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Pre-Service Teacher's Professional Knowledge Development Of Phonological Awareness Through Constructivist Learning Engagements

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PRE-SERVICE TEACHERS' PROFESSIONAL KNOWLEDGE DEVELOPMENT OF PHONOLOGICAL AWARENESS THROUGH CONSTRUCTIVIST LEARNING ENGAGEMENTS

by

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A Dissertation

Submitted to the Graduate Faculty

of the

University of North Dakota

in partial fulfillment of the requirements

for the degree of

Doctor of Education

Grand Forks, North Dakota
August
2012

This dissertation, submitted by Ruth M. Newton in partial fulfillment of the requirements for the Degree of Doctor of Education from the University of North Dakota, has been read by the Faculty Advisory Committee under whom the work has been done, and is hereby approved.

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This dissertation is being submitted by the appointed advisory committee as having met all of the requirements of the Graduate School of the University of North Dakota and is hereby approved.

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Dr. Wayne Swisher, Dean of the Graduate School

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Date

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PERMISSION

Title   Pre-service Teachers' Professional Knowledge Development of
             Phonological Awareness through Constructivist Learning Engagements

Department   Teaching and Learning

Degree   Doctor of Education

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Ruth M. Newton

June 27, 2012

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ACKNOWLEDGMENTS

I would like to offer my sincere gratitude to Dr. Shelby Barrentine without whom this dissertation most likely would not have seen completion. My debt to her can never be repaid. She offered greatly needed and greatly appreciated support.

I also offer heartfelt thanks my committee members: Dr. Glenn Olsen, Dr. Kari Chiasson, and Dr. Peggy Mohr. I am genuinely appreciative of my advisor and committee chairperson, Dr. Barrentine, and also to my committee members all of whom provided invaluable critique of my work. I am greatly indebted to each committee member for sharing his or her expertise with me; I offer a profound thank you to each committee member.

I am also forever thankful to my husband who provided emotional support and encouragement. He has been instrumental in keeping our home clean and meals prepared. I know that beyond a shadow of a doubt I would not have been able to accomplish this great undertaking without his help and love; thank you dearest Bill.

Finally, thank you to each of my children for their support and love. My daughters have given me love and encouragement so many times during this long journey. My son has shown me love throughout this time of great learning. Thank you to all who have contributed to my learning. Words cannot express my love, appreciation, and gratitude to each of you.

For I know the plans I have for you…Plans to give
You hope and a future. Jeremiah 29:11

ABSTRACT

This case study is an investigation of pre-service teachers' development of professional knowledge relative to phonological awareness. An effort to gain insight into two research questions was undertaken.

1. What differences are evident in pre-service teachers' knowledge about phonemic awareness and phonics before and after instruction?

2. What is the nature of the in-class engagements about phonemic awareness and phonics that pre-service teachers find influential?

Pre-service teacher participants were those who enrolled in a literacy foundations course in a midwestern university and are education majors. Pre-service teachers' phonological awareness knowledge was assessed through a pre- and post-assessment. In-class engagements were constructivist-based and addressed phonological awareness concepts. Pre-service teachers completed these engagements after receiving classroom instruction of phonological awareness concepts. Feedback forms were also completed after in-class engagements. Feedback forms provided information regarding pre-service teachers' self-perceived learning, elements of the engagement they viewed as helpful to their learning, and what they would change to enhance their learning.

Data suggest approximately half of the sixty-two pre-service teachers who completed the post-assessment demonstrate some of the features of expertise regarding phonological awareness knowledge. Their knowledge, as sufficient in extent and basic

in quality suggests their knowledge is growing fluent and organized. The remaining

half have gained some knowledge of phonological awareness, however, their

knowledge is incomplete. Extent of knowledge is limited and quality of knowledge is

inadequate suggesting these students' knowledge is not growing towards expertise at

this point in time.

Key Words: pre-service teachers; professional knowledge development; phonological

awareness; phonemic awareness; phonics

CHAPTER I

INTRODUCTION

In the elementary school years, general education teachers face the task of teaching children how to learn to read and spell. Although many teachers and children accomplish this task successfully, an increasing number of students fail to acquire basic literacy skills. Unfortunately, children who do poorly at reading in first and second grade tend to remain poor readers throughout school, with a substantial proportion eventually identified as students with learning disabilities (Mather, Bos, & Babur, 2001, p. 472).

The above statements are disheartening. Is this the prognosis we want for our children? I am sure it is not. Yet, it continues to happen year after year in so many schools. Many children leave elementary school as ineffective readers (Mather et al., 2001; Rapp, van den Broek, McMaster, Kendeou, & Espin, 2007).

We want highly effective educators teaching our children. We want all of our nation's children to be successful readers. So then, what is the problem? Why are some children capable readers while others are not? This is obviously an extremely complex dilemma to which there are no easy answers.

As an instructor of pre-service teachers this issue is close to my heart. I have investigated literacy domains of knowledge which my pre-service teachers' enter the classroom and then leave with after taking the foundational literacy course that I teach. In particular, I conducted research in the areas of phonemic awareness and phonics.

Statement of the Problem

Professional literature reveals the nature of problems some children experience when learning how to read; attainment of even basic literacy skills are out of reach for many children. "Unfortunately, many children struggle to learn to read" (Johnson, 2004, p. 72). Rapp et al. (2007) note approximately one-third of fourth graders and one-fourth of eighth graders cannot read at a basic level. It has also been observed that reading difficulties experienced in grade school can persist into adulthood (Rapp et al., 2007). Piasta, McDonald Conner, Fishman, and Morrison (2009) have noted that too many children do not learn to read effectively.

There are a number of factors associated with children's reading difficulties. Among them are familial problems, gender-related issues, and perceived faulty teacher education programs upon which some of the blame for reading difficulties has been placed—deserving or not (Harding & Parsons, 2011; Johnson, 2004). It has been suggested master teachers understand the impact of relationships, collaboration, community and the influence each can have on the children they teach. Otto (2008) addresses the influence of children's environments, especially regarding their social environment, on their education and learning. There is evidence in professional literature that a child's social environment impacts his or her learning (Harding & Parsons, 2011; Johnson, 2004; Otto, 2008). A child's family comprises a large part of that child's social environment and therefore affects his or her education and learning.

Familial difficulties also influence children's learning (Harding & Parsons, 2011; Johnson, 2004). Otto (2008) makes it clear that teacher's and parent's roles in children's literacy learning (i.e., children from varied socio-cultural groups), is

important. The mother's level of education has been associated with children's early success or failure in learning to read (Johnson, 2004). A mother who has attained a high level of education is more likely to believe her children will achieve a high quality education compared to a mother who has only a minimum level of education.

Gender-related issues also influence children's reading development (Johnson, 2004). Hausheer, Hansen, and Doumas (2011) found significantly more males than females were referred to an elementary school remedial reading program. The program focused on improving reading fluency and comprehension. Hausheer et al. (2011) also indicated that with remediation, reading comprehension scores for males improved more than for females. Results of the Hausheer et al. (2011) study demonstrated gender impacts reading acquisition.

Regarding the complexities of reading acquisition, there are many declarations in professional literature that purport teacher education programs as failing to adequately prepare teachers for the field. For example, research has yielded a growing body of empirical evidence to support a direct relationship between teachers' knowledge and skills about essential components of effective literacy instruction and student literacy outcomes (Mccombes-Tolis & Reinn, 2008). Teachers' literacy-related knowledge and skills have been extensively documented within the literature as insufficient to support effective instructional delivery to students (Mccombes-Tolis & Reinn, 2008).

Piasta et al. (2009) found word gain outcomes for students who were taught by more knowledgeable teachers and spent more time in explicit instruction were predicted to be stronger. Students taught by less knowledgeable teachers who also

spent more time in explicit instruction were associated with weaker skill gains (Piasta et al., 2009). It can be inferred that many times both teachers and teacher education programs (Brady & Moats, 1997) are deemed responsible for children's lack of reading ability. Allington (2006) acknowledged that teacher preparation programs in higher education have been under attack for reasons that include insufficient teacher preparation in reading.

While teacher education programs have become highly scrutinized in recent years, pre-service, beginning and in-service teachers have also come under scrutiny (Mather et al., 2001; Spear-Swerling et al., 2005). Teachers are expected to possess specialized knowledge of reading as well as "to become ever more proficient and knowledgeable across the curriculum" (Cunningham et al., 2004, p. 140). Researchers who have analyzed teacher knowledge of reading instruction are in agreement that teachers must be sufficiently prepared to enter the teaching field (Cunningham et al., 2004; Mather et al., 2001; Report of the National Reading Panel, 2000; Spear-Swerling et al., 2005). This implicates teacher education programs as the primary teacher preparation entities and predominantly responsible for education of teachers.

Reading Acquisition and Phonological Awareness

There is a body of literature identifying reading acquisition difficulties with deficiency relative to instruction of phonological awareness concepts (National Institute for Literacy, 2002, 2008; Report of the National Reading Panel, 2000). Phonological awareness is comprised of phonemic awareness and phonics (Tompkins, 2008) and are building blocks that help children construct the ability to read. Phonemic awareness is the ability to hear sounds in words and lays the foundation for using phonics to decode

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print (Gunning, 2010). Phonics is the ability to associate printed letters and letter combinations with letter sounds (Fox, 1996). Again, ability to use phonics is part of learning to decode text.

Ehri, Nunes, Willows, Schuster, Yaghoub-Zadeh and Shanahan (2001) note phonemic awareness instruction is a necessary component of reading acquisition. Spear-Swerling and Sternberg (2001) state, "Most beginning readers benefit from explicit instruction in word analysis, (e.g., phonics instruction, and for youngsters who are vulnerable to reading difficulties), this instruction appears to be particularly important" (p. 53). It may be that teachers, pre-service, beginning and experienced, lack adequate knowledge concerning oral language development, phonemic awareness, phonics or word decoding (Bos, Mather, Dickson, Poshajski, & Chard, 2001; Spear-Sperling, 2007). Lack of knowledge of these domains negatively impact children's reading acquisition (Report of the National Reading Panel, 2000).

Pre-service teachers' development of a professional knowledge base in literacy, and in particular, in phonological awareness, is my topic of interest. The literature presents a robust case regarding the problem of teacher's absence of phonological awareness knowledge (Koedel, 2011; Spear-Swerling & Sternberg, 2001). I am concerned my students, pre-service teachers, may not have gained the necessary knowledge of phonemic awareness and phonics, (i.e. phonological awareness), when they leave the literacy foundations course I teach.

As the instructor of a literacy methods course, I am cognizant of pre-service teachers' apparent lack of knowledge about phonological awareness. In my capacity as course instructor, I have observed a number of my students who are unable to

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distinguish between phonemic awareness skills and phonics skills. Therefore, when the opportunity became available I chose to undertake an investigation of pre-service teachers' development of a professional knowledge base in literacy and specifically, acquisition of phonological awareness information.

While investigating teacher's knowledge of phonological awareness I discovered information relative to teacher quality. In particular, "The quality of the teacher is the key to improved student performance, regardless of the condition of the schools, the affluence of the child, the nature of the community, or any other element in the lives or educational environment of school children" (The American Council on Education, 1999; p. 5-6, as cited in Gibson, 2010). It is clear that teacher quality is vital as it relates to student success. Therefore, after completion of literacy methods courses in teacher preparation programs, it is essential that students possess an adequate level of expertise in teaching basic literacy concepts such as phonological awareness.

Constructivist Framework

Constructivism is a learning theory which asserts learners are active rather than passive and construct knowledge (Johnson, 2004) based on reflection of their experiences (Gallant & Schwartz, 2010; Concept to Classroom, 2004). Constructivists say, when learners experience something new, it must be integrated with previous knowledge which changes present knowledge.

For this study, I developed constructivist in-class engagements to teach pre-service teachers about phonological awareness. These engagements were designed to promote active participation of learners. For example, there is an element of discussion that is inherent within each engagement. In-class engagements provided opportunities

for pre-service teachers to engage in conversation and reflection. Reflection is a significant characteristic of constructivism (Gallant & Schwartz, 2010; Concept to Classroom, 2004) and of expert teachers (Brady & Moats, 2001). It is logical then to provide pre-service teachers with in-class engagements that invite active participation and include elements for intellectual reflection. "Teacher education programs have placed increasing emphasis on the importance of teacher reflection" (Stough, Palmer & Sharp, 2001).

Constructivism has guided my approach to instruction of pre-service teachers. As I designed the study, constructivist principles such as social interaction and building meaning provided guidance. Each in-class engagement was constructed so that social interaction was inherent. Pre-service teachers work with a partner or in a small group. Therefore, it is inevitable that discussion and interaction will occur during each in-class engagement.

Purpose of the Study

The purpose of this study was to explore pre-service teachers' development of a professional knowledge base in regard to phonemic awareness and phonics, (i.e., phonological awareness). My intent was to describe the phonological awareness knowledge of pre-service teachers before and after instruction and to gain insight into professional knowledge attained. I wished to gain some understanding of the level of expertise pre-service teachers left the course. Additionally, I wanted to describe pre-service teachers' responses to constructivist learning methods.

Research Questions

Creswell (2007) suggests beginning the process of developing research questions by proposing a central question first.   My research questions developed as the outcome of a central question, which is: What is the process for pre-service teachers to begin building a professional knowledge base in literacy? From this central question I entered into a thought process which resulted in the emergence of two sub-questions (Creswell, 2007).

Following are research questions that guided my study. They address my primary concerns related to this study.

1. What differences are evident in pre-service teachers' knowledge about phonemic awareness and phonics before and after instruction?

2. What is the nature of the in-class engagements about phonemic awareness and phonics that pre-service teachers find influential?

Significance of the Study

I initiated this investigative journey to attain useful information for my own instructional practices as well as for the purpose of pursuing a topic (i.e., phonological awareness), of great interest. What I discovered from this study will be implemented in the literacy foundations course I teach. Although the findings of this study are not generalizable to all pre-service teachers, I have contributed to the body of knowledge relative to pre-service teachers by describing their knowledge of phonological awareness.

Gibson (2010) noted knowledge of teachers' expertise regarding literacy instruction is of key importance. If pre-service teachers do not gain at least adequate

knowledge of phonemic awareness and phonics before leaving teacher preparation programs, a spiral begins which is vast in its reach. Children must have access to effective teachers of reading if they are to have opportunities to function appropriately in society. Thus, it is critical that teacher educators conduct studies such as this one to further understanding about how to prepare pre-service teachers in the area of literacy.

Limitations of the Study

A limitation of this study is generalizability. The sample size was not large enough for results to be generalized to other pre-service teacher populations. Creswell (2007) states that qualitative researchers are typically not concerned with generalizability. Findings will be integrated into the literacy foundations course where I am the instructor.

It is not known whether the sixty-two pre-service teacher who completed the post-assessment participated in all of the class sessions on phonological awareness. This is a second limitation to the study.

Delimitations of the Study

This study was delimited to participants who were pre-service teachers enrolled in a literacy foundations course over a one semester period at a midwestern university and were education majors. The three groups of pre-service teachers were students I taught at the time of the study and were available for research purposes.

Pre-service teachers who were enrolled in other literacy courses within the education department were excluded from the study. It was not feasible to include other pre-service teachers, so I did not include them in the study. Only pre-service

teachers whom I was teaching in the literacy foundations course at the time of the study were included.

This study is also delimited to instruments designed by the researcher. The instruments were specifically designed to address phonological awareness concepts particular to this study. They were based on constructivist theory and principles. Instruments that fit these criteria appeared unavailable.

Finally, the study was delimited to one specific geographic location. The university I chose is my worksite and the location of the foundations literacy course involved in the study. Since I was interested in case study research with pre-service teachers it was to my advantage to choose my university and a literacy foundations course I teach.

Organization of the Study

I have organized the study into five chapters and four appendices. This first chapter consists of the predominant ideas of the study, the problem and research questions have been posed, and the significance of the study has been presented. I also included definitions of key terms used in the study.

Chapter II addresses a review of current professional literature relative to domains of knowledge pertaining to literacy, and specifically, to this study. Reading acquisition, a breach among what science indicates in terms of the literacy skills teachers' must possess and apply to their instructional practices, teacher expertise, and constructivist teaching and learning are discussed in Chapter II.

In Chapter III, I describe a case study approach to research, design of the study, and constructivist-based instruments. Data collection and data analysis methods are

also described. Chapter IV includes the findings and in Chapter V, I provide discussion of the findings, implications, and recommendations for instructional practices.

To assist the reader's understanding of this study, I included definitions of several terms from the specialized language base relative to reading instruction and acquisition. These terms are especially relevant to the study.

Definition of Terms

Alphabetic Principle. The relationship that exists between letters (i.e., graphemes) and sounds (i.e., phonemes) (Tompkins, 2008).

Constructivism. Refers to a collection of educational practices that are student-focused, meaning-based, process-oriented, interactive, and responsive to student personal interests and needs (Johnson, 2004, p.72).

Expert. "Instead, experts have acquired extensive knowledge that affects what they notice and how they organize, represent, and interpret information in their environment" (National Research Council, 2000, p. 1). Notice of meaningful patterns, organization of knowledge and flexible retrieval of knowledge are characteristics of expertise.

In-class Engagements. Those tasks designed and developed for this study, were completed in-class and in which students actively participated for the purpose of learning new information and for applying their knowledge of a specific new learning.

The National Reading Panel. A 14 member panel of parents and professionals created by the United States government, the National Institute of Child Health and Human Development, and charged with providing a report that "should present the panel's conclusions, an indication of the readiness for application in the classroom of

the results of this research, and, if appropriate, a strategy for rapidly disseminating this information to facilitate effective reading instruction in the schools" (Report of the National Reading Panel, 2000, p. 1).

Novice. Novices have acquired some knowledge that affects what they notice and how they organize, represent, and interpret information in their environment (National Research Council, 2000).

Phonemic Awareness. "The ability of students to notice, think about, and manipulate individual sounds in spoken syllables and words" (Minnesota Board of Teaching Standards for Teachers of Reading, 2009, p. 3).

