Early Childhood Professional Development: An Experimental Study of
Adult Teaching Practices Derived from Adult Learning Theory

DISSERTATION

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Abstract

Research that describes how adults acquire and use new information, collectively called adult learning theory, has potentially important implications for facilitating such adult learning experiences as educator professional development. The purpose of this study was to examine whether integrating adult teaching practices derived from adult learning theories into early childhood educators’ professional development would result in better gains in educator engagement in professional development, phonological awareness abilities, phonological awareness knowledge, and language and literacy beliefs. The impact on educator engagement and educator proximal knowledge was analyzed using one way ANOVA. The impact on educator phonological awareness abilities, phonological awareness general knowledge, and beliefs was analyzed using a 3 X (2 X S) mixed analyses of variance to examine the pretest to posttest change between educators participating the three conditions. Results revealed significant findings for increased engagement in professional learning and gains in educators’ general knowledge. This study is a first step in understanding effective adult teaching practices that may or may not contribute to better educator outcomes and promoting more effective professional learning experiences for early childhood educators.
Dedicated to David, Arabella, Bridget, and Genevieve
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Major Field: Education: Teaching & Learning

Reading and Literacy for Early and Middle Childhood
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Chapter 1: Introduction

Researchers are increasingly concerned with describing the linkage between the design and implementation of professional development and subsequent improvements in educator knowledge and practice (Landry, Anthony, Swank, & Monseque-Bailey, 2009). Research that describes how adults acquire and use new information, collectively called adult learning theory, has potentially important implications for facilitating such adult learning experiences. Andragogy, a term originated in Europe in the 1950’s and introduced in the United States in the 1970’s by Malcom Knowles, has become the term used to describe adult learning. Originally proposed as a theory and later revised as a framework of adult learning, andragogy holds a set of assumptions about how adults learn and emphasizes the value of the process of learning. Knowles (1970) defined andragogy as "the art and science of helping adults learn." The current theories of adult learning are premised on this definition and framework.
Adult learning theories have potentially significant implications for how to facilitate early childhood educator learning experiences. For instance, Knowles (andragogy; 1970), Mezirow (transformative learning; 1991), Merriam (pillars of andragogy; 2001), and Vella (dialogue education; 2008) all point to similar key andragogical principles and adult teaching practices that may influence the adult learning experience. These practices include a disorienting dilemma for adult learners, acknowledging and utilizing adults’ prior experiences into the learning events, reflection within learning opportunities through dialogue, and relationship building with adult learners (Mezirow, 1991; Vella 2008). Collectively, these researchers posit that when implemented effectively, these principles of adult learning theories should enhance the learning experience for the adult learner, which should lead to better outcomes (Knowles, 1970; Merriam, 2001; Mezirow, 1991; Vella, 2008).

Federal- and state-level initiatives have invested large amounts of money into developing and providing professional development to educators supporting young children (Darling-Hammond, 2009; United States, President Obama’s Race to the Top Early Learning Challenge: RTT-ELC). Despite these investments, research reveals mixed outcomes when professional development is evaluated for its impacts on educators’ knowledge and practices (Neuman & Cunningham, 2009). One explanation for why researchers do not see the changes intended may be the lack of consideration for the adult learner and the theories that speak to how adults learn, namely: how adults change beliefs, how adults gain and use knowledge to inform practice, and, ultimately, how adults change the way they work with young children. In fact, very few studies
acknowledge the fact that educators are indeed adult learners and fewer still describe the processes taken during the adult learning experiences (see Landry et al., 2009; Cunningham, Etter, Platas, Wheeler, & Campbell, 2015). To my knowledge, there are no studies of early childhood educator professional development that have empirically tested specific adult teaching practices proposed in current theories of adult learning. Moreover, no studies have compared professional development with adult teaching practices infused to other professional development.

The present study examined whether the integration of adult teaching practices common across theories of adult learning into early childhood educator professional development resulted in better educator outcomes. The topic of the professional development was phonological awareness instruction for young children. Children’s competence in early phonological awareness skills have been empirically tested and found to be a critical precursory skill predictive of later reading success (Bradley & Bryant, 1983; Cisero & Royer; 1995; Bus & van Ijzendoorn, 1999; Anthony, Lonigan, Burgess, Driscoll, Bacon, et al., 2002; Anthony, Lonigan, Driscoll, & Phillips, 2003; Catts, Adolf, & Weismer, 2006; Whitehurst & Lonigan, 1998; National Early Literacy Panel [NELP], 2008). Yet, current research suggests that early childhood educators provide little attention to phonological Awareness skills and strategies in their daily practices and have minimal phonological awareness abilities and knowledge of how to teach it (Crim, Hawkins, Thornton, Rosof, Copley, & Thomas, 2008; Cunningham, 2009; Pelatti et al., 2014; Cunningham et al., 2015). Thus, phonological awareness constitutes an important topic for additional professional development for early childhood educators.
This experimental study contributes to the emerging scientific literature of early childhood educator professional development by being the first to explicitly manipulate professional development and test the integration of adult teaching practices derived from adult learning theories. Although many researchers have written about early childhood professional development (Landry et al., 2006; Neuman & Cunningham, 2009; Milburn, Girolametto, Weitzman, & Greenberg, 2013), very few researchers of early childhood educator professional development have explicitly acknowledged the way in which the adult learner (educator) learns (Landry et al., 2009). Such research is particularly important as professional development remains the main format for delivering key content for early childhood educators to use to provide effective approaches for educating young children. By empirically testing the learning practices associated with current adult learning theories, this study aimed to provide evidence of how to effectively promote change in adult learners working with young children.

