session lasted only 15 minutes. Forty-five minutes of classroom data can't begin to substantiate a compelling link between teacher knowledge, teacher practice and student learning. This limitation provides a rationale for more research inclusive of classroom lessons in an effort to better understand what relationship may exist between teacher knowledge, teacher practice and student learning. While the present study was also limited by time, the inclusion of videotaped lessons and the use of stimulated recall methods began to add more insight not only into classroom instruction but also into teachers' practical knowledge used during reading instruction.

While the previous study cited lack of classroom observation time as a possible explanation for smaller effect sizes, another group of researchers hypothesized that previous studies failed to simultaneously study all essential variables (teacher knowledge, classroom practice and student outcomes). Therefore, in 2009 Piasta et al. enacted a study aimed to understanding the interaction of all of these variables. The study was predicated on the hypothesis that the link between teacher knowledge and student outcomes is not direct. Rather, teacher knowledge impacts student outcomes as a function of the classroom instruction (Piasta et al., 2009).

The study included 616 students across 49 first-grade classrooms representing 10 elementary schools in northern Florida (Piasta et al., 2009). This study was part of a larger study known as the Individualizing Student Instruction (ISI) Project (Connor, Morrison, Fishman,

Schatschneider, & Underwood, 2007; Connor et al., 2009). The ISI studies are reviewed in the section devoted to beginning reading instruction. As part of the ISI Project, teachers included in this study received nine hours of professional development focused on principles of differentiated classroom instruction.

Teacher's code-related reading knowledge was assessed in the fall using the TKA. This assessment was adapted from previous surveys of teacher knowledge (Bos et al., 2001; Moats, 19994; Moats & Foorman, 2003). Classroom data resulted from three classroom observations during the fall, winter and spring periods of the school year but only data from the winter observations was used in the final data analysis. Observations were coded to capture the precise amounts of time that target students spent in specific classroom activities (Piasta et al., 2009). Classroom activities coded as decoding instruction were of particular interest to this study given the support in the literature for explicit decoding instruction in the first grade classroom (Adams, 1990; Snow et al., 1998). Student data were collected in the fall and in the spring across two skill areas including word identification and expressive vocabulary (Piasta et al., 2009). Using a hierarchical-linear model, data analysis revealed an interaction between teacher knowledge and decoding instruction. Students receiving more time in explicit decoding instruction, delivered by a more knowledgeable teacher showed stronger word-reading gains. Conversely, students who received more time in explicit decoding instruction, delivered by less knowledgeable teachers showed weaker word reading gains. Researchers concluded that classroom observations, analyzed at the student level, were a unique strength of this study. Future studies, according to researchers, might include a deeper study of these variables and the interaction amongst these variables (Piasta et al., 2009).

While a number of the studies previously reviewed have typically explored teachers' reading knowledge connected to a specific professional development effort, other researchers suggest that this type of design presents methodological limitations (Carlisle et al., 2009). In an effort to address such issues, a team of researchers studied teachers' reading knowledge using a different design. First, researchers attempted to control for variables such as student socio-demographics that may have accounted for changes in instruction or student learning. Earlier studies (McCutchen et al., 2002a; 2002b) failed to control for such variables. Additionally, researchers attempted to measure teacher knowledge as a multidimensional construct and not as one dimensional which is the implication when using a single knowledge instrument such as Moats' knowledge survey (Carlisle et al., 2009).

One-hundred twelve elementary schools, participating in the state's Reading First initiative, participated in this study (Carlisle et al., 2009). Student data sources included two subtests (word analysis and reading comprehension) of a norm-referenced, standardized assessment. Socio-demographic characteristics were also gathered for all participating students. Teacher data were gathered with a three part reading knowledge test called *Language and Reading Concepts* (LRC) that was administered at three points during the school year. The composite score resulting from all three test administrations was used for analysis. Descriptive data such as advanced degrees, years of experience, etc., was also collected for each participating teacher. Several different analyses were performed in an attempt to understand the contribution of teachers' reading knowledge to students' reading gains. Data analysis suggested weak associations between teachers' knowledge and students' reading achievement. Despite accounting for methodological issues present in earlier studies, this study produced some similar

findings, compounding the challenges surrounding the study of teacher knowledge and the teaching of reading. In an effort to understand these findings, the researchers suggested shortcomings with the tool used to measure teacher knowledge (LRC). The assessment placed a heavy emphasis on linguistic knowledge such as the number of phonemes in a word and less emphasis on the knowledge teachers' use when teaching reading (Carlisle et al., 2009).

Each of the previous studies explored teacher knowledge connected to classroom instruction and student outcomes and some positive findings were reported (Cirino et al., 2007; McCutchen et al., 2009; Piasta et al., 2009). A clear gap, however still exists. This body of teacher knowledge studies primarily assessed formal teacher knowledge. This is not to suggest that studies of practical teacher knowledge are nonexistent. The following is a review of the small number of studies concerned with practical teacher knowledge. A team of researchers (Meijer, Verloop, Beijaard, 1999; Meijer et al., 2001) have contributed a number of studies devoted to the understanding of teachers' practical knowledge. Fenstermacher (1994) suggested that practical knowledge is knowledge of teachers and is derived as a result of experiences and personal reflections. Meijer, Verloop and Beijaard (2001) reviewed studies of teachers' practical knowledge and found that the literature supported six basic tenets. Practical knowledge (a) is personal or somewhat unique to the individual teacher; (b) is contextual meaning it is adapted based on the specific classroom situation; (c) results from experience (d) is tacit meaning that teachers' typically can't articulate this practical knowledge; (e) is content-related or connected to the specific content area being taught; (f) guides teachers' practice (Meijer et al., 2001). If practical knowledge is so personal and context-based how can its study be fruitful? Some research suggests similarities and patterns in teachers' practical knowledge (Grimmett &

MacKinnon, 1992). It is their view that such similarities may serve as a general framework and could hold important implications for teacher education (Grimmett & MacKinnon, 1992). This line of thinking converges with Carter (1990) who suggested that although classrooms, teachers and students vary significantly, the field can "codify a general sense of what teachers know that enables them to navigate within these settings (p. 302). It is this premise that spurred researchers to study the role of practical knowledge in the teaching of reading comprehension (Meijer et al., 1999; 2001).

The first study attempted to investigate the content of teachers' practical knowledge or to "ascertain whether there is a shared body of knowledge that underlies teachers' actions" (Meijer et al., 1999, p. 60). Four research questions stemmed from this goal. Researchers aimed to describe and analyze teachers' practical knowledge, identify patterns in the content of teachers' practical knowledge, identify "shared" practical knowledge and identify background variables that may influence teachers' practical knowledge (Meijer et al., 1999). Participants included 13 secondary level language teachers. Teachers' practical knowledge was derived from two instruments including structured open interviews and concept maps. The intent of the structured open interview was to reveal teachers' underlying knowledge about the teaching of reading comprehension. The use of concept maps is a research technique for "capturing and graphically representing concepts and their hierarchical interrelationships" (Meijer et al., 1999, p. 62). Data from both instruments were analyzed using a seven-category system pertinent to understanding practical knowledge related to reading comprehension instruction. The seven categories included subject matter knowledge, knowledge of general pedagogy, knowledge of student learning and understanding, knowledge of purposes, knowledge of curriculum and knowledge of instructional

strategies and knowledge of context. These seven categories were derived from the work of van

Driel et al. (1998) but also share some commonalities with Shulman's (1986) knowledge

framework. In analyzing collected data, researchers were able to provide detailed information

about teachers' practical knowledge but were unable to establish evidence of shared knowledge.

Additionally, researchers were able to conclude that a teacher's practical knowledge is

influenced by one's continuing education. Such findings led researchers to call for continued

research into the role of practical knowledge as an important element of teachers' professional

knowledge base (Meijer et al., 1999).

Extending this line of research, Meijer et al. (2001) conducted another study into the

similarities and differences in teachers' practical knowledge. Based on the findings from the

previous study (1999), Meijer and her colleagues developed a questionnaire. The items were

structured around the seven categories used for data analysis in the previous study and were

written in the form of a five-point Likert scale so that teachers could indicate their level of

agreement or disagreement with each statement (Meijer et al., 2001). Analysis of teachers'

responses suggests some shared knowledge amongst teachers. To that end, the questionnaire

revealed significant differences in teachers' practical knowledge as well as to some insight into

understanding these differences. Ultimately, analysis led researchers to be able to identify four

clusters of teachers. Given that most studies into teachers' practical knowledge are qualitative in

nature, this study's attempt at a quantitative design was significant.

Analyzed holistically, several trends were evident in the current research into the

construct of teacher knowledge. First, a number of theoretical models addressing essential

teacher knowledge do exist (Darling-Hammond & Baratz-Snowden, 2007; Paris et al., 1983;

Pearson, 2007; Shulman, 1986; Snow et al., 2005). These models seem to be theoretical at best. The field continues to debate what knowledge is essential to teaching as well as what knowledge is essential to the teaching of reading (Reutzel et al., 2011). Second, in the area of reading, teachers tend to perform poorly on assessments of basic language concepts (Bos et al., 2001; Cunningham et al., 2004; Moats, 1994). Third, many teachers do not accurately calibrate their own knowledge of reading concepts (Cunningham et al., 2004; Spear-Swerling et al., 2005). Fourth, professional development can improve teachers' knowledge of reading concepts (McCutchen et al., 2002a; McCutchen et al., 2009; Piasta et al., 2009). Fourth, studies do not consistently link increased amounts of formal teacher knowledge to improved student learning (McCutchen et al., 2002b; McCutchen et al., 2009; Moats & Foorman, 2003). Last, the study of teacher knowledge relative to the concepts critical to beginning reading instruction has historically focused on formal reading knowledge (Bos et al., 2001; Cunningham et al., 2004; McCutchen et al., 2002a, 2002b, 2009; Moats, 1994; Piasta, 2009). Fewer studies have explored the relationships between formal and practical teacher knowledge. Thus, it was the aim of this study to contribute insight to this gap.

At-Risk Readers. Knowing how to read effectively is critical and learning how to do so early on is essential (Adams, 1990; Juel, 1988). It is a well-documented fact that students who are poor readers at the end of first grade are highly likely to be poor readers at the end of grade four (Juel, 1988). This same longitudinal trend holds true for high school students whose early reading challenges persist (Francis, Shaywitz, Stuebing, Shaywitz, & Fletcher, 1996). It is imperative that readers get off to a good start. Otherwise, students' reading struggles tend to

haunt them throughout their schooling career and into their adult life. Such grave consequences were the impetus for No Child Left Behind which placed utmost importance upon high quality literacy instruction in grades K-3 as well as early intervention for those students identified as "at-risk" for meeting literacy benchmarks (U.S. Department of Education, 2001).

In reviewing the literature focused on "at-risk" readers, it tended to fall into two distinct categories. Many studies explored the efficacy of specific instructional programs or techniques in accelerating at-risk readers. Reading Recovery, direct instruction and Success for All are perhaps the three most widely researched programs with regards to early literacy intervention. In addition to researching comprehensive programs such as those aforementioned, there is an abundance of literature focused upon the efficacy of instructional practices. For instance, much research points to the importance of direct and systematic phonics instruction for all students but especially for those students identified as at-risk in reading (Foorman & Torgeson, 2001; NRP, 2000; Snow et al., 1998).

The second category of studies can be classified as student focused. In the past decade in particular, researchers have attempted to pinpoint common characteristics of students who fail to respond to typically effective reading practices or programs. The literature refers to these students as "non-responders" or "treatment resistors." These studies have yielded several traits often common to students who fail to show adequate response to instruction. In summary, these students have: specific phonological awareness weaknesses, rapid naming deficits, encoding deficits, cognitive or language deficits, and attention and/or behavior problems (Al Otaiba & Fuchs, 2002; 2006; McMaster, Fuchs, Fuchs, & Compton, 2005).

This research focused on at-risk readers was important to this current study for several reasons. First, some recent research supports the connection between higher amounts of teacher knowledge upon classroom instruction and student learning (McCutchen et al., 2009; Piasta et al., 2009). One study in particular found direct benefits for the lowest-performing students in the experimental classrooms (McCutchen et al., 2009). Knowing the importance of getting readers off to a good start with beginning reading instruction and the potential links between teacher knowledge, classroom practice and student learning, research that incorporates all of these variables is imperative. It was then the intent of this study to describe and understand any potential relationships between teachers' formal and practical knowledge relative to the teaching of beginning reading to at-risk readers. Few studies to date have simultaneously included these factors specific to at-risk readers.

Conclusion

This chapter presented a review of the research significant to this study including beginning reading instruction differentiated by core and intervention reading instruction, teacher effectiveness, teacher knowledge and at-risk readers. Gaps existing in the current literature were also presented. Chapter three outlines the methodology and research design procedures employed as a means to overcome some of the limitations identified within the current literature.

CHAPTER THREE: RESEARCH DESIGN AND METHODOLOGY

Introduction

Researchers and policymakers alike argue that teachers' preparation, background and knowledge hold the greatest potential for positively impacting student learning and closing the educational achievement gap (Coleman, 1966; Wright et al., 1997, Darling-Hammond et al., 2001). In the area of reading, however, researchers have had particular difficulty with the construct of teacher knowledge (Reutzel, et al., 2011). Issues include the absence of an accepted theoretical model of teacher knowledge development, disagreements over what teacher knowledge is essential for effective reading instruction, difficulties in creating valid and reliable assessments to measure essential teacher knowledge, and challenges in linking teacher knowledge to students' literacy gains (Reutzel, et al., 2011). Such challenges must not deter research efforts to better understand the role of teacher knowledge on teaching and student learning. Pearson (2007, p. 2) reminds us, "It is the solemn responsibility of any profession to monitor the professional knowledge of its members." Therefore, it was the purpose of this study to describe the formal and practical knowledge of intensive reading intervention teachers working with at-risk first graders and to explore any potential relationships between these two types of knowledge.

The remainder of this chapter includes the following sections: population and sample, data collection and instrumentation, and data analysis procedures.

Population and Sample

The population for this study was defined as intensive reading intervention teachers (IRITs) who provide daily reading instruction to at-risk first grade students. A large school district located in the southeastern United States funds a K-2 early intervention program. The goal of this district sponsored program is to prevent reading failure by providing early intervention services for at-risk readers. Currently, 62, Title-One elementary schools fund the IRIT position. Title-One schools are higher poverty schools that receive federal monies to support academic achievement (U.S. Department of Education, 2004). While the role of each IRIT differs slightly based on factors unique to individual school sites, the IRIT position is broadly defined by the district. The IRIT (a) provides daily immediate, intensive intervention(iii) in the five areas of reading including phonemic awareness, phonics, fluency, comprehension, and vocabulary development; (b) assists classroom teachers in providing explicit, systematic instruction, as supported in scientifically based research; (c) assists teachers with implementation of strategies and accommodations that can be used with struggling readers in the general education classrooms; (d) collaborates with teachers to develop intervention strategies for students in the RtI process and/or any struggling learners; and (e) provides on-going diagnostic progress monitoring.

While these guidelines provide a general framework for the role of an IRIT, the district has also employed specific selection criteria for becoming an IRIT. It is a screened position meaning teachers must meet certain criteria and must successfully engage in a series of tasks before they are admitted into the district pool of IRITs. All applicants must (1) possess a minimum of three years of classroom experience and preference is given to those applicants with

primary level (K-2) teaching experience; (2) complete a written application which asks applicants to describe his/her professional experiences and professional learning specific to reading, to convey his/her interest in the IRIT position, to detail successful strategies he/she has employed with at-risk readers and to explain his/her experiences with intervention in a co-teaching setting. Beyond the written application, potential candidates must secure a recommendation from his/her supervising principal and he/she must engage in an oral interview conducted by a district committee. The face to face interview process explores applicants' knowledge of beginning reading instruction and knowledge of intervention practices as well as the applicant's currency with regards to reading research and professional resources. Applicants that meet all the selection criteria and successfully meet expectations on the written and oral screening tasks are admitted to a district pool of teachers and are then able to apply for any current IRITs openings.

Beyond screening and hiring practices, the district also has a number of supports in place for all current IRITs. First, the district provides quarterly whole group meetings for all IRITs. These meetings include a variety of topics including data analysis, professional development related to reading instruction and reading intervention, and professional reading including book studies and article reviews. All IRITs are also part of a small-group Professional Learning Community (PLC). During these small group meetings, IRITs share ideas, review data, and support one another with specific questions and challenges. Finally, the IRIT supervisors provide site-based support through school visits. During these visits, IRITs can receive feedback on lessons, data analysis support and general problem-solving for site-specific challenges.

The project guidelines along with the district's screening process for selecting IRITs and the projects ongoing support and attention to professional development specific to the teaching of at-risk readers led the researcher to hypothesize that this population of teachers would perform better on the TKA than general education teachers have historically performed (Bos et al., 2001; Cunningham et al., 2004; Moats, 1994).

This hypothesis along with two other factors led to the researcher's decision to use purposeful sampling. First, as this study was specifically interested in exploring the knowledge base of intensive reading intervention teachers that serve first grade students the district's IRIT position aligned with the study's target population. Secondly, the researcher serves as an IRIT in this same district. This fact allowed for ease of access for data collection.

All IRITs in the purposeful sample (minus the researcher) were invited to participate in phase one of the study. The study invitation was extended first by email (Appendix F) and then discussed in person at a monthly face-to-face IRIT meeting. At this meeting, the researcher reviewed the documents granting approval from the Institutional Review Board (IRB) at the University of Central Florida (UCF) as well as the district approval letter. These approval documents are found in Appendices B and C. Each potential participant was also given the phase one consent approval letter (Appendix D). In presenting these documents, the researcher reviewed participant expectations for both phases of the study so each IRIT could make an informed decision about participation. Thirty-two teachers (52% of the total study population) consented to participation in phase one of the study. These 32 participants individually completed the paper/pencil TKA assessment (Appendix I). A unique identifier was assigned to each TKA and was matched to each consenting participant. This identifier was only known to the

researcher to ensure participant confidentiality and was used to match participants' scores to

participants' names in order to identify and select participants for phase two of the study.

Phase two selection occurred after participants' scores on the TKA were rank ordered

from lowest percentage of correct answers to highest percentage of correct answers. The

researcher contacted eight potential participants by email (Appendix J) and presented each with a

copy of the informed consent document for phase two (Appendix E). These eight potential

participants represented the four highest scoring participants on the TKA and the four lowest

scoring participants on the TKA. Two of the lowest scoring participants declined participation in

the study so the researcher invited the participants with the next two lowest scores. These two

participants agreed to participate. All four of the highest scoring participants agreed to participate

in the study. When contacting potential participants for phase two of the study, the researcher did

not disclose details about the selection process and participants were not told their score on the

TKA. The TKA scores were known only to the researcher and were not revealed to any of the 32

phase one participants or any of the eight phase two participants during any point of the study.

Instrumentation

To answer the three research questions, this study employed a mostly qualitative

approach. Quantitative data were collected in phase one of the study through the TKA and the

Background Questionnaire. The TKA data were used to guide the selection of phase two

participants. Data were collected for each of the eight participants involved in phase two of the

study using four instruments: a semi-structured interview, a concept map, a videotaped reading

lesson, and a blank, un-scored copy of the TKA. Each of the quantitative and qualitative instruments is discussed in detail in the sections that follow.

Teacher Knowledge Assessment: Language and Print (TKA). The TKA tested teachers' code related knowledge including knowledge of English phonology, orthography, morphology as well as concepts important to literacy acquisition and reading instruction (Piasta et al., 2009). The TKA was adapted from previous surveys of teacher knowledge including validated measures. Developers of the TKA borrowed items from previous teacher knowledge surveys and piloted the borrowed questions with veteran teachers. From the pilot testing, 30 items were retained and four entirely new questions were devised. These four new questions were a combination of multiple-choice and short answers and were intended to more fully assess participants' knowledge of specific reading concepts. The final TKA consisted of 34 multiple-choice items (ex: How many speech sounds are in the word box? Count the number of syllables in the word unbelievable.) and eleven short answer items (ex: List the six syllable types.). The TKA has a reliability of $\alpha = .87$ (Piasta et al., 2009). The full TKA is found in appendix I along with the researcher's correspondence with the first author to secure permission for use of the TKA (Appendix A).

Background Questionnaire. The background questionnaire consisted of several short-answer questions pertaining to participants' experiences, degrees, and certifications. Participants were asked to provide the following information: (a) total years in education; (b) positions held during career in education; (c) total years in current IRIT position; (d) degrees earned; (e)

certifications listed on teaching certificate; (f) National Board status/area of certification. The complete questionnaire can be found in appendix H.

Semi-Structured Interview. According to Gudmunsdottir (1996), "structured interviews that have traditionally been central in social science research are frequently not useful in the exploration of the kind of practical knowledge that shapes what teachers know about teaching and what they do in the classroom" (p. 293). As this study was specifically interested in exploring and understanding teachers' practical knowledge relative to the teaching of at-risk first graders, a semi-structured interview design was appropriate. In an earlier study of practical knowledge pertaining to the teaching of reading comprehension at the high school level, researchers and practicing teachers constructed a semi-structured framework for the interview (Meijer et al., 1999). Given that this study was focused upon beginning reading instruction and at-risk first grade readers, the questions were not useful for the current study.