Phonics. "Phonics is the understanding that there are systematic and predictable relationships between written letters and spoken words. Phonics instruction is a way of teaching reading that stresses learning how letters correspond to sounds and how to apply this knowledge in reading and spelling" (Minnesota Board of Teaching Standards for Teachers of Reading, 2009, p. 3).

Phonological Awareness. The basics of developing reading abilities and including: phonemic awareness skills and phonics skills (Report of the National Reading Panel, 2000).

Rime. "A rime is the part of a syllable that contains the vowel and all that follows it (the rime of bag, is –ag; of swim, is –im)" (National Institute for Literacy, 2008, p. 3).

CHAPTER II

REVIEW OF THE LITERATURE

Despite educator's best efforts reading difficulties persist (Walsh, Glaser, & Wilcox, 2006). Literature is clear that phonological awareness (i.e., phonemic awareness and phonics), is a significant factor in reading acquisition (Ball, 1993; Cunningham et al., 2004; Mather, Bos, & Babur, 2001; Phillips, Clancy-Menchetti, Lonigan, 2008; Turan & Gul, 2008). Turan and Gul (2008) observed that phonological awareness is the most important indicator of future reading development. This implies that teachers must be knowledgeable and well prepared to instruct children in phonological awareness skills.

It is widely known among educators, and other professionals, that effective reading instruction is crucial to children's reading development. Research suggests that the professional knowledge base of beginning teachers must be well-developed in five areas of reading instruction: phonemic awareness, phonics, fluency, text comprehension, and vocabulary (Moats & Foorman, 2003; Report of the National Reading Panel, 2000). Literature has described both pre-service and beginning teachers as lacking adequate understanding of phonemic awareness and phonics and being ill prepared to teach reading (Ball, 1993; Moats, 1999/2001).

What does a professional knowledge base in literacy consist of regarding pre-service teachers and their understanding of phonological awareness? According to the

Report of the National Reading Panel (2000) a significant portion of that knowledge must include a firm grasp on understanding phonemic awareness and phonics. The Report of the National Reading Panel (2000) found that in today's classrooms, it is vital teachers possess this knowledge in order to become effective teachers of reading. An essential part of a teacher's professional knowledge base relative to literacy is to encompass high quality information about phonemic awareness and phonics. This conclusion was based on research that found phonemic awareness and phonics as significant for children's successful development of reading (Ball, 1993; Castiglioni-Spalten & Ehri, 2003; Cunningham et al., 2004; Treiman, Tincoff, Rodriguez, Mouzaki, & Francis, 1998).

Importance and Complexities of Phonological Awareness

Professional literature identifies a large body of knowledge regarding phonemic awareness as a necessary domain of knowledge for teachers (National Institute for Literacy, 2008; Phillips et al., 2008; Rapp et al., 2007; Report of the National Reading Panel, 2000; Spear-Swerling, 2007). In the following section I provide information from the literature relative to phonemic awareness knowledge.

Next, a section on activities for promoting phonemic awareness development in children follows (National Institute for Literacy, 2008). These activities are common to many teachers who wish to develop phonemic awareness in children. Skills acquired through these activities are ability to manipulate phonemes in spoken words. This ability allows children to readily map phonemes onto graphemes.

A discussion of phonics as a required domain of knowledge ensues. Professional literature documents knowledge of phonics as a necessary domain for

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teachers (National Institute for Literacy, 2008; Spear-Swerling, 2007). Effective

reading instruction is enhanced with teacher's knowledge of phonics. Teachers gain a

higher probability they will become effective teachers or reading.

Lastly, the complexities of developing understanding of phonemic awareness

and phonics are addressed. Phonemic awareness and phonics share similarities and

differences. Shared elements contribute to the difficulties of complete understanding of

these skill sets.

Phonemic Awareness as a Necessary Domain of Professional Knowledge

A broad body of knowledge within professional literature has identified

components of literacy instruction that are considered necessary for effective reading

instruction to occur (National Institute for Literacy, 2008; Phillips et al., 2008; Rapp et

al., 2007; Report of the National Reading Panel, 2000; Spear-Swerling, 2007).

Phonemic awareness knowledge is a domain of knowledge that is considered to be vital

to reading instruction (Ball, 1993; Castiglioni-Spalten & Ehri, 2003; Cunningham, et

al., 2004; Turan & Gul, 2008). This understanding of phonemic awareness "has been

shown to be critical to reading acquisition" (Cunningham, et al., 2004, p. 143).

"Various studies have shown that phonemic awareness and letter knowledge are the

best two predictors of how well children learn to read during the first 2 years of

instruction" (Castiglioni-Spalten & Ehri, 2003, p. 26). Byrne and Fielding-Barnsley

(1990) reported that skill in phonemic awareness "...underpins the acquisition of the

alphabetic principle and hence of reading skill." (p. 805). Previous studies have also

documented that "phonemic awareness instruction causes improvement in students'

phonemic awareness, reading, and spelling" (Foorman & Torgesen, 2001, p. 204).

Similarly, Mather et al. (2001) reported that early instruction of phonological awareness in general education classrooms improve children's reading and spelling skills. Spear-Swerling and Sternberg (2001) cite lack of phonemic awareness knowledge in children who encounter difficulties when learning to read. Phonemic awareness proficiency is a required knowledge domain for pre-service teachers because of its inherent connection with learning to read. Teachers must be knowledgeable in instructional methods regarding the development of phonemic awareness ability in children (Foorman & Torgesen, 2001).

Some research suggests in order for children to acquire phonemic awareness they must be explicitly taught phonemic awareness concepts (Ball, 1993; Castiglioni-Spalten & Ehri, 2003; Cunningham, et al., 2004; Turan & Gul, 2008). The Minnesota Board of Teaching Standards for Teachers of Reading (2009) has defined phonemic awareness as, "The ability of students to notice, think about, and manipulate individual sounds in spoken syllables and words" (p. 3). Specific activities to assist children with developing phonemic awareness have been suggested. The National Institute for Literacy (2008) recommended specific activities for developing phonemic awareness. Activities for promoting phonemic awareness include the following: identify phonemes, categorize phonemes, blend phonemes to form words, segment words into phonemes, delete or add phonemes to form new words, and substitute phonemes to make new words.

Activities for Development of Phonemic Awareness

Teachers engage children in the following kinds of activities to enhance phonemic awareness development (National Institute for Literacy, 2008). Children

learn to say the initial, middle, and ending phoneme in words as well as learning several other phonemic awareness skills through participating in these activities. The activities that follow promote phonemic awareness development.

Identifying phonemes. A teacher engaged in teaching a child phoneme identification might be heard to say, "Tell me the sound you hear at the beginning of the word *cat*. Yes, you are right, */k/* begins the word *cat*." Notice the teacher does not ask the child to name the grapheme that begins the word, but the phoneme that begins the word.

Categorizing phonemes. The ability to categorize phonemes refers the ability to choose the 'odd' word out of a series of words. For example, the teacher may ask, "Which word does not belong? *Sun, can, sit*." The child may respond, "*Can* does not belong. It does not begin with */s/*." The child is demonstrating that he or she is able to categorize words according to the same beginning phoneme. Children are also taught to categorize objects and words by ending and middle phonemes as well.

Blending phonemes. The ability to blend phonemes is a skill a child develops through explicit instruction. The teacher segments a spoken word into separate phonemes and asks the child to blend the phonemes together to form a word. Blending phonemes to form words may sound like this, "If I say the sounds */s/ /a/ /t/* and then put them all together what word do I make? Yes, I make the word *sat*. You did that very well."

Segmenting phonemes. Segmenting phonemes in words is the opposite of blending phonemes in words. For example, the teacher may say, "I am going to say a word. I want you to listen to the sounds you hear and then tell me the sounds you hear

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in the word: *man*. Yes, the sounds in the word man are */m/ /a/ /n/*." The word *man* has three sounds: */m/ /a/ /n/*. Note, however, not all words have the same number phonemes and letters, as in the word *man*. For example, *word* has four letters but three phonemes: */w/ /r/ /d/*.

     Deleting or adding phonemes. Deleting or adding phonemes to form new words is also a phonemic awareness skill that children develop. Children may be asked, "What word do we make if we take the */b/* sound off of the word *band*? Yes, we have the word *and*. Now, if we add the */s/* sound onto the front of *and,* what word do we make? *Sand,* yes, you are right."

     Substituting phonemes. Lastly, substituting one phoneme for another phoneme in spoken words is a further skill children acquire. A teaching scenario may look like this: "What if I take off the */s/* sound off of the word *sat* and put the */m/* sound in its place? What word do we make? Yes! We make the word *mat.* You have done very well."

     Phonemic awareness skills are typically learned as foundational reading skills by young children through these kinds of activities. These activities represent the types of activities that build basic phonemic awareness skills (Report of the National Reading Panel, 2000). Cunningham et al. (2004) cite phonemic awareness skill knowledge as being critical to reading acquisition. Professional literature supports phonemic awareness skill as significant to reading development success and reading failure (Ball, 1993; Cunningham et al., 2004; Mather et al., 2001; Report of the National Reading Panel, 2000; Turan & Gul, 2008).

Phonics as a Necessary Domain of Professional Knowledge

Phonics is the understanding of phonemes and the grapheme or graphemes that represent a phoneme or phonemes in written language (National Institute for Literacy, 2008; Spear-Swerling, 2007). To help young children develop phonemic awareness, teachers design activities wherein children learn to identify the phonemes, (i.e., the sounds in spoken words); whereas, in phonics instruction teachers help children learn to associate an alphabetic symbol or symbols with a specific phoneme or phonemes. This understanding is referred to as the "Alphabetic Principle". An example of phonics instruction is when the teacher instructs children about the grapheme (i.e., letter) that represents the phoneme (i.e., sound of the letter) */d/* in words. He or she may say, "This is the letter "*d*". It represents the */d/* sound in words such as in the word dog. The letter "*d*" begins the word *dog*."

In terms of phonics, the crucial point to remember is that phonics deals with graphemes and phonemes in written language (National Institute for Literacy, 2008). Graphemes and phonemes are significant in phonics instruction. Teachers of young children must understand the differences between phonemic awareness and phonics if their reading instruction is to be effective (Ball, 1993).

Pre-service teachers, beginning teachers, general education teachers, and reading specialists must understand phonics instruction and its role in reading acquisition (Piasta, McDonald Conner, Fishman, & Morrison, 2009; Spear-Swerling, 2007). While keeping this in mind, Moore and Harris (1986) found that

> …most of the students (i.e. pre-service teachers) could not articulate appropriate
> instructional strategies for either the implicit or explicit approach to phonics
> instruction for first grade children. Results also indicated that respondents had

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not reviewed the literature pertaining to the teaching of phonics. In addition, none of the students listed an instructional strategy that met the standards for an appropriate instructional session, such as explanation of goals and objectives, learner practice, and feedback (Moore & Harris, Abstract, 1986, p. 1).

The pre-service teachers in Moore and Harris' (1986) study could not express appropriate implicit or explicit phonics instructional strategies for first grade children. Exposure to current research in phonics instruction had not occurred. Clearly, these pre-service teachers were not prepared to teach phonics.

Spear-Swerling (2007) addressed the difficulty of English orthography. Orthography is the writing system of a language (Spear-Swerling, 2007). The English writing system is an alphabetic system consisting of mapping graphemes onto phonemes relationships (i.e., associating a phoneme with a grapheme). The English language is an opaque orthography as compared to fairly transparent orthographies such as German, French, Turkish and Spanish. Transparent orthographies display a fairly consistent one to one correspondence among symbol/sound relationships. Opaque writing systems are not as reliable concerning one to one correspondence between grapheme/phoneme relationships. The English language is a very difficult language to learn because of the scarcity of one to one correspondence among grapheme and phoneme relationships. A one to one correspondence can be observed in this example: The t represents the */t/* phoneme in the word *tan.* The grapheme *t* almost always represents the */t/* phoneme in words; the grapheme */t/* is quite reliable. An example of a grapheme that is mostly unreliable is the grapheme "*o*". This grapheme represents a number of different phonemes in words. Notice the various phonemes

represented by "*o*" in the following words: *lot, boat, toot,* and *book.* The grapheme "*o*" is quite unpredictable.

Because the English writing system is so unreliable regarding one to one correspondence among phonemes and graphemes, this writing system is difficult to learn. One to one correspondences play a significant role in learning words in the English language through phonics. Part of what makes words in the English language so difficult is that many words do not adhere to phonics rules. For example, r-modified vowels appear in the words *fur, sir*, and *her* (Fry, 2010). The vowels *"u", "i",* and *"e"* do not represent a short or a long vowel sound in these words. This illustrates the confusion that can occur when a child tries to decode a word, like *sir*, and encounters difficulty when applying a short or long vowel sound to the letter "*i*". Saying the word *sir* using a short sound for "*i*" does not result in an English word nor does using a long vowel sound. The difficulty of learning words in the English language is seen. This also displays problems related to learning to read and write the English language.

Difficulty of Phonics

To illustrate difficulties children encounter with regard to phonics and decoding (Treiman et al., 1998) of words several examples follow. Children learn about words that contain silent letters, such as *main.* Phonics generalizations (i.e., rules are taught in respect to these words). The word *main* adheres to the generalization, put here in layman's terms, "When two vowels go walking the first one does the talking". In other words, when two vowels are side by side in a word try saying the name of the first vowel. There are words however that do not follow the generalization such as the word

should. The *"o"* and the *"u"* are side by side yet the long *"o"* phoneme is not present in the word *should* (Fox, 1996).

The word *time* also follows a phonics generalization. Children who are taught phonics skills are taught this generalization. Children are instructed to apply this generalization when they encounter words that have this pattern: consonant vowel consonant silent *"e"* (i.e., CVCe). This letter pattern can be observed in the word *time.* The difficulty appears when children encounter words that contain this letter pattern but the words however, do not adhere to the generalization. There are many exceptions to this generalization as well as to all generalizations. An example from the English language of a word that adheres to the CVCe phonics generalization but is not pronounced according to the generalization is the word *come.* In the word, the *"c"* represents the first consonant; *"o"* represents the vowel, *"m"* represents the second consonant, and *"e"* represents a silent *"e"*. Thus, the word *"come"* follows the generalization but does not result in a word from the English language when the generalization is applied. At times phonics generalizations prove unreliable (Fox, 1996).

There is an example from a textbook that illustrates the difficulty of phonics regarding children. Fox (1996) presented a poem in her textbook *Strategies for Word Identification* written by a young child that displays the difficulties of phonics generalizations. I present the poem here. The title of the poem is *School*, "I like school. School is fun. School is nete. School is cool" (Fox, 1996, p. 59). Notice the word *nete* in the third line at the end of the sentence. This word follows the CVCe generalization yet, the word, *neat,* is misspelled. The child correctly applied the CVCe

phonics generalization to his or her writing but was still incorrect in his or her attempt to spell the word correctly.

Spear-Swerling (2007) provides other examples of letters and letter patterns that when they appear in words are very difficult for children to decode. For instance, *"g"* can represent the hard sound, */g/* as in *go*, or the soft sound, */j/* as in *huge;* and the letter pattern *"-igh"* represents the long */i/* sound as in night, not a blend of the individual sounds for *"i"*, *"g"* and *"h"* (Spear-Swerling, 2007). The letter *"g"* is silent in the word *night*. Spear-Swerling (2007) offers an example for the letter "*a*". The letter *"a"* can represent each of the sounds for a heard in these words: *cat, cake, farm,* and *small* (Spear-Swerling, 2007). This discussion illustrates some of the complexities of phonics.

As well as knowledge and understanding of phonemic awareness, phonics is a knowledge domain necessary for teachers. Reading teachers, general education teachers, and pre-service teachers must be knowledgeable so they can provide children with operative reading instruction (Cunningham et al., 2004; Report of the National Reading Panel, 2000; White, 2005). In regard to general education teachers, White (2005) states "Virtually all K-2 teachers in the United States regard phonics instruction as essential or important" (p. 234). It is a significant foundation of literacy. Children must learn the sound that a letter or letters represent in words (Treiman et al., 1998). "Children need to know that the grapheme *"b"* generally corresponds to the phoneme */b/* that the grapheme *"h"* generally corresponds to the phoneme */h/*, and so on" (Treiman et al., 1998, p. 1524). Pre-service teachers must have a working knowledge of phonics to teach children this content.

Cunningham, et al. (2004) investigated K-3 teachers and found that early instruction in phonemic awareness and phonics improves children's reading and spelling abilities of children who are considered to be at risk. Bos et al. (2001) also found a relationship between poor reading ability and early, systematic instruction in phonological awareness and phonics. They found that early reading and spelling skills are heavily influenced by instruction in phonological awareness skills and phonics (Bos et al., 2001). A related finding that Spear-Swerling and Sternberg (2001) cite is that "Most beginning readers benefit from explicit instruction in word analysis, and for youngsters who are vulnerable to reading difficulties, this instruction appears to be particularly important" (p. 53). The International Reading Association (2007) has long recognized the importance of the inclusion of phonics in reading instruction programs. In summary phonics instruction is critical to reading acquisition both for children who are at-risk for reading difficulties as well as for those who are not at-risk (Moats, 1999; Report of the National Reading Panel, 2000; Spear-Swerling, 2007).

Complexity of Phonemic Awareness and Phonics

A common misunderstanding often occurs regarding phonemic awareness and phonics (Spear-Swerling, 2007). "Phonemic awareness and phonics are related yet distinct abilities: Phonemic awareness involves spoken language whereas phonics involves written words" (Spear-Swerling, 2007, p. 302). Misunderstanding these distinct areas of skill development for emergent readers may contribute to pre-service and beginning teacher's lack of ability to teach reading effectively. Many pre-service and beginning teachers mistakenly believe that phonemic awareness and phonics are the same or mostly the same domains of knowledge. They are not. A crucial

understanding regarding what phonemic awareness involves, is to be aware of the differences between phonemic awareness and phonics. (Spear-Swerling, 2007).