However, the semi-structured interview design was maintained and questions were guided by the work of van Driel et al. (1998). Based on van Driel et al. (1998), several categories of knowledge emerged from studies of teachers' practical knowledge. These categories included (a) knowledge of subject matter; (b) knowledge of general pedagogy; (c) knowledge of student learning and concepts; (d) knowledge of purposes; (e) knowledge of curriculum and media; (f) knowledge of representations and strategies; and (g) knowledge of context. One standard question was asked for each of the seven categories (Ex: Thinking of subject-matter knowledge...what knowledge learned from research, trainings, etc. do you possess about beginning reading?). Based on the participants' responses to these standard questions, the researcher then probed further. These

probing questions were asked to seek clarification or to encourage elaboration of an idea

presented first by the participant (Ex: You mentioned _____. Could you tell me more about that?"

Or "I am a little confused by _____.Could you tell me more about what you mean?") The

complete interview protocol can be found in Appendix K.

        Concept Map. The field of cognitive psychology helps us to understand that people tend

to store knowledge in a graphic way and in doing so construct mental representations of what

they know (Meijer et al., 1999). The assumption is that these mental representations are related

to teachers' practice. These assumptions support the use of concept mapping as a research

technique for examining "the content and schematic representations of teachers' knowledge"

(Meijer et al., 1999, p. 62). A concept map as a research technique can be used in either a

structured or non-structured manner. If structured, participants are given a pre-determined list of

concepts to be represented in the concept map. If non-structured, participants have more latitude

and can brainstorm original concepts around a general topic of study and then organize these

concepts into a map. The concept mapping activity for this study was completely non-structured.

Participants were given blank paper and were asked to generate concepts related to the teaching

of beginning reading to at-risk readers and to organize these concepts into a map. Once

participants completed their maps, they were asked to explain their maps to the researcher. This

explanation was audio-recorded and then transcribed at a later time. The researcher asked

clarifying and elaborative questions as needed (Ex: Can you tell me more about this part of your

map? OR I am a little confused by what you included here…can you tell me more about this part

of your map?) The researcher did not insert any personal opinion statements or make judgments

about the participants' maps to ensure that the process remained participant driven and not researcher influenced. The protocol for the concept mapping activity can be found in Appendix L.

Videotaped reading lesson. The final piece of data was collected using stimulated recall procedures (Calderhead, 1981). In using stimulated recall methods, participants are presented with authentic stimuli and/or cues in an effort to tap their thoughts about the original situation (Vesterinen, Toom, & Patrikainen, 2010). For this study, each of the eight participants videotaped themselves teaching one typical reading intervention lesson to a small group of at-risk first graders. Participants were given freedom to select the group and the instructional focus for the videotaped lesson. For this activity, the videotape served as the stimuli to enable participants' to "relive the episode to the extent of being able to provide an accurate verbalized account of his original thought processes" (Calderhead, 1981, p. 212). With this goal in mind, each videotaped lesson was viewed jointly by the researcher and the participant. While viewing the video, participants were instructed by the researcher to provide a running commentary about their thoughts that occurred during the actual lesson. Participants were free to stop the videotape at any point during the viewing to elaborate and to provide more detailed comments. While the intent was for participants to drive the stimulated recall process, the researcher did also stop the video to ask clarifying questions in an effort to gain more understanding about the teachers' thought processes. These clarifying questions aligned with the seven categories illuminated in previous studies of teachers' practical knowledge. For example, if the teacher offered little insight into her knowledge of the students taught in this video lesson, the researcher asked

"Thinking about this group of students, what do you know about them as readers?" The complete list of clarifying questions and the complete videotape protocol are found in appendix M.

Blank TKA. A second activity in connection to the videotaped lesson involved the review of a blank copy of the TKA administered in phase one of the study. After watching the video in its entirety, participants were asked to review the TKA questions and then identify any questions that connected to specific content or instruction evident in the videotaped lesson. The purpose of this activity was to explore any potential relationships between participants' practical knowledge, demonstrated in the videotaped reading lesson and participants' formal knowledge as measured by the TKA. The complete protocol for this activity can be found in Appendix N.

Data Collection Procedures

Phase one data collection procedures included completion of the TKA and the background questionnaire with all 32 consenting participants (Appendix G). The TKA was completed by study participants on February 9, 2012 when the teachers of the district intervention project met for a whole-group staff meeting. The paper/pencil TKA was completed individually by each consenting participant and required approximately 30-45 minutes (Appendix I). Along with the TKA, participants completed the background questionnaire (Appendix H). Once both documents were completed and turned in, participation in phase one of this study was complete. Scores on the TKA were not disclosed to any phase one participants so as not to interfere with the phase two selection process and to also show sensitivity towards all participants.

Phase two data were collected for each participant from four sources including a semi-structured interview, a participant created concept map, a videotaped reading lesson and the blank TKA. The data collection procedures for each of these sources are outlined below.

- Participants engaged in a face-to-face interview (Appendix K) that was conducted after student hours at the participants' school site and lasted approximately 1 hour. This interview was audiotaped.

- Participants created a concept map (Appendix L) that captured her knowledge about beginning reading instruction and then explained her map to the researcher. This explanation was audiotaped. The directions for the concept map were provided following the interview and participants completed their maps prior to the second meeting with the researcher. During this second session, each participant explained her map to the researcher and the researcher asked clarifying questions as needed. These discussions were audiotaped.

- Participants videotaped one lesson that captured her typical reading instruction with an at-risk group of first grade readers. The videotaped was played with the participant and researcher jointly viewing the recording (Appendix M). The participant was asked to provide commentary for the lesson so the researcher could capture the participants' thinking.

- After viewing the videotape, participants were presented with a blank copy of the TKA completed during phase one. Scored results on the TKA were not shared with phase two participants during any point of the study. Using only a blank copy of the TKA, participants were asked to share connections between TKA items and the instruction on

the videotape (Appendix N). All discussions were audiotaped. The lesson viewing, lesson

commentary and TKA activity required approximately 90 minutes. These activities

occurred at the participants' school sites after school hours.

Data Analysis

A variety of data analysis procedures were employed to answer the study's research

questions. These procedures are described and discussed for each of the three questions.

Research question one asked, "What is the formal knowledge of intensive reading

intervention teachers teaching at-risk first grade readers?" The results of the TKA administered

to 32 total participants were used to answer this research question. TKA data collected was

entered into SPSS and the results were analyzed to determine the following: total percentage of

items correct per participant rank ordered from lowest to highest, percentage of correct responses

per test item, and percentage of correct responses per content clusters (phonology, phonics,

morphology, comprehension, syllables, and phonetics). In addition to analyzing TKA data for all

phase one participants, TKA data were analyzed for each of the eight participants involved in

phase two of the study. All data is reported in detail in chapter four.

Research question two asked, "What is the practical knowledge of intensive reading

intervention teacher teaching at-risk first grade readers?" The data used to answer this question

included eight interview transcripts, eight transcripts connected to the concept mapping activity,

and eight transcripts connected to participants' videotaped reading lessons and connections to the

un-scored TKA. Prior to any analysis of the data, member checking procedures were employed

(Glesne, 2006). Each participant was given the opportunity to review all of the transcribed notes

from her interview, concept mapping activity and videotaped reading lesson. Participants were invited to review the data to ensure that ideas and thoughts were accurately captured. Only one participant made changes and these edits were minor.

Once participants validated the content of the transcripts, each of the 24 total pieces of qualitative data (three per participant) were analyzed individually and condensed into summaries, resulting in three one-page summaries of key points for each of the eight participants. Each key point was coded according to the seven categories of knowledge (van Driel et al., 1998). Data were also analyzed for any emerging themes beyond the categories outlined by prior studies of teachers' practical knowledge (van Driel et al., 1998). The one-page summaries were then sorted into two groups: data for the four participants that scored lowest on the TKA and data for the four participants that scored the highest on the TKA. These two data sets were then used to answer research question two. Although four participants comprised each of these two groups, the data is reported in chapter four in the form of two people. These two people are fictitious composites of the four participants representing the lowest formal knowledge group and the four participants representing the highest formal knowledge group. Hinchman and Hinchman (1997) provided a rationale for the use of composite narratives describing them as "discourses with a clear, sequential order that connect events in a meaningful way for a definite audience and thus offer insights about the world and/or people's experiences" (p. xvi). Richardson (1990) added another description saying that the narrative is collective account, telling one individual's story using "the experiences of the social category to which the individual belongs, rather than by telling a particular individual's story" (p. 25). Rather than tell the stories of eight individuals, the researcher made a conscious and deliberate decision to collectively represent the four members

of each group (highest formal knowledge and lowest formal knowledge) in the form of two composite narratives. As the researcher was especially interested in understanding the relationships between formal and practical reading knowledge, composite narratives supported this goal. The composite narratives enabled the researcher to collectively represent the knowledge and experiences of the four participants representing the highest formal knowledge group and the lowest formal knowledge group. Not only did these composite stories reflect the similarities and differences existing amongst the participants in the two groups but the use of composite narratives enabled the researcher to respect each individual's right to confidentiality.

Research question three asked, "What is the relationship, if any, between intensive reading intervention teachers' formal and practical knowledge of beginning reading instruction provided to at-risk readers?" In phase two, participants were presented with a blank, un-scored copy of the TKA administered in phase one. In reviewing the blank TKA, participants were asked to share any perceived connections between items on the TKA and their videotaped reading lesson. These data were collected and analyzed using the chart found in Appendix O. This chart provided a column for each TKA item and a column to record participants' perceived connections between the TKA item and evidence in the videotape. By analyzing participants' reflections in connection with the TKA item, the researcher determined the quantity of connections evident between the TKA and the participants' lessons as well as the accuracy of connections between the TKA content and the participants' lessons.

Descriptive data from the background questionnaire was collected from all 32 phase one participants and was entered into SPSS. These descriptive data are reported in chapter four and

provided more contextual background for the 32 phase one participants as well as the

participants included in phase two of the study.

Summary

  This chapter provided a discussion of the research design procedures employed in this

study. It began with an introduction and then detailed specific information about the study

population, sampling techniques, instrumentation, data collection and analysis procedures. The

results of this study are presented in chapter four while chapter five includes the discussion of

these results, the implications for practice and directions for future research.

CHAPTER FOUR: ANALYSIS OF DATA

Introduction

There were two primary goals of this study. The first goal was to describe the formal and practical knowledge of intensive reading intervention teachers (IRITs) that provide beginning reading instruction to at-risk first graders. The second goal was to understand any potential relationships between IRIT's practical knowledge and formal knowledge. The study was conducted in two phases and employed a mostly qualitative approach. Phase one data collection was quantitative, consisting of results from the TKA. These results were used to answer research question one and to guide the selection process of phase two participants.

Phase two data sources were qualitative and consisted of three activities: a semi-structured interview, a participant constructed concept map of beginning reading knowledge, and a stimulated recall activity with a videotaped reading lesson and a blank TKA. These data were used to answer research question two which asked, "What is the practical knowledge of intensive reading intervention teachers teaching at-risk first graders?" Phase two data were analyzed using van Driel's et al. (1998) seven categories including (a) knowledge of subject matter; (b) knowledge of general pedagogy; (c) knowledge of student learning and conceptions; (d) knowledge of purposes; (e) knowledge of curriculum and media; (f) knowledge of representations and strategies; and (g) knowledge of context. These seven categories as well as emerging categories facilitated rich descriptions of two intensive reading intervention teachers' practical knowledge of beginning reading. The two teachers described later in this chapter are

fictitious composites of the four teachers representing the lowest formal knowledge group and the four teachers representing the highest formal knowledge group.

Both phase one data and phase two data were used to answer research question three which asked, "What is the relationship, if any, between intensive reading intervention teachers' formal and practical knowledge of beginning reading provided to at-risk first grade readers? After viewing the videotaped reading lesson, participants were presented with a blank copy of the TKA administered during phase one. The researcher asked participants to re-read each TKA question and then discuss any perceived connections between the content in a given question and evidence presented in the videotape. The data collected from this activity was analyzed to determine the quantity and accuracy of perceived relationships and to determine any potential relationships existing between participants' formal knowledge demonstrated through the TKA and participants' practical knowledge demonstrated through a reading lesson.

Organization of Data Analysis

This chapter continues with a presentation of the descriptive characteristics for all phase one participants and then data are presented for each of the study's three research questions. TKA data for all 32 phase one participants were used to answer research question one. Research question two was answered using data collected through participants' interviews, concept maps and reading lessons and research question three was answered using data collected from the participants' self-identified connections between the TKA content and their reading lesson.

Presentation of Respondents' Descriptive Characteristics

The descriptive characteristics for the 32 phase one participants are summarized below both in narrative and table form. The descriptive information for the eight phase two participants is extracted from the total data set of 32 phase one participants and is discussed at the end of this section.

Phase one of the study included a total of 32 participants and demographic information was collected from all participants. These 32 participants represented 52% of the total number invited to participate in phase one of this study. All 32 participants served in the position of Intensive Reading Intervention Teacher (IRIT) as part of an early intervention project funded within a large school district in the Southeastern United States. Of the 32 participants, 100% were female. Thirty-one of the 32 participants provided ethnicity information. Of those 31 respondents, 22 (71%) were white, 6 (19.4%) were Hispanic, and 3 (9.7%) were either Black or Asian.

The percentages of respondents holding a bachelor's or master's degree were nearly equal. Fifteen respondents (46.9%) held a bachelor's degree as their highest level of education, while 16 respondents (50%) held a master's degree. One respondent (3.1%) held an educational specialist degree. Five respondents (15.6%) held National Board Certification.

Respondents worked for an average of 20.6 years in education, with a standard deviation of 9.4 years. The minimum number of total years of experience was seven, while the maximum total years of experience was 37. Respondents worked in the IRIT position for an average of 4.8 years, with a standard deviation of 2.3 years. The minimum amount of experience in the IRIT position was one month, while the maximum was 10 years of experience.

Table one provides a breakdown of the various types of teaching jobs respondents held prior to becoming an IRIT. Note the percentages exceeded 100% when summed, as respondents often held more than one position. The vast majority of respondents previously held teaching positions in early childhood education (K-3) which was expected given that preference is given to applicants possessing teaching backgrounds in these grades. Other frequent positions included reading resource teachers and coaches, as well as ESE teacher. See Table 1.

Table 1: Frequencies for Types of Previous Teaching Positions

Position	N	%
Early Childhood Ed Teacher (K-3)	22	71.0
Reading Resource	9	29.0
Exceptional Student Education Teacher	6	19.4
Reading Coach	5	16.1
Elementary Education Teacher	4	12.9
ESOL Teacher	4	12.9
Writing Resource	2	6.5
District Resource	1	3.2
General Classroom Teacher	1	3.2
Physical Education Teacher	1	3.2

Table two describes respondents' areas of formal study. Twelve of 32 respondents only provided a level of degree (e.g., BS, MA) and not a field. Therefore, the "% Valid" column addresses percentage frequencies of the remaining 20 respondents who did provide a field. Again, the percentages exceeded 100% when summed as respondents often held multiple degrees. See Table 2.

Table 2: Frequencies for Areas of Study

Area of Study	*N*	% Valid
No Field Given	12	
Elementary Education	10	50.0
Educational Leadership	6	30.0
Early Childhood Education	5	25.0
Reading	5	25.0
Special Education	4	20.0
Curriculum Instruction	1	5.0
History and Politics	1	5.0
Psychology	1	5.0

Note. Valid % represents the percentage of each category within the $N = 20$ who responded with an area of study.

Eight phase one participants were purposely selected to participate in phase two of this study. Four participants represented the lowest formal knowledge group, earning a mean score of 41% on the TKA. Four participants represented the highest formal knowledge group, earning a

mean score of 82.75% on the TKA. Demographic information is presented collectively for the four participants representing each of these subgroups.

Lowest Formal Knowledge group: All four participants (100%) were white and female. Three of the participants (75%) held advanced degrees. Two participants held degrees in Educational Leadership while one held a degree in Reading. None of the participants (0%) were National Board certified teachers. Participants worked for an average of 21.8 years. Positions held prior to becoming an IRIT included ESE teacher, K-3 general education teacher, physical education teacher, reading coach and resource teacher. Participants held the IRIT position for an average of 5.6 years. The minimum number of years of experience as an IRIT was 3.5 years and the maximum number of years of experience was ten.

Highest Formal Knowledge group: All four participants (100%) were white and female. Two of the participants (50%) held advanced degrees in reading. Two of the participants (50%) held National Board Certification with concentrations in literacy/language arts. Participants worked in education for an average of 20.9 years. The minimum number of years of experience was 12 while the maximum number of years was 32.5. Positions held prior to becoming an IRIT included K-3 general education teacher, Primary ELL teacher, reading coach, and reading resource teacher. Participants held the IRIT position for an average of 4.9 years. The minimum number of years of experience as an IRIT was five months and the maximum number of years of experience was eight.

Analysis of the Data

Data for each of the study's three research questions are presented in the following sections.

Research Question One. Research question one asked, "What is the formal knowledge of intensive reading intervention teachers teaching at-risk first grade readers?" Data from the TKA were used to answer this question. The TKA consisted of a total of 45 questions. Thirty-four questions were of a multiple-choice format and 11 of the questions required a short-answer response. Each of the 45 total questions was scored as correct (1 point) or incorrect (0 points). Possible scores for the TKA ranged from 0% to 100%. The minimum score earned was 36%, while the maximum score earned was 91%. In this sample, the mean score achieved was 60.1% with a standard deviation of 13.6%. The median score was 63% and the modal score was 64% with six respondents earning that score.

Item analysis revealed the following findings. Nine of the 45 questions were answered correctly by 80% or more of the respondents. These nine questions assessed participants' knowledge of the following content: phoneme blending, phoneme segmentation, discrimination of long and short vowel sounds, counting syllables, counting speech sounds in words, and the spelling rule for the ck pattern.
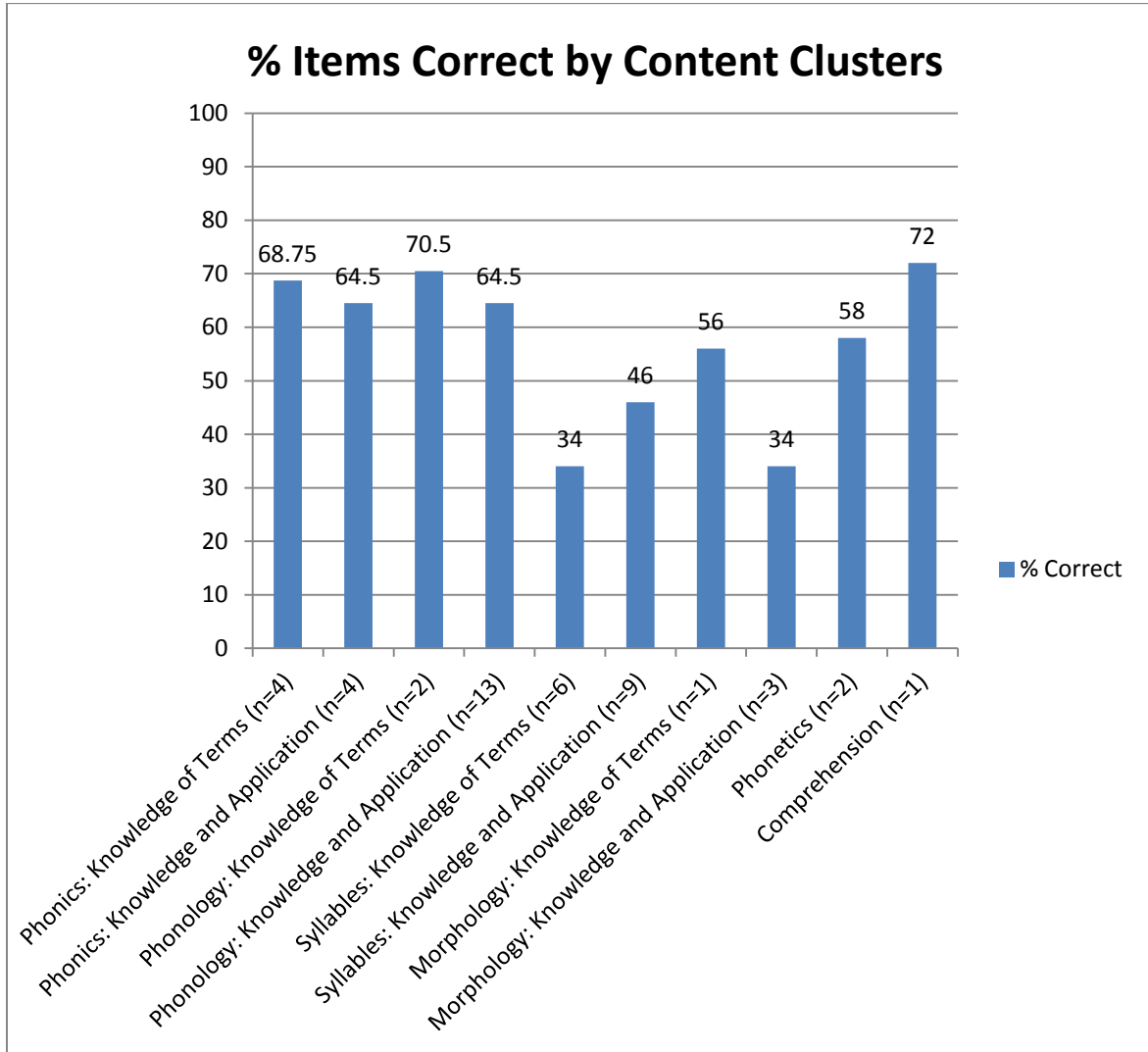
Questions answered incorrectly by 80% or more of the respondents assessed participants' knowledge of the following content: recognition of two distinct sounds for the letter x (/ks/) and the letter combination qu (/kw/), knowledge and application of syllable types including r-controlled, vowel teams, and final stable and phoneme elision (phoneme deletion was the term

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known to participants). A table reporting the percentage of correct and incorrect responses for each individual TKA item can be found in Appendix P.