Distinguishing the difference between phonemic awareness and phonics.
According to the National Institute for Literacy (2008) in *Put Reading First*, phonemic awareness involves oral language phonemes and the ability to manipulate those phonemes verbally. For instance, a teacher may design a lesson wherein he or she will say a word and then ask the children what word they will have if they take off the */p/* in the word and replace it with the */m/* sound. "Listen while I say the word *pet*. What word will we make if we take off the */p/* and put on the */m/*? Yes, we make the word *met"*. Emphasis is placed on identifying the phoneme or phonemes in words when teaching phonemic awareness, not the grapheme.

The main point of this explanation of the difference between phonemic awareness and phonics is to underscore the difficulty of these concepts. There are a number of similarities among the two concepts with only one primary difference: one involves working with spoken language while the other involves working with written language (Report of the National Reading Panel, 2000; Spear-Swerling, 2007).

Gap Identified between Science and Practice

It is the goal of teacher preparation programs to educate pre-service teachers so that they are able to successfully instruct their students in the acquisition of reading. However, recent research has identified a gap between science and practice (Gibson, 2010; Harding & Parsons, 2011; Moats, 1999; Spear-Swerling, 2007; Spear-Swerling, Owen Brucker & Alfano, 2005; Spear-Swerling & Sternberg, 2001). Many teachers are not incorporating results from scientific research into their teaching. Hence, this is

where the gap appears. It also seems that pre-service, beginning and experienced

teachers, lack adequate knowledge concerning oral language development, phonemic

awareness, phonics or word decoding, vocabulary, and text comprehension (Bos et al.,

2001; Moats & Foorman, 2003; Spear-Sperling, 2007). The findings indicate there is

reason for concern. Spear-Swerling and Sternberg (2001) suggest that many teachers

are not exposed to scientific research on reading (Moats, 1999) until after their teacher

preparation program has ended. "Providing teachers with a solid understanding of the

theoretical and scientific underpinnings of literacy development" is recommended by

Brady and Moats (1997, Abstract, p. 1). Implications reveal that teachers must be

exposed to scientific research on effective reading instruction and must activate their

newly gained knowledge by incorporating it into their teaching practice (Moats, 2001;

Spear-Swerling, 2001).

Phonemic awareness and phonics are domains of professional knowledge that

have been identified by the Report of the National Reading Panel (2000) as necessary

components of effective reading instruction programs. Phonemic awareness skill is the

first reading skill children develop under formal instruction (National Institute for

Literacy, 2008). Spear-Swerling and Sternberg (2001) cite several "examples of well-

established scientific findings" (p. 63). Among these scientific findings is that during

early stages of reading development children's sensitivity to the sounds in spoken

words heavily influence their word-analysis skills and that children whom lack

phonemic awareness have difficulty learning to read (Spear-Swerling and Sternberg,

2001). Phonemic awareness knowledge provides the foundation that teachers build

upon in order to promote reading acquisition in children (International Reading Association, 2007).

Teacher education programs are challenged to prepare teachers with professional knowledge of the domains of phonemic awareness and phonics. Deficiencies and weak knowledge development in teacher education programs must be addressed (Bos et al., 2001; Moats, 1999). Changes in teacher education programs are recommended (Brady & Moats, 1997).

This is a significant dilemma. If teachers lack the necessary knowledge and skills to teach children to read fluently, our entire society is considerably and negatively affected. The future success of all students centers on their ability to become effective readers in school and in life (Scola, 2002). In order to function effectively in society one must be able to read efficiently. Teachers are those whom society depends upon to teach children to read.

Phonemic Awareness and Phonics: The Other Side

Although instruction of phonemic awareness and phonics has been perceived as critical to children's reading acquisition (Ball, 1993; Cunningham et al., 2004; Mather et al., 2001; National Institute for Literacy, 2008; Report of the National Reading Panel, 2000; Spear-Swerling & Sternberg, 2001; Turan & Gul, 2008; White, 2005) there is another perspective. There are those who believe explicit and systematic phonemic awareness and phonics instruction are not crucial to reading acquisition (Manzo, 1997).

Whole Language and Phonics

Among those who do not view explicit and systematic phonics curriculum as a necessary component of reading instruction are whole language supporters who believe that students learn reading skills through interaction with literature, writing and significant others (Manzo, 1997). One primary belief is that children learn to read through being read to. Children are exposed to language through stories, poetry, and oral language play in the company of knowledgeable, caring adults. They hear, see, and experience text and gradually learn to read text.

Whole language proponents recognize graphophonics (i.e., phonics) as an essential but insufficient component of reading experiences for beginning readers, and they discourage isolated instruction of graphophonics. Instead, they promote instruction on sounds and letters to be embedded in meaningful contexts (e.g., following reading of whole text). The letters and sounds taught and learned are determined by the learner's current need in a situation rather than determined by a prescribed curriculum (Barrentine, 1999). It seems a more 'natural' approach is taken regarding instruction of phonics.

Whole language proponents "…want them to read for meaning" (Barrentine, 1999, p. 1). They view reading as a process that requires readers to make simultaneous use of multiple cues such as letters and sounds, sentence structure (i.e., syntax), and meaning (i.e., semantics). Isolating phonics instruction can create over-reliance on letters and sounds for decoding at the expense of using all cues that are available to the reader. A heavy emphasis on the importance of phonics-oriented word decoding is perceived as a possible barrier to learning to read for meaning (Barrentine, 1999).

Although, whole language supporters do not altogether dismiss phonics as inconsequential to reading acquisition, they do not wholly embrace phonics as significant to children's attainment of reading ability. Rather, their perspective is phonics instruction is important to reading development when brought into the reading process at the moment it is needed by readers to decode unfamiliar words. Readers utilize phonics when it is needed. Whole language theory, regarding phonics, appears to represent a type of 'middle of the road' approach.

The "Reading Wars" was and is the debate over whether phonics instruction or meaning-first instruction provides more effective reading instruction (Garan, 2001). Those on both sides of the issue appear to have strong feelings regarding an emphasis on phonics or meaning-first reading instruction. Allington (2006) poses an interesting question regarding phonics: "How did it happen that the federal government now requires schools to adopt phonics-first reading programs…?" (p. 7). It appears that how to teach reading is being determined by the federal government and phonics is favored as compared to meaning-first reading instruction. Allington (2006) is very much against the federal government setting policy on how to teach reading.

Balanced Literacy and Phonics

Balanced literacy promotes a 'balance' between literature and phonics instruction. Balanced literacy has been referred to as a "middle of the road approach" to instruction (Otto, 2008). According to this perspective, children who enter school lacking oral language experience must gain this kind of experience before phonics instruction occurs. Reading stories to children is one way which they can get oral language experience (Manzo, 1997).

Although, there is no one agreed upon definition of balanced literacy instruction there is agreement on the general philosophy and theoretical perspective of this approach. There are elements which maintain a proper balance between phonics and meaning-based instruction. These two elements are advocated by those who support balanced literacy (Otto, 2008). Balanced literacy philosophy integrates both skill-based, (i.e., phonics), instruction and whole-language instructional activities.

The manner in which balanced literacy is achieved in the classroom varies. Instructional engagements that support readers are: "direct instruction and independent, discovery learning; isolated skill emphasis and meaning-construction emphasis; pre-planned formal instruction and flexible instruction in response to children's questions or immediate needs; use of trade books and use of commercially developed, ability-leveled reading texts; formal standardized assessments and informal assessments; focus on language arts within a communicative context; and heterogeneous, flexible grouping of students and homogeneous, ability grouping" (Otto, 2008, p. 31). A number of strategies may be employed within the classroom when a balanced approach to reading instruction is adopted.

Teacher Expertise

Teacher expertise is a topic of interest that corresponds with the focus of this study. Pre-service teachers' development of a professional knowledge base in phonemic awareness and phonics was investigated. Pre-service teachers' knowledge may be better understood if described relative to features of expertise.

A description of expertise is that it is "generally defined as superior knowledge and skill within a specific domain" (Stough, Palmer, & Sharp, 2001, p. 2). According

to the National Research Council (2000) those who have obtained expertise in specific areas are able to think effectively about problems in those areas. However, Lin (1999) asserts there is no commonly agreed upon definition for teaching expertise.

Features of Expertise

The characteristics of experts are ability: to perceive meaningful patterns in information, to perform tasks quicker than novices, and to have an outstanding memory about events (Stough et al., 2001). Barrentine, Waller, and Beck (2011) cite characteristics of expert level knowledge as well. The first characteristic of expertise they address is somewhat similar to characteristics noted by Stough et al. (2001). Experts notice meaningful patterns that go unnoticed by novices. Secondly, Barrentine et al. (2011) articulate this characteristic of expertise: experts "…organize their knowledge in ways that are suited to the subject matter…" (p. 26). Lastly, the National Research Council (2000) suggests that "…experts fluently retrieve knowledge that is relevant to the context" (para. 3).

Meaningful Patterns

Experts notice meaningful patterns of information that novices do not notice (Barrentine et al., 2011; Gallant & Schwartz, 2010; Stough et al., 2001). The information observed by novices is different than that noticed by experts. The National Research Council (2000) noted "…one of the earliest studies of expertise demonstrated that the same stimulus is perceived and understood differently, depending on the knowledge that a person brings to the situation" (para. 4). The prior knowledge an individual brings to an event affects how he or she thinks about the event and patterns that are noticed.

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An example of experts, chess masters, who notice meaningful patterns, is provided by the National Research Council (2000). Chess masters contemplated options for moves that were of superior quality than those pondered by less experienced players (National Research Council, 2000).

> Degroot concluded that the knowledge acquired over tens of thousands of hours of chess playing enabled chess masters to out-play their opponents. Specifically, masters were more likely to recognize meaningful chess configurations and realize the strategic implications of these situations; this recognition allowed them to consider sets of possible moves that were superior to others. The meaningful patterns seemed readily apparent to the masters… (National Research Council, 2000, para. 5)

As experience and knowledge in a specific area build, properties that were previously abstract become distinctly perceived. Meaningful patterns, such as those in chess moves, become apparent as a result of increased experience and knowledge. As a result of considerable experience within a particular area, which builds knowledge, individuals are able to notice key patterns of information. Experience as well as a strong knowledge base is important (Kudva, 1999) with regard to the ability to notice meaningful patterns of information.

Organization of Knowledge

Secondly, experts organize their knowledge according to their area of expertise (Barrentine et al., 2011). Gallant and Schwartz (2010) observed that teachers who are proceeding from novice to expert develop progressively detailed, complex, and interconnected information about their disciplines. Others who write about expertise say, "Experts have acquired a great deal of content knowledge that is organized in ways that reflect a deep understanding of their subject matter" (National Research Council, 2000, para. 3). Lin (1999) noted the quantity and quality of knowledge teachers hold

differs among novices and experts as well as the method of organization that

knowledge is held in memory. Experts are able to organize their knowledge in memory

in a manner that makes it easily accessible.

Retrieval of Knowledge

The National Research Council (2000) noted that experts are able to confidently

retrieve knowledge that is pertinent to the context. Specifically, "experts are able to

flexibly retrieve important aspects of their knowledge with little attentional effort"

(National Research Council, 2000, para. 3). Gallant and Schwartz (2010) also note the

ability of experts to easily retrieve knowledge with little energy output. Teachers who

are able to easily bring relevant knowledge to the forefront are typically expert

teachers. Expert teachers characteristically display this ability.

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Constructivist Teaching and Learning

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A concise synopsis of Dewey's thoughts regarding education and learning is

that schools should teach students how to think rather than merely learning rote

information (National Research Council, 2000).

According to constructivist learning theory, experience and active learning is

the framework for successful instruction (Lo, 2010). Clinchy (2003) described the

basic foundation of constructivist education as 'learning by doing'. Most educational

researchers acknowledge that children's learning beyond the walls of the school occurs

almost exclusively in the context in which the training will be used.

> Native American children exemplify this. They learn to create beadwork,
> paddle a canoe or hunt simply and effectively. Children learn from
> accomplished adults who are carrying out those actions. Gradually children
> become helpers and participants in these on-going activities, and eventually
> assume the key role (Researcher's example: Ruth M. Newton, 2012).

The kind of learning that ensues outside of the school environment, flows within the context of the task to be learned and is informal in that there is no direct instruction such as that within the classroom setting. Thus, children learn 'contextually' and 'informally' (Clinchy, 2003).

Clinchy (2003) also asserts that children are active and motivated learners which, is a further premise of constructivist learning theory. Children and young people possess an intrinsic drive to learn. Howard Gardner (Clinchy, 2003) pointed out the vast differences between constructivist learning theory and the typical kind of instruction that takes place in many schools: formal, direct instruction outside the context of the task to be learned as compared to the natural, within context, learning that arises in the social environment of the child.

Constructivist learning theory applies nicely, in particular, to instruction of pre-service teachers. Lo (2010) noted a significant change being adopted by a number of institutions of higher education. The role of students is shifting from that of passive receiver to active learner (Barr & Tagg, 1999). A new learning paradigm with a constructivist methodology is being embraced by higher education and asserts that students must become responsible for their own learning (Lo, 2010).

We see the break from traditional teaching practice to a new perspective in higher education (Barr & Tagg, 1995). Students are increasingly being viewed as active participants in their own learning processes as well as being held responsible for construction of knowledge (Clinchy, 2003; Lo, 2010). It is becoming more acceptable for the instructor to play a facilitator role, rather than the absolute authority in the classroom who directs a structured, rigid learning environment.

Summary

Pre-service teachers must gain the professional knowledge required to teach children to read, including foundational knowledge about phonological awareness. Understanding of the differences among phonemic awareness and phonics as well as understanding of the complexities of these two concepts must also be attained. Ideally, they begin to develop knowledge that reflects characteristics of expertise through constructivist experiences. This is the kind of professional knowledge that is critical to effective reading instruction.

CHAPTER III

METHODS

The purpose of this study was to explore pre-service teachers' attainment of phonemic awareness and phonics knowledge gained from a literacy foundations course at a four-year university. In this Chapter I explain how I explored this topic. A section on research questions is provided followed by discussion of the design of the study. Next I discuss a case study approach to the investigation. Then I provide an overview of study methods. I also discuss the procedure taken to attain research consent. The setting for the study and description of participants are addressed next. A discription of instruments, instructional engagements and implementation and data collection follow. Lastly, trustworthiness of data and biases and how these were addressed are discussed.

Research Questions

This study presents a case study design of pre-service teachers' development of a professional knowledge base relative to phonemic awareness and phonics. Research was driven by two major research questions.

1. What differences are evident in pre-service teachers' knowledge about phonemic awareness and phonics before and after instruction?

2. What is the nature of the in-class engagements about phonemic awareness and phonics that pre-service teachers find influential?

Design of the Study

"In general, the design of a study is the overall approach used to study the problem of interest" (Gay, 1996, p. 218). To illustrate the specific design of the study, I created a concept map. Further, I use the design of the study (Figure 1) to provide a brief overview of the study methods. I utilized a case study approach as a foundation for investigation of pre-service teacher's development of phonological awareness. This approach is described below.

Case Study

Creswell (2007) states, "…*case study* research involves the study of an issue explored through one or more cases within a bounded system (i.e., a setting, a context)" (p. 73). My study corresponds with this criterion. The case is a foundations literacy course at a four-year university. The university serves as the bounded system within which the study occurs (i.e., setting or context).

Further, Stake (2005) asserts that "case study research is not methodology but a choice of what is to be studied i.e., a case within a *bounded system* …" (as cited in Creswell, 2007, p. 73). This describes the type of research I conducted. Creswell (2007) views a case study approach as "…a type of design in qualitative research …" (p. 73). Following is a description of the study with a concept map that outlines the design. (Figure 1). This design presents the overall approach used to shed light on the central phenomenon (i.e., the process of pre-service teachers' attainment of knowledge of phonological awareness) (Gay, 1996).
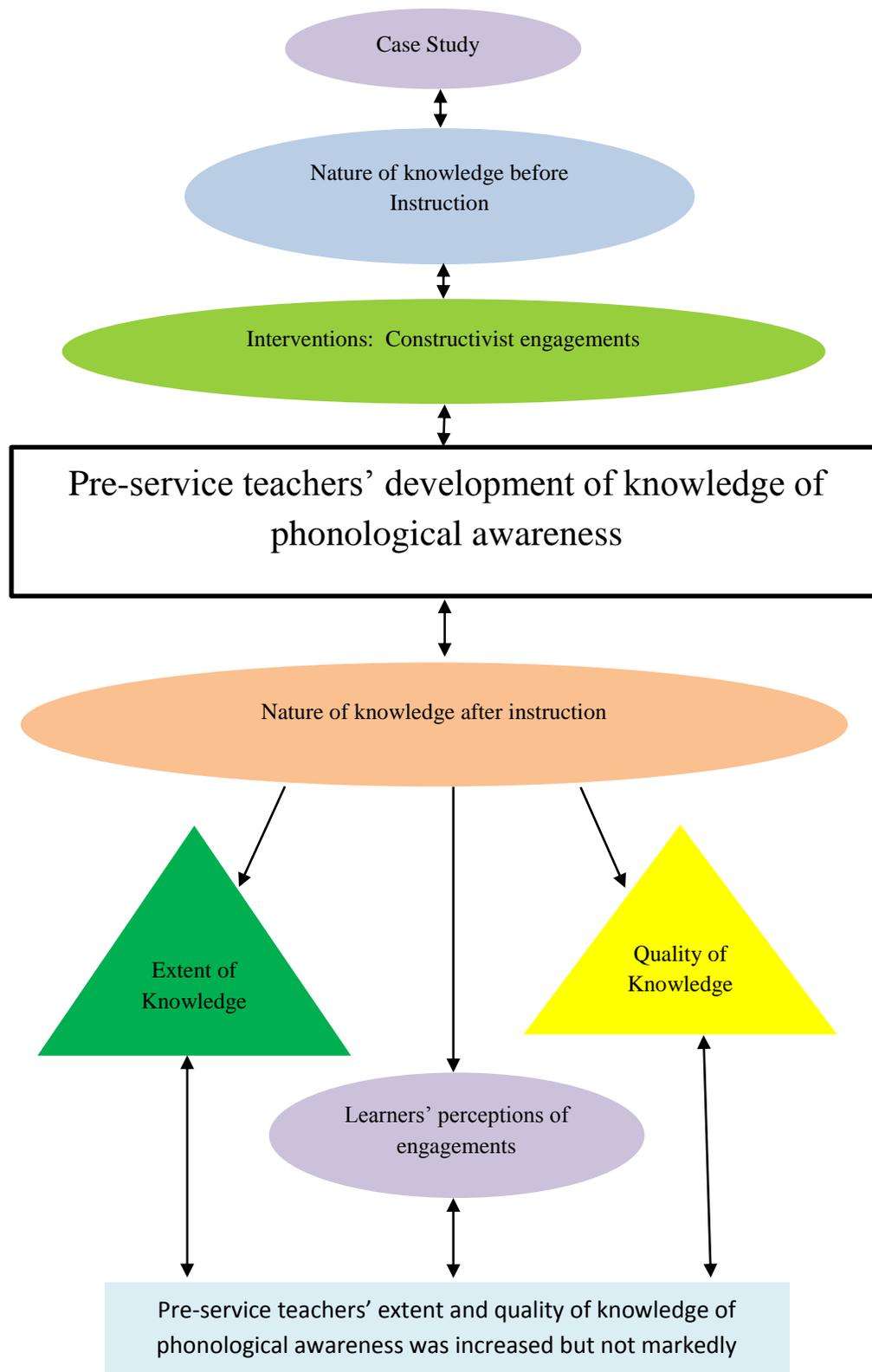
Figure 1. Design of the Study.

Overview of Study

I employed appropriate methods to collect and analyze data (Tomal, 2010) consistent with my research design. I collaborated with an expert to develop data collection instruments: a pre-assessment and post-assessment, four constructivist instructional in-class engagements, and an instructional feedback form. These instruments are described in more detail later in this chapter.

Exploration of the central problem began with determination of existing knowledge pre-service teachers held relative to phonological awareness. This was accomplished through administration of a pre-assessment. Direct instruction on phonemic awareness and phonics followed. For example, class lectures, viewing videos and discussion of reading assignments ensued. These instances of direct instruction were followed by students' participation in active and 'hands-on' engagements in class. These engagements concluded with pre-service teachers' written responses to three questions that appear on a feedback form (Appendix A).

After instruction pre-service teachers' knowledge was evaluated by a post-assessment, which is the same instrument as the pre-assessment (Appendix B). Then data were analyzed. Data analysis was guided by existing research that informed the study (Barrentine et al., 2011).

Data collected from feedback forms about in-class engagements were also analyzed. Pre-service teachers completed feedback forms after each in-class engagement was concluded. Feedback forms provided information about the in-class engagement. Data collection and analysis procedures are explained later in this chapter.

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Research Consent

For this study, I obtained consent from two universities: the one at which I was a student and the one at which I was an instructor (Appendix C). In compliance with Institutional Review Board (IRB) (Appendix D) policies at the universities, I issued informed consent to all of my students who were enrolled in the literacy foundations course in which the study took place. Additionally, in compliance with IRB requirements, I stored consent information and data I collected in separate areas under lock and key.

Setting for the Study

The setting, or context, for the study is a mid-western four-year university. The university offers a variety of programs in education: early childhood education, early childhood special education, elementary education, special education, secondary education, and K-12 education.

The case used in this study is a teacher education course for pre-service teachers. It is a three credit course that requires face to face meetings between instructor and students. Instructor and students met twice a week for seventy-five minutes for one semester.

The course is a literacy foundations course that pre-service teachers who are education majors must complete. It is part of the required course load that comprises their core education coursework. The catalog description for this course follows:

> This course provides the learner with an overview of early literacy development in children ages birth to 6. Attention will be focused on the continuum of early literacy development; the relationship between language acquisition and early literacy; the importance of promoting literacy development in all children, particularly those with special needs; the impact of sociological and cultural

factors on literacy development; and the wide variety of home and school experiences that provide children with a solid foundation of success for learning to read and write (University catalog description of the course, 2012).

Participants

Participants were from three sections of the literacy foundations course from one semester. Eighty-eight students enrolled in the course sections. Two students dropped the course and consequently were unable to continue in the study. Ultimately, seventy-five students signed consent forms. Students participated in the pre-assessment, in-class engagements and feedback forms. Post-assessment data were collected on only sixty-two students because not all students attended class on the day I held the post-assessment. It is unknown whether all sixty-two students who completed the post-assessment attended all of the class sessions on phonological awareness.

Participants were pre-service teachers enrolled in this literacy foundations course that I teach. Students who take the course are pursuing a career in the field of education as educators. These are education majors earning a baccalaureate degree in early childhood education, elementary education, special education, or early childhood-special education.

There is a prerequisite course that students take to be admitted into the literacy foundations course. Every student must have taken a child development course. There are two child development courses that are accepted: Child Development for Teachers or Developmental Psychology.

Students are typically freshman or sophomores as these are the optimum levels at which the course should be taken. Occasionally there are students who are at later stages in their academic career who take the course, however, this is unusual.

If a student's GPA is below 2.25 he or she is not permitted to register for this literacy course. Those who are working toward a baccalaureate degree in education are required to successfully complete the literacy foundations course in order to progress in the program.

Demographic data used to describe participants were obtained from class lists (e.g., major, number of available participants) and from my own interactions with students (e.g., older than average, race, sex). It should be noted, however, that participants' data were aggregated and no findings were described according to demographics or associated with individual students.

Pre-service teachers are between the ages of eighteen and twenty years with two older than average female pre-service teachers. Participants consisted of both males and females. Pre-service teachers attended the university on a full-time basis registering for between twelve and sixteen credits per semester. There was one student who was Hispanic. The remaining students were European Americans.

Instruments, Instructional Engagements and Implementation and Data Collection

Two data collection instruments were developed for this study and four instructional engagements were also developed (Appendices E). Data collection instruments include a pre-assessment, post-assessment and an instructional feedback form. I also constructed two phonemic awareness engagements and two phonics engagements. These engagements are integral to the design of the study and are described following description of the data collection instruments. To devise the instruments and engagements, I consulted various professional resources on phonological awareness. I also met with the expert with whom I consulted. We

devoted approximately four hours drafting the two instruments and instructional

engagements. I refined these instruments a number of times before implementation and

developed plans for implementation.

Pre-assessment and Post-assessment

The pre-assessment and post-assessment is designed to compare students'

knowledge about phonemic awareness and phonics (i.e., phonological knowledge)

before and after instruction.   The instrument is a paper and pencil task with eight items

designed to have students express their phonological knowledge (Appendix B). To

ensure the assessment was measuring the constructs of interest, I consulted with an

expert.

All students present in class completed the assessments because these tasks

reflect normal educational practices. It should be noted student performance on the

assessment was not calculated as a factor in students' course grade. Data were

analyzed for only those who were participants in the study—seventy-five participants

completed the pre-assessment and sixty-two completed the post-assessment. Both the

pre-assessment and post-assessment were completed in class; all three sections had

approximately the same amount of time to complete the assessments.

For the pre-assessment, in all three course sections, I explained that they were to

do their best to answer all items on the form. They were encouraged to take as much

time as needed and to use the back of the paper, if needed. They were instructed to

work alone. I allotted about thirty minutes but all students completed the pre-

assessment within thirty minutes. All assessments were turned in to me when students

had completed them. They were placed in a pile on a desk with name sides facing a downward position.

The post-assessment was administered after instruction (e.g., lectures, readings, in-class engagement) on phonological awareness was concluded. I employed similar procedures for the post-assessment as for the pre-assessment. Students received instructions to work alone and to take time to think about and respond carefully to the items. The time allotment was again approximately thirty minutes. Students were asked to place papers name side down when turning them in and then they were free to leave.

In the final analysis, not all data collected from the instruments were used for the study. Data were collected from pre-assessment and post-assessment items one and nine and were analyzed (Appendix B). For Item1, students were asked "What is phonemic awareness?" and "What is phonics?" Regarding Item 9 students were presented with a real life scenario and asked to explain a mother's misconception. Item 9 presents this situation:

> A five-year old is being assessed for entrance into kindergarten. The mother is astonished when assessment results indicate her child lacks phonological awareness. The mother states, "But she knows her ABC's and she sings it all the time! Explain the mother's misconception.

Pre-assessment and post-assessment responses to this situation were analyzed.

In-Class Engagement Feedback Form

As mentioned, several in-class engagements were designed to teach students about phonological awareness which will be described in a following section. Immediately after students finished an in-class engagement they completed the

feedback form (Appendix A). Pre-service teachers were instructed to respond with honesty to the three questions posed on the form. A time range of ten to fifteen minutes was allotted for completion of feedback forms. When students completed the forms they placed them face down on an empty desk and were free to leave. This procedure was followed for each in-class engagement and for every student in each of the three sections of the course.

At the point in the semester when it was time to address phonological awareness concepts the routine schedule was followed. Pre-service teachers were assigned readings from the text with direct instruction following. When direct instruction was concluded for the class session, pre-service teachers participated in an in-class engagement with a partner or group. In-class engagements provided opportunities for pre-service teachers to actively practice phonological awareness skills.

After completion of the engagement, pre-service teachers provided written feedback on the feedback forms. Feedback forms contained three questions that pre-service teachers responded to in written form after each in-class engagement was completed. At the end of the class session both the feedback form and engagement were collected.

Since I had three sections I was teaching, I color-coded the engagements and feedback forms so that I could keep accurate records for each section. One section was assigned blue: folders to keep the engagement documents in were blue as well as the paper the engagement documents were printed on and feedback forms were also printed on blue paper. Another section was assigned orange and the remaining section was assigned green. This technique, however, was purely for organizational purposes

because data were combined for all analyses and the performance for the course

sections were not compared.

The in-class engagements are: Elkonin Boxes, Realia I: Phonemic Awareness,

Phonemic Awareness and Realia II: Phonics (Appendix D). These are described below.

I describe each phonemic awareness instructional engagement, followed by the phonics

engagement.

Design of In-Class Engagements

In class engagements can be described as normal educational procedures.

Though the engagements were shaped for this study, they are typical of activities

implemented in university classrooms when teaching and learning about phonological

awareness. These engagements, in particular, were shaped to reflect the constructivist

principle of social interaction. The Elkonin Boxes in-class engagement was created to

assist pre-service teachers with learning to identify phonemes in spoken and written

words (Appendix D). On the handout, which is the in-class engagement, there were

examples of two, three, and four phoneme words with the appropriate number of boxes

for each word that pre-service teachers used for practice. Each student participated in

using the boxes to count the phonemes in the example words. The Elkonin Boxes were

arranged into sets of two boxes, three boxes, and four boxes that were connected to

each other. For example, the pre-service teacher would choose the two phoneme word,

which is *pie.* He or she would place his or her index finger into the first of the two

boxes while saying the word aloud and specifically saying the */p/* phoneme. Then the

finger would slide over to the second box while the pre-service teacher said the

phoneme */i/.* His or her pronunciation corresponded to the two boxes: the first box is

for the /p/ phoneme and the second box is for the second phoneme */i/*. He or she would

observe sound (i.e., hearing the word) and through sight and touch that the word

contains two phonemes: */p/ /i/*.

     Realia I: Phonemic Awareness. The second in-class engagement was Realia I:

Phonemic Awareness. This engagement was designed to assist pre-service teachers

with learning how to identify initial and ending phonemes in words. Each pre-service

teacher was assigned a beginning phoneme for which they had to bring in a real object

that had the assigned phoneme. The pre-service teachers were placed in small groups

and then they chose one pre-service teacher to act as the teacher for his or her group.

Each student placed his or her object in one row. The teacher then named each object

aloud so that it would be accurately named. He or she named each object alone, then

with the students. Without this step there is a likelihood of the object being misnamed.

For example, a bird might be called a robin, which is technically correct if the bird is

indeed a robin however, let us say that the teacher is instructing his or her students

about the initial phoneme */b/*. Then he or she would want to ensure that the object is

referred to as a bird.

     Next the teacher, (i.e. pre-service teacher who is playing the role of teacher),

asked each student to choose a specific object beginning with the, for example, */f/*

sound.

     The teacher may have stated something similar to this, "Susie, please choose the

object that begins like fan*".* He or she would proceed this way until all of the object's

initial and ending phonemes had been correctly identified.

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Phonemic awareness. Lastly, the Phonemic Awareness in-class engagement consisted of three tasks: counting phonemes, phoneme identification, and counting syllables. The first task required pre-service teachers to read a list of words and determine the number of phonemes in the words. Pre-service teachers took turns completing the task. One pre-service teacher would read a word from the list and count the number of phonemes in the word while the other would write the number of phonemes on the line beside the words.

The second task involved identifying the third phoneme in a list of words. Pre-service teachers traded places: one would name the third phoneme while his or her partner wrote the letter that represented the phoneme. For example, if the word was *boat*, the pre-service teacher would say the word aloud and listen for the third phoneme */b/o/t/.* When he or she determined the third phoneme, */t/,* the other would write that letter on the line beside the word.

The third task concerned counting syllables. Pre-service teachers again traded places. One read a word from the list and determined the number of syllables while the other recorded the number on the line beside the word. At the conclusion of each engagement, students completed the feedback form designed to elicit pre-service teacher's thoughts about the engagement.

Realia II: Phonics. The third in-class engagement pre-service teachers participated in is the Realia II: Phonics engagement. This in-class engagement is similar to Realia I: Phonemic Awareness engagement, however, there are some significant differences. Pre-service teachers were assigned a rime such as *-an.* Each pre-service teacher brought in a real object representative of his or her rime. For

example, for the *"-an"* rime a pre-service teacher may have brought in a can to represent "-*an*". Each pre-service teacher would name his or her object and then a word that contained the rime. The rime *"-an"* appears in the words *can* and *pan.* If these are the words the pre-service teacher named, then his or her partner would write a list of words that contain the rime *"-an".* They would continue naming words with the *"-an"* rime until possibilities were exhausted. Pre-service teachers would utilize the same procedure for the rime selected by his or her partner.

Data Analysis

Data were analyzed in aggregate form and individual student performance was not compared for achievement. Further, data were aggregated for all three course sections. Results were not compared for performance between or among sections but considered as one data set.

Data from pre-assessment outcomes was not used to inform further instruction. Pre-assessment data was not analyzed until after the post-assessment was given. Therefore, a case study approach was selected rather than an action research method.

Analysis of Assessment Data

Data analysis for the pre-assessment and post-assessment data collected for this study was informed by existing research (Barrentine et al., 2011). Barrentine et al. (2011) identified codes and categories within their study that were relevant to my study. They described pre-service teachers' strategic comprehension knowledge before and after instruction. From their work I adapted analysis terminology for my study. Extent and quality of knowledge and related descriptors served well to describe my students' knowledge before and after instruction. A key difference between Barrentine et al.

(2011) analyses and mine, however, is that they used the terms extent and quality simultaneously to describe student knowledge. In my study, I did not combine the two categories to describe student knowledge but described extent and quality of student knowledge separately. Extent of knowledge refers to the amount of knowledge pre-service teachers demonstrated in their responses. Quality of knowledge refers to a robust, detail-oriented response that includes use of professional terms. I developed definitions for the codes (Appendix E) and adapted the existing analysis information to my study.

Definitions of Categories and Descriptive Codes for the Assessment Data

The two main categories, extent of knowledge and quality of knowledge, each contained several codes (Appendix E). The category, extent of information revealed participants' amount of knowledge about phonemic awareness and phonics. Thus, codes used to describe participants' extent of knowledge were extensive, sufficient and limited. Responses coded extensive in extent included professional language in this domain and were elaborated in explanation, and may have included examples to clarify meaning. By contrast, responses coded limited in extent lacked detail, use of communicative professional language and no clarifying details were offered. Sufficient responses were accurate, though brief, and may have included professional terminology to communicate information.

The category, quality of information related to the worth or value of information in response to phonemic awareness and phonics learning situations. Codes to describe quality of knowledge were enriched, basic, and inadequate. Responses coded as enriched provided robust detail to communicate, used professional language, and were

accurate. Inadequate responses were those that used overly conventional language, may have been inaccurate, were too brief to be meaningful, lacked descriptive information, or were inaccurate. Basic responses were accurate but may have lacked descriptive detail or explanatory information to be coded "enriched". Basic responses, however, suggested the quality of the participant's knowledge was basic enough so that the participant had gained accurate information about phonemic awareness and phonics that contained some detail. No response replies meant the pre-service teacher left the space blank. Incorrect responses contained information that was incorrect.

Each participant's response on the pre-assessment and post-assessment Items 1 and 9 received a code, one for the extent of knowledge and one for the quality of knowledge. In the following section, to explain how I coded assessment data using the descriptive codes, I provide examples and explanations about coding data for extent of information.

Examples and explanation of coded data. Regarding explanations of phonemic awareness, for example, the response "When a child understands how words and sounds go together" was coded as sufficient for extent of knowledge and basic for quality of knowledge. This response demonstrates the pre-service teacher knows that phonemic awareness skills involve knowledge of words and sounds. The pre-service teacher has not made any reference to letters in her response. This indicates that he or she is mindful of the difference between phonemic awareness and phonics. This pre-service teacher understands that phonemic awareness involves understanding that sounds are present in words.

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Related to phonemic awareness, a response such as, "Learning parts of word sounds" was coded as limited for extent of knowledge and inadequate for quality of knowledge. The response has little substance. A response such as "When a child learns to say letters" received not applicable for both extent and quality of knowledge because the information is inaccurate. "Listeners are able to hear, identify, and manipulate phonemes" is an example of an enriched response for quality of knowledge. The pre-service teacher used some professional terms (e.g., manipulate, phonemes) that accurately described phonemic awareness. However, it was coded as sufficient for extent of knowledge because even though the pre-service teacher accurately described phonemic awareness, he or she did not go on to describe further characteristics of phonemic awareness such as, the ability to segment words sounds, and add on or delete phonemes in spoken words. Therefore it was not coded as extensive knowledge.

There were many responses on the pre-assessment that I coded as not applicable. These responses contained inaccurate information, for example, "knowing what words mean" does not describe the characteristics of phonemic awareness nor explain any part of what phonemic awareness is. Lastly, there was one participant who did not respond to Item 1. This 'response' was simply coded an NR for no response. I assume the reason for not responding was because he or she did not know the skills of phonemic awareness nor how to explain what it is however, since I was unsure whether this was true I did not feel I should include it with the not applicable responses.