The original TKA authors coded each test question according to the reading content area (ex: phonics, phonology, etc). These codings are denoted next to each TKA question (Appendix I). For this study, the researcher analyzed the test questions and categorized them differently. Similar to the previous researchers, questions from the TKA were first categorized by the reading content area tested. Six broad categories emerged including phonological awareness, phonics, phonetics, syllables, morphology and comprehension. Then, with four of these six categories (excluding the categories of phonetics and comprehension) questions were further categorized into two groups: questions assessing knowledge of terms specific to the broader reading area and questions assessing knowledge and application of terms/concepts specific to the broader reading area. These new category codings for all 45 TKA questions are noted in the column labeled "question content category" within the document found in Appendix P.

In total, 45 questions represented these seven categories of formal reading knowledge. The categories with the highest percentages of correct answers included phonics, phonology and comprehension (only assessed with one question). The categories with the lowest percentages of correct answers included syllables, morphology, and phonetics. See table three for the complete display of data for each content cluster. Included with the label for the content area is the total number of questions representing a given content cluster (n=total number of TKA items for a specific content cluster).

Table 3: Percentage of TKA Items Correct by Content Cluster

% Items Correct by Content Clusters

Content Cluster	% Correct
Phonics: Knowledge of Terms (n=4)	68.75
Phonics: Knowledge and Application (n=4)	64.5
Phonology: Knowledge of Terms (n=2)	70.5
Phonology: Knowledge and Application (n=13)	64.5
Syllables: Knowledge of Terms (n=6)	34
Syllables: Knowledge and Application (n=9)	46
Morphology: Knowledge of Terms (n=1)	56
Morphology: Knowledge and Application (n=3)	34
Phonetics (n=2)	58
Comprehension (n=1)	72

Research Question Two. Research question two asked "What is the practical knowledge of intensive reading intervention teachers teaching at-risk first grade readers?" As defined in the literature, practical knowledge is "knowledge of teachers" and refers to knowledge known by practicing teachers as a result of their teaching experiences (Fenstermacher, 1994). Practical knowledge is further described as personal, contextual, grounded in experience, tacit,

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content-specific and influential upon teacher practice (Meijer et al., 2001). Despite the personal nature of practical knowledge, some researchers argue that similarities exist across teachers and classrooms (Carter, 1990). This tenet guided this study's selection of participants, data collection and data analysis.

Participants' formal knowledge scores on the TKA were used to select the eight phase two participants. Participants with the lowest four TKA scores and the highest four TKA scores were identified and invited to participate. Two of the lowest scoring participants declined participation so the next two lowest scoring participants were invited and both elected to participate in the study. All four of the highest scoring participants elected to participate in the study. At no point during the research process were these participants told their individual scores on the TKA.

Three pieces of data were collected from all eight participants including a semi-structured interview, a concept map, and a videotaped reading lesson. These data were fully transcribed and included a total of twenty-four pieces of data: eight semi-structured interviews, eight explanations of participants' concept maps, and eight participant reflections of a videotaped reading lesson. Then each of the 24 pieces of data (three per participant) were analyzed and condensed into summaries, resulting in three one-page summaries of key points for each of the eight participants. These one-page summaries were then divided into two groups: data for the four participants that scored the highest on the TKA and data for the four participants that scored the lowest on the TKA. The data set for each of these two groups was then used to answer research question two, "What is intensive reading intervention teachers' practical knowledge teaching at-risk readers?" Although four participants comprised each of these two groups, the

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data for all four group participants were summarized and reported in the form of one fictitious

person. In analyzing the data and constructing the two composite narratives (one for the lowest

formal knowledge group and one for the highest formal knowledge group), the researcher first

identified data consistent with two or more participants in the group. These commonalities

identified amongst several participants in the group framed the bulk of the content within each

composite narrative. However, the researcher also gave careful consideration to any discrepant

date that was unique to one particular individual in the group. If these discrepant data were

important to answering any of the research questions, these data were included in the composite.

As a result, the data conveyed in each of the composite stories is intentionally included in order

to provide a comprehensive description and understanding of the four participants representing

each of the two formal knowledge groups (highest formal knowledge and lowest formal

knowledge).

Hazel King is described first. Hazel is not an actual person but rather she is a composite

of the four participants scoring highest on the TKA test of formal knowledge (**H**ighest formal

Knowledge – **H**azel **K**ing). The mean TKA score for this group of teachers was 82.75%. Lila

Kraft is the second participant described. Lila is also not a real person but rather a composite of

the four participants scoring lowest on the TKA test of formal reading knowledge (**L**owest

formal **K**nowledge - **L**ila **K**raft). The mean TKA score for this group of teachers was 41%. What

follows is a rich description of the Hazel King's practical reading knowledge and then Lila

Kraft's practical reading knowledge. The practical knowledge descriptions for these two teachers

(Hazel King and Lila Kraft) are intentionally detailed and highly specific. The researcher felt this

level of specificity was important and necessary to better illuminate the similarities and the

differences in each teacher's practical reading knowledge given that the two teachers differed

significantly in their formal knowledge of reading as tested by the TKA. The data for each

composite (Hazel King and Lila Kraft) is first presented in a table format and then a narrative

follows.

Table 4: Summary of Data for Hazel King

Hazel King (Composite for Four Highest Scoring Participants on the TKA)	
Descriptive Characteristics	• 15 years of teaching experience • Has worked as an IRIT for the past 4.5 years • BS in elementary education, MA in reading education • Holds National Board Certification in language arts/literacy and holds an ESOL endorsement • Scored 82.75% on the TKA
Subject-Matter Knowledge and Knowledge of Instructional Strategies	
Phonological Awareness	• Defined as sound work • Includes auditory discrimination tasks • Includes blending and segmenting (words, syllables and sounds) • Includes rhyming • Includes manipulation tasks such as deletions or additions (syllable, onset/rime, and sounds) • She teaches phonemes connected to graphemes • Two primary strategies: elkonin boxes and stretch and blend
Phonetics	• Proper sound production (position in mouth, placement of teeth, presence of air/vibration) • Teacher must model sounds in a pure form
Phonics	• Knowledge of letter/sound correspondences • Blend sounds represented by letters • Includes consonants, consonant blends, consonant digraphs, long and short vowel patterns, vowel digraphs, vowel teams, schwa sound, inflectional endings • Described all six syllable types (closed, open, vowel teams, vce, r-controlled, final stable) as an essential decoding strategy • Teaches high utility consonants and a short vowel sound early to facilitate reading/writing of words.

Hazel King (Composite for Four Highest Scoring Participants on the TKA)	
Phonics (continued)	• Strategies: explicit instruction of letter sounds using multisensory techniques; use of color to code patterns in words, blending using "stretch sounds" or continuous sounds. • Importance of decodable text to reinforce phonic elements
Fluency	• Speed, accuracy, prosody • Serves as a bridge to comprehension • Automaticity • Strategies: timed readings, sight word phrases, pin lights to push eyes forward, teacher-student conferences
Vocabulary	• Oral language and reading vocabulary • Word meanings, context clues, word categories/classification, synonyms, antonyms, word roots • Strategies include conversation, meaning based, visual representations of words, use of cognates, actions to "act out" words
Comprehension	• Visualizing, questioning, predicting, rereading, summarizing, determining importance, making connections and synthesizing • Goal of all reading instruction
Knowledge of Pedagogy	
General aspects of teaching	• Planning, classroom management • Positive, immediate corrective feedback • Student engagement • Teacher modeling • Use of explicit teacher language • Scaffolded instruction through the gradual release model (I do, we do, you do) • Assessment • Deep knowledge of instructional materials
Knowledge of Student Learning and Knowledge of Purposes	
Characteristics of at-risk readers	• Tend to learn at a slower rate • Require lots of opportunities to learn new skills • Require repetition • May have attention and/or emotional issues • Require close monitoring of progress
Purposes of Instruction	• Bolster students' confidence • Risk-free learning environment • Support students in reaching their fullest potential • Help students to develop authentic love of reading • Help students use what they know, apply learning to all contexts

Hazel King (Composite for Four Highest Scoring Participants on the TKA)	
Knowledge of Texts, Curriculum Materials	
Materials	• Early Interventions in Reading (research-based) • Supplement as needed • Match curriculum to students' needs
Texts	• Balance and variety • Blend of decodable phonics readers, leveled readers and authentic texts
Knowledge of Context	
External factors that inform teacher knowledge	• School level: scheduling, allocation of resources, presence of collaborative conversations between colleagues, alignment of classroom/intervention instruction • District level: IRIT program guidelines, district reading guidelines (use of Reader's Workshop model) • State level: testing demands
Emerging Category	
Personal passions, beliefs	• Passionate about subject-matter, content

Hazel King has 15 years of teaching experience. She has worked as an IRIT, providing intensive reading intervention instruction, for the past 4.5 years. Hazel earned a BS in elementary education and a MA in reading education. She also earned National Board Certification in the area of language arts and holds an ESOL endorsement. Prior to becoming an IRIT, Hazel taught first and second grades and worked as a reading resource teacher, providing small group reading instruction to at-risk readers and providing reading focused professional development to fellow colleagues. Hazel scored 82.75% on the TKA test of formal knowledge.

Hazel's reading knowledge was uncovered through a variety of data collection activities including the interview, concept map, and video. Each of these data pieces contributed unique insight into her collective reading knowledge while also providing evidence of her knowledge

across varying contexts, thus deepening the researchers' understanding of her practical knowledge base.

When asked about subject-matter knowledge, Hazel was asked to consider content knowledge specific to the subject of reading. Hazel tended to discuss her subject-matter knowledge of beginning reading connected to her knowledge of instructional strategies so that is how her knowledge is represented here. Subject-matter knowledge and knowledge of representations and strategies are discussed together.

Hazel shared her reading knowledge relative to the five areas of reading outlined by the research of the NRP (2000). She highlighted comprehension, defined as the construction of meaning, as the goal of all reading instruction. In achieving this goal, she went on to discuss the importance of providing beginning readers with a strong foundation in phonological awareness and phonics. She defined phonological awareness as sound work including auditory discrimination tasks, blending and segmenting tasks at the sentence, syllable and sound level, rhyming activities, manipulation tasks such as sound deletions and/or additions at the syllable level and sound level, and sound isolation. During the discussion of sounds, Hazel emphasized the importance of proper sound production. The teacher, she said, must model those sounds "purely and correctly" (Participant G, interview). The children, in turn, must have opportunities to hear the sound and feel the sound in their mouth. Teaching children the sound's "position in the mouth, the placement of the teeth and tongue, and the presence of air" is vitally important (Participant E, interview). In addition to sound production, Hazel shared the importance of sound instruction connected to letters (graphemes). Although she knows phonological awareness refers to auditory tasks, she has found that "teaching explicit sounds in tandem with letter names"

contributes to students' learning (Participant E, interview). In teaching letter sounds together with letter names, many students readily learn both. However, if students are struggling, Hazel emphasized the importance of sound knowledge above letter name knowledge. She has found that if students know letter sounds, they can still decode words even if they lack knowledge of the letter names.

Hazel highlighted two instructional strategies important for the development of phonemic awareness, and the emphasis on discreet sounds. She discussed elkonin boxes (boxes or squares drawn on paper or white board, with each box representing a syllable or phoneme in a word depending on the level of segmentation being taught) and stretch and blend. Elkonin boxes used with manipulatives such as chips or cubes enable students to "assign a sound to a cube and they have a much easier time" (Participant G, interview). She finds elkonin boxes to be versatile in that they can be used across the phonological spectrum, from onset/rime blending and segmenting, to phoneme blending and segmenting, to phoneme deletion, and phoneme manipulation. Hazel also described the use of elkonin boxes with letters. Students may first segment and blend phonemes using manipulatives and then represent the sounds with letter(s)/letter combinations. Using this instructional strategy in this way provided further evidence of Hazel's attention to connected, rather than isolated skill instruction.

Stretch and blend is an instructional strategy outlined in Early Interventions in Reading (EIR). This is one research-based curriculum provided to IRITs for use with struggling first grade readers. The stretch and blend strategy teaches students to raise one finger for each sound heard in a word. After stretching each of the phonemes, the teacher provides a cue for the students to blend the sounds together. Hazel emphasized this strategy for developing students'

phonemic awareness and students' encoding skills. Students first stretch a word and represent each sound with a finger, then blend the word and then Hazel often has students write the word. For instance, "when we stretch truck, we hear four sounds but when we write truck we see five letters. You can see the light bulb go on! They will say the letter combination ck stands for the /k/ sound" (Participant C, interview). This example provides evidence of how Hazel uses an instructional strategy (stretch and blend) to demonstrate her subject-matter knowledge in the areas phonemic awareness and phonics.

Hazel next described her knowledge of phonics. She defined phonics as knowledge of letter/sound correspondences and the ability to blend sounds represented by letters. In expanding on letter/sound knowledge, Hazel listed knowledge of consonants, consonant blends, consonant digraphs, knowledge of vowel sounds including long and short sounds, vowel digraphs, vowel teams, and the schwa sound. She discussed affixes, including inflectional endings, prefixes, and suffixes. She then discussed syllable types including closed, open, vowel teams, magic e (vce), bossy-r (r-controlled), consonant + le (final stable), and knowledge of accented vs. unaccented syllables connected to the schwa sound. She shared the importance of first introducing several high-utility consonants such as s, t, m, n along with a short vowel sound so that students could immediately apply their letter/sound knowledge to make and read words such as mat, sam, or tan. After securing a solid foundation in cvc pattern words, Hazel tends to introduce digraphs, blends and the magic-e pattern. Explicit letter/sound instruction within the context of the six syllable types is one strategy that aids her students' decoding. Hazel also cited the importance of other strategies beyond a reliance on phonics/syllable work including the use of semantic cues, word syntax, rereading, reading ahead, picture clues, chunking, and decoding by analogy. For

Hazel, the goal with all of these decoding strategies is "balance and integration" as high word accuracy provides "greater opportunity for creating meaning" (Participant E, interview and concept map).

Hazel discussed several phonics strategies including explicit instruction of letter sounds/letter combinations in a multisensory fashion (hear the sound, engage in word play with the target sound, feel the sound in the mouth, display a visual chart representing the letter/sound correspondence that children can access on their own, incorporate orthography by having the children write the letter/letters in conjunction with the sound, use the letter sounds to read and write words). Hazel also discussed the importance of color to highlight patterns in words (ex: vowels red, consonants blue). When first teaching a new phonics pattern, Hazel will code the word with the students but over time the goal is for the children to independently recognize and apply knowledge of these patterns to read new words. Along with recognizing phonics patterns, Hazel discussed blending techniques to aid her early readers. The first sounds she explicitly teaches include what she calls the "stretch sounds" (Participant E, interview and concept map). These are the sounds that can be held out longer without distorting the sound (ex: a, s, m, o, r). Hazel has found that teaching students to hold sounds longer and move fluidly to the next "stretch" sound actually improves their ability to blend those stretch sounds together (ssssssaaaaammm…sam). Lastly, Hazel shared the importance of using decodable texts that reinforce the target letter/sound correspondence and that provide students with immediate practice in applying knowledge of the letter/sound correspondence.

For the area of fluency, Hazel discussed a number of aspects that contribute to fluent reading. She knows that fluency encompasses speed, accuracy, prosody, expression and phrasing

and each of these components support comprehension. Hazel also discussed the importance of "automaticity" at the skill level, sentence level, and text level (Participant D, interview and concept map). At the skill level, the goal is for students to be automatic in their knowledge of letter names or sounds. At the sentence and text levels, this includes automaticity with most words. Automaticity coupled with all aspects of fluent reading "serves as a bridge to reading comprehension" (Participant E, interview and concept map).

Instructional strategies supportive of fluency development include text or passage re-readings, timed readings, the use of sight word phrases, the use of pin lights to encourage students to move their eyes ahead through text, and the use of teacher-student conferences to discuss students' strengths and areas of focus for improvement.

When discussing subject-matter knowledge for the area of vocabulary, Hazel differentiated between listening vocabulary/oral language and reading vocabulary. She generally referred to both as knowledge of word meanings, use of context clues, knowledge of word categories and word classification, knowledge of synonyms, antonyms, word roots, and base words but expanded more extensively on the importance of oral language as it relates to beginning reading instruction. "I believe that the true secret to filling the gap between a struggling learner and a nearly effortless learner is the quality and quantity of a child's oral vocabulary" (Participant D, interview).

She defined oral vocabulary as words held in children's speaking and listening vocabulary. She has found that children's oral vocabularies are primarily developed through conversation and by hearing books read aloud. Hazel has observed firsthand how students' oral vocabulary either supports or impedes their reading progress. Hazel shared this example. "If a

student comes to a word they don't know, and they just make the first two sounds and the word is in their oral vocabulary, they will more likely read the word" (Participant D, interview and concept map). A child's oral vocabulary helps students make approximations for unknown words when used in tandem with sound knowledge and decoding. In addition, children's oral vocabularies are related to children's schema or background knowledge which in turn aids comprehension.

Hazel discussed three instructional strategies for increasing students' vocabulary, oral or reading. She exposes students to meaningful vocabulary instruction through multisensory experiences. She uses pictures and other visual representations for the word. She asks students to use the word in conversation and in writing. Students "act out" the word. For English Language Learners, she attempts to connect the English word to a word in the students' native language. Vocabulary instruction, according to Hazel, must provide multiple opportunities to use the word in a variety of contexts so that the students' "own the word" (Participant G, interview).

For the area of comprehension, Hazel referred to the following strategies: visualizing, questioning, predicting, rereading, summarizing, determining importance, making connections and synthesizing. These are "really just good thinking strategies" because they are applicable to all content areas (Participant E, interview and concept map). Comprehension is the goal of all Hazel's reading instruction. "We want them (readers) to get meaning from text and have a sense of story and not just call words" (Participant E, interview).

Knowledge of pedagogy, or of general aspects of teaching, is another category of van Driel's et al. (1998) knowledge framework. Hazel discussed a number of practices important to teaching including planning, classroom management, positive, corrective and immediate

feedback, well-paced instruction, high levels of student engagement, teacher modeling, the use of explicit and clear teacher language, the use of the gradual release of responsibility model ("I do, we do, you do), the use of "well-fitted" assessment, and knowledge of instructional materials (Participant G, interview and concept map; Participant C, interview and concept map).

Data representing Hazel's knowledge of student learning and concepts and knowledge of purposes are reported together. In thinking about how beginning readers learn to read, particularly those at risk, Hazel discussed several common trends. She said that at-risk readers tend to learn at a slower rate, require a lot of opportunities to learn new skills, require significant amounts of repetition, may have attention issues and/or emotional issues, require immediate feedback and explicit instruction, require close progress monitoring and need opportunities to apply knowledge in new contexts. Hazel's general knowledge of student learning then aligns with her purposes for instruction. She feels it is imperative to bolster students' confidence by providing opportunities for them to experience success in a risk-free learning environment. In attending to these affective areas of student growth, Hazel's academic goals are for students to reach their own fullest potential, to use what they know, to develop an authentic love of reading and "to read for meaning so that they can cross that threshold of it (a story) just being about decoding and recognizing sight words into actually lifting a message off the page" (Participant G, interview).

Curriculum knowledge refers to knowledge of texts, curriculum materials, instructional resources or any curricular materials supportive of beginning reading instruction. Hazel utilizes a variety of resources. The district program directs her to use a research-based program such as Early Interventions in Reading but she supplements with other resources as needed (ex: Project

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Read materials, Creating Strategic Readers, Words their Way, FCRR center binders, LiPS program). She adheres to a consistent lesson design and consistent instructional strategies but does not rely solely on one specific program. "I am not just following along a prescribed curriculum because if that were the case, if teacher knowledge wasn't valuable and important, than anyone could just come in and follow the script and implement" (Participant E, interview). In order to do this, she must know all of her programs well and she must "take what she has and match it up to kids' needs. Teaching is a science and an art. We have all of these instructional materials but you have to be able to pick out what is really going to help drive what you are trying to teach and will meet the kids where they are" (Participant E, interview).