The response, "Learning to discriminate among oral/spoken sounds" was coded sufficient. This response would have been coded extensive if the pre-service teacher had used the term 'phonemes' rather than 'sounds' and added 'in words' after sounds.

"Learning to discriminate among oral/ spoken phonemes in words" is an extensive

response. This response was coded as sufficient in extent of knowledge. This

illustrates the cognitive process I engaged in when analyzing responses and

determining a code. Overall, the codes help describe the nature of students'

professional knowledge and lead to further discussion about students' developing

expertise related to this body of knowledge.

Quantifying the qualitatively analyzed assessment data. While the pre-

assessment and post-assessment data were analyzed qualitatively, the nature of the

analysis allowed counting the number of instances of each category of information. For

example, I was able to note that on a phonics question from the pre-assessment, 14 out

of 79 responses were coded as incorrect, or 18% were incorrect. On the post-

assessment 5 out of 62 responses were coded as incorrect, or 8%. Thus, I was able to

numerically summarize all of the coded data. This created a way for me to concretely

describe students' change in performance before and after instruction. Thus, in the

Results chapter of this study, I describe pre-service teacher's performance before and

after instruction quantitatively and qualitatively. Doing so allows me to quantify the

percentage of responses described extensive and enriched and those described limited

and inadequate.

Explanation of Analysis on Feedback Forms

Feedback forms were analyzed utilizing qualitative methods. Pre-service

teacher responses to 3 questions on a feedback form were analyzed (Appendix A).

Data from 3 sections of pre-service teachers who were enrolled in the literacy

foundations course were aggregated and treated as one data set. Codes developed as

data was analyzed. Codes that emerged from data were: activity-related, management-related, and people-related (Table 1).

Table 1

Example of Analysis Process for Feedback Forms

CODES	CATEGORIES

Feedback Form Question 1: What did you learn?

CODES	CATEGORIES
Activity-Related	• how to count phonemes in words using Elkonin Boxes • number of graphemes is not always equal to the number of phonemes • difficult to count phonemes in words
Management-Related	• instructor examples and explanations assisted in learning how to use Elkonin Boxes to count phonemes in words • phonemic awareness tasks must be taught as oral activities • real objects work well for teaching children rimes
People-Related	• children learn to count phonemes using multiple senses when they use Elkonin Boxes • Elkonin Boxes would work well for teaching children to count phonemes in words

Feedback Form Question 2: What helped you learn it?

CODES	CATEGORIES
Activity-Related	• visual aids/objects • saying words aloud
Management-Related	• instructor modeling, examples, explanation
People-Related	• working with a partner • discussion with and feedback from a partner • participants own thinking

Not Applicable: 3 responses

Feedback Form Question 3: What changes would you make?

CODES	CATEGORIES
Activity-Related	• utilize the objects more than just for representing the rime: write a short poem, play a game • groups share their rimes with their classmates
Management-Related	• assign more than one rime to a person • define rime and rhyme more in-depth
People-Related	• more interaction between groups: discussion

No Changes: 11 responses No Response: 1

Development of Themes and Assertions

Three themes emerged from the data. Development of themes arose from analysis of pre-assessment, post-assessment, and feedback forms. I aggregated several large clusters of information from assessment and feedback data from which I developed themes.

Assertions were developed from my efforts to "…make sense of the data and provide an interpretation of the data couched in terms of personal views…" (Creswell, 2007, p. 244). Assertions resulted data outcomes and my interpretations of data.

Trustworthiness of Data Analysis

To enhance trustworthiness of my data analysis, I developed a model response for Item 1 on the pre-assessment and post-assessment which asked students to define phonemic awareness and phonics. My model response defined phonemic awareness in the following way: "The ability of students to notice, think about, and manipulate individual sounds in spoken syllables and words" (Minnesota Board of Teaching Standards for Teachers of Reading, 2009, p. 3). My model definition for phonics was, "Phonics is the understanding that there are systematic and predictable relationships between written letters and spoken words. Phonics instruction is a way of teaching reading that stresses learning how letters correspond to sounds and how to apply this knowledge in reading and spelling" (Minnesota Board of Teaching Standards for Teachers of Reading, 2009, p. 3).   I used these model descriptions of phonemic awareness and phonics as I coded the pre-assessment and post-assessment for extent and quality of information.

Additionally, to enhance trustworthiness of my findings from the data analysis, I sought out an expert who provided advice and feedback regarding analysis of data. We devoted approximately four hours to coding one piece of data. We each coded the same large segment of data for extent and quality and then discussed the rationale each of us utilized for our coding of the pieces of information. One example that exhibits a response we struggled with is this, "The child needs to bring the letters together and know how the letters are pronounced." This response was given in response to Item 9 on the post-assessment, (i.e., the item about the parent who misunderstands phonological awareness) (Appendix B).

One of us coded the response limited and inadequate. Limited is a code for extent of knowledge and inadequate for quality of information. The other coded it sufficient and for basic. These codes are also for extent of knowledge and quality of knowledge. We entered into a conversation about our thinking in regard to why we chose these particular codes. We concluded that the scenario actually asked students to explain why the child could not be considered phonologically aware not phonemically aware. Phonological awareness involves both phonemic awareness and phonics skills. Phonological awareness is a term that is used to represent both concepts therefore; in conclusion, the data was coded as S for sufficient extent of knowledge and B for basic quality of information.

This experience prompted me to develop an "answer key" for the pre-assessments and post-assessments. I created a pre-assessment and post-assessment prototype to guide my coding. Following is the prototype I developed for the scenario presented in Item 9 on the pre-assessments and post-assessments. Along with the

definition of codes developed for the analysis (Appendix F), it was used to maintain

consistency in how data were coded.

> Being able to sing the ABC song informs that the child can name the
> ABC's and names them in correct sequence. It does not reveal whether she
> can identify the letters when they are in written form. Phonological
> awareness includes phonemic awareness and phonics skills, for example,
> knowing how to manipulate phonemes in words when spoken (i.e.
> phonemic awareness) and when written (i.e. phonics). Understanding how
> to break a word apart to reveal its syllables when spoken (i.e. phonemic
> awareness) and when written (i.e. phonics) make up phonological
> awareness and are not present in a child's ability to sing the ABC song.
> Developing the prototype served to guide my coding process and assured
> that I employed the same criteria to each pre-service teacher response.

Researcher Bias

I have invested much of myself into this course and the study and wanted each

one of the pre-service teachers to experience success. Would I inadvertently "help"

students to complete the in-class engagements successfully? Would I recognize

providing information to them that I wanted them to gain from direct instruction and

completion of the in-class engagement? These were questions I used to guard against

obtaining inflated, or overly positive data.

The recognition of one's biases supports validity when analyzing data

(Creswell, 2007). Because I was aware of my specific biases, I brought them to mind

when I was teaching the lessons and administering the pre-assessments and post-

assessments.

Further, when analyzing data I was mindful of using definitions and analysis

models to attain unbiased analysis of the data and unbiased interpretation of the

findings.

CHAPTER IV

FINDINGS

In this chapter I report the findings of the study. Purpose of the study and research questions are presented followed by an overview of results. Comparison of pre-service teachers' knowledge about phonemic awareness and phonics before and after instruction is addressed. This includes findings of pre-assessment items one and nine, post-assessment items one and nine, and feedback forms. Tables provide a summary of results for phonemic awareness extent and quality of knowledge, phonics extent and quality of knowledge, and pre-service teachers' ability to use their knowledge of phonemic awareness to explain a mother's misconception about her daughter's lack of phonological awareness (i.e., applying phonological awareness).

Purpose of the Study and Research Questions

Domains of professional knowledge about reading have been identified in the literature (National Institute for Literacy, 2008; Report of the National Reading Panel, 2000; Rapp et al., 2007; Spear-Swerling, 2007) as well as a gap between theory and practice, the problem appears to lie partly within teacher preparation programs. It seems that teacher preparation programs may not be adequately preparing pre-service teachers in the area of phonemic awareness and phonics. According to the literature, knowledge of these domains, phonemic awareness and phonics, are required to teach reading effectively (Report of the National Reading Panel, 2000).

The purpose of this study is to gain insight into pre-service teachers' knowledge of phonological awareness, (i.e., phonemic awareness and phonics), before and after instruction. Does their knowledge reflect characteristics of expertise after instruction? Gaining insight into this question is significant to the study as well. These questions allow me to consider whether or not my students are developing a level of expertise with important domains of professional knowledge related to literacy instruction.

To gain insight I developed two research questions to guide me as I conducted research and gathered data on pre-service teachers and their acquisition of professional knowledge. Specifically, I wanted to bring together data collected from pre-service teachers who were enrolled in a literacy foundations course at a four-year university. Of particular interest to me was phonemic awareness and phonics knowledge acquisition. I wanted to determine whether pre-service teachers were gaining the professional knowledge base required of teachers in the field. I also wished to know which in-class engagements pre-service teachers found most helpful in aiding their learning.

My questions focused on professional knowledge gained before and after instruction and in-class engagements that were most powerful in assisting pre-service teachers attain knowledge of phonemic awareness and phonics.

1. What differences are evident in pre-service teachers' knowledge about phonemic awareness and phonics before and after instruction?

2. What is the nature of the in-class engagements about phonemic awareness and phonics that pre-service teachers find influential?

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In the following section of this chapter, I provide results of the study relative to these questions. I also include some discussion comments in the results section.

Overview of Results

Pre-service teachers' professional knowledge of phonemic awareness and phonics did not appear to change markedly in extent and quality relative to their ability to define or describe skills of phonemic awareness and phonics before and after instruction at levels. Analysis of pre-assessments and post-assessments indicate pre-service teachers' extent of knowledge was often limited and the quality of information was inadequate in respect to their skill at describing phonemic awareness and phonics skills. Yet, most pre-service teachers were able to apply their knowledge of phonological awareness. Relative to Item 9 (Appendix B) on the post-assessment most pre-service teachers were able to respond appropriately to the scenario. A real-life literacy problem was posed and responses were mostly sufficient in extent and basic in quality.

Data suggest approximately half of the sixty-two pre-service teachers who completed the post-assessment demonstrate some of the features of expertise regarding phonological awareness knowledge. Their knowledge, as sufficient in extent and basic in quality suggests their knowledge is growing fluent and organized. The remaining half have gained some knowledge of phonological awareness, however, their knowledge is incomplete. Extent of knowledge is limited and quality of knowledge is inadequate suggesting these students' knowledge is not growing towards expertise at this point in time.

Data also revealed that pre-service teachers found the Elkonin Boxes in-class engagement particularly helpful for learning of how to determine the number of phonemes within a word. The Realia 1: Phonemic Awareness in-class engagement was also viewed as helpful for learning rimes.

Analysis of Item 1: Comparison of Participants' Knowledge about Phonemic Awareness and Phonics Before and After Instruction

Pre-service teachers completed a pre-assessment and post-assessment with the pre-assessment having been administered before instruction and then the post-assessment administered after instruction of phonemic awareness and phonics (Appendix B). The items all relate to phonemic awareness and phonics skills. Participant responses to Items 1 and 9 were analyzed for this study. These assessments assisted in ascertaining pre-service teachers' knowledge of phonemic awareness and phonics components before and after instruction. This addresses the first research question, "What differences are evident in pre-service teachers' knowledge about phonemic awareness and phonics before and after instruction?" The results that follow are reported in a pre-assessment and post-assessment comparison manner addressing extent of knowledge first and then quality of knowledge relative to phonemic awareness. Because the qualitative analysis is supported by additional quantitative analysis I share results in both qualitative and quantitative modes. Results for phonics will be addressed after phonemic awareness.

Phonemic Awareness: Extent of Knowledge

On the pre-assessment and post-assessment, pre-service teachers' extent of knowledge about phonemic awareness was described as incorrect, limited, sufficient

or extensive (Appendix F). Pre-service teachers' extent of knowledge is used to describe their professional knowledge before and after instruction and represents their developing expertise in this domain of professional knowledge. For Item 1 on the pre-assessment and post-assessment, pre-service teachers are asked to "Use the chart to explain phonemic awareness and phonics". The chart is simply two box shapes in which the term phonemic awareness has been placed in the first box and the term phonics has been placed in the second box (Appendix D). See Table 2 for a summary of findings.

Table 2

Phonemic Awareness Extent of Knowledge: Pre-assessment and Post-assessment Item 1

Codes	Pre-assessment		Post-assessment	
	n	%	n	%
Incorrect	44	59%	13	21%
Limited	17	22%	18	29%
Sufficient	13	17%	25	40%
Extensive	1	1%	6	10%
Total	75	99%	62	100%

Note. *** Due to rounding percentages may not add up exactly to 100%

Incorrect responses. To begin, the most extreme outcome for Item 1 on the pre-assessment and post-assessment, in relation to describing phonemic awareness, occurs in respect to the number of incorrect responses from pre-assessment to post-assessment. There was a decrease from 44 incorrect responses out of 75 (59%) responses on the pre-assessment, to 13 incorrect responses out of 62 (21%) responses on the post-assessment. Thus, before instruction there were 59% incorrect descriptions of phonemic awareness skills. After instruction, 21% of pre-service teachers responded with an incorrect description of phonemic awareness skills. This

data displays a decrease of 38% in incorrect responses from pre-assessment to post-assessment. Although, there remain 21% of pre-service teachers with incorrect responses, which at the outset appears quite negative, the positive outcome is that 38% of the incorrect responses have now changed to limited, basic, or enriched.

An example of an incorrect response is, "The sound of the letter". This incorrect response is drawn from the post-assessment but is representative of incorrect responses on both the pre-assessment and post-assessment. This response is incorrect because it refers to a component of phonics knowledge. The primary error made for incorrect responses is that pre-service teachers described a characteristic that is associated with phonics. Their responses included some description of a child's ability to identify a grapheme (i.e., letter), with its corresponding phoneme (i.e., sound). In contrast, to be considered phonemically aware, a child is not required to name graphemes nor identify the grapheme's phoneme. For phonemic awareness the child needs only to identify phonemes in words, not the graphemes. The child does not need to understand the alphabetic principle (i.e., understanding that graphemes represent phonemes). This demonstrates the tremendous difficulty of grasping skills related to phonemic awareness and those associated with phonics.

Limited responses. Limited responses for phonemic awareness extent of knowledge revealed 17 out of 75 (22%) responses were limited on the pre-assessment whereas post-assessment data has shown that limited responses were 18 out of 62 (29%). There was an increase of 7% from before instruction to after instruction.

A limited response typical of these responses is, "Phonemic awareness is sound knowledge". This example was taken from the post-assessment. Limited

responses reveal that these pre-service teachers have acquired some information about the skills of phonemic awareness but still have much more to learn. According to my coding scheme, pre-service teachers whose response was given a limited code for extent of knowledge do not have command of the professional language associated with phonemic awareness characteristics nor do they know that phonemic awareness involves much more than simply "sound knowledge".

Sufficient responses. Next, sufficient responses for extent of knowledge on phonemic awareness increased from 13 out of 75 (17%) on the pre-assessment to 25 out of 62 (40%) on the post-assessment. An example of a sufficient response is, "Learning to discriminate among oral/spoken sounds". This sufficient response is representative of phonemic awareness responses that were coded as such. According to my coding scheme, sufficient responses had to include some reference to phonemic awareness as involving phonemes in words. On the pre-assessment, 17% of the pre-service teachers' responses were sufficient in extent of information about phonemic awareness. After instruction, 40% of the pre-service teachers' responses were sufficient in extent of information. Sufficient responses increased 23% from pre-assessment to post-assessment. These pre-service teachers are now able to provide enough information about phonemic awareness to communicate their grasp of this professional knowledge. Forty percent sufficient responses are one of the largest increases in the entire study. This knowledge is a necessary element of the professional knowledge base that is being formed.

The extent of knowledge of phonemic awareness for these pre-service teachers is sufficient and indicates they understand the major distinction between

phonemic awareness and phonics—which is that phonemic awareness skills all involve oral or spoken words. Phonics involves written words. This understanding is quite important because there are so many similarities among phonemic awareness and phonics that it's difficult for pre-service teachers to grasp this difference. The professional literature suggests that pre-service teachers who have developed this understanding have greater potential for their students to become successful readers. Teachers' understanding of phonemic awareness has "been shown to be critical to reading acquisition" (Cunningham, et al., 2004, p. 143).

Extensive responses. Lastly, phonemic awareness responses coded as extensive increased from pre-assessment to post-assessment. Before instruction, 1 response out of 75 (1%) on the pre-assessment was coded as extensive while 6 out of 62 (10%) responses after instruction on the post-assessment resulted in extensive responses. An extensive response contains accuracy of information as well as use of professional terminology, and may include examples. For instance, these are extensive responses, "When a person can manipulate, hear, and identify phonemes" and "Awareness that speech sounds can be separated into distinct sounds". The terms 'manipulate, speech sounds, identify phonemes, and distinct sounds' are all examples of professional terminology that relates to phonemic awareness knowledge. A pre-service teacher who has acquired this knowledge has achieved a level of professionalism that is an essential component of his or her professional knowledge base. If he or she desires to become an effective teacher of reading that individual must have acquired this crucial information (The National Reading Panel, 2000).

Phonemic Awareness: Quality of Knowledge

On the pre-assessment and post-assessment, pre-service teachers' quality of knowledge about phonemic awareness was described as incorrect, inadequate, basic, or enriched. Pre-service teachers' quality of knowledge is used to determine whether their knowledge is professionalized before and after instruction, e.g., are they able to express their understanding accurately and with language that communicates on a professional level? See Table 3 for a summary of findings on phonemic awareness and pre-service teachers' quality of knowledge.

Table 3

Phonemic Awareness Quality of Knowledge: Pre-assessment and Post-assessment Item 1

	Pre-assessment		Post-assessment	
Codes	n	%	n	%
Incorrect	45	60%	13	21%
Inadequate	14	18%	25	40%
Basic	14	18%	18	29%
Enriched	2	2%	6	10%
Total	75	98%	62	10%

Note. ***Due to rounding percentages may not add up to 100%.

Incorrect responses. A comparison of pre-assessment and post-assessment results about pre-service teachers' quality of knowledge, relative to describing phonemic awareness is reported here. First, the number of incorrect responses decreased from 45 out of 75 (60%) on the pre-assessment to 13 out of 62 (21%) on the post-assessment. Thus, after instruction, an additional 39% of pre-service teachers provided correct information about phonemic awareness.

Inadequate responses. Data reveal the number of inadequate responses from pre-assessment to post-assessment for quality of information increased by 22%. Pre-assessment results are 14 out of 75 (18%) with post-assessment results being 25 out of 62 (40%). Initially, this appears quite negative however there is some restorative value. Pre-service teachers who contributed incorrect responses on the pre-assessment moved to inadequate responses on the post-assessment which demonstrates that learning has occurred.

One example displaying typical features of inadequate responses is, "Understanding that sounds of letters make words". This example was drawn from pre-assessment outcomes for description of phonemic awareness relative to quality of information in the response. These pre-service teachers have some correct information regarding the characteristics of phonemic awareness however lack knowledge of professional terminology associated with the ability to converse about phonemic awareness on a professional level. Terms such as manipulate, segment, blend, grapheme, and phoneme are some of the terms that would be expected in a basic or enriched response. Inadequate responses do not include any of these terms.

Basic responses. Next, the comparison of pre-assessment results with post-assessment results reveal that basic responses increased from 14 out of 75 on the pre-assessment (18%) to 18 out of 62 (29%) on the post-assessment. A basic response taken from the post-assessment is demonstrated in this response and is representative of basic responses, "Awareness of spoken sounds that make up words". While the description is accurate there is no use of professional terms nor are any examples

provided. The description contains accurate information but only the most

fundamental information about essential skills of phonemic awareness is given.

Although, an increase of 11% in basic responses from pre-assessment to post-

assessment was observed, movement is positive. Eleven percent of pre-service

teachers experienced positive gains in information concerning phonemic awareness.

This knowledge is valuable and may be added to their professional knowledge bases.

Enriched responses. On the pre-assessment for quality of information 2 out of

75 (2%) responses were coded as enriched while 6 out of 62 (10%) were coded as

enriched on the post-assessment. A rise of 8% was seen in responses coded as

enriched. An enriched response drawn from the post-assessment is exemplified in

this response, "Phonemic awareness is the ability to recognize and manipulate sounds

in a word" and "Listeners are able to hear, identify, and manipulate phonemes".

These pre-service teachers employed professional terms appropriately in their

descriptions: manipulate phonemes, identify, and recognize. These descriptions are

accurate and the quality of these responses is high. Results suggest, the knowledge

pre-service teachers have developed is of high quality and can be effortlessly

integrated into the professional knowledge base of literacy that they are forming.

 Pre-service teachers who responded with a basic answer are able to

accurately describe phonemic awareness using language common to all. While, this

is relevant information that is situated to a professional knowledge base, it does not

rise to the level of an enriched response that suggests pre-service teachers'

professional knowledge is highly developed.

Phonics: Extent of Knowledge

On the pre-assessments and post-assessments, pre-service teachers' extent of knowledge about phonics was described as incorrect, limited, sufficient, or extensive. Pre-service teachers' extent of knowledge is used to describe the extent of professional knowledge before and after instruction. For Item 1 on the pre-assessments and post-assessments, pre-service teachers are asked to "Use the chart to explain phonemic awareness and phonics" (i.e., the chart is simply two box shapes in which the term phonemic awareness has been placed in the first box and the term phonics has been placed in the second box) (Appendix B). See Table 4 for summary of findings about pre-service teachers' extent of phonics knowledge.

Table 4

Phonics Extent of Knowledge: Pre-assessment and Post-assessment

Codes	Pre-assessment		Post-assessment	
	n	%	n	%
Incorrect	14	18%	6	10%
Limited	48	64%	30	48%
Sufficient	13	17%	21	34%
Extensive	0	0%	5	8%
Total	75	99%	62	100%

Note. ***Due to rounding percentages may not add up to 100%.

Incorrect responses. Incorrect responses, in relation to describing phonics, revealed a decrease from 14 out of 75 (18%) on the pre-assessment to 6 out of 62 (9%) on the post-assessment. One incorrect response that typifies such responses is this, "Phonics is the general reading process". This incorrect response is drawn from the pre-assessment but is representative of incorrect responses on both the pre-assessments and post-assessments. Responses such as these are so distant from

accuracy of description that they cannot receive any other code. Pre-service teachers whose responses received this code must acquire much more information about phonics if they are to demonstrate potential to become effective teachers of reading (Report of the National Reading Panel, 2000).

Limited responses. Limited responses displayed a decrease of 21% from pre-assessment to post-assessment. In particular, limited responses declined from 48 out of 75 (64%) on the pre-assessment to 30 out of 62 (48%) on the post-assessment resulting in the 16% decrease. When the 16% decrease in limited responses is combined with the decline of 9% for incorrect responses from pre-assessment to post-assessment, a 25% reduction in incorrect and limited responses is observed. Therefore, 25% of incorrect and limited responses on the pre-assessment have now moved to a sufficient or extensive response on the post-assessment.

Limited responses for phonics descriptions were drawn from the post-assessment and are exhibited in this response, "How sounds get put together to make words". Relative to my coding scheme, pre-service teachers whose responses were coded as limited have gained some information about the characteristics of phonics however, have much yet to learn. In order for them to become effective teachers of reading they must acquire more information about the features of phonics (Report of the National Reading Panel, 2000).

Sufficient responses. Sufficient responses for extent of knowledge on phonics increased from 13 out of 75 (17%) on the pre-assessment to 21 out of 62 (34%) on the post-assessment. Data revealed an increase of 17% in sufficient responses from pre-assessment to post-assessment. Sufficient responses for description of phonics are

represented in this response, "The relationship between letters and sounds". This sufficient response is drawn from the post-assessment and is representative of phonics responses that were coded as sufficient. According to my coding scheme, pre-service teachers' whose responses were similar to this and received a sufficient code have gained enough information about the characteristics of phonics to engage in professional conversations about phonics. The knowledge they have acquired is easily integrated into their professional knowledge bases. The extent of phonics information these pre-service teachers have gained suggests they are adequately prepared for the next literacy course.

Extensive responses. Extensive responses for extent of knowledge of phonics increased from 0 out of 75 on the pre-assessment to 5 out of 62 (8%) on the post-assessment. An increase of 8% in extensive responses was seen from pre-assessment to post-assessment. This extensive response was drawn from the post-assessment and is representative of those kinds of responses, "Phonics is sound knowledge that is directly related to letter knowledge". These pre-service teachers understand skills associated with phonics.

Phonics: Quality of Knowledge

On the pre-assessments and post-assessments, pre-service teachers' quality of knowledge about phonics was described as incorrect, inadequate, basic, or enriched. Pre-service teachers' quality of knowledge was used to determine whether their knowledge was professionalized before and after instruction, (i.e., are they able to express their understanding accurately and with language that communicates on a

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professional level?). See Table 5 for a summary of pre-service teachers' quality of

knowledge about phonics.

Table 5

Phonics Quality of Knowledge: Pre-assessment and Post-assessment

	Pre-assessment		Post-assessment	
Codes	n	%	n	%
Incorrect	14	18%	5	8%
Inadequate	44	58%	27	44%
Basic	17	24%	29	46%
Enriched	0	0%	1	2%
Total	75	100%	62	100%

Note. ***Due to rounding percentages may not add up to 100%.

Incorrect responses. For quality of knowledge of phonics pre-service

teachers' incorrect responses decreased from pre-assessment to post-assessment: 14

out of 75 (18%) to 5 out of 62 (8%) respectively. Following is an example of an

incorrect response that exemplifies those responses, "Phonics is saying the word".

This response was pulled from the post-assessment. According to my scheme for

coding, incorrect responses were so remote from an accurate description of phonics

skills that there were no redeeming qualities that would support placing the response

under any other code.

Inadequate responses. For quality of information in respect to phonics,

inadequate responses declined from pre-assessment to post-assessment: 44 out of 75

(58%) on the pre-assessment to 27 out of 62 (44%) on the post-assessment. These

kinds of responses lack enough accurate information to be placed within a

professional knowledge base. An example of such a response is, "It is how you learn

sounds/letters". The pre-service teacher knows that phonics involves learning about

sounds and letters or the alphabetic principle. However, this information is very scant

and weak. Phonics entails so much more than simply learning about sounds and

letters. There are many phonics generalizations (i.e., rules, that one must familiarize

him or herself with if he or she is to possess a firm grasp on the characteristics of

phonics). These pre-service teachers must acquire much more information about

phonics if they wish to develop the potential to become an effective teacher of

reading.

Basic responses. In regard to quality of knowledge of phonics skills, basic

responses increased from 17 out of 75 (23%) on the pre-assessment to 29 out of 62

(46%) on the post-assessment. Specifically, an increase of 24% relative to responses

coded as basic occurred from pre-assessment to post-assessment. One example of a

basic response is this: "Sound knowledge that is directly related to letter knowledge".

This response was drawn from the post-assessment and is representative of basic

responses. According to my coding scheme, basic responses indicate the pre-service

teacher's quality of knowledge is of acceptable value. Even basic responses embody a

degree of excellence that indicates the information gained is adequate and can

become part of their professional knowledge bases in literacy.

Enriched responses. Lastly, enriched responses for quality of information

rose from 0 out 75 on the pre-assessment to 1 out of 62 (2%) on the post-assessment.

As is easily observed, the outcome for enriched responses is not significant. This

enriched response is taken from the post-assessment and is representative of an

extensive response, "Phonics is sound knowledge that is directly related to letter

knowledge". Quality of information is enriched because the pre-service teacher is

able to successfully communicate his or her knowledge at a professional level. He or

she has stated the foundation of phonics skills.

Analysis of Item 9 Applying Phonological Awareness Knowledge: Extent of Knowledge

For Item 9 on the pre-assessment and post-assessment, pre-service teachers

were asked to apply their phonological awareness knowledge by responding to a

scenario describing a literacy problem. Pre-service teachers discussed in writing a

mother's misconceptions concerning her daughter's lack of phonological awareness.

This scenario appeared as Item nine on both pre-assessment and post-assessment:

> "A five-year-old was being assessed for entrance into kindergarten. The
> mother was astonished when assessment results indicated her child lacked
> phonological awareness skills. The mother stated, "But she knows the ABC
> song and she sings it all the time!" Explain the mother's misconception
> (Appendix B).

Table 6 displays results for applying phonological awareness extent of

knowledge.

Table 6

Applying Phonological Awareness Knowledge Extent of Knowledge: Pre-assessment
and Post-assessment Item 9

	Pre-assessment		Post-assessment	
Codes	n	%	n	%
No Response	16	21%	2	3%
Incorrect	16	21%	0	0%
Limited	26	35%	28	45%
Sufficient	17	23%	29	47%
Extensive	0	0%	3	5%
Total	75	100%	62	100%

Note. ***Due to rounding percentages may not add up to 100%.

On the post-assessment many pre-service teachers were able to appropriately apply their knowledge to explain a phonological awareness problem posed in the scenario. They were able to accurately discuss a child's lack of phonemic awareness knowledge in relation to extent. Extent of knowledge was adequate. Almost half, 47%, of pre-service teachers contributed responses that were coded as sufficient for extent of knowledge.

No response. Pre-assessment results were 16 out of 75 (21%) no response responses to 3 out of 62 (3%) on the post-assessment. From pre-assessment to post-assessment a decline of 18% in no response responses occurred. An eighteen percent drop is not perfect however, still demonstrates a notable result.

Incorrect responses. The outcome for Item 9 from the pre-assessment regarding the number of incorrect responses for extent yielded 16 out of 75 (21%) incorrect responses while the post-assessment outcome was 0 out of 62 responses. This outcome demonstrates a decline of 21% for incorrect responses from pre-assessment to post-assessment. There were no incorrect responses on the post-assessment. One example that exemplifies incorrect responses is, "She may have memorized the song instead of actually understanding it". Responses such as these contain vague information that lacks use of professional language relative to phonemic awareness. This response was drawn from pre-assessment data.

Limited responses. A rise in limited responses became apparent from pre-assessment to post-assessment. Limited responses for extent were 26 out of 75 (35%) on the pre-assessment and 28 out of 62 (45%) on the post-assessment. Limited responses typically made reference to some characteristic of phonemic awareness,

such as, "Phonemic awareness is everything, sounds of words, spoken language". Sounds of words and spoken language are technically correct, however, the phrase "phonemic awareness is everything" is incorrect and brought this response to a limited level. This response was drawn from post-assessment data.

Sounds of spoken words are the foundation of phonemic awareness, yet there is so much more, such as manipulation and segmentation of spoken words and adding and deleting phonemes in spoken words. Limited responses did not refer to any of this kind of information.

An initial reaction to this outcome might be that it appears very negative however there is a positive. On the post-assessment there were 0% incorrect responses and a rise in the number of limited, sufficient, and extensive responses. This indicates that pre-service teachers' extent of knowledge grew from incorrect phonological knowledge to at least limited knowledge with some pre-service teachers gaining sufficient and extensive phonological awareness knowledge.

Sufficient responses. For sufficient responses on the pre-assessment in relation to extent 17 out of 75 (23%) of pre-service teachers responded with this response. On the post-assessment an increase of 24% was observed as those results were 29 out of 62 (47%) pre-service teachers responding with a sufficient response. Forty-seven percent of pre-service teachers now possess sufficient information that allows them to express their knowledge through use of some professional language and some conventional language during conversation.

Sufficient responses for extent looked like this, "The young girl knows the letters and the alphabet—but she is not as familiar with the sound structure needed for

spoken words" and "Knowing the letters does not mean she has phonological awareness or know that speech units can be separated into distinct sounds". Each response was taken from post-assessment data and exemplifies common characteristics of responses coded as sufficient. These kinds of responses reflect that pre-service teachers' extent of knowledge of phonemic awareness is adequate. These responses include integration of some professional terms (i.e. phonological awareness, sound structure, speech units, and distinct sounds); as well as utilization of some language common to all. This knowledge can be incorporated into a professional knowledge base in literacy.

   Extensive responses. Lastly, extensive responses increased from pre-assessment to post-assessment. Zero out of 75 of the responses on the pre-assessment were coded as extensive however on the post-assessment 3 out of 62 (5%) received an extensive code. Thus, an increase of 5% was achieved.

Analysis of Item 9 Applying Phonological Awareness Knowledge: Quality of Knowledge

   When pre-service teachers responded to the scenario in Item 9 on the pre-assessment and post-assessment about the concerned mother, they were provided an opportunity to apply their knowledge of phonemic awareness to a real-life kind of dilemma. This type of problem affords insight into pre-service teachers' quality of information. Quality of knowledge is used to determine whether their knowledge is professionalized before and after instruction, (i.e., are they able to express their understanding accurately and with language that communicates on a professional

level?). See Table 7 for a summary of findings about pre-service teachers'

application of knowledge about phonological awareness.

No response. On the pre-assessment 16 out of 75 (21%) of pre-service

teachers did not record a response for Item 9. On the pre-assessment 2 out of 62 (3%)

did not provide a response for Item 9. Reasons for nonresponse are unknown.

However, there was a decline of 18% in nonresponses from pre-assessment to post-

assessment. This signified a decline in nonresponses which can be viewed as a

positive outcome.

Incorrect responses. Relative to quality of information, there was a decline in

incorrect responses from pre-assessment to post-assessment: 16 out of 75 (21%)

responses were incorrect whereas 0 out of 62 responses were incorrect respectively.

Therefore, a decrease of 21% in incorrect responses was observed from pre-

assessment to post-assessment. This outcome was positive and demonstrated that

learning occurred in respect to pre-service teachers' knowledge of phonological

awareness before and after instruction.

Inadequate responses. Inadequate responses changed from 29 out of 75

(39%) on the pre-assessment to 19 out of 62 (31%) on the post-assessment relative to

quality of knowledge. Initially, this outcome appears quite unfavorable. However,

39% of those responses that were no response or incorrect responses on the pre-

assessment have changed to either inadequate, basic, or enriched responses because

there were no incorrect responses on the post-assessment. Learning has occurred.

Inadequate responses are represented in this response, "Recognizes letters by

sight". This response was taken from the post-assessment but is representative of

inadequate responses. Inadequate responses display some fundamental knowledge of phonemic awareness however; the quality of the response is poor. The term 'sound out words' is generally referred to when discussing phonics rather than phonemic awareness.

Basic responses. Pre-service teachers' pre-assessment quality of knowledge for basic responses rose from 14 out of 75 (19%) to 37 out of 62 (60%) on the post-assessment. Sixty percent is the largest increase of the study. Basic responses are typical of this response, "I would explain to the mother that knowing her ABC's is great, but we need her to become phonologically aware. This means that she is able to acknowledge oral sounds that make up words". The one common element in basic responses is the mention of 'oral sounds in words'. In contrast, the one primary element in phonics is reference to "the written word".

Enriched responses. Enriched responses increased from 0 out of 75 to 4 out of 62 (6%) from pre- to post-assessment respectively. Enriched responses typical of these types are embodied in this response which was drawn from the post-assessment, "The girl may know the ABC song but not be aware of how the letters in the song work. Knowing the order of the alphabet does not make someone phonologically aware. They also need to be able to recognize the sounds and patterns these letters make". This pre-service teacher has successfully communicated his or her understanding of phonological awareness demonstrating his or her skill at speaking with others on a professional level.

Table 7

Applying Phonological Awareness Knowledge Quality of Knowledge: Pre-assessment and Post-assessment Item 9

	Pre-assessment		Post-assessment	
Codes	n	%	n	%
No Response	16	21%	2	3%
Incorrect	16	21%	0	0%
Inadequate	29	39%	19	31%
Basic	14	19%	37	60%
Enriched	0	0%	4	6%
Total	75	100%	62	100%

Note. ***Due to rounding percentages may not add up to 100%.