Hazel also gives consideration to the texts that she uses with her beginning readers. She knows they need access to a variety of texts and specifically discussed the importance of non-fiction and some student choice. She knows that phonics readers have a place in beginning reading instruction as they build students' confidence as they are learning and applying new decoding skills. Whatever texts kids are reading, text levels are important. Hazel has found that "beginning readers need texts at their level, within their 'zone of proximal development.' that support their development and do not frustrate them" (Participant G, interview). In thinking about text levels, Hazel recognizes that there are many factors that influence text levels including "the number of words on the page, whether they are multi-syllable words, words with inflectional endings, also the story content, and (the students') background knowledge" (Participant E, interview).

Knowledge of context refers to knowledge of external factors such as educational policies or district guidelines that inform teacher knowledge. Hazel discussed factors at three levels:

school, district and national. At the school level, reading instruction is impacted by scheduling, the allocation of resources within the school building, the quantity and quality of collaborative conversations between the classroom teacher and the reading intervention teacher, and the level of alignment between the classroom instruction and the intervention instruction.

Hazel spoke about the importance of the Reader's Workshop Model. She stated that she has seen her intervention students make the most progress when they have "strong teachers" which she defined as teachers "who are very good about having the 90 minute reading block (as required by the state and district) truly dedicated to reading and with all of those reader's workshop components including read alouds" (Participant C, interview). Hazel is also guided by her knowledge of early intervention as important for getting readers off to a good start. This knowledge comes from the district's emphasis on early intervention through district programs as well as the state's emphasis on early intervention through Reading First grants.

Hazel expressed concern about the overemphasis on testing. District and state testing impact her schedule and interrupt her time with her kids as she often serves as a test proctor. Hazel further expressed concerns about the impact of testing on kids' desire to read. She fears we are creating a generation of children who are able to read but do not want to read because they associate reading with a comprehension article and answering questions so they can "pass those tests" (Participant E, interview).

Several pieces of data emerged that did not fit into one of van Driel's et al. (1998) knowledge categories. These data spoke to Hazel's personal belief systems and to her passions. She shared that she regularly seeks out new knowledge whether through the attainment of advanced degrees, participating in district workshops, participating in webinars, reading

professional materials, joining professional networks and leading professional development within and/or outside of her own school building. In addition, Hazel expressed several personal passions about certain aspects of reading instruction. For instance, she feels "linguistics is fascinating" and "vocabulary is everything" (Participant C, interview; Participant D, interview). While personal beliefs, this data may provide some insight into understanding Hazel's formal and practical reading knowledge.

The data presented above reflects information shared through the face-to-face interview and the concept map. The videotaped reading lesson also contributed data specific to Hazel's enactment of her practical reading knowledge. Hazel's lesson included four first grader readers identified at the beginning of the school year as at-risk. This lesson took place in May and the students were reading at grade level. Hazel shared that the students now possessed and applied multiple strategies for solving unknown words. They had a solid understanding of various syllable types (such as open, closed, bossy-r) within one syllable words but needed more practice with using these patterns to solve multisyllabic words. They also needed additional practice in flexing vowel sounds in words containing a schwa (Participant E, videotaped lesson). Hazel's lesson included attention to phonological awareness, phonics, encoding, oral language, and comprehension. The phonological awareness activity required students to attend to parts in words and to distinct sounds in words. The phonics portion of the lesson was dedicated to a review of previously taught phonics patterns and the use of new elements to decode multisyllabic words. The focus of the phonological awareness activity was connected to the skills reinforced during the phonics portion of the lesson. When reviewing phonics sounds, Hazel helped students to differentiate difficult sounds such as /w/ and /wh/ by correctly modeling both sounds and

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asking "did you feel a lot of air or a little bit of air" (Participant D, videotaped lesson)? She did

the same with the voiced and unvoiced sounds for "th" by instructing students to look at her

mouth and watch the placement of her tongue and to listen for vibration (Participant D,

videotaped lesson).

Students used their knowledge of phonics patterns and syllable types to both read and

spell words independently. Students used their knowledge of syllable types to sort words by

common patterns: open syllables, closed syllables, bossy-r syllables. Hazel also used different

colors to bring attention to specific patterns in the words the students were decoding. For

instance, in the word wagon, she coded the a and o in red and then the students suggested she

divide between the g and the o. They pronounced the word wag/on but recognized that it didn't

sound right. Hazel called attention to the anchor chart dedicated to the schwa sound and students

then flexed the sound for the o in the "on" syllable so that the word sounded right (Participant G,

videotaped lesson). Hazel also capitalized on opportunities to extend spelling beyond that

outlined in the EIR program. For instance, while practicing the all/al patterns, the program

expected the students to spell small. Hazel had the students do this and then asked them to

change the word to smaller. She then discussed the meaning of the word with the addition of the

er suffix (Participant D, videotaped lesson).

Hazel supported students as they all independently read the text at their own pace. She

would first ask students what they noticed about the word. If students became stuck, she

provided more support by modeling the reading for the student. Then she asked students to do it

with her and finally observed the readers do it on their own. After supporting the students with a

particular word, she asked "What strategies did you use with that word" (Participant E,

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videotaped lesson)? The students shared a number of different strategies: "I chunked it and then I went back to see if it made sense!" and "It is an open syllable" (Participant E, videotaped lesson; Participant G, videotaped lesson). Hazel also supported accurate decoding by prompting students with clues about tricky sounds. For instance, when a student struggled with the sound for "er" she pounded her fist into her hand and said "er says…" (Participant E, videotaped lesson). The student instantly said /er/. When another student demonstrated difficulty with the short e sound, Hazel called attention to her mouth: "Do you feel the corners of your mouth (when you say /e/)" (Participant G, videotaped lesson)?

Hazel embedded vocabulary throughout the lesson by discussing words that she expected might be unfamiliar to the students. These vocabulary words were explained as they related to the context of the story.

Hazel attended to comprehension in two ways. First, she modeled how to make a personal connection to the text by sharing what she was thinking about while she read the story. She also had the students use text-based evidence to determine essential details in the story (Participant C, videotaped lesson; Participant E, videotaped lesson).

In summary, Hazel King demonstrated strong formal knowledge on the TKA as she answered 82.75% of the TKA questions correctly. She also demonstrated strong practical knowledge of beginning reading. She communicated a deep understanding of subject-matter knowledge not only in conversation but in her teaching. Her subject-matter knowledge informed her use of sound instructional strategies, her knowledge of her students and her curriculum knowledge. Lila Kraft (composite for the lowest formal knowledge group) demonstrated lower

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formal knowledge on the TKA than Hazel. Lila answered 41% of the TKA questions correctly. Lila's practical knowledge of reading is presented next.

Lila Kraft has been teaching for 20 years and has worked as an IRIT for the past five years. She has taught kindergarten and first graders in the general education and exceptional education settings. She holds a BS in elementary education and a MA in Educational Leadership. She scored 41% correct on the TKA test of formal reading knowledge.

Lila's reading knowledge was uncovered through a variety of data collection activities including an interview, concept map, and video. Each of these three data pieces contributed unique insight into her collective reading knowledge while also providing evidence of her knowledge across varying contexts, thus deepening the researchers' understanding of her practical knowledge base.

Table 5: Summary of Data for Lila Kraft

Lila Kraft (Composite for Four Highest Scoring Participants on the TKA)	
Lila's Descriptive Characteristics	• 20 years of teaching experience • Has worked as an IRIT for the past five years • BS in elementary education, MA in educational leadership • Scored 41% on the TKA
Subject-Matter Knowledge and Knowledge of Instructional Strategies	
Phonological Awareness	• Defined as sound work but also discussed use of letters as part of phonological awareness • Rhyming • Blending • Segmenting • Manipulation • Sound isolation • Differentiating sounds • Strategies: Elkonin boxes, elbow phones, stretch and blend

Lila Kraft (Composite for Four Highest Scoring Participants on the TKA)	
Phonetics	• Importance of proper sound production
Phonics	• Knowledge of letter/sound correspondences • Discussed consonants, consonant blends, word endings, word families, short vowels, long vowels, vce, sight words. • Teaches high utility consonants and a short vowel sound early to facilitate reading/writing of words. • Strategies: blending using "stretch sounds" or continuous sounds, phonics checkers
Fluency	• Speed, accuracy, prosody, punctuation, and sight words • Serves as a bridge to comprehension • Strategies: choral reading, timed readings, variety of texts, push cards to push eyes forward
Vocabulary	• Spoke mostly of oral language • Strategies included conversation, use of pictures, realia, word meanings, categorizing words, relating words to personal experiences
Comprehension	• Metacognition, asking questions, determining importance, schema, visualizing, summarizing, synthesizing, making connections, predictions • Strategies: story retells, graphic organizers
Knowledge of Pedagogy	
General aspects of teaching	• Proper screening • Modeling • Consistency of instruction • Scaffolded instruction through the Gradual Release of Responsibility • Knowledge of children's developmental learning stages • Positive learning environment
Knowledge of Student Learning and Knowledge of Purposes	
Characteristics of at-risk readers	• Impact of students' home lives/environment • Lack of prior knowledge • Students' physical needs • May have attention issues
Purposes of Instruction	• Develop avid readers • Risk-free learning environment • Provide students with learning strategies • Set personal learning goals

Lila Kraft (Composite for Four Highest Scoring Participants on the TKA)	
Knowledge of Texts, Curriculum Materials	
Materials	• Early Interventions in Reading (research-based) • Supplement as needed to add variety and interest
Texts	• Balance and variety • Blend of decodable phonics readers, leveled readers and authentic texts
Knowledge of Context	
External factors that inform teacher knowledge	• School level: relationships with other teachers and administration. • District level: program guidelines, district reading guidelines (use of Reader's Workshop model) • State level: testing demands, RtI practices, • Out-of-school factors: social ills, school/family partnership
Emerging Category	
Passions, beliefs	• Passionate about out-of-school factors (poverty, community supports for families in need) • Importance of home-school connection

Lila, like Hazel, was familiar with the five elements of reading as outlined by the NRP report (2000). Her subject-matter knowledge in these five areas is discussed in connection with her knowledge of instructional strategies for teaching specific skills.

For the area of phonological awareness, Lila first said "it is all about sounds" (Participant H, interview). She elaborated that this includes rhyming, blending, segmenting, sound manipulation, isolation of sounds, differentiation of sounds. Although she defined phonological awareness as a focus on sounds, she did also include letter name and sound knowledge as part of phonological awareness (Participant F, interview and concept map). She used the terms phonemic awareness and phonological awareness interchangeably. Lila also shared the following as an example of phonemic awareness. "As it comes to phonemic awareness, I think you also see

language. If I ask a student a question, such as 'what lives in the ocean?' one might say a fish, one says a shark and you would be surprised but one student may say "people" (Participant B, interview and concept map).

Instructional strategies Lila uses to develop phonological awareness include elkonin boxes, rhyming games, elbow phones and the stretch and blend routine included in the EIR program. Elkonin boxes are "very helpful for children because they know that chip moves to that particular area" (Participant H, interview). The elbow phones are made from a piece of PVC elbow pipe. The children put the phones to their ears and to their mouth just like a real telephone. The phone amplifies sounds for children so they can hear them more clearly. Lila also discussed the stretch and blend routine from EIR that emphasizes the holding of sounds. Lila described it as "singing the sounds" and has found that this routine helps her students blend sounds together (Participant F, interview).

Lila related the area of phonics to decoding. Lila knows that students must understand that "letters and sounds match up and fit together, letters become words, and words become sentences" (Participant F, interview). Her subject-matter knowledge of phonics included knowledge of consonants and consonant blends, word endings, word families, knowledge of short vowels, long vowels, the silent e rule, sight words, and cueing strategies. She also mentioned the letter combinations of ow, ou, and oi. She expressed the importance of modeling sounds correctly and if students distort sounds (saying /tuh/ instead of /t/), errors must be corrected immediately. She also has teaches letters and sounds simultaneously. Also during the discussion of phonics, Lila differentiated between sight words and high frequency words. She defined sight words as those "more decodable words" and high frequency words as those "that

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don't follow a pattern. The ones you see more often in text are those high frequency words" (Participant F, interview and concept map).

For the area of phonics, Lila discussed the following instructional strategies. She uses a phonics checkers game that includes several levels of difficulty. At the easiest level, the game board includes single letters. At the most difficult level, the game board includes more complex patterns such as digraphs, three letter blends, endings, and the schwa. She differentiates the game for different learners by requiring different responses. For instance, one student may only be asked to provide the name of the letter and the letter sound. Other students may be asked to provide the letter name, sound and then write a simple word with the target letter. She says she relies on cueing strategies for decoding instruction. She will ask students, "Does the word look right? Does the word sound right? Does the word make sense?" (Participant F, interview and concept map). She also encourages students to look at the picture, chunk words and self-correct. She also cited word work with the emphasis on beginning sounds, then beginning and ending sounds and finally beginning, middle and ending sounds.

For the area of fluency, Lila discussed rate, accuracy, phrasing, expression, knowledge of punctuation, and sight words. She knows that fluent reading aids comprehension and is developed through modeled examples, activities that promote the pushing of readers' eyes forward (push cards), rereading, choral reading, timed readings, and exposure to a variety of texts such as poetry and plays. She monitors fluency with timed assessments that measure words correct per minute (Participant A, interview and concept map; Participant H, interview).

Lila discussed vocabulary primarily related to oral language. "Language concerns are a huge impediment to reading" (Participant B, interview and concept map). She knows that oral

language development begins at home when parents read to children, provide experiences for children and talk to them. Lila build students' oral language and reading vocabulary by showing pictures and other realia, discussing word meanings, relating words to students' personal experiences and categorizing words (Participant A, interview and concept map).

For Lila, comprehension includes metacognition, asking questions, determining importance, inferring, schema, visualizing, summarizing, synthesizing, making connections, and making predictions with story retelling being an important goal for young readers. She has found that comprehension instruction helps to build prior knowledge and is done through graphic organizers and story retells using pictures.

Knowledge of pedagogy refers to knowledge of general aspects of teaching, not specific to one content area. Lila knows the importance of proper screening to identify students' needs and to plan instruction. She discussed modeling, consistency of instruction, scaffolding (I do, We do, You do), knowledge of children's developmental learning stages, a positive learning environment and the use of specific praise.

Knowledge of student learning includes knowledge of how at-risk readers learn. Lila first discussed the impact of students' home lives on how students' learn. She discussed the fact that many children enter school lacking literacy experiences and consequently, they lack prior knowledge. "You have to work very hard with it and zone in on that (prior knowledge)" (Participant A, interview). She also discussed knowledge of students' physical needs. She considers daily, "Have they eaten or have they slept?" (Participant B, interview and concept map). Additionally, at-risk learners may have attention or focus issues. Specific to her instruction, Lila discussed the importance of explicit teaching where her language is clear and

where content has been broken into small, manageable chunks. Along with this, repetition supports her students' learning. Lastly, Lila discussed knowledge of students' learning styles such as visual, auditory, tactile and kinesthetic learning approaches.

Knowledge of purposes of instruction relates to goals for student learning. Lila wants students to be avid readers who enjoy a variety of genres and experience reading success in a risk-free learning environment. She feels that providing students with learning strategies are critical to building success. While she holds general goals for all students, she also has personal goals for individual students based on students' unique needs.

Curriculum knowledge refers to knowledge of texts, curriculum materials, instructional resources or any curricular materials supportive of beginning reading instruction. Lila discussed the merits of the EIR program including how it teaches phonics in a way that breaks the skills down. She uses the EIR decodable texts to reinforce the target phonics skills and sight words and to build students' confidence, but these texts alone she feels are not enough. Students need access to texts with varied vocabulary and different text structures so "they don't freeze when there isn't a picture or a cvc word that we just decoded in our lesson" (Participant F, interview). The incorporation of other texts also allows for integration of all the cueing strategies. Lila strives to embed other activities into her instruction and draws from other resources.

Knowledge of context refers to knowledge of external factors such as educational policies or district guidelines that inform and/or guide how a teacher may proceed in the classroom. Lila shared examples from the school, district, state and national levels that impact her reading instruction. First, at the school level, Lila is impacted by relationships with fellow teachers and with her principal. Having worked for several principals, some have closely monitored and

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directed her work and others have left her alone "to do what she knows to do" (Participant A, interview). She appreciates "having the freedom to do what I know and not be questioned" (Participant A, interview). With regards to fellow teachers, Lila has experienced teachers who have questioned what she is doing with the students.

At the district level, Lila discussed guidelines from the reading department. Teachers are expected to implement a 90 minute reading block that incorporates the reader's workshop components. She believes this model to be vital to kids' progress and must be provided by classroom teachers. Lila shared that if teachers fail to provide guided reading instruction (one component of the reader's workshop model) students do not have an opportunity to transfer the skills taught and learned during intervention. Another district policy is that of the intervention project. IRITs must use a program from a list of acceptable options. Most IRITs utilize EIR with first grade readers. Lila understands that the project set forth these guidelines to ensure consistency and fidelity of implementation but she feels restricted. "I have the reading knowledge" and she feels she should have more autonomy in deciding what students need (Participant A, interview).

At the state level, Lila discussed the impact of state legislation guiding Response to Intervention (RtI) practices. She feels that RtI practices may be delaying the identification of students with language disabilities and these practices frustrate her. Also coming from the state are standards and benchmarks for performance. While she appreciates guidelines for expected growth, she doesn't always feel that these are realistic and they fail to consider students' maturity and developmental milestones. Lila also expressed concerns over the amount of testing mandated by the state and district. She feels these practices "waste a lot of time. Time we could spend

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teaching them to read is spent prepping them for a test or assessing them 500 times a year. Every time we turn around we are asking them to do something else, whether it is the art, music, PE, SAT…there is just so much wasted time that could be spent teaching kids to read" (Participant F, interview).

Lastly, Lila discussed out of school factors such as the community and children's families. Lila says that the education of children does not happen solely within the school walls. She cites our nation's social ills (poverty, homelessness, lack of prenatal care) as factors that impact what she does and can accomplish in the classroom (Participant A, interview; Participant B, interview). She also discussed the school/family partnership. Parents, she feels, should also be held accountable for a child's education and schools have a responsibility to partner with families.

The data presented above reflects information shared through the face-to-face interview and the concept map. The videotaped reading lesson also contributed data specific to Lila's enactment of her practical reading knowledge. Lila delivered a lesson from the EIR program. She followed the lesson as prescribed and did not delete or add any new instructional routines beyond those called for in the lesson. Lila's lesson included attention to phonological awareness, phonics, encoding, and text reading. At the sound level, Lila had the students discriminate long and short vowel sounds by providing a word and asking for the vowel sound heard in the word. The teacher asked "what vowel sound would that be of a?" (Participant B, videotaped lesson). The students responded with the words "long a" or "short a". There was attention to naming the vowel but the students were not consistently expected to produce the correct sound as intended with the EIR lesson routine.

Phonics instruction was incorporated into several activities. Students chorally and individually produced sounds for single letters and letter combinations. Most of the sounds were accurately produced with the exception of the /wh/ and the /tch/ sounds. Lila also added an extra /u/ sound to several of the consonant sounds. Another phonics activity involved the decoding of words. Lila showed the words as presented in the EIR presentation book and asked for individual students to read each word. She affirmed correct responses by saying "yes, the word is _____." EIR codes parts of words with dots and lines and the teacher can use these marks to draw students' attention to patterns in words. Lila did not consistently point to the word parts as outlined in the EIR presentation book. For instance, the word chuck had three sounds. EIR denoted this by placing a dot under the letters that represent each sound. The word shows a dot under the ch digraph, a dot under the letter u, and a dot under the ck digraph. Lila asked a student to read the word while she pointed to the dot under the ch and then swept her finger under the "uck" portion of the word. A similar observation was made with the word called. In the EIR presentation book, there is a dot under the c, the "all" pattern and the ed ending. Lila moved her finger under the c, then the a, then the ll, then the ed. She did say "I chunked it wrong" as she watched the video (Participant B, videotaped lesson).

During the encoding portion of the lesson, Lila said the word and then instructed the students to "stretch and blend" the word before they spelled it. She anticipated difficulty with the word tops because of the s ending so she stretched this word with the students first before asking them to spell it. Students had spelling errors on the word hitter and dishes. The teacher supported the correction of these errors by stretching the word slowly with the child. For the word hitter, the teacher stretched the word as follows: /h/i/t/t/er. She made two separate t sounds even though

these two t's represent only one sound in the word. She did not discuss the base word (hit), the doubling of the consonant with the addition of the er suffix or how the suffix changed the meaning of the word. The word "dishes" was also difficult for the students to spell. Lila noticed that the students spelled the word "dishis". To support the correction for this word, the teacher stretched the sounds for the students but continued to pronounce the "es" suffix as "is". She repeated the ending several times and prompted the students by saying "it isn't i, but…" The students finally changed the ending to es. As Lila watched the video she did say "I wasn't saying that correctly" (Participant B, videotaped lesson).

During text reading, the books were distributed and the children first read on their own. Then the teacher asked each student to read two pages aloud for the entire group. The teacher encouraged the use of one strategy, stretch and blend, to support their text reading. The book's meaning was not discussed during this lesson.