Analysis of Feedback on In-Class Engagements

Qualitative methods were utilized to analyze data from feedback forms. Categories were developed from similar information provided in response to each of the three questions on the feedback form. Similar information from question one was placed into a category. The same procedure was followed for questions two and three. Then codes were created based on the categories. Themes emerged from coded information from which assertions were made. See Appendix F.

In-class engagements which followed the constructivist approach to learning were designed to enhance pre-service teachers' knowledge of phonological awareness concepts. I developed three questions that may be applied to both phonemic awareness and phonics concepts. The three questions that appear on the form are: 1) What "light bulbs" lit for you throughout this engagement—what did you learn? Use examples (e.g. words) to explain. 2) What about this engagement helped you learn the

content? 3) What would you change so that you could have learned more? Pre-service teachers completed this form after each in-class engagement was concluded.

Research question two asks, "What is the nature of the in-class engagements about phonemic awareness and phonics that pre-service teachers find influential?" To obtain insight into the nature of these engagements responses on the feedback forms were analyzed.

In the section that follows I report themes that emerged from categories of similar information and from the codes for each category. Themes resulted from analysis of data provided on each feedback form (see Table 1) and the pre-assessment and post-assessment data analysis. Following are the three themes with discussion of those themes.

Thematic Analysis of Data

In sections above, I have provided a mix of qualitative and quantitative description of findings attained from data analysis. From these, thematic patterns emerge to further explain the findings.

Theme 1: Pre-service Teachers' Extent and Quality of Knowledge about Phonological Awareness Increased after Instruction

Pre-service teachers' extent of phonological awareness information lies between sufficiency and limited information. Pre-service teachers gained some phonological awareness knowledge. There were no incorrect responses on the post-assessment which denotes pre-service teachers' responses rose from pre-assessment to post-assessment to limited, sufficient, or extensive responses. Extent of knowledge regarding phonemic awareness responses were at the limited level with some at a

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sufficient level: eighteen percent and twenty-five percent respectively. Extent of knowledge regarding phonics yielded similar results to phonemic awareness with many pre-service teachers being at the limited or sufficient levels. Phonics extent of knowledge results was thirty percent limited responses and twenty-one percent sufficient responses.

A limited knowledge of phonological awareness signifies the pre-service teacher has some foundational information of phonemic awareness and phonics knowledge however lacks detailed knowledge. Pre-service teachers who are at this level possess scarce knowledge of phonemic awareness and phonics. They must acquire knowledge that goes beyond limited. Pre-service teachers must become familiar with the specialized language related to phonemic awareness and phonics. They must also understand the meaning of those terms. Those who are at a limited level of understanding of phonological awareness concepts are not prepared for teaching these concepts. Their knowledge of phonemic awareness and phonics must progress to a higher level of understanding and information.

Sufficient levels of phonemic awareness were at twenty-five percent while sufficient levels of phonics information were lower at twenty-one percent on post-assessments. Some pre-service teachers left the literacy foundations course with sufficient knowledge of phonemic awareness and phonics regarding extent and quality. Pre-service teachers at a sufficiency level are able to use some professional terminology and also common language related to phonological awareness. The information they hold is accurate. They are able to discuss phonological awareness skills on a professional level utilizing specialized terms related to phonemic

awareness and phonics. These pre-service teachers are ready to move on in their academic careers.

Pre-service teachers' quality of information lies within the parameters of basic quality to inadequate quality. Many pre-service teachers have gained a level of knowledge that lies within a range from basic to inadequate: thirty-one percent and sixty-percent respectively. Pre-service teachers who have gained a quality of information that is at the inadequate level are those who must acquire more information of phonemic awareness and phonics. Having left the literacy foundations course at this juncture of learning i.e., having attained an inadequate level of knowledge, demonstrates more understanding of phonemic awareness and phonics is required. Inadequacy regarding quality of knowledge means the pre-service teacher has developed a knowledge base that includes inaccurate information with little detail and that he or she cannot utilize specialized terminology related to phonemic awareness and phonics. Language common to all is utilized when discussion of phonological awareness occurs. These pre-service teachers must acquire more information regarding phonological awareness.

Pre-service teachers who have acquired a basic quality of knowledge are able to converse with others on a professional level relative to phonological awareness. They have attained a grasp on use of the specialized terminology related to phonological awareness. Information gained is accurate and sufficient to be placed within a professional knowledge base. These pre-service teachers are prepared to continue moving forward in their careers in education.

Theme 2: Pre-service Teachers Gained Professional Knowledge about Phonemic Awareness and Phonics from Constructivist Engagements

Pre-service teachers have gained phonemic awareness knowledge regarding how to use their knowledge of phonemic awareness. Extent of knowledge increased. Post-assessment outcomes revealed phonological awareness results for extent with limited responses at forty-five percent and sufficient levels at forty-seven percent.

Those pre-service teachers who are at a limited level of phonemic awareness knowledge relative to application of knowledge i.e., ability to explain a mother's misconception of her daughter's lack of phonological awareness, must acquire more information regarding phonemic awareness and phonics. The knowledge they have is weak and they are not able to provide real-life examples to represent their thinking. These pre-service teachers are not adequately prepared.

Forty-seven percent of pre-service teachers in the study had responses described as sufficient knowledge of phonological awareness on a question which required them to apply their knowledge to a real-life situation. Their knowledge is sufficient and allows them to use the specialized language of phonemic awareness and phonics. Terms such as segmenting words, decoding, phonic analysis, and manipulation of sounds are just a few of the specialized language these teachers may now have in their vocabulary. They are able to think accurately about phonemic awareness and phonics literacy problems. They can describe the problem and express a probable solution. These pre-service teachers were able to use their knowledge to explain a mother's misunderstanding of her daughter's lack of phonological awareness. These teachers are prepared to move forward.

Quality of knowledge for many pre-service teachers increased from pre-assessment to post-assessment at nineteen percent on pre-assessments to sixty percent on post-assessments. Sixty percent of pre-service teachers in the study have gained a basic level of information of phonological awareness. A basic level of knowledge of phonological awareness indicates these pre-service teachers have gained accurate phonological awareness information.

Pre-service teachers who have gained knowledge that is at a sufficient level for extent and at a basic level for quality have exhibited some characteristics of expertise. They have demonstrated an ability to notice meaningful patterns of information. When presented with a real-life scenario depicting a phonological awareness misconception they were able to aptly explain the mother's misconception. Skill in addressing the literacy problem required some ability to notice patterns of information that are important for explanation of the mother's misconception.

Theme 3: Pre-service Teachers Prefer Socially-Interactive, Hands-on Learning, Active Participation in Engagements, Instructional Modeling and Tasks that Offer Challenges

Analysis of pre-service teachers' written responses on feedback forms provided insight into preferred learning modes. Feedback was qualitatively analyzed. Findings indicated pre-service teachers' preferred learning engagements were those that allowed for work in pairs or small group work. They preferred working with others in order to ask questions of their peers and because working with others provided opportunities for expression of each one's thoughts and ideas. Opportunity for reflection was also stated as an element of in-class engagements that was beneficial to pre-service teachers learning.

Pre-service teachers also expressed preference for active participation and hands-on learning engagements. Direct instruction was followed by an engagement that reinforced learning and provided for active participation and hand-on learning. For example, when pre-service teachers were learning how to count syllables they were taught the 'jaw bump' method. They would place their hands under their chins and say the target word aloud. Their hands would feel the number of times their jaws bumped their hands while saying the word. The number of times the jaw bumped the hand was the number of syllables in the word. Pre-service teachers commented they favored tasks that included active participation.

Instructional modeling was preferred as well by pre-service teachers. Comments made by pre-service teachers indicated they believed they understood concepts better when preceded by modeling during direct instruction.

Pre-service teachers favored instructor modeling and would have liked engagements that offered more challenge. Written remarks on feedback forms specified pre-service teachers' request for engagements that provided challenge. They felt that some of the in-class engagements did not offer challenges.

Summary of Results

Relative to phonemic awareness and phonics description, pre-service teachers' knowledge increased, although not markedly, in both extent and quality from before instruction to after instruction. This result illustrates that learning has occurred in relation to pre-service teachers' ability to describe phonemic awareness and phonics skills while using some professional language.

Some pre-service teachers exceeded their earlier ability to describe the characteristics of phonemic awareness and phonics. Currently, relative to extent and quality, a number of pre-service teachers are now able to accurately and richly describe phonemic awareness and phonics. Many comprehend the differences between phonemic awareness and phonics.

In regard to application of knowledge for extent and quality pre-service teachers were able to explain a literacy problem using some professional language. They were able to efficiently describe a mother's misunderstanding and provide a suitable analysis.

Growth in both extent of knowledge and quality of information was experienced by a number of pre-service teachers, however, not markedly. Those who experienced sufficient and extensive learning gained knowledge about phonemic awareness and phonics that is well suited to professional knowledge bases. Those whose responses were coded as basic and enriched are able to converse about phonemic awareness and phonics on a professional level.

"Effective literacy instruction, then, might be defined as the application of teacher's knowledge of literacy processes…" (Ross & Gibson, 2010, p. 176). Pre-service teachers were better able to apply their knowledge as compared to ability to accurately describe phonemic awareness and phonics. The real challenge for teacher preparation programs is whether and how teachers can learn to use such knowledge flexibly in their work with learners. This highlights the importance of ability to apply knowledge. I am encouraged because many of my pre-service teachers were able to accurately apply literacy knowledge (i.e., as seen in the phonological awareness

problem with the child entering kindergarten) (Appendix B). In conclusion, pre-service teachers experienced learning and application of literacy knowledge.

Pre-service teachers reported they had learned a number of phonological awareness skills, had gained valuable knowledge about how to teach children phonological awareness concepts, preferred constructivist instructional techniques for their own learning and view themselves as teachers who will utilize some of the same hands-on engagements to teach their future students.

Some pre-service teachers have acquired valuable phonological awareness knowledge that may be integrated into a professional knowledge base. They have gained important literacy foundational information that can be built upon in future course work. The area of literacy where they must obtain more skill is in application of knowledge. It does little good, if any, to attain skills if they are not able to use those skills in their teaching lives.

CHAPTER V

DISCUSSION AND RECOMMENDATIONS

The purpose of this study was to gain insight into the process of pre-service teachers' professional knowledge development of phonological awareness through constructivist -based learning engagements. The strategies of inquiry (Creswell, 2007) that framed the study were action research. These types of design (Creswell, 2007) were selected because they were most suited to the nature of this study.

In the previous chapter, I discussed one theme that evolved from the pre-assessment and post-assessment data and two themes derived from the feedback forms:

Theme 1: Pre-service teachers' extent and quality of knowledge about phonological awareness increased after instruction.

Theme 2: Pre-service teachers gained professional knowledge about phonological awareness and phonics from constructivist engagements.

Theme 3: Pre-service teachers prefer socially-interactive, hands-on learning, active participation in engagements, as well as instructional modeling and engagements that offer challenges.

In this chapter I will address my research questions once again and discuss them relative to assertions made based on the data analysis:

1. What differences are evident in pre-service teachers' knowledge about phonemic awareness and phonics before and after instruction?

2. What is the nature of the in-class engagements about phonemic awareness and phonics that pre-service teachers find influential?

I begin with discussion of the assertions that emerged from analysis of data. The assertions are:

Assertion One: Pre-service Teachers Need to Possess Sufficient and Basic Professional Knowledge to Develop Expertise for Teaching Literacy

Some pre-service teachers gained accurate information about phonemic awareness and phonics. Among pre-service teacher learning was a gain in knowledge of phonics generalizations. An understanding of how to count phonemes was attained by some pre-service teachers. New strategies for learning phonemic awareness skills were achieved. The Elkonin Boxes strategy for counting phonemes in words was new to pre-service teachers.

While I have brought them about 180° in the cycle of development in this domain of professional knowledge, they must arrive at 360° (Figure 2). Disappointingly, students' performance on the post-assessment ranged from 50% to 68% below sufficient and basic when they were asked to define phonemic awareness and phonics. Only 39% and 50% of participant responses defining phonemic awareness were described as sufficient and basic or extensive and enriched. On the post-assessment 68% and 52% of the responses defining phonics were described below sufficient and basic. Thus, only 42% and 48% of the responses were described at or above sufficient and basic. In the case of both definitions, less than half of the responses can be viewed as representing attainment of threshold knowledge.

The Report of the National Reading Panel (2000) has established five areas of reading instruction that must be included in all reading programs. The required areas of instruction are: phonemic awareness, phonics, vocabulary, text comprehension, and

fluency (Report of the National Reading Panel, 2000). The Report of the National

Reading Panel's (2000) findings and recommendations has provided guidance to many.

Therefore, it is critical that pre-service teachers attain a professional knowledge base that

includes information that is extensive and of rich quality in each of these vital areas of

reading.

Because of the vital nature of the information covered in my course, I admit to a

level of disappointment about what can be perceived as students' limited acquisition of

the phonemic awareness and phonics domains of knowledge. My hope is they will

continue to grow toward expertise in these domains throughout their degree program.

My concern is, some may not gain the full circle of knowledge (Figure 1), even at a basic

and sufficient level. Participants who did not acquire basic and sufficient knowledge may

be unlikely to develop the level of expertise required to be effective literacy teachers.

They may not possess ability to recognize phonics patterns or segment words by sounds,

or they may not be able to retrieve the knowledge required for content-rich lessons

(Barrentine, et al., 2011). Less knowledgeable teachers may be less fluent in their ability

to recognize the information children need in order to achieve the next stage of literacy

learning (Ross & Gibson, 2010).

I have considered why a higher percentage of my students failed to demonstrate

sufficient and basic knowledge about phonemic awareness and phonics. First, it could be

my coding was overly stringent. I was very concerned about researcher-bias. Because I

was the course instructor, data collector and analyzer, I tried to be extremely strict about

coding responses more favorably than the definitions and models allowed.

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This may account for a small percentage of responses coded limited and inadequate when perhaps they could have been coded sufficient and basic.

Upon reflection, another explanation about why students performed below what could be considered threshold expectations of sufficient and basic is they may not have taken the post-assessment as a serious demonstration of their knowledge. Regarding assignments and assessments, students are often motivated by grades. Because I did not assign grades to the pre-assessment or post-assessment, students may not have performed at their highest levels. Of course, we want our students to be intrinsically motivated, there is a reality factor, and perhaps, assigning grades would have yielded stronger performances.

Pre-Service Teacher Learning

Literacy Foundations Course
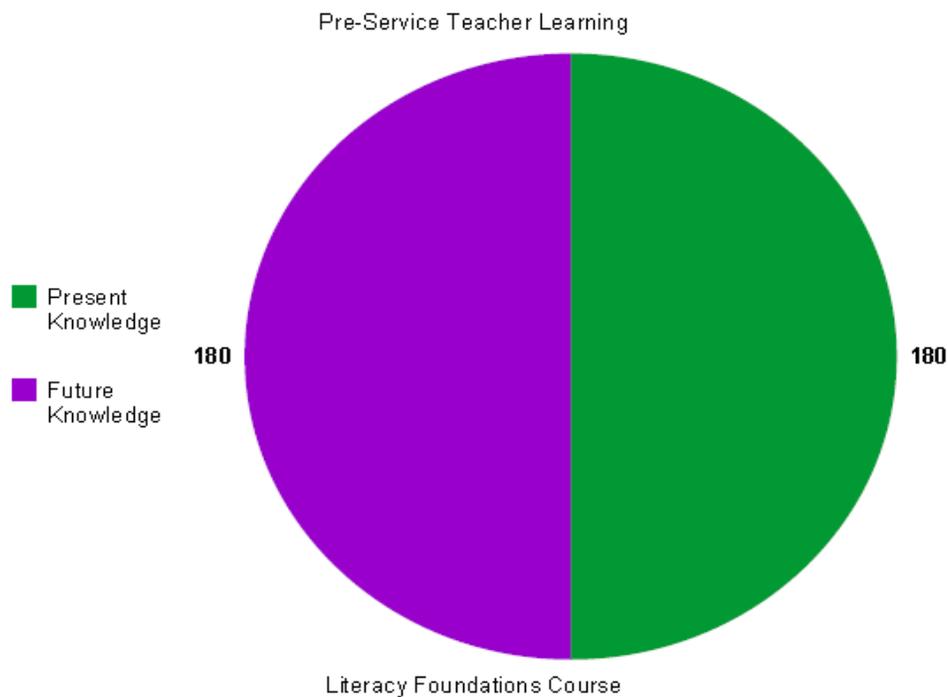
Figure 2. Pie Chart Illustrating Phonological Awareness Knowledge Pre-service Teachers has Developed while in a Literacy Foundations Course and Phonological Awareness Knowledge that must yet be Obtained.

Below I address two other assertions that offer positive perspectives on the nature of this research. Both assertions, however, also play into my reflections on student achievement of professional knowledge. While students valued and enjoyed application-oriented and constructivist engagements, can application situations gloss over the need to possess deep and flexible professional knowledge? And, were the learning engagements numerous enough and rigorous enough? First, application situations can be highly specific and may not cover the full range of knowledge experts possess. Second, from a teaching perspective, I must consider how I might have lifted the opportunity for students to acquire levels of knowledge that reflect characteristics of expertise. Perhaps more application-oriented engagements and more rigorous in-class engagements would support students' development of detailed, flexible, fluent, elaborate, conceptual information (Barrentine, et al., 2011; Gibson & Ross, 2010; National Research Council, 2000) about phonemic awareness and phonics.

Assertion Two: Pre-service Teachers have Gained Phonological Awareness Knowledge Relative to Application of that Knowledge

Despite a low threshold performance, pre-service teachers gained knowledge of phonemic awareness and phonics in extent and quality. Limited responses rose from thirty-five percent to forty-five percent from pre-assessment to post-assessment. Sufficient responses rose from twenty-three percent on pre-assessments to forty-seven percent on post-assessments. Despite the rise from pre-assessment to post-assessment, the gain is not substantial and indicates a need for further knowledge gains.

Pre-service teachers whose responses were coded as limited must acquire much more information about phonemic awareness and phonics. Pre-service teachers whose

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responses were coded as sufficient are prepared. However, forty-seven percent of pre-service teachers who are well-prepared is not acceptable. There needs to be a much higher number of pre-service teachers who are prepared to build further knowledge upon the literacy foundation information already gained.