Lila Kraft and Hazel King differed significantly from one another in their formal knowledge of reading as measured on the TKA (41% correct vs. 82.75% correct). Their practical knowledge of reading was similar in some ways but quite different in others. Subject-matter knowledge accounted for a significant portion of those differences. Less subject-matter knowledge impacted Lila's use of instructional strategies in her teaching and her responses to students' learning. These differences are more fully discussed in chapter five.

Research Question Three. Research question three asked "What is the relationship, if any, between intensive reading intervention teachers' formal and practical knowledge of beginning reading provided to at-risk first grade readers?" To answer this question, participants were presented with a blank copy of the TKA after jointly viewing the videotaped lesson with the researcher. The researcher asked participants to review each of the multiple choice questions (1-34) from the TKA and to note any connections between the content of the question and evidence presented in the lesson. The researcher recorded the participants' responses and then analyzed them for both accuracy of the response and the quantity of accurate connections (Appendix O).

Data for the four participants collectively represented as Hazel King are presented first. Hazel presented a teacher-created lesson focused on the use of syllable patterns to read multisyllabic words. After reading the book, the students explored multisyllabic words taken primarily from the text through an auditory discrimination task and then a closed word sort activity. The students used their knowledge of word patterns to find open, closed and bossy-r syllable types. Beyond the syllable work, her lesson also included attention to phonological awareness, encoding, and comprehension.

After we viewed the videotaped lesson, Hazel reviewed each question on the TKA and denoted accurate connections between 18 TKA items and her lesson. When a question's content did not specifically relate to the lesson at hand, Hazel readily shared examples of how she has addressed that particular skill/content in other lessons. Several times, Hazel even reflected on the question content and discussed how she could have incorporated the skill/content into the current lesson. For instance, question 28 of the TKA focused on the counting of syllables. Hazel said, "I

could have told them the syllables, like in bigger and said take out the er and change it to est. Now blend the syllables together" (Participant E, videotaped lesson). She went on to discuss how these suffixes changed the word's meaning. This reflection revealed her knowledge of syllables, suffixes, and morphology as well as her ability to reflect on her instruction. These examples of reflection prompted by the content of the TKA were not evident from Lila Kraft (composite representation for the lowest formal knowledge group).

Data for the four participants collectively represented as Lila Kraft are presented next. She presented a reading lesson from the EIR reading program and shared accurate connections to four questions on the TKA. The four questions generating accurate connections focused on the following content: identification of a short vowel sound or a long vowel sound in a vce pattern, counting of phonemes in words, segmentation of phonemes, and use of the ck spelling pattern. After reviewing the TKA, Lila shared this reflection: "If I had it in here (the EIR teacher's manual) that these are blends and digraphs, then I will be apt to review what they are. I skip a lot of this (referring to the EIR teacher's manual). I don't see the importance of it. I just don't. Maybe if I had to write it in my lesson plan, I would see the importance of it" (Participant A, videotaped lesson). She went on to say "I don't use words like this with my kids. I think I learned to read without knowing what a diphthong is" (Participant F, videotaped lesson). Unlike Hazel, Lila did not offer any additional insights to questions beyond those she identified as connecting to her immediate lesson. She also did not offer any specific reflections for how she could have adjusted her instruction.

Summary

This chapter was dedicated to the presentation of the data collected in connection with each of the three research questions. It began with a review of the study's purpose. Descriptive characteristics were provided for all phase one participants as well as the eight phase two participants. Then data were presented for each of the three research questions. Chapter five includes a discussion of the study's findings, implications of these findings and avenues for future research.

CHAPTER FIVE: FINDINGS, CONCLUSIONS, AND IMPLICATIONS

Introduction

This chapter begins with a brief summary of the study including a review of the problem, the three research questions, the literature framing the study, and the population explored. Then, the chapter continues with a discussion of the study's findings, the implications of those findings and areas for future research.

Summary of the Study

In the area of reading, researchers have had particular difficulty with the construct of teacher knowledge (Reutzel et al., 2011). Issues include the absence of an accepted theoretical model of teacher knowledge development, disagreements over what teacher knowledge is essential for effective reading instruction, difficulties in creating valid and reliable assessments to measure essential teacher knowledge, and challenges in linking teacher knowledge to students' literacy gains. A thorough review of the literature was presented in chapter two. The literature review was organized around several broad categories including beginning reading instruction differentiated into characteristics of core reading instruction as well as characteristics of effective reading intervention instruction; teacher effectiveness research; teacher knowledge research; and at-risk readers. This study was situated within the existing literature and was guided by three research questions: 1) What is the formal knowledge of intensive reading intervention teachers teaching at-risk first grade readers? 2) What is the practical knowledge of intensive reading intervention teachers teaching at-risk first grade readers? 3) What is the

relationship, if any, between intensive reading intervention teachers' formal and practical knowledge of beginning reading provided to at-risk first grade readers? To answer these questions, data were collected in two phases from a purposeful sample of intensive reading intervention teachers in a large, urban school district in the southeast United States. In drawing from this sample, one purpose of this study was to describe the formal and practical knowledge of intensive reading intervention teachers related to beginning reading instruction with at-risk first graders. A second goal of this study was to determine any potential relationships between intensive reading intervention teachers' formal knowledge of reading and their practical knowledge of reading.

Summary of Findings

Formal reading knowledge was measured by the TKA. The TKA was completed by 32 intensive reading intervention teachers during phase one of the study. The mean score achieved on the TKA was 60.1%. The TKA data were used to answer research question one and to guide selection of the eight phase two participants.

Practical knowledge was measured using three data collection activities: face-to-face interview, concept mapping activity, videotaped reading lesson. Data were collected and analyzed for eight participants (the four consenting participants scoring lowest on the TKA and the four consenting participants scoring highest on the TKA). Hazel King and Lila Kraft are two fictitious participants created to reflect each of the two groups of participants in this study. **H**azel **K**ing (**H**ighest formal **K**nowledge) is a composite of the four participants who scored highest on the TKA test of formal knowledge. She answered 82.75% of the questions correctly. **L**ila **K**raft

(**L**owest formal **K**nowledge) is a composite of the four consenting participants who scored

lowest on the TKA test of formal knowledge. She answered 41% of the questions correctly.

While these two teachers did share some similarities in their practical knowledge of beginning

reading, they also differed significantly, especially in the category of subject-matter knowledge.

These differences were revealed during the face-face interviews and were also evident through

the teachers' videotaped lessons. These similarities and differences are summarized below in

both in table form and in narrative form.

Table 6: Summary of Similarities and Differences between Hazel King and Lila Kraft

Knowledge Category	Notable Similarities	Notable Differences
Subject-Matter Knowledge		
Five categories of National Reading Panel Report	• Shared an awareness of the "Fab Five" and the National Reading Panel Report	• Hazel demonstrated more depth of knowledge specifically in the areas of phonological awareness and phonics.
Phonological Awareness	• Both understood the relationship to sounds • Both were familiar with two research-based strategies (elkonin boxes and stretch and blend)	• Lila did not differentiate between phonological awareness vs. phonemic awareness. • Hazel provided more specific examples of how she adapts elkonin boxes to fit students' phonological needs.
Phonics	• Both understood phonics to be the teaching of letter/sound correspondences. • Both discussed the importance of teaching phonemes and graphemes together.	• Lila spoke mostly of simple phonics elements including CVC and vce.

Knowledge Category	Notable Similarities	Notable Differences
Phonics (continued)	• Both discussed the importance of multi-sensory learning experiences connected to phonics instruction.	• Hazel's phonics knowledge was more extensive (knowledge of simple and complex elements along with syllable types and the schwa) • Only Hazel demonstrated evidence of this practice in her lesson (used color to differentiate sounds and phonics patterns)
Phonetics	• Both discussed the importance of proper sound production.	• Hazel provided evidence in her lesson of proper sound production (coached students on sound formation in the mouth, presence of air). Lila distorted several sounds and made two sounds incorrectly (/wh/ and /tch/).
Decoding Strategies	• Both discussed the importance of multiple reading strategies.	• Evidence of this teaching was more prevalent in Hazel's teaching. Her subject-matter knowledge helped her to be strategic as she coached students during decoding work.
Fluency	• Both agreed that fluency includes rate, accuracy, and prosody. • Shared similar strategies (timed readings, pushing eyes forward)	
Vocabulary	• Both agreed on the importance of oral language.	• Provided more examples for teaching reading vocabulary and discussed the importance of cognates with English Language learners.

Knowledge Category	Notable Similarities	Notable Differences
Comprehension	• Agreed that comprehension refers to the construction of meaning and is the goal of all reading.	• Hazel provided more concrete examples of how she integrates all the reading components as she facilitates comprehension. Lila portrayed the components as more isolated rather than integrated towards a greater goal.
Knowledge of Pedagogy		
General aspects of teaching	• Both Hazel and Lila agreed on the use of modeling, assessments to guide teaching, scaffolded instruction (I do, We do, You do) and the use of clear language.	• Hazel also discussed planning, the use of immediate, corrective feedback, student engagement, and the importance of extensive curriculum knowledge.
Knowledge of Student Learning and Purposes of Instruction		
Characteristics of At-Risk Learners	• Agreed on potential for attention issues. • Agreed that learners need lots of repetition and a risk-free learning environment. • Both want readers to be confident and love reading.	
Knowledge of Texts, Curriculum and Materials		
Texts	• Both teachers agreed that students need access to a variety of texts (decodable, leveled readers, authentic texts)	
Curriculum	• Both Hazel and Lila agreed that EIR provides comprehensive decoding instruction.	• Hazel described her adaptations to the curriculum based on students' need. Lila described her adaptations mostly because of the monotony of the program

Knowledge Category	Notable Similarities	Notable Differences
Knowledge of Context		
District Level	• Both guided by district guidelines (IRIT, reading department) • Both support the use of the use of the Reader's Workshop model as directed by the district.	
State Level	• Agreed that there is too much testing.	

Hazel King and Lila Kraft possessed some similarities in their knowledge of the five areas of reading and both could talk about general characteristics of each component of reading. Hazel and Lila differed however in their depth of knowledge, specifically in the areas of phonological awareness and phonics. Both teachers understood that phonological awareness relates to sounds in words but Hazel displayed a deeper understanding of the phonological spectrum from rhyming to the syllable level to the phoneme level. While both teachers had knowledge of elkonin boxes as an instructional strategy, Hazel shared specific examples of how she adapts this strategy to fit the goals of her lesson and to meet the needs of her students.

Both teachers understood phonics to be the teaching of letter/sound correspondences but Lila spoke mostly of simple phonics elements and patterns such as single consonants or consonant blends within cvc words and long vowels within vce words. Hazel had knowledge of both simple and complex phonic patterns such as vowel teams, schwa sounds, and r-controlled patterns and possessed knowledge of syllable types as one decoding strategy. This was particularly evident in the decoding of multisyllabic words. Hazel's video provided evidence of how she explicitly teaches syllable types but also how uses her knowledge of syllable types to

support students in the decoding of unfamiliar words. Both Hazel and Lila shared the importance of other reading strategies such as chunking, rereading and use of picture clues but Hazel's subject-matter knowledge aided her decision-making as she supported readers' use of strategies when decoding new words. A deeper understanding of phonics patterns helped Hazel be strategic in guiding students in their decoding work. Both teachers discussed the importance of multisensory methods but Hazel gave concrete examples of multisensory phonics instruction and provided evidence of this strategy during her video. For example, she used different colors to code phonics patterns in words and to differentiate syllables in multisyllabic words. Hazel has found that color helps students to readily identify and internalize phonics patterns in words.

Related to phonics knowledge, both teachers discussed the importance of teaching letter sounds and letter names simultaneously. Hazel, representing the highest formal knowledge group, extended upon this and discussed the importance of decoding instruction in tandem with encoding. Both teachers discussed the importance of teaching sounds accurately and correctly but Hazel provided more specific examples than Lila of how she models and reinforces correct sound production (tongue and teeth placement, presence of absence of air, vibration in throat, etc). Lila's video revealed some of her errors with sound production.

Both Hazel and Lila agreed that fluency, including rate, accuracy, and expression, aids comprehension. Both teachers utilize strategies that help students learn to push their eyes forward as this practice contributes to more fluent reading. Hazel and Lila agreed about the importance of oral language development and they develop students' language by categorizing words, showing pictures and discussing word meanings. Only Hazel discussed the importance of cognates when working with English language learners.

While both teachers discussed comprehension and the goal of meaning construction, Hazel made more explicit connections than Lila with regards to comprehension instruction. Hazel emphasized that phonological awareness, phonics, fluency, and vocabulary must not be viewed as isolated components. Rather, she knows that development of these areas supports text comprehension which is the goal for all of her reading instruction.

In terms of pedagogy, Hazel and Lila agreed on the importance of modeling, the use of assessment to guide instruction, scaffolded instruction through the Gradual Release of Responsibility, and the use of clear and explicit teacher language. Hazel, unlike Lila, also discussed several additional pedagogical practices vital to her teaching: planning, the use of immediate corrective feedback, high levels of student engagement and developing an extensive knowledge of curriculum materials.

In discussing student learning and purposes of instruction, Hazel and Lila have both observed some learning characteristics often common with at-risk learners. Students may have attention issues and need a significant amount of repetition in a risk-free learning environment to learn new skills. Both teachers want students to become confident readers who love reading.

In terms of curriculum knowledge, both Hazel and Lila agreed that students must have access to a variety of texts. The level one EIR program is a comprehensive program with a significant amount of attention given to decoding instruction. The lessons utilize decodable, phonics readers that include a high number of words containing a target phonics element. Both Hazel and Lila agreed that these decodable readers build students' confidence and cement their learning of phonics patterns but feel they also need exposure to other types of texts. Also related to curriculum knowledge, is the teacher's personal beliefs about a particular product. Both

teachers' like EIR for the purpose of decoding instruction as it teaches students to systematically look through words but both teachers make adaptations to the program. Hazel makes adjustments in the delivery of the content when she knows of a better way to impart the skills to her students. Lila shared that she makes adaptations because she finds the repetition monotonous and therefore adds activities to add interest and variety.

Both Hazel and Lila shared similar context knowledge. Both expressed concerns about the amount of testing required of schools. State mandated assessments along with district mandated tests interrupt her instruction at different points during the year. Both teachers knowledge base is influenced by district reading guidelines. The district prescribes the use of the Reader's Workshop model across all elementary reading classrooms. Both teachers discussed the importance of this model to all students' reading growth but especially for at-risk readers. Hazel and Lila see the components of the reader's workshop model as essential for students to receive comprehensive reading instruction with ample opportunities for authentic reading practice. Both teachers also adhere to the district program guidelines which recommend the use of EIR as a research-based intervention for at-risk readers.

The videotaped reading lessons provided valuable insight into how Hazel and Lila enact their reading knowledge into instruction with at-risk first grade readers. While both teachers attended to the same reading components (phonological awareness, phonics, encoding, text reading, comprehension) there were distinct differences in how students' learning was supported. First, Lila demonstrated several errors in her teaching. These errors most likely stemmed from errors in her subject-matter knowledge related to phonology and morphology. Secondly, Hazel's depth of subject-matter knowledge enabled her to accurately support and deepen students'

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decoding and spelling skills. Her knowledge of morphology supported her teaching around the "er" suffix. Her knowledge of the schwa sound supported the students as they decoded the words wagon, parade, and Kamara. Her knowledge of syllable types reinforced the students' decoding of multisyllabic words and led to her explicit teaching of these skills to her students. Although there were opportunities to reinforce syllable patterns within Lila's lesson, no attention was given to syllable types as a decoding strategy. Hazel's students clearly articulated patterns they observed in words such as bossy-r and open syllables and applied a wider range of strategies such as chunking, rereading, blending, and decoding by analogy. Hazel also attended to comprehension in a more explicit manner. Hazel's interview and concept map underscored the importance of comprehension where she reinforced that all instruction, even at the skill level, must be grounded in meaning. "Does that make sense" was a question posed repeatedly to the students during the lesson. She devoted more time to students' understanding of the story than was evident in Lila's lesson.

Summary and Discussion of Major Findings

Research question one asked, "What is the formal knowledge of intensive reading intervention teachers teaching at-risk first grade readers?" Analysis of this question yielded three major findings.

1. The intensive reading intervention teachers in this study's sample differed in their formal knowledge of beginning reading concepts as measured by the percentage of items answered correctly on the TKA.

2. Collectively, the intensive reading intervention teachers in this sample demonstrated more formal knowledge in the areas of phonology and phonics as measured by specific test items on the TKA.

3. Collectively, the intensive reading intervention teachers in this study's sample demonstrated less formal knowledge in the areas of syllable types and morphology as measured by specific test items on the TKA.

The literature on teacher knowledge specific to beginning reading instruction has shown that many general elementary education teachers lack knowledge of language and literacy concepts deemed important for early reading instruction (Bos et al., 2001; Moats, 1994; Moats & Lyon, 1996). The TKA data collected from the sample of intensive reading intervention teachers used in this study seems to converge with the findings of previous studies. For instance, the study conducted by Bos et al. (2001) found that the mean score on their *Teacher Knowledge Assessment: Structure and Language* was 68% for in-service teachers. The mean score on the TKA administered during phase one of this study was 60.1%. The mean results on the TKA used in this study differed little from previous investigations of teachers' knowledge. Participants in the present study did however perform better than samples of teachers studied previously with regards to several specific reading areas. In the present study, the majority of participants (80% or better) correctly answered the questions assessing their knowledge of phoneme blending, phoneme segmentation, discrimination of long and short vowel sounds, counting syllables, counting speech sounds in words, and the spelling rule for the ck pattern. Moats (1994) previously cited the counting of speech sounds in words and knowledge of the ck spelling pattern as unfamiliar content to many teachers (known by less than 45% of teachers surveyed).

While the TKA results in this study indicate that this sample of intensive reading intervention teachers may have more knowledge of some reading skills, weaknesses in other areas were also identified. For instance, only 20% of this study's participants correctly answered questions related to the following concepts: the recognition of two distinct sounds represented by the letter x and the letters qu, knowledge and application of all six syllable types but especially knowledge of the r-controlled, vowel team, and final stable syllable types and phoneme elision (phoneme deletion is the term known to participants.). Additionally, less than half of this study's participants correctly answered questions assessing their knowledge of morphology. These findings are consistent with Moats (1994) earlier study which indicated a lack of knowledge specific to the sound of x, morpheme structures, and the six syllable types.

Several important factors led the researcher to expect this study's sample of intensive reading intervention teachers to earn a mean score on the TKA that exceeded 60%. First, the school district that participated in this study was a recipient of Reading First grant monies between the years of 2003-2009. A significant amount of professional development, targeting the essential components of reading instruction, was offered and taken by a large percentage of the district's teachers. These district trainings may have had some impact on the knowledge base of intensive reading intervention teachers included in this study given that the participants performed better on the TKA in the areas of phonology and phonics. However, as a whole this same sample of participants still did poorly in the areas of morphology and syllable types. Morphology and syllable types were definitely an emphasis during the district-wide professional development sessions yet this sample of teachers did not score well on these TKA items.

Secondly, previous studies of teacher knowledge have not specifically explored the knowledge of base of intensive reading intervention teachers. To be an IRIT, a teacher must pass a district screening and be admitted to the IRIT pool before he/she can seek an IRIT position at a district school. Additionally, IRITs work solely with at-risk readers who some researchers suggest need the most expert reading teachers (Allington, 2002). The mean years of IRIT experience for the teachers included in phase one of this study was 4.8 years and the mean years of total teaching experience in education was 20.6 years. Therefore, the participants who took the TKA were generally an experienced group, both as educators and specifically as teachers of intensive reading instruction. Despite the presence of these factors, this study's results of teacher's formal knowledge of reading concepts did not differ significantly from the results of previous studies of general education elementary teachers' formal reading knowledge (Bos et al., 2001; Cunningham et al., 2004; Moats, 1994).

Analysis of research question two yielded four important findings related to intensive reading intervention teachers' practical knowledge of reading.

1. The intensive reading intervention teachers in this study's sample shared some similarities and differences in their practical knowledge of reading with subject-matter knowledge accounting for most of the differences.

2. Some of the intensive reading intervention teachers in this sample had gaps in subject-matter knowledge that impacted their use of instructional strategies and purposes of instruction.

3. The intensive reading intervention teachers in this sample tended not to use formal terminology as is represented in the literature.

4. With this sample of intensive reading intervention teachers, personal beliefs and passions were reflected in some teachers' practical knowledge of reading.

Given that most previous studies of teacher knowledge have focused solely on the measurement of teachers' formal knowledge through paper/pencil instruments, this study attempted to uncover teachers' practical reading knowledge. Fenstermacher (1994) defined practical knowledge as "knowledge of teachers" meaning knowledge produced and known primarily by practicing teachers. Despite the personal nature of practical knowledge, some researchers argue that similarities do exist across teachers and classrooms (Carter, 1990). Results from this study support this one assertion and may make the case for further investigations into teachers' practical knowledge.

Hazel King (composite for the Highest formal Knowledge group) and Lila Kraft (composite for the Lowest formal Knowledge group) shared some similarities in their practical knowledge of reading. These similarities were evident across all seven categories of knowledge used to analyze the data for question two. Not only did the participants share some common practical knowledge in comparison with one another but much of Hazel and Lila's common knowledge was consistent with the literature on effective reading instruction and effective reading interventions. For instance, both Hazel and Lila had general knowledge of the five categories of reading as cited by the NRP report (2000). In discussing these five categories, both teachers emphasized the importance of a firm foundation in the areas of phonological awareness and phonics which is consistent with prior research (Adams, 1990; NRP, 2000; Spear-Swerling, 2007). Hazel and Lila also shared common knowledge of instructional strategies and practices supportive of phonological awareness and phonics instruction such as phoneme segmentation

tasks using elkonin boxes, the attachment of letters to phonemes during phonemic instruction, and the use of manipulatives such as magnetic letters. These practices mirror those outlined by the NRP (2000).

Hazel and Lila, despite differing amounts of formal reading knowledge, shared similar knowledge of effective teaching practices such as the importance of modeling and scaffolding, the use of clear teacher language, the importance of authentic reading experiences and the use of assessment that drives instruction which are consistently cited in the literature on effective reading instruction (Allington, 2000, 2002; Leslie & Allen, 1999; NRP, 2000; Snow et al., 1998; Pressley et al., 2001; Wharton-McDonald et al., 1998).

Despite the presence of similarities in Hazel and Lila's practical knowledge, there were some marked differences as well. Hazel, representing the highest formal knowledge group had far greater depth in the area of subject-matter knowledge. Lila, representing the lowest formal knowledge group communicated far less subject-matter knowledge during the face-to-face interview, constructed a concept map with less specificity and depth related to subject-matter knowledge and her teaching video revealed less explicit teaching and even some inaccuracies stemming from gaps in subject-matter knowledge. These findings seem to converge with the body of studies that argue the importance of teachers' possessing a specialized body of knowledge about language and literacy concepts (Snow et al., 2005; Moats, 1994, 1999, 2000; Moats & Lyon, 1996). Hazel and Lila's videotaped reading lessons perhaps provided the most compelling evidence in favor of this specialized body of subject-matter knowledge given that instruction was less explicit and in some cases inaccurate. For instance, both Hazel and Lila shared with the researcher that their daily instruction is grounded in EIR, a prescribed program

with significant amounts of instructor support. Despite using the same curriculum, instruction was enacted differently based on the teachers' depth of subject-matter knowledge. As an example, both Hazel and Lila engaged students in spelling activities utilizing target phonics elements. However, Hazel deepened the instruction and learning by calling explicit attention to features of the word such as how the addition of a word ending changed the meaning of the word or she guided students to the identification of patterns across words (closed or vce syllables). The teachers' subject-matter knowledge seems to account for these differences. In a contrasting example, Lila helped a student to spell the word correctly (hitter) thus accomplishing the task in the EIR manual but in doing so modeled inaccurate knowledge of phonemes vs. graphemes when she produced two /t/ sounds because of the presence of two letter t's in the middle of the word. A gap in Lila's subject-matter knowledge seems to explain this error.

Another interesting implication of subject-matter knowledge was reflected in Hazel and Lila's knowledge of instructional strategies and purposes of instruction. For instance, both teachers were aware of sound segmentation as a phonemic activity but gaps in subject-matter knowledge led to the inefficient use of this technique as a research-based instructional strategy (NRP, 2000). Lila lacked a firm understanding of phonemes connected to graphemes and as a result she did not slide her finger under the appropriate graphemes for each phoneme which hindered students' decoding and led to some errors in students' responses.

Data suggested that Hazel and Lila's purposes for instruction were guided by their knowledge of student learning as well as subject-matter knowledge. Hazel (composite representing the highest formal knowledge group) articulated students' needs and then planned instruction to those needs. Lila (composite representing the low formal knowledge group)

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demonstrated less alignment between her assessments of the students' needs and the content of the lesson. For instance, Lila shared that the students in the video were stronger with decoding yet she delivered a lesson dedicated to simple phonics elements including the decoding of cvc words. The students made few errors during the lesson which one would expect based on her assessment of their needs. Deeper subject-matter knowledge may have improved her ability to assess the relevance of the lesson for the students' needs. Hazel's lesson was more tightly aligned to students' needs than was Lila's lesson. Knowledge of subject-matter as well as knowledge of student learning appeared to inform both teachers' purposes of instruction.

Another finding specific to teachers' practical knowledge related to the use of formal terminology. Neither Hazel nor Lila tended to use formal terms as is represented in the academic literature. Given Hazel's strong performance on the TKA which is heavy with formal terminology, one might have expected her to use this language in everyday conversation. However, the converse was true. Hazel used more common terms such as sound for phoneme, deletion rather than elision, stretch rather than segment, and "flex the vowel" rather than schwa. Lila also used more common terms for those concepts most familiar. This is an important finding related to the teaching of this content to pre-service and in-service teachers. The results from this study coupled with results from earlier studies reinforce the assertion that specialized subject-matter knowledge is important for reading teachers. It seems equally important to provide teachers with practical terminology for sophisticated terms and provide opportunities to develop a deep conceptual understanding of the content.

A final finding emerging from the analysis of teachers' practical knowledge was the role of teachers' personal beliefs. One earlier study investigated teachers' beliefs in relation to their

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formal knowledge of reading concepts (Bos et al., 2001). In this study, researchers surveyed teachers' theoretical orientations towards reading (explicit, code-based or implicit, meaning-based). While this study did not specifically gather data on participants' beliefs, they emerged nonetheless. Overall, both Hazel and Lila expressed positive feelings towards EIR which aligns with a more code-based theoretical orientation. At the same time, both Hazel and Lila expressed a need for authentic reading experiences that occur in the general education classroom through a rich reader's workshop model. The call for authentic reading and writing experiences and a student-managed learning environment aligns more with a meaning-based theoretical orientation. Support for both seems to converge with findings from the studies conducted during the "best practices" or "balanced literacy" era of reading research (Allington, 2002; Foorman & Torgeson, 2001; Fountas & Pinnell, 1996; Morrow & Gambrell, 2000; Wharton-McDonald et al., 1998).

Hazel and Lila were passionate about different aspects of teaching and learning. Hazel (composite for the Highest formal Knowledge group) expressed a passion for subject-matter knowledge. She specifically shared her passion for words and the structure of our language. Lila (composite for the Lowest formal Knowledge group) spoke passionately about external factors such as community partnerships, the importance of quality early childhood experiences, means to meet students' basic needs because of the impact these factors have on academic learning. These findings led the researcher to wonder if one's passions drive one's learning or does one's learning drive one's passions? Whatever the answer, how do we spark all teachers' passion for deep subject-matter knowledge? This is an area that deserves more attention.

Analysis of research question three yielded three primary findings related to the relationship between intensive reading intervention teachers' formal and practical reading knowledge.

1. Intensive reading intervention teachers in this study's sample demonstrating more formal knowledge of reading concepts on the TKA also demonstrated more evidence of these concepts within their instruction provided to at-risk first grade readers.

2. Intensive reading intervention teachers in this study's sample demonstrating less formal knowledge of reading concepts on the TKA demonstrated less evidence of these skills/concepts and within reading instruction provided to at-risk first grade readers.

3. Intensive reading intervention teachers in this study's sample demonstrating less formal knowledge on the TKA accurately calibrated their knowledge of the concepts tested on the TKA but did not equate their score to their teaching efficacy.

At the onset of this study, the researcher hypothesized that teachers' may possess and enact practical knowledge of reading concepts despite lacking formal knowledge of these concepts as measured on a paper/pencil instrument such as the TKA. The results from this study seem to suggest exactly the opposite. The teachers in this study who demonstrated more formal knowledge of reading concepts (collectively represented as Hazel King) identified a significantly greater number of accurate connections between the videotaped lesson and the content of the TKA. Additionally, when no evidence existed between a TKA question and the lesson at hand, Hazel was able to provide a specific example of how she would teach that skill in other lessons. On the contrary, the teachers in the lowest formal knowledge group (collectively represented as Lila Kraft) articulated significantly fewer connections between the TKA and the videotaped

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lesson and did not readily provide examples from other lessons. This finding aligns with the results from an earlier study of teacher knowledge and primary reading instruction (Piasta et al., 2009). In this earlier study, analysis revealed a positive interaction between teachers' formal knowledge and their explicit decoding instruction. The results from the current study support these earlier findings as a relationship was evident between teachers' formal knowledge of reading concepts and how they enacted this knowledge in every day instruction.

Another interesting factor explored in earlier studies is that of knowledge calibration. Research suggests that teachers do not accurately calibrate their own knowledge of reading concepts (Cunningham et al., 2004; Spear-Swerling et al., 2005). In other words, they tend to overestimate their knowledge in certain areas. While this study did not formally measure teachers' perceptions through a perception survey, this data emerged. Despite receiving no scores indicating how well they did on the TKA, all four participants representing the lowest formal knowledge group (collectively represented as Lila Kraft) said that they did not do well. However, they also seemed to dismiss the content saying that they don't use these terms with their students therefore implying that they weren't important to know. Another said that if these terms were in the EIR teacher's guide, she would be more apt to use them (Participant A, videotaped lesson). However, many of the terms and concepts are explicitly included in the manual. Despite recognizing that each did poorly on the TKA, all the teachers in the lowest formal knowledge group demonstrated confidence in their ability to teach reading with at-risk students.

Summary of Contributions to the Literature

This study added several significant contributions to the literature on teacher knowledge

and beginning reading instruction. First, the study was unique in its focus on intensive reading intervention teachers, thus contributing new findings related to a specialized group of teachers. Secondly, this study contributed descriptions of teachers' practical knowledge with regards to beginning reading instruction. These descriptions are relatively absent in the current literature on teacher knowledge. Thirdly, the results from this study support earlier findings in favor of a specialized body of subject-matter knowledge, especially related to beginning reading skills and concepts. The TKA included questions representative of these important areas of beginning reading (ex: phonics, phonology, phonetics). Based on these areas of reading, the original TKA authors coded each question according to the specific area of reading (ex: phonics, morphology, etc). These codings are noted in parentheses following each question/question stem within the original TKA document (Appendix I). As the current researcher analyzed the content of each question, it became clear that the questions could be analyzed more specifically into two categories within each of these broad reading areas: questions testing just knowledge of terms and questions testing knowledge and application of terms/concepts. The researcher felt this was an important distinction to bring to light in the analysis because it appears that knowledge of terms alone is insufficient. Rather, knowledge that supports application of these terms/concepts into everyday practical situations seems paramount. This more specific analysis of the TKA questions taken together with the analysis of teachers' formal and practical knowledge conducted during phase two of the study contributed insight into the relationships between teachers' formal reading knowledge and practical reading knowledge. These relationships are currently under-researched in the area of beginning reading.

Practical Implications

This design of the current study was guided by one key assertion: "the debate about teacher quality has shifted from a focus on which teacher qualities matter to a contemporary focus on how much and under what conditions teachers' knowledge enacted in classroom instruction affects student performance" (Reutzel et al., 2011, p. 186). The results from this study strengthen this claim. This study uncovered an important relationship between teachers' formal reading knowledge and practical knowledge as enacted in classroom instruction. These two types of knowledge seem intertwined and interdependent. The presence of both types of knowledge, specifically related to subject-matter knowledge, seems to be one indicator of more explicit beginning reading instruction. This finding holds significant implications for the preparation of pre-service teachers as well as in-service teachers. Pre-service teachers need opportunities to develop deep conceptual understandings of these reading skills. This must be done through coursework but also through meaningful and practically based in-field learning experiences. For instance, it seems insufficient for a teacher just to know the meaning of the word phoneme if she lacks an understanding of what this concept looks like in practice, with a variety of learners and in a variety of instructional contexts.

Beyond the pre-service setting, these findings have implications for in-service teachers as well. All four of the participants in the highest formal knowledge group had a difficult time pinpointing when they acquired formal knowledge of reading. Most attributed their accumulation of knowledge over numerous trainings, through advanced degrees, through the National Board process and through extensive classroom experiences. One participant may have articulated this phenomenon best when she said "You have stuff in your brain and you hear something new that

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gets attached to something you already know so it expands what you already know" (Participant D, interview). Formal knowledge of these reading concepts may already be a part of the curriculum in elementary education programs but without practical experiences to attach that knowledge to, perhaps such formal knowledge is relatively meaningless. This assertion seems to align with Snow's et al. (2005) theoretical model of teacher knowledge that accounts for changes in teacher knowledge occurring over the course of time.

Based on the results from this study, coupled with results of earlier studies, the question may not be if teachers need a specialized knowledge of reading concepts but rather how does the field ensure that all teachers acquire formal knowledge of these concepts and then effectively translate this head knowledge into practical knowledge enacted into everyday teaching?

Limitations of the Study

While several limitations were noted in chapter one, they need to be reiterated here. First, this study was limited by sample size. While smaller numbers provided the opportunity to collect rich data, the small numbers limited the researcher's ability to make wide generalizations of the findings. Inclusion of a greater number of participants in both phases of the study would have strengthened the findings. Secondly, this study was limited by time and resources for data collection. While the inclusion of a videotaped reading lesson was significant and revealed insight into the relationship between teachers' formal and practical knowledge, the findings would have been strengthened by more evidence of participants' everyday teaching. The study was also limited given the researchers' personal connections with the district program and with the study's participants. While the researcher took steps to ensure accuracy and reliability of the

data (triangulation of the data, use of member checking procedures), the researcher possessed intimate knowledge of the district program guidelines, the EIR curriculum, and maintained professional relationships with the study participants. This fact posed a limitation to the study.

Recommendations for Future Research

Limitations of the current study, however, create opportunities for future research. More studies devoted to the exploration of teachers' formal reading knowledge and practical reading knowledge would help to add to this currently small body of literature. Studies that add deeper insight and understanding of the potential relationships between teachers' formal and practical reading knowledge are warranted. For this study, the researcher originally proposed a second activity connected to the blank TKA. The researcher intended for this activity to potentially uncover participants' practical knowledge that may not have been demonstrated through the TKA questions. After participants shared their perceived connections between the videotaped lesson and the TKA, the researcher planned to probe the participant about four to six items pre-selected test items on the TKA. The researcher planned to select questions that the participant answered correctly and incorrectly. For each of these items, the researcher would ask an alternative question in an effort to uncover a teacher's practical knowledge about the content tested by the TKA item. For instance, question seven on the TKA asked, "A schwa sound is found in the word…" The answer is (a) cotton. An alternative question for this item would be, "Tell me how you would help a student decode the word cotton." The teacher's answer may have provided insight into her practical knowledge of decoding instruction with words that contain schwa sounds even if she may lack the formal knowledge to correctly identify words with a

schwa sound as tested on the TKA. Although time constraints prevented the researcher from conducting this activity within the scope of the current study, this activity could be included in future studies of formal and practical reading knowledge.

While this study focused on the knowledge base of intensive reading intervention teachers, additional studies may seek to explore the role of teacher knowledge within models where at-risk readers receive reading instruction from two different providers. Previous studies indicate the importance of instructional alignment when multiple providers are instructing the same students (Allington, 1990; Deeney, 2008). What factors help to ensure such curricular congruence? Surely teacher knowledge comes into play but currently few studies explore the knowledge construct when multiple teachers are matched to individual students.

When first devising this study, it was also the intent of the researcher to include students' learning gains given the results from a study that directly linked teachers' formal knowledge to student outcomes as a function of the classroom instruction (Piasta et al., 2009). Time constraints, however, prohibited the inclusion of student data within the current study. Research that explores the interaction of all of these variables (teachers' formal and practical knowledge related to classroom instruction and student learning gains) would address a gap present in the current study.

Summary

This chapter provided a summary of the findings reported in chapter four as well as a discussion of the findings related to each of the three research questions. The findings of this study were then situated within the existing teacher knowledge research. The chapter concluded

with a discussion of practical implications resulting from the study as well as limitations and

areas for future research.

APPENDIX A:

PERMISSION TO USE TEACHER KNOWLEDGE ASSESSMENT

Letter to Dr. Shayne Piasta

December 22, 2011

Dear Dr. Piasta,

I am a graduate student at the University of Central Florida and I am researching teacher knowledge and beginning reading instruction with at-risk first graders. I am proposing two phases of data collection. In phase one, participants will be asked to complete a teacher knowledge survey. Participants' scores on the teacher knowledge instrument will then be stratified into performance quartiles and four participants will be randomly selected to participate in phase two of the study. Phase two of the study will be qualitative in nature and data will be collected in the form of participant interviews, participant created concept maps, and videotaped reading lessons. Each of the phase two data techniques is intended to capture and to understand participants' practical knowledge related to beginning reading instruction with at-risk readers.

I am seeking permission to use the Teacher Knowledge Assessment: Language and Print described in your 2009 study titled *Teachers' Knowledge of Literacy Concepts, Classroom Practices, and Student Reading Growth*. If you are inclined to grant permission I request that you respond to me by email indicating your permission. It is my hope that the results from this study will contribute to the current collection of studies focused on the construct of teacher knowledge and beginning reading instruction.

Sincerely,

Katy Cortelyou
krc3313@yahoo.com
Doctoral Candidate, Curriculum and Instruction

Response from Dr. Piasta

December 30, 2011

Hi Katy,

I grant you permission to use my Teacher Knowledge Assessment: Language and Print for the purposes of your dissertation research. I will be interested to see the results of your study!

Best,
Shayne

APPENDIX B: IRB APPROVAL LETTER AND ADDENDUMS

Approval of Human Research

From: **UCF Institutional Review Board #1**
           FWA00000351,
           IRB00001138

To: **Kathryn Cortelyou**

Date: **February 01, 2012**

Dear Researcher:

On 2/1/2012, the IRB approved the following human participant research until

   1/31/2013 inclusive: Type of Review: UCF Initial Review

   Submission Form
      Project Title: EXPLORING INTENSIVE READING INTERVENTION
                TEACHERS' FORMAL AND PRACTICAL
                KNOWLEDGE RELATED TO BEGINNING
                READING INSTRUCTION PROVIDED TO AT-
                RISK FIRST GRADE READERS.
      Investigator: Kathryn Cortelyou
      IRB Number: SBE-12-08190
   Funding
      Agency:
      Grant
      Title:
      Research ID: N/A

The Continuing Review Application must be submitted 30days prior to the expiration
date for studies that were previously expedited, and 60 days prior to the expiration date
for research that was previously reviewed at a convened meeting. Do not make changes
to the study (i.e., protocol, methodology, consent form, personnel, site, etc.) before
obtaining IRB approval. A Modification Form **cannot** be used to extend the approval

period of a study. All forms may be completed and submitted online at
https://iris.research.ucf.edu .

If continuing review approval is not granted before the expiration date of 1/31/2013,
approval of this research expires on that date. When you have completed your research, please submit a
Study Closure request in iRIS so that IRB records will be accurate.

Use of the approved, stamped consent document(s) is required. The new form
supersedes all previous versions, which are now invalid for further use. Only approved
investigators (or other approved key study personnel) may solicit consent for research
participation. Participants or their representatives must receive a copy of the consent
form(s).

In the conduct of this research, you are responsible to follow the requirements of the

Investigator Manual. On behalf of Sophia Dziegielewski, Ph.D., L.C.S.W., CF IRB

Chair, this letter is signed by:

Signature applied by Joanne Muratori on 02/01/2012 09:45:48 AM EST

Joanne Muratori

IRB Coordinator

Approval of Human Research

From: **UCF Institutional Review Board #1**
         FWA00000351,
         IRB00001138

To: **Kathryn Cortelyou**

Date: **March 19, 2012**

Dear Researcher:

On 3/19/2012, the IRB approved the following minor modifications to human participant research until
01/31/2013 inclusive:

Type of Review:	IRB Addendum and Modification Request Form
Modification Type:	Phase 2 will include eight (8) participants rather than four (4) and revised Informed Consent has been approved for use. In addition, the invitation to take part in Phase 2 has been uploaded to study documents in iRIS.
Project Title:	EXPLORING INTENSIVE READING INTERVENTION TEACHERS' FORMAL AND PRACTICAL KNOWLEDGE RELATED TO BEGINNING READING INSTRUCTION PROVIDED TO AT-RISK FIRST GRADE READERS.
Investigator:	Kathryn Cortelyou
IRB Number:	SBE-12-08190
Funding Agency:	
Grant Title:	
Research ID:	N/A

The Continuing Review Application must be submitted 30days prior to the expiration date for studies that were previously expedited, and 60 days prior to the expiration date for research that was previously reviewed at a convened meeting. Do not make changes to the study (i.e., protocol, methodology, consent form, personnel, site, etc.) before

obtaining IRB approval. A Modification Form **cannot** be used to extend the approval period of a study.   All forms may be completed and submitted online at https://iris.research.ucf.edu .

If continuing review approval is not granted before the expiration date of 01/31/2013, approval of this research expires on that date. When you have completed your research, please submit a
Study Closure request in iRIS so that IRB records will be accurate.

Use of the approved, stamped consent document(s) is required. The new form supersedes all previous versions, which are now invalid for further use. Only approved investigators (or other approved key study personnel) may solicit consent for research participation. Participants or their representatives must receive a copy of the consent form(s).