Harding and Parsons (2011) recommend pre-service teacher training programs include information about how written language represents spoken language and information about the structure of English language (i.e., orthography). The foundational course in literacy, that is the case for this study, includes these components of teacher training recommended by Harding and Parsons (2011). For this I am pleased. However, what is disconcerting is the low number of pre-service teachers who have only limited extent of knowledge and inadequate quality of knowledge of phonemic awareness and phonics.

Assertion Three: Pre-service Teachers View Constructivist Methods as Optimal for Learning and Teaching

There is no doubt "…that constructivism has played an important role in learning and instruction" (Chan, 2010, p. 23). "Constructivism refers to a collection of educational practices that are student-focused, meaning-based, process-oriented, interactive, and responsive to student personal interests and needs" (Johnson, 2004, p. 72). This describes a number of components of constructivist-based learning that present in the engagements pre-service teachers in the study participated in. In-class engagements were purposefully designed to promote active involvement of pre-service teachers in process-oriented tasks. Reiser (2007) asserts "…constructivist views of teaching and learning has had a major influence on thoughts and actions of both practitioners and theorists…" (as

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cited in Chan, 2010, p. 27). This is certainly true regarding my teaching perspective.

When I was pondering an optimal approach for teaching pre-service teachers how to count phonemes (i.e., sounds in words) I almost immediately thought of Elkonin Boxes. This strategy offers active involvement in a process-oriented engagement that is utilized when teaching a student to count phonemes in words (Appendix D). Pre-service teachers were unfamiliar with this strategy. This strategy provided pre-service teachers with the opportunity for ample learning. I modeled how to use the boxes and allowed for question and answer time, and then they selected a partner with which to work. The handout I prepared contained several examples of words with two, three, and four phonemes. For example, the word *go* embodies two phonemes: */g/* and */o/.* It also has two graphemes, (i.e., letters). I placed two blank boxes which were interconnected to one another on the handout. I instructed pre-service teachers to say the word aloud while sliding their index fingers from one box to the other. In this manner they could determine the number of phonemes in words.

I received some comments on the feedback forms from pre-service teachers requesting more challenges. I will describe one word that 'stumped' almost all and presented a challenge. The word is axe. At the outset pre-service teachers believed that x contained only one phoneme. However, words that encompass *"x"* were particularly problematic for pre-service teachers because *"x"* has two phonemes. This word was a focus of class discussion since it was somewhat irregular, meaning that the *"x"* actually holds two phonemes: */k/* and */s/.* Student feedback suggests they desire additional challenges like this example.

An interesting point arises from this. The low performance of students on the post-assessment and their call for more challenges on the student feedback form at first appear to be contradictory. Probing this point, however, suggests students are not low performers or poor students. Rather, they seek challenges and value opportunity to learn relevant information.

Implications

Several implications arise from this research. The first implication is that constructivist -based engagements are preferred by pre-service teachers and should be continued. They provided written comments on feedback forms indicating their preference. Secondly, pre-service teachers must gain a threshold of knowledge to possess some level of expertise relative to phonological awareness. Lastly, teacher education programs need to confront their practices to assure students are receiving optimum education.

Constructivist-Based Learning

Data suggest the pre-service teachers in my study value a constructivist framework for learning. Based on this assertion, which is grounded on data, an obvious implication is that constructivist-based learning continues. Pre-service teachers view constructivist methods as worthwhile: learning in a context that is relevant to their literacy needs, learning through tasks that allow for and promote discussion, questioning, and feedback from others, instructor modeling, explanations, and examples, and authentic tasks that provide for application of knowledge.

Analysis of data on feedback forms indicated pre-service teachers' inclination for constructivist-based learning. Pre-service teachers recorded many comments in response

to the question, "What would you change so that you could have learned more?"

Comments that follow typify responses:

- "The splitting the sounds apart in the boxes and using my finger to slide along them and counting the phonemes really helped my understanding of what phonemes are."

- "The hands-on learning with the worksheets. Also the repetitiveness that we did really helped it make sense to me."

- "The fist on my chin helped me learn syllables better. I would have never thought of this."

- "Counting the syllables and the phonemes on my fingers."

- "Sounding out the words and clapping out the syllables helped me really understand the concepts of phonemes and syllables."

These responses represent constructivist preferences regarding learning.

The comment about "splitting the sounds apart in the boxes and using my finger to slide along them…" reveals the pre-service teacher's preference for active learning engagements wherein there are opportunities for dynamic interaction. Clapping out the syllables is constructivist-based and an authentic task. Many children are taught to count syllables in words by utilizing this technique. The design of the handout was cited as helpful because it provided for hands on learning. There were a number of comments such as those that are included here. These comments provide support for the notion that pre-service teachers prefer constructivist-based learning engagements.

A study conducted by Neo and Neo (2010) found that placing an authentic task within a constructivist paradigm is highly motivating to learners. Their study revolved

around a multimedia project and was based in constructivism. An authentic task is completely appropriate and effective for pre-service teachers' learning as well. Pre-service teachers in my study suggested that teaching a child would improve their learning. They perceived in-class engagements as being especially well suited to a teaching setting with an actual child. This is an example of an authentic task.

Technology is one method of incorporating constructivist-based learning. "In the classroom, technology allows educators to incorporate innovative ideas into their curriculum. It is fitting for educators to find technologies that make their jobs more efficient and make their student's learning more engaging" (MacIntyre Latta & Marme' Thompson, 2011, p. 6). Studies have found that incorporating technology into curricula enhances many students' learning. Incorporating a video that depicts a teaching and learning situation where pre-service teachers are instructed to critique a literacy event in terms of accuracy of phonological awareness content is constructivist-based learning.

Teacher Expertise

Aside from the point that students' inadequate and limited performances in this study suggest their developing expertise may be in jeopardy, the notion of expertise has relevance for teacher educators. The National Research Council (2000) identifies qualities of expertise such as ability to identify meaningful patterns, organized and detailed knowledge, and ability to use knowledge when needed. Teacher educators can use these qualities to describe students' performances for the purpose of determining their preparation to teach. Students, whose performances on lesson plans reveal detailed, organized, and meaningful information, can be assessed as developing expertise for teaching literacy.

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Teacher Education Programs

The third, and last, implication of my study is that teacher education programs confront their practices. They need to investigate and assess their effectiveness. They may need to pose some difficult questions. Are pre-service teachers being well prepared for teaching reading? Are they leaving the program with the knowledge they need to teach reading effectively? These are complex and difficult questions. As our programs come under scrutiny, it is essential we know whether or not our practices are providing rigor and that our engagements are leading students to develop the domains of knowledge required to teach literacy. My own practices experienced a wake-up call as a result of my own scrutiny through this research.

Conclusion

These assertions, implications, and recommendations provide useful information which I plan to implement within my classroom. I found that pre-service teachers prefer constructivist-based learning engagements and opportunities for application of knowledge. They also favor working with a partner or group so there are occasions for discussion, questioning, and hearing feedback from a partner or those within the group. Pre-service teachers' optimum instructional method of learning includes instructor modeling, examples, and explanations. They also want to participate in engagements that offer some challenges.

Implications are that constructivist-based engagements are preferred and should be continued, a novice level of expertise must be achieved, and teacher education programs must confront inadequacies. Limited extent of information and inadequate

quality of information is not acceptable relative to pre-service teachers leaving a literacy foundations course with.

The information that has been gained from this study is appropriate and beneficial knowledge that I can implement in the foundations literacy course I teach. I am grateful to have had this significant opportunity in which to gain insight into pre-service teachers' thoughts about the in-class learning engagements. Regarding the phonological awareness knowledge they entered the course with and the knowledge they exited the course with will be helpful information when I plan for teaching the literacy foundations course. I now have some understanding of the level of expertise with which they have left the course. I find, to some extent, I am exactly where I was when I began this study. I was and still am very concerned with improving my instructional practices. I plan on doing my utmost to improve instruction. Overall, I am more informed regarding my pre-service teachers and feel that I can provide more optimum learning conditions.

APPENDICES

APPENDIX A

FEEDBACK FORM

<u>Feedback Form</u>

Directions: Respond to the following questions in writing.

1. What "light bulbs" lit for you throughout this engagement—what did you learn? Use examples (e.g., words) to explain.

2. What about this engagement helped you learn the content?

3. What would you change so that you could have learned more?

APPENDIX B

PRE-ASSESSMENT AND POST-ASSESSMENT
Pre-assessment and Post-assessment of Phonological Awareness Knowledge

1. Use this chart to explain phonemic awareness and phonic.

What is phonemic awareness?	What is phonics?

2. Tell how you could use the rime –an in a phonemic awareness lesson.

3. Tell how you could use the rime –an in a phonics lesson.

4. State as many phonics generalizations as you can.

5. What is the Alphabetic Principle?

6. List the vowels.

7. List the consonants.

8. Complete the following chart. Provide at least two words that show different ways to make the same vowel sound; also provide at least two examples of words with an r-controlled vowel.

Long a words	Long e words	Long i words	Long o words	Long u words	Words with an r-controlled vowel

9. Read and respond to the following scenario.

"A five year old is being assessed for entrance into kindergarten. The mother is astonished when assessment results indicate her child lacks phonological awareness. The mother states, "But she knows the ABC song, and she sings it all the time!" Explain the mother's misconception. (May use the back side for response.)

APPENDIX C

INFORMED CONSENT

INFORMED CONSENT

TITLE: Growing Professional Knowledge: Early Literacy in a Foundations
                                          Course for Pre-service Teachers

PROJECT DIRECTOR: Ruth M. Newton

PHONE #:   (218) 477-2023

DEPARTMENT: School of Teaching and Learning

A person who is to participate in a research project must give his or her informed consent to such
participation. This consent must be based on an understanding of the nature and risks of the research. This
document provides information that is important for this understanding. Research projects include only
subjects who choose to take part. Please take your time in making your decision as to whether to
participate. If you have questions at any time, please ask.

Because you are an education major enrolled in STL 291: Early Literacy, you are invited to be in a research
study about your growing professional knowledge about teaching literacy to young children.

The purpose of this research study is to discover the knowledge pre-service teachers are leaving STL 291:
Early Literacy with in regard to early literacy instruction. All sections of this class are invited to participate
in the study—approximately 90 students this semester could participate. Your participation in the study will
last for the entire semester in which you are enrolled in STL 291.

If you choose to participate in the study, you will be asked to do the following:

1. Allow the researcher, who is also the course instructor, to keep copies of your course assignments that
are related to phonemic awareness and phonics and pre- and post-assessments that address reading. Note—
these are not extra assignments, but ones completed as a routine part of the course.

2. Allow the researcher to collect information on various in-class engagements.

3. Sign the consent form and return it to Ruth M. Newton.

The information below aims to inform you about participation in the study.

1. Your participation is completely voluntary and requires your informed consent. You may discontinue
participation at any time without penalty. To withdraw from the study, contact me by telephone or e-mail
(see contact information below).

Date _____
Subject Initials _____

2. You will not have any costs for being in this study. The copies of your assignments will be at the expense of the researcher and the university. You will not be paid for being in this study. Note, too, the researcher does not receive payments to conduct the research.

3. The records of this study will be kept private to the extent permitted by law. In any report about this study that may be published, you will not be identified. Your study record may be reviewed by Government agencies, the UND Research Development and Compliance office, and the University of North Dakota Institutional Review Board.

4. Any information that is obtained in this study and that can be identified with you will remain confidential and will be disclosed only with your permission or as required by law. To maintain your confidential participation, the researcher will assign codes and pseudonyms in place of student names on papers and documents. If I write a report or article about this study, I will describe the study results in a summarized manner so that you cannot be identified. Consent forms and document data will be shredded within 3 years of the publication of articles or by 2015, whichever is first, but not before being stored separately for at least three years following completion of the study.

5. During the study, the only individual who will have access to the data will be the researcher, my doctoral advisor, and the people who audit the IRB procedures. Within an appropriate time frame, when the study is complete, all materials (documents) associated with the study will be destroyed.

6. You may not benefit personally from being in this study. However, I hope that in the future, other people might benefit from this study because the findings will add to the knowledge about how to prepare teachers for effective reading instruction.

7. There is no penalty if you choose not to participate in the study. Students who do not participate will not be singled out or identified.

The researcher in this study is Ms Ruth M. Newton. You may ask any questions you have now. If later you have questions, concerns, or complaints about the research please contact Ms Ruth M. Newton at (218)-477-2023. You may also contact my doctoral advisor who is Dr. Shelby Barrentine at (701)-777-3243.

If you have questions regarding your rights as a research subject, or if you have any concerns or complaints about the research, you may contact the University of North Dakota Institutional Review Board at (701) 777-4279. Please call this number if you cannot make contact with the researcher or you wish to talk with someone else.

Your signature indicates that this research study has been explained to you, that your questions have been answered, and that you agree to take part in this study. You will receive a copy of this form.

Subject's Name

_____

Signature of Subject   Date

_____ _____

                                                                                Date _____
                                                                                Subject Initials _____

ELKONIN BOXES

Elkonin Boxes

Directions: Create 3 different sets of words that have: 2 phonemes, 3 phonemes, and 4 phonemes. For example, the word 'pie' has 2 phonemes, the word 'gate' has 3 phonemes, and the word 'plane' has 4 phonemes. Each set may contain the same rime or different rimes.

Example: Word List	**WORD LIST**
pie—tie	2 phoneme words _____
gate—late	3 phoneme words _____
plane—train	4 phoneme words _____

Example: Elkonin Boxes   ⟶

Directions: Say 'pie' while annunciating each phoneme. As you say the word, slide your index finger into the first box while saying the /p/ phoneme. Do the same for the next phoneme /i/. Thus, you have shown that the word 'pie' has 2 phonemes. Do the same with the other words, Use the following Elkonin Boxes to make 2, 3, and 4 phoneme words.

APPENDIX D2

REALIA I: PHONEMIC AWARENESS

<u>Realia I: Phonemic Awareness</u>

Directions for the engagement.

1. Decide who will act as the teacher with the remaining members acting as students.

2. The teacher will group all objects together.

3. The teacher will name each object aloud to ensure that the objects are called by the correct name. For example, a child might call a robin a bird which is technically correct. However the sound of /r/ is being taught so the teacher wants to be sure the object is called a robin.

4. The teacher will tell the students that they are going to:

- practice naming the beginning *sound* for each object
- practice naming the beginning *sounds* for several objects
- practice naming the ending *sound* for each object
- practice naming the ending *sounds* for several objects

5. The teacher will ask, "Who can choose the object that begins like _____?" For example, for the sound of /r/ the teacher might use the word *ride*. He or she would ask, *"Who can choose the object that begins like ride?"*

6. Call on students who raise their hands first (make sure every student has an opportunity to respond). Then call on those who have not raised their hands.

7. After the object has been chosen the teacher will check to see whether the object's sound (beginning or ending) matches the word used. She would say, "Let's check to see if the beginning sound for *robin* matches the word *ride*. Let's say those words together. *Robin—Ride.* Do the beginning sounds match? Yes they do."

8. Continue until all of the objects have been addressed.

APPENDIX D3

PHONEMIC AWARENESS

<u>Phonemic Awareness</u>

Task One: Counting Phonemes

DIRECTIONS: One person will act as the leader and ask his or her partner to count the phonemes in each word and the leader will write the number of phonemes on the line beside the word. Next students will switch roles and do the same.

Bat _____   Under _____   Doctor _____

Pie _____   Lips _____   Key _____

Flame _____   Wax _____   Bands _____

Task Two: Phoneme Identification

DIRECTIONS: The leader will ask his or her partner to name the third phoneme in each of the following words after he or she has spoken the word aloud. Write the phoneme on the line beside the word. Then switch roles and use the same procedure for your partner.

Select _____   Serve _____   First _____

Willow _____   Sand _____   Circle ____

Blink _____   Play _____   Tan _____

Task Three: Counting Syllables

DIRECTIONS: The leader will name the word orally and then ask his or her partner to count the number of syllables in each word and write the number on the line beside the word. Again, switch roles so the partner has a turn.

Number _____   Handy _____   Kindergarten _____

Box _____   Grocery _____   Suitcase _____

Syllable _____   Arithmetic _____   House _____

REALIA II: PHONICS

<u>Realia II: Phonics</u>

Directions for the engagement.

Partners will choose one rime. Each member will bring an item to the next class session that represents the chosen rime. During the second class meeting the group will compose a list of words made from the rime.

The steps to follow for composing words are:

1. Name each item and the rime it contains.

2. Each member will take a turn naming one word that contains the rime.

3. One member will do the writing and act as the leader.

4. After the word is written, the contributing member will read the word. If the word makes a nonsense word, the leader will ask, "Is this a real word or not a real word?"

5. Write the unreal words in a separate list to the right of the real word list.

6. Then both members will read the real words together.

7. Make as many words as you can.

8. When the lists are exhausted, the partners read the words on both lists with the leader reminding which words are real words and which words are unreal words.

APPENDIX E

DEFINITION OF CODES

Codes for Data Analysis of Pre- and Post-Assessment Items 1 and 9

Extent of Information
- Extensive: information that goes beyond basic information and includes use of professional terms; may include examples for support
- Sufficient: accurate, but brief information that may or may not include examples for support and may include some professional terms but uses mostly common language
- Limited: very little, weak information with use of some appropriate terms

Quality of Information
- Enriched: information that is accurate and robust in detail of description of phonemic awareness or phonics; use of professional terms to describe phonemic awareness or phonics;
- Basic: accurate information that may or may not include examples to support description, includes some detail
- Inadequate: very little accurate information using common terms that may not be fully accurate; does not provide examples to support description; no expanse in detail of description

Other

- No Response: Space was left blank.
- Incorrect: Response contains almost all incorrect information.
- Not Applicable: Information contained information that was incorrect and/or did not apply to what was asked on the assessment.

Analysis of Data from Student Feedback Form

Activity-Related: student learning that the student attributes mostly to the design of the in-class engagement

Management-Related: student learning that the student correlates with instructor management of teaching strategies and in-class engagements

People-Related: student learning that the student associates with the opportunity to work with a partner or group.

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