In the conduct of this research, you are responsible to follow the requirements of the

Investigator Manual. On behalf of Sophia Dziegielewski, Ph.D., L.C.S.W., CF IRB

Chair, this letter is signed by:

Signature applied by Joanne Muratori on 03/19/2012 03:13:28 PM EST

APPENDIX C: DISTRICT APPROVAL LETTER

Katy Cortelyou

██████████████████████

████████████████

Dear Ms. Cortelyou:

The ███████████████████████████████ has agreed to participate in
your research proposal, *Exploring Intensive Reading Intervention Teachers'
Formal and Practical Knowledge of Beginning Reading Instruction
provided to At-Risk First Grade Readers.* A copy of this letter MUST be
presented to all participants at each school to assure them your research has been
approved by the district. Your approval number is RR1112-317. You must
refer to this number in all correspondence. Approval is given for your research
under the following conditions:

1) Participation by the schools is to be on a voluntary basis. That is,
                 participation is not MANDATORY
   and you must advise A<u>LL</u> PARTICIPANTS that they are not obligated to
   participate in your study.

2) If a principal agrees the school will participate, it is up to you
   to find out what rules the school has for allowing people on
   campus and you must abide by the school's check-in policy. You
   will <u>NOT BE ALLOWED</u> on any school campus without first
   following the school's rules for entering campus grounds.

3) Active parent permission must be obtained for all students
   involved in your research. You must indicate in your letter to
   the parent all the types of data you will be collecting (i.e., race,
   gender, FCAT scores, etc.). You must have this consent before you
   begin your research of data.

4) Confidentiality must be assured for all. That is, <u>All DATA
   MUST BE AGGREGATED SUCH THAT THE</u>
   PARTICIPANTS CANNOT BE ID<u>EN</u>TIFIED. Participants
   include the district, principals, administrators, teachers, support
   personnel, students and parents.

5) Student data MUST be DESTROYED when the project has been
   completed <u>unless the parents</u> have been notified that the data has
   to be kept longer.

6) Since you are an employee of the ████████████████
   ██████,**all** work related to this research must be done outside
   your normal working hours unless your administrator believes
   the research is a function of your position.

7) If this work is <u>not part of your job, you cannot use the school
   mail or email system</u> to send or receive any documents.

8) Research approval does not constitute the use of the district's
   equipment or software. In addition, requests that result in
   extra work by the district such as data analysis, programming or
   assisting with electronic surveys, may have a cost borne by the
   researcher.

APPENDIX D: INFORMED CONSENT LETTER FOR PHASE ONE

University of Central Florida

EXPLORING INTENSIVE READING INTERVENTION TEACHERS' FORMAL AND PRACTICAL KNOWLEDGE RELATED TO BEGINNING READING INSTRUCTION PROVIDED TO AT-RISK FIRST GRADE READERS.

Informed Consent

Principal Investigator(s):   Katy Cortelyou, MA

Faculty Supervisor: Karen Biraimah, PhD

Introduction: Researchers at the University of Central Florida (UCF) study many topics. To do this we need the help of people who agree to take part in a research study. You are being invited to take part in a research study consisting of two phases. Phase one will include roughly ███████████ ███████████████████████████████ and phase two will include 4 people selected from the pool of phase one participants. You have been asked to take part in this research study because you are an ██ You must be 18 years of age or older to be included in the research study.

The person doing this research is Katy Cortelyou, graduate student at the University of Central Florida in Orlando, FL. Because the researcher is a doctoral student, she is being guided by Karen Biraimah, PhD, a UCF faculty supervisor in the College of Education.

What you should know about a research study:

Someone will explain this research study to you.

A research study is something you volunteer for.

Whether or not you take part is up to you.

You should take part in this study only because you want to.

You can choose not to take part in the research study.

You can agree to take part now and later change your mind.

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Whatever you decide it will not be held against you.

Feel free to ask all the questions you want before you decide.

Purpose of the research study: The purpose of this study is to describe the formal and practical knowledge of intensive reading intervention teachers that provide beginning reading instruction to at-risk first graders.

What you will be asked to do in the study:
Consenting participants will be asked to do the following.

Phase One: All current intensive reading intervention teachers in the ████████████ ████ are invited to participate in phase one of this research.

> Consenting participants will complete a Background Questionnaire and a Teacher Knowledge Assessment consisting of multiple choice items and one short answer item. This assessment will be administered during a regularly scheduled meeting and will require 30-45 minutes to complete.

Four participants from phase one of the study will be selected to participate in phase two of the study. Phase two activities will include a face-to-face interview with the researcher, a participant constructed concept map and one videotaped reading lesson.

Location: Phase one of this study will take place at ████████████████████ ████████████████ (February 9, 2012).

Time required: I expect that phase one participants will be in this research study for 30-45 minutes during a regularly scheduled meeting (February 9, 2012).

Risks:
There are no reasonably foreseeable risks or discomforts involved in taking part in this study.

Benefits:
I cannot promise any benefits to you or others from your taking part in this research. However, possible personal benefits include an increased understanding of the research process as well as increased knowledge of concepts essential to beginning reading instruction. The findings may provide a benefit ██

Compensation or payment:
None

Confidentiality: I will limit your personal data collected in this study to people who have a need to review this information. I cannot promise complete secrecy. Phase one data will not contain participants' names. Rather, all data collected will be coded with a unique number and participants' unique number will only be known by the researcher and by the individual participant. Paper artifacts, including the background questionnaire and teacher knowledge assessment, will be filed according to the uniquely assigned numbers and will be maintained throughout the study in a locked file cabinet in the researcher's personal home. All paper documents will be shredded at the conclusion of this study.

Study contact for questions about the study or to report a problem: If you have questions, concerns, or complaints, or think the research has hurt you, talk to me at (███████████ or my supervising professor, Dr. Karen Biraimah, Professor in the School of Teaching, Learning and Leadership at the University of Central Florida. Her contact number is (████████.

IRB contact about your rights in the study or to report a complaint: Research at the University of Central Florida involving human participants is carried out under the oversight of the Institutional Review Board (UCF IRB). This research has been reviewed and approved by the IRB. For information about the rights of people who take part in research, please contact: Institutional Review Board, University of Central Florida, Office of Research & Commercialization, 12201 Research Parkway, Suite 501, Orlando, FL 32826-3246 or by telephone at (407) 823-2901. You may also talk to them for any of the following:

> Your questions, concerns, or complaints are not being answered by the research team.
> You cannot reach the research team.
> You want to talk to someone besides the research team.
> You want to get information or provide input about this research.

APPENDIX E: INFORMED CONSENT LETTER FOR PHASE TWO
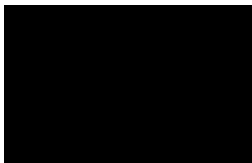
EXPLORING INTENSIVE READING INTERVENTION TEACHERS' FORMAL AND PRACTICAL KNOWLEDGE RELATED TO BEGINNING READING INSTRUCTION PROVIDED TO AT-RISK FIRST GRADE READERS.

Informed Consent

Principal Investigator(s):   Katy Cortelyou, MA

Faculty Supervisor: Karen Biraimah, PhD

Introduction: Researchers at the University of Central Florida (UCF) study many topics. To do this we need the help of people who agree to take part in a research study. You are being invited to take part in a research study consisting of two phases. Phase one will include roughly ██████████ ██ You have been asked to take part in this research study because you are an ████████████████████   ████████████████████████████████ You must be 18 years of age or older to be included in the research study.

The person doing this research is Katy Cortelyou, graduate student at the University of Central Florida in Orlando, FL. Because the researcher is a doctoral student, she is being guided by Karen Biraimah, PhD, a UCF faculty supervisor in the College of Education.

What you should know about a research study:

> Someone will explain this research study to you.
>
> A research study is something you volunteer for.
>
> Whether or not you take part is up to you.
>
> You should take part in this study only because you want to.
>
> You can choose not to take part in the research study.
>
> You can agree to take part now and later change your mind.

Whatever you decide it will not be
held against you.

Feel free to ask all the questions you want
before you decide.

Purpose of the research study: The purpose of this study is to describe the formal
and practical knowledge of intensive reading intervention teachers that provide
beginning reading instruction to at- risk first graders.

What you will be asked to do in the study:

Consenting participants will be asked to do the following:

Phase Two: Eight participants from phase one of the study will be selected to
participate in phase two of the study. Phase two participation will consist of three
activities.

- A face-to-face interview with the researcher. The intent of this interview is to
  better capture practical knowledge related to the teaching of at-risk first graders.
  The interview will be conducted after student hours and will last approximately 1
  hour. The interview will be audio taped.
- A participant constructed concept map. Participants will create a concept map that
  captures her knowledge about beginning reading instruction and will then explain
  her map to the researcher. This concept map will be created at the same time as
  interview and will approximately 30 minutes.
- A videotaped reading lesson. Participants will videotape one lesson that captures
  her typical instruction. The videotaped will be instantly played with the participant
  and researcher jointly viewing the recording. The participant will be asked to
  provide commentary for the lesson so the researcher can capture the participants'
  thinking. Participants' will also be asked to answer several predetermined questions
  specific to the videotaped lesson. After discussing the videotaped lesson,
  participants will revisit a blank copy of the Teacher Knowledge Assessment used
  during phase one of the study. Participants will be asked to review the TKA
  questions and discuss any connections evident between specific questions and the
  videotaped reading lesson. The researcher will also ask several probing questions
  in connection to selected TKA items. These activities will take approximately one
  hour.

Location: Phase two research will be conducted at each of the eight participants'
school sites with the researcher traveling to each participant at an agreed upon time.

Time required: Phase two participants will be in this research study for an
approximately 3 hours occurring during 1-2 additional meetings with researcher.
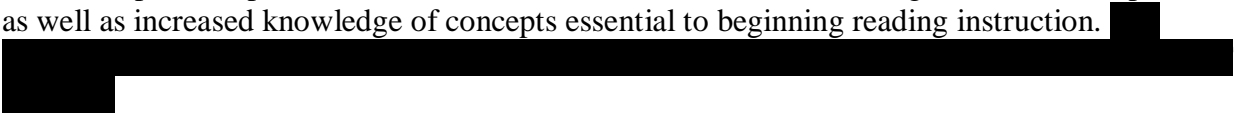
Audio or video taping:

You will be audio taped during this study. If you do not want to be audio taped, you will not be able to be in this study. All tapes will be kept in a locked, safe place. The tape will be erased/destroyed at the conclusion of the study.

You will also be videotaped. If you do not want to be videotaped, you will not be able to be in the study. The video tape will be used to stimulate your thinking about a reading lesson. One copy of the video file will be left with you and another copy will maintained by the researcher. The researcher's copy will be erased/deleted at the conclusion of the study.

Risks

There are no reasonably foreseeable risks or discomforts involved in taking part in this study.

Benefits: I cannot promise any benefits to you or others from your taking part in this research. However, possible personal benefits include an increased understanding of the research process as well as increased knowledge of concepts essential to beginning reading instruction. ■

Compensation or payment:

You can expect to spend approximately three-four hours engaging in three data collection procedures. You will be provided with a flip video camera to tape a reading lesson. Participants may keep the video recorder as a token of thanks for participation in the study.

Confidentiality: I will limit your personal data collected in this study to people who have a need to review this information. I cannot promise complete secrecy but will take the following measures. No data will contain participants' names. Rather, all data collected will be coded with a unique number and participants' unique number will only be known by the researcher and by the individual participant. Paper artifacts including participant-constructed concept maps will be filed according to the uniquely assigned numbers and will be maintained throughout the study in a locked file cabinet in the researcher's personal home. Transcribed audio and video artifacts will be stored as Microsoft office documents on the researcher's personal computer that is password protected. Audio recordings will be preserved on the audio recording device until the conclusion of the study at which point they will be erased/deleted. Video files will be stored on the researcher's personal computer that is password protected and will be permanently deleted at the conclusion of the study.

Study contact for questions about the study or to report a problem: If you have questions, concerns, or complaints, or think the research has hurt you, talk to me at ▮▮▮▮▮▮▮ or my supervising professor, Dr. Karen Biraimah, Professor in the School of Teaching, Learning and Leadership at the University of Central Florida. Her contact number is ▮▮▮▮▮▮▮

IRB contact about your rights in the study or to report a complaint: Research at the University of Central Florida involving human participants is carried out under the oversight of the Institutional Review Board (UCF IRB). This research has been reviewed and approved by the IRB. For information about the rights of people who take part in research, please contact: Institutional Review Board, University of Central Florida, Office of Research & Commercialization, 12201 Research Parkway, Suite 501, Orlando, FL 32826-3246 or by telephone at (407) 823-2901. You may also talk to them for any of the following:

Your questions, concerns, or complaints are not being answered by the research team. You cannot reach the research team.
You want to talk to someone besides the research team.
You want to get information or provide input about this research.

APPENDIX F: EMAIL CORRESPONDENCE FOR PHASE ONE

Email Invitation to Intensive Reading Teachers in the Intervention Project
Prior to Face-Face Meeting

Dear Intensive Reading Teachers:

I am a graduate student at the University of Central Florida working on my doctorate in Curriculum and Instruction. I am researching the subject of formal and practical knowledge related to beginning reading instruction with at-risk readers. Given your ███████████ ██ I am extending an invitation for participation in this valuable research study. The study will include two phases of data collection. Participation in phase one of the study will be open to all current intensive reading intervention teachers. Phase two participation will be limited to four participants selected from the pool of phase one participants. Each phase of data collection is outlined below:

Phase One: Completion of a multiple/choice Teacher Knowledge Assessment and a background questionnaire.

Phase Two: A face-to-face interview, creation of a concept map specific to beginning reading knowledge, one videotaped reading lesson to be viewed and discussed with the researcher.

Attached to this email is the full letter of consent containing specific information regarding the timelines for data collection, the potential benefits and risks of participation, compensation for participation as well as contact information for my supervising professor and university. Thank you for reviewing this consent letter prior to our meeting on February 9, 2012 at which time this research will be discussed more fully and formal consent forms will be signed and collected. Also at this time, phase one data will be collected for all consenting participants.

Should you have any questions about this research prior to our face-to-face meeting on February 9, 2012, please feel free to contact me by email ███████████████████ ██████████████

We find ourselves in a time of great change with regards to how teachers are evaluated and compensated. Please consider participating in research that may potentially contribute valuable insight into the importance of teacher knowledge and teacher effectiveness.

Sincerely,

Katy Cortelyou
University of Central Florida, Doctoral Candidate
Curriculum and Instruction
████████████████████████████████

APPENDIX G: PROTOCOL FOR PHASE ONE

This packet includes a background questionnaire (page 1) and Teacher Knowledge Assessment. All questions are to be answered independently and without assistance from any other person. The directions for the background questionnaire are found at the top of the page. The directions for the Teacher Knowledge Assessment are found at the top of page 3 of your packet. There is only one correct answer for each multiple-choice question. The final question on the assessment is a short answer response. Please provide your answer on the lines provided. Please note that you are free to withdraw your consent to participate at anytime without consequence and you do not have to answer any question that you do not wish to answer.

Once you have completed both the questionnaire and the Teacher Knowledge Assessment, please bring your packet directly to me. Only one person at a time should come to turn in documents to ensure privacy for all participants. Are there any questions before you begin? You may begin.

APPENDIX H: BACKGROUND QUESTIONNAIRE

Background Questionnaire

Total years in education:	
Positions held during your career in education	
Total years in current IRIT position	
Degrees earned	
Certifications held (listed on teaching certificate)	
Are you a National Board Certified Teacher?	_____ Yes OR _____No If yes, year certification earned: _____ If yes, list certification area: _____

APPENDIX I: TEACHER KNOWLEDGE ASSESSMENT

Individualizing Student Instruction (ISI)
Teacher Knowledge Survey

Fall 2005

Shayne B. Piasta
Carol McDonald Connor

Florida State University and the Florida Center for Reading Research

As adapted from:

Bos, C., Mather, N., Dickson, S., Podhajski, B., & Chard, D. (2001). Perceptions and knowledge of pre-service and in-service educators about early reading instruction. *Annals of Dyslexia, 51*, 97-120.

Mather, N., Bos, C., & Babur, N. (2001). Perceptions and knowledge of pre-service and in-service teachers about early literacy instruction. *Journal of Learning Disabilities, 34*(5), 472-482.

Moats, L. C. (1994). The missing foundation in teacher education. *Annals of Dyslexia, 44*, 81-102.

Moats, L. C., & Foorman, B. R. (2003). Measuring teachers' content knowledge of language and reading. *Annals of Dyslexia, 53*, 23-45.

Name: _____   School: _____

Multiple Choice. Please write the letter of the best answer on the line.

_____ 1. A schwa sound is found in the word (Phonics/terms, Answer d)
    (a) resume   (d) about
    (b) bread   (e) flirt
    (c) look

_____ 2. Which word contains a short vowel sound? (Phonics/phonology, Answer c)
    (a) treat   (d) paw
    (b) start   (e) father
    (c) slip

_____ 3. A phoneme refers to (Terms/phonology, Answer b)
    (a) a single letter   (c) a single unit of meaning
    (b) a single speech sound   (d) a grapheme

_____ 4. A pronounceable group of letters containing a vowel sound is a (Terms/syllables,
Answer c)
        (a) phoneme   (c) syllable
        (b) grapheme   (d) morpheme

_____ 5. If *tife* were a word, the letter *i* would probably sound like the *i* in (Phonics, phonology,
Answer c)
        (a) if   (d) ceiling
        (b) beautiful   (e) sing
        (c) find

_____ 6. A combination of two or three consonants pronounced so that each letter keeps its own
identity is called a (Terms/phonics, Answer d)
    (a) silent consonant   (c) diphthong
    (b) consonant digraph   (d) consonant blend

_____ 7. A schwa sound is found in the word (Terms/phonics, Answer a)
    (a) cotton   (d) preview
    (b) phoneme   (e) grouping
    (c) stopping

_____ 8. A diphthong is found in the word (Terms/phonics, Answer b)
    (a) coat   (d) sing
    (b) boy   (e) been
    (c) battle

_____ 9. A voiced consonant digraph is in the word (Terms/phonics/phonetics, Answer d)
    (a) think   (d) the
    (b) ship   (e) photo
    (c) whip

_____ 10. Two combined letters that represent one single speech sound are a (Terms/phonics, Answer d)
    (a) schwa   (d) digraph
    (b) consonant blend   (e) diphthong
    (c) phonetic

_____ 11. How many **speech sounds** are in the word *eight*? (PA, Answer a)
    (a) two   (c) four
    (b) three   (d) five

_____ 12. How many **speech sounds** are in the word *box*? (PA, Answer d)
    (a) one   (c) three
    (b) two   (d) four

_____ 13. How many **speech sounds** are in the word *grass*? (PA, Answer c)
    (a) two   (c) four
    (b) three   (d) five

_____ 14. Why may students confuse the sounds /b/ and /p/ or /f/ and /v/?
    (a) Students are visually scanning the letters in a way that letters are
        misperceived. (Phonology/Phonetics, Answer c)
    (b) The students can't remember the letter sounds so they are randomly guessing.
    (c) The speech sounds within each pair are produced in the same place and in the
        same way, but one is voiced and the other is not.
    (d) The speech sounds within each pair are both voiced and produced in the back
        of the mouth.

_____ 15. What type of task would this be? "I am going to say a word and then I want you to break the word apart. Tell me each of the sounds in the word *dog*." (Phonology task, Answer c)
    (a) blending   (c) segmentation
    (b) rhyming   (d) deletion

_____ 16. What type of task would this be? "I am going to say some sounds that will make one word when you put them together. What does /sh/ /oe/ say?" (Phonology task, Answer a)
    (a) blending   (c) segmentation
    (b) rhyming   (d) manipulation

_____ 17. Mark the statement that is **<u>FALSE</u>**. (Phonology, Answer c)
    (a) Phonological awareness is a precursor to phonics.
    (b) Phonological awareness is a oral language activity.
    (c) Phonological awareness is a method of reading instruction that begins with individual letters and sounds.
    (d) Many children acquire phonological awareness from language activities and reading.

_____ 18. A reading method that focuses on teaching the application of speech sounds to letters is called (Phonics, Answer a)
    (a) phonics   (d) phonetics
    (b) phonemics   (e) either (a) or (d)
    (c) orthography

_____ 19. What is the rule for using a *ck* in spelling? (Phonics, Answer b)
    (a) when the vowel sound is a diphthong   (c) when the vowel sound is long
    (b) when the vowel sound is short   (d) any of the above

_____ 20. Count the number of **syllables** for the word *unbelievable*. (Syllables, Answer b)
    (a) four   (c) six
    (b) five   (d) seven

_____ 21. Count the number of **syllables** for the word *pies*. (Syllables, Answer a)
    (a) one   (c) three
    (b) two   (d) four

The next two items involve saying a word and then reversing the order of the sounds. For example, the word *back* would be *cab*.

_____ 22. If you say the word, and then reverse the order of the sounds, *ice* would be (PA, Answer d)
     (a) easy   (c) size
     (b) sea   (d) sigh

_____ 23. If you say the word, and then reverse the order of the sounds, *enough* would be (PA, Answer c)
     (a) fun   (c) funny
     (b) phone   (d) one

_____ 24. What is the second sound in the word *queen*? (PA, Answer d)
     (a) u   (c) k
     (b) long e   (d) w

_____ 25. What is the third speech sound in the word *wretch*? (PA, Answer a)
     (a) /ch/   (c) /t/
     (b) /e/   (d) /r/

_____ 26. In the word *crouch*, the *cr-* part is called the (Onset/rime, Answer e)
     (a) rhyme   (d) morpheme
     (b) initial phoneme   (e) onset
     (c) rime

_____ 27. In language, a single unit of meaning is called a (Morphology, Answer d)
     (a) grapheme   (d) morpheme
     (b) syllable   (e) phoneme
     (c) rime

_____ 28. Count the number of **syllables** in the word *walked*. (Syllables, Answer a)
     (a) one   (c) three
     (b) two   (d) four

_____ 29. What type of task would this be? "The word is *taught*. What word would you have if you said *taught* without the /t/ sound?" (Phonology Task, Answer c)
     (a) rhyming   (c) elision
     (b) blending   (d) none of the above

_____ 30. In the word *plan*, the *–an* part is called the (Onset/rime, Answer c)
     (a) rhyme   (d) morpheme
     (b) final phoneme   (e) onset
     (c) rime

_____ 31. For skilled readers, listening and reading comprehension are usually about equal. For developing readers in K-3, it is true that (Comprehension, Answer b)
     (a) Reading comprehension is better than listening comprehension.
     (b) Listening comprehension is better than reading comprehension.
     (c) Reading and listening comprehension are comparable, about the same.
     (d) There is no systematic relationship between reading comprehension and
         listening comprehension.

_____ 32. How many **morphemes** are in the word *gardener*? (Morphology, Answer b)
     (a) one   (c) three
     (b) two   (d) four

_____ 33. How many **morphemes** are in the word *unbelievable*? (Morphology, Answer c)
     (a) one   (c) three
     (b) two   (d) four

_____ 34. How many **morphemes** are in the word *pies*? (Morphology, Answer c)
     (a) zero   (c) two
     (b) one   (d) three

Short Answer. Please answer to the best of your ability.
35. List the **six syllable types** and an example of each (e.g., a single-syllable word exemplifying the particular syllable type, a multi-syllable word with the specified syllable type circled). As an example, the first has been listed for you (with any **one** of the labels considered correct); if you are able, please provide an example of this syllable type before moving onto the others.

Type	**Example**
(1) Closed syllable, CVC, or VC	_____
2) _____	_____
3) _____	_____
4) _____	_____
5) _____	_____
6) _____	_____

APPENDIX J: PHASE TWO INVITATION EMAIL

Hello,

Thank you for your participation in phase one of my research study. I am now beginning phase two of my study and you have been selected to participate. Your involvement will add so much to the field's understanding of teacher knowledge and the teaching of at-risk readers. By consenting to participation, you will be involved in three data collection activities (a face-to-face interview conducted by me, a concept-mapping activity, and a video-taped reading lesson). These activities are described fully in the consent letter that is attached. These activities should take no more than 3 hours of your time and you will be compensated with a Flip Video Camera that will be yours to keep. I will be scheduling these activities during the window of March 26th – April 27th and I will make every effort to accommodate your busy schedule. So that we can quickly begin scheduling these activities, please respond to this email regarding your intentions to participate (the decision is yours) and any days/dates that would work best for you. Also, feel free to provide a personal email address if you would prefer me to use an alternative address. I can't say thank you enough and I am so excited to learn from you!
Sincerely,

Kathryn R. Cortelyou, Doctoral Student
UCF

APPENDIX K: INTERVIEW PROTOCOL AND QUESTIONS

Thank you again for your participation in phase one of this study. You have now been selected to participate in phase two which includes this interview, the concept mapping activity, and discussion around a videotaped reading lesson. We will begin today with the interview. The purpose of this interview is to explore your knowledge of beginning reading instruction. I will ask you several pre-determined questions and may probe for more information based on your responses to these questions. I would like to remind you that your participation in this study is voluntary and you have the right to withdraw consent at any time without any consequence. You do not have to answer any question that you do not wish to answer. As indicated on the consent form, this interview will be audio taped. Do you have any questions before we begin? Do I have your permission to begin the recording now?

- Thinking of subject-matter knowledge...what knowledge learned from research, trainings, professional study, personal study, etc. do you know about beginning reading?

- Thinking about knowledge of general pedagogy...what do you know about general aspects of teaching?

- Thinking about your knowledge of student learning…what do you know about how at-risk readers learn?

- Thinking of your knowledge of purposes for instruction…What are your goals for teaching beginning reading to at-risk first grade readers?

- Thinking of your curriculum knowledge…What do you know about texts, instructional materials, resources for beginning reading instruction?

- Thinking of your knowledge of instructional strategies…What do you know about the design, structure and preparation for lessons specific to beginning reading with at-risk first graders?

- Thinking of knowledge of context…how does your knowledge of the greater educational context such as school policies, district policies, state and federal guidelines impact your teaching with at-risk first grade readers?

Is there any knowledge important to the teaching of beginning reading to at-risk readers that we haven't yet discussed?

Interview Questions	Analytical Framework (van Driel et al., 1998)
Thinking of subject-matter knowledge...what knowledge learned from research, trainings, etc. do you possess about beginning reading?	Subject-matter knowledge
Thinking about your student knowledge…what do you generally know about at-risk first grade readers?	Student knowledge
Thinking about knowledge of student learning…what do you know about the learning processes and understandings of at-risk first grader readers?	Knowledge of student learning
Thinking of your knowledge of purposes for instruction…What are your goals for teaching beginning reading to at-risk first grade readers?	Knowledge of purposes
Thinking of your curriculum knowledge…What do you know about texts, instructional materials, resources for beginning reading instruction?	Knowledge of curriculum
Thinking of your knowledge of instructional techniques…What do you know about the design, structure and preparation for lessons specific to beginning reading with at-risk first graders?	Knowledge of instructional techniques
Thinking of your knowledge of contexts…What do you know about factors outside of the classroom (school, district, state, and/or nationally) that informs or guides the teaching of beginning reading with at-risk first grade readers?	Knowledge of contexts
Is there anything else that you would like to share important to the teaching of at-risk, first grade readers?	

APPENDIX L: CONCEPT MAP PROTOCOL

Concept maps serve as a research technique for exploring teachers' knowledge. Here is an example of a concept map on the topic of Saint Nicholas.
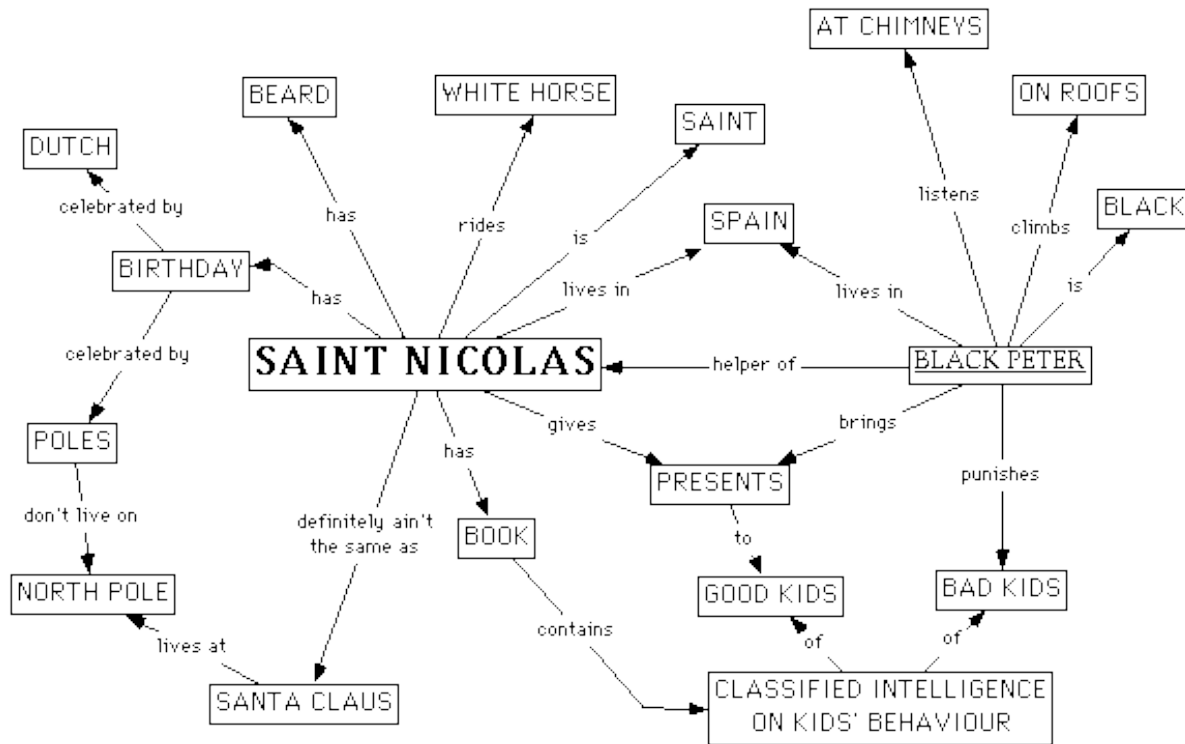
Now that you have seen this sample, you will create an original concept map that captures your knowledge of beginning reading instruction. To get you started, think of teaching beginning reading to at-risk first grade readers. Now organize your thoughts in the form of a map that represents your knowledge on this topic. You may include any concepts you know to be relevant to beginning reading instruction and you may organize these concepts in the way that best displays this information. Once your map is complete, you will have the opportunity to explain your map to me. Do you have any questions before you begin?

Now that your map is complete, please explain your map to me. This conversation will be audio recorded, as indicated in the consent document.

APPENDIX M: VIDEOTAPE PROTOCOL AND QUESTIONS

Thank you for recording your reading lesson. As we watch the video together, I am interested in capturing your authentic thoughts and reflections. As a thought comes to mind, pause the video so that you can verbalize your thinking. You may rewind the video should you wish to see a part of the video again. You may pause and restart the video as many times as you would like. As you share your thinking, I may or may not ask clarifying questions before you play the video again. As indicated on the consent form, this conversation will be audio recorded. Do you have any questions about this activity? Do I have your permission to start the audio recording?

Now that we have watched the video in its entirety, I will ask you several pre-determined questions related to your video. For each question, you will be asked to discuss evidence from the video so you may replay the video should you wish to do so. As indicated on the consent form, this conversation will be audio recorded. Do I have your permission to continue the audio recording now?

- Did you notice any examples in the video that provide evidence for the specific content and/or skills you were teaching in this lesson?
- Did you notice any examples in the video that provide evidence of your knowledge of general teaching practices?
- Did you notice any examples in the video that provide evidence of how these students' were learning?
- Did you notice any examples in the video that provide evidence of your purpose for instruction?
- Did you notice any examples in the video that provide evidence of your knowledge of curriculum?
- Did you notice any examples in the video that provide evidence of your knowledge of instructional strategies?
- Did you notice any examples in the video that provide evidence of your knowledge of contexts (school, district, state, federal policies, rules, etc) that inform your teaching?

Videotape Questions

Questions – Reading Lesson	Analytical Framework (van Driel et al., 1998)
Thinking of subject-matter knowledge...what content are you aiming to teach in this lesson?	Subject-matter knowledge
Thinking about your student knowledge…what do you generally know about this group of first grade readers?	Student knowledge
Thinking about knowledge of student learning…what do you know about the learning processes of this particular group of students? How do they learn best?	Knowledge of student learning
Thinking of your knowledge of purposes for instruction…What are your goals for teaching with this specific group of students?	Knowledge of purposes
Thinking of your curriculum knowledge…how did you go about choosing the materials, curriculum, resources used in this specific lesson?	Knowledge of curriculum
Thinking of your knowledge of instructional techniques…what led you to use this specific technique in this lesson?	Knowledge of instructional techniques
Thinking of your knowledge of context…what outside factors, if any, influenced your lesson?	Knowledge of contexts

APPENDIX N: PROTOCOL FOR THE BLANK TKA

Now we are to the final phase of this videotaping activity. Here is a blank copy of the Teacher Knowledge Assessment (TKA) that you completed during phase one of the study. Take a moment to review the items and as you do so, consider any connections between specific questions on the TKA and the lesson we just watched. If you do note a connection, please identify the specific question for me and then share how it relates to evidence from your lesson.

APPENDIX O: DATA ANALYSIS CHARTS FOR QUESTION THREE

TKA Item	Participant Provided Evidence from the Videotape	Participant's connection is congruent or divergent with TKA item?

TKA Item	Researcher posed question connected to TKA content	Participant's evidence congruent or divergent?

APPENDIX P: PHASE ONE DATA FOR EACH TKA QUESTION

TKA Item	Answer	Question Content Category	% of Respondents to Answer Item Correctly
1. A schwa sound is found in the word (a) resume (b) bread (c) look (d) about (e) flirt	(d) about	Phonics -Knowledge and Application	69%
2. Which word contains a short vowel sound? (a) treat (b) start (c) slip (d) paw (e) father	(c) slip	Phonics -Knowledge and Application	84%
3. A phoneme refers to (a) a single letter (b) a single speech sound (c) a single unit of meaning (d) a grapheme	(b) a single speech sound	Phonics -Knowledge of terms	78%
4. A pronounceable group of letters containing a vowel sound is a (a) phoneme (c) syllable (b) grapheme (d) morpheme	(c) syllable	Syllables – Knowledge of Terms	66%
5. If *tife* were a word, the letter *i* would probably sound like the *i* in (a) if (b) beautiful (c) find (d) ceiling (e) sing	(c) find	Phonology/Phonological Awareness – Knowledge and Application	88%

TKA Item	Answer	Question Content Category	% of Respondents to Answer Item Correctly
6. A combination of two or three consonants pronounced so that each letter keeps its own identity is called a (a) silent consonant (b) consonant digraph (c) diphthong (d) consonant blend	(d) consonant blend	Phonics – Knowledge of terms	81%
7. A schwa sound is found in the word (a) cotton　　(d) preview (b) phoneme　(e) grouping (c) stopping	(a) cotton	Phonics – Knowledge and Application	47%
8. A diphthong is found in the word (a) coat (b) boy (c) battle (d) sing (e) been	(b) boy	Phonics – Knowledge and Application	56%
9. A voiced consonant digraph is in the word (a) think　(d) the (b) ship　　(e) photo (c) whip	(d) the	Phonetics – Knowledge and Application	44%
10. Two combined letters that represent one single speech sound are a (a) schwa (b) consonant blend (c) phonetic (d) digraph (e) diphthong	(d) digraph	Phonics – Knowledge of terms	66%

TKA Item	Answer	Question Content Category	% of Respondents to Answer Item Correctly
11. How many speech sounds are in the word *eight*? (a) two (c) four (b) three (d) five	(a) two	Phonological awareness – Knowledge and Application	84%
12. How many speech sounds are in the word *box*? (a) one (c) three (b) two (d) four	(d) four	Phonological awareness – Knowledge and Application	6%
13. How many speech sounds are in the word *grass*? (a) two (c) four (b) three (d) five	(c) four	Phonological awareness – Knowledge and Application	75%
14. Why may students confuse the sounds /b/ and /p/ or /f/ and /v/? (a) Students are visually scanning the letters in a way that letters are misperceived. (b) The students can't remember the letter sounds so they are randomly guessing. c) The speech sounds within each pair are produced in the same place and in the same way, but one is voiced and the other is not. (d) The speech sounds within each pair are both voiced and produced in the back of the mouth.	(c) the speech sounds within each pair are produced in the same place and in the same way but one is voiced and the other is not.	Phonetics – Knowledge and Application	72%
15. What type of task would this be? "I am going to say a word and then I want you to break the word apart. Tell me each of the sounds in the word *dog*." (a) blending (b) rhyming (c) segmentation (d) deletion	(c) segmentation	Phonological Awareness – Knowledge and Application	91%

TKA Item	Answer	Question Content Category	% of Respondents to Answer Item Correctly
16. What type of task would this be? "I am going to say some sounds that will make one word when you put them together. What does /sh/ /oe/ say?" (a) blending (b) rhyming (c) segmentation (d) manipulation	(a) blending	Phonological Awareness – Knowledge and Application	88%
17. Mark the statement that is <u>FALSE</u>. (a) Phonological awareness is a precursor to phonics. (b) Phonological awareness is an oral language activity. (c) Phonological awareness is a method of reading instruction that begins with individual letters and sounds (d) Many children acquire phonological awareness from language activities and reading.	(c) phonological awareness is a method of reading instruction that begins with individual letters and sounds.	Phonological awareness – Knowledge of terms	63%
18. A reading method that focuses on teaching the application of speech sounds to letters is called (a) phonics (b) phonemics (c) orthography (d) phonetics (e) either (a) or (d)	(a) phonics	Phonics – Knowledge of Terms/concepts	47%
19. What is the rule for using a *ck* in spelling? (a) when the vowel sound is a diphthong (b) when the vowel sound is short (c) when the vowel sound is long (d) any of the above	(b) when the vowel sound is short	Phonics – Knowledge and application of terms	81%

TKA Item	Answer	Question Content Category	% of Respondents to Answer Item Correctly
20. Count the number of syllables for the word *unbelievable*. (a) four (b) five (c) six (d) seven	(b) five	Syllables – Knowledge and Application	75%
21. Count the number of syllables for the word *pies*. (a) one (b) two (c) three (d) four	(a) one	Syllables – Knowledge and Application	84%
22. If you say the word, and then reverse the order of the sounds, *ice* would be (a) easy (b) sea (c) size (d) sigh	(d) sigh	Phonological awareness – Knowledge and Application	75%
23. If you say the word, and then reverse the order of the sounds, *enough* would be (a) fun (b) phone (c) funny (d) one	(c) funny	Phonological awareness – Knowledge and Application	75%
24. What is the second sound in the word *queen*? (a) u (b) long e (c) k (d) w	(d) w	Phonological awareness – Knowledge and Application	13%
25. What is the third speech sound in the word *wretch*? (a) /ch/ (b) /e/ (c) /t/ (d) /r/	(a) /ch/	Phonological awareness – Knowledge and Application	81%

TKA Item	Answer	Question Content Category	% of Respondents to Answer Item Correctly
26. In the word *crouch*, the *cr-* part is called the (a) rhyme (b) initial phoneme (c) rime (d) morpheme (e) onset	(e) onset	Phonological awareness – Knowledge and Application	75%
27. In language, a single unit of meaning is called a (a) grapheme (b) syllable (c) rime (d) morpheme (e) phoneme	(d) morpheme	Morphology – Knowledge of terms	56%
28. Count the number of syllables in the word *walked*. (a) one (b) two (c) three (d) four	(a) one	Syllables – knowledge and application	50%
29. What type of task would this be? "The word is *taught*. What word would you have if you said *taught* without the /t/ sound?" (a) rhyming (b) blending (c) elision (d) none of the above	(c) elision	Phonological awareness – Knowledge and application	9%
30. In the word *plan*, the *–an* part is called the (a) rhyme (b) final phoneme (c) rime (d) morpheme (e) onset	(c) rime	Phonological awareness – Knowledge and application	78%

TKA Item	Answer	Question Content Category	% of Respondents to Answer Item Correctly
31. For skilled readers, listening and reading comprehension are usually about equal. For developing readers in K-3, it is true that (a) Reading comprehension is better than listening comprehension. (b) Listening comprehension is better than reading comprehension. (c) Reading and listening comprehension are comparable, about the same. (d) There is no systematic relationship between reading comprehension and listening comprehension.	(b) listening comprehension is better than reading comprehension.	comprehension	72%
32. How many morphemes are in the word *gardener*? (a) one (b) two (c) three (d) four	(b) two	Morphology – Knowledge and Application	50%
33. How many morphemes are in the word *unbelievable*? (a) one (b) two (c) three (d) four	(c) three	Morphology – Knowledge and Application	31%
34. How many morphemes are in the word *pies*? (a) zero (b) one (c) two (d) three	(c) pies	Morphology – Knowledge and Application	22%

TKA Item	Answer	Question Content Category	% of Respondents to Answer Item Correctly
35. Provide an example of a closed syllable	Responses will vary.	Syllables – Knowledge and Application	72%
36. Name one of the six syllable types	Open	Syllables – Knowledge of terms/concepts	50%
37. Provide an example for the syllable type named in previous question.	Responses will vary.	Syllables – Knowledge and Application	44%
38. Name one of the six syllable types.	Vce	Syllables – Knowledge of terms/concepts	47%
39. Provide an example for the syllable type named in the previous question.	Responses will vary.	Syllables – Knowledge and Application	47%
40. Name one of the six syllable types.	Vowel team	Syllables – Knowledge of terms/concepts	13%
41. Provide an example for the syllable type named in the previous question.	Responses will vary.	Syllables – Knowledge and Application	16%
42. Name one of the six syllable types.	r-controlled	Syllables – Knowledge of terms/concepts	19%
43. Provide an example for the syllable type named in the previous question.	Responses will vary.	Syllables – Knowledge and Application	16%
44. Name one of the six syllable types.	Final stable	Syllables – Knowledge of terms/concepts	9%
45. Provide an example for the syllable type named in the previous question.	Responses will vary.	Syllables – Knowledge and Application	9%

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