Understanding more about the integration of key adult learning practices identified through adult learning theories could have important implications for those who design, conduct, and research professional development opportunities and educator outcomes. To that end, the argument in this study brings together research on early childhood professional development, theories of adult learning, and phonological awareness as it applies to professional development and early childhood settings. I do this in order to make a case for the explicit integration of adult learning teaching practices into early childhood educators’ professional learning experiences specific to phonological awareness. The early childhood professional development literature lays the foundation
for what we know about early childhood educators’ knowledge and practice, the adult learning theory literature provides principles and practices to use to inform effective adult learning, and the review of phonological awareness professional development provides an argument for the selection of phonological awareness as the content topic for this study. The aims of this study were to test the extent to which the integration of adult teaching practices derived from adult learning theories impact educator engagement in professional development, phonological awareness abilities and knowledge, and changes in beliefs.

I begin my argument with a summary of some of the research on early childhood professional development in order to describe what the field has already learned regarding professional development and educator outcomes. In addition, my purpose here is to identify the lack of attention focused on the role of the educator as an adult learner. I then examine the body of research on adult learning theory to describe adult teaching practices posited to promote change in knowledge and beliefs and establish its potential importance in the realm of professional development for early childhood educators. Next, I shift to the relevance of phonological awareness as the topic of the professional development content. Synthesizing this literature, I present my research questions and methodology drawing from the three fields of study to inform my research design.
Chapter 2: Literature Review

The purpose of chapter two is to discuss early childhood educator professional development, adult learning, and phonological awareness as the selected content topic for this study. This chapter includes theoretical perspectives, research findings, and the potential significance of adult learning theory to the field of early childhood educator professional development. I outline the need to expand the body of research on adult learning theory, especially with respect to experimental studies, in order to evaluate causal claims concerning improvements in adult learning as these may apply to early childhood educator professional development.

Early Childhood Educator Professional Development

Early childhood education is an important means of supporting children’s early and continued learning. Numerous federal and state efforts have been aimed at raising children’s school readiness prior to the kindergarten year (e.g., state early learning standards; Scott-Little, Lesko, Martella, & Milburn, 2007; Darling-Hammond, 2009). Understanding how to provide children with an early foundation of important precursory skills is critical given that many states estimate that half of their children arrive at kindergarten inadequately prepared for academic success (Zill & West, 2001). These efforts are premised on research indicating children’s experiences in early education explain significant amounts of variance in key educational outcomes in the future.
(Belsky, 2006; Campbell, Ramey, Pungello, Sparling, & Miller-Johnson, 2002; Peth-Pierce, 1998). Issues of quality in early childhood settings continue to receive considerable attention. In 2012, over $500 million was provided to states via the White House’s Race to the Top Early Learning Challenge (RTT-ELC) initiative to support states’ efforts to improve the quality of early childhood education; many of these funds were earmarked for professional development.

As suggested by the RTT-ELC funding, recent years have seen increased interest in the professional learning of early childhood educators, namely those who work with children birth to grade three (Buysse, Winton, & Rous, 2009). This may be due not only to the development of early childhood learning standards to promote accountability for children’s early learning, but also the creation of professional development standards to promote accountability for high quality learning for educators (e.g., New Jersey Professional Standards for Educators, 2014; Ohio Standards for professional development, 2008). Professional development standards aim to delineate the essential characteristics of quality professional development. These include standards such as: “Professional development is continuous and includes planning, implementation, reflection, evaluation, and revision” (Ohio Professional Development Standards, 2008, p. 36). Standards have been developed to ensure that professional development meets the needs of educators while also responding to the needs of children. In addition, standards suggest that the professional learning opportunities of educators align with educator, building, district, state, and national goals for establishing high quality early childhood settings. Some studies have shown that higher quality settings can result in better
opportunities for child development (Mashburn, et al., 2008; Paro et al., 2009). With learning standards for children and educators becoming common, and in some states mandatory (Scott-Little et al., 2007), we must begin to take closer examination of how best to facilitate the continued learning of adults who work with young children.

The conceptualization and overarching effects of professional development. Buysse, Winton, and Rous (2009) conducted a review of the literature on early childhood professional development to inform conceptualizations and definitions of professional development. These researchers set forth several important points which guided their conceptualization and proposed definition and set the stage for this dissertation study. First, Buysee and colleagues noted that the term professional development includes various types of facilitated learning. These have been identified as workshops and summer institutes (e.g., Guskey & Yoon, 2009), coaching and mentoring (e.g., Neuman & Cunningham, 2009; Neuman & Kamil, 2010), study groups (e.g., Ball & Cohen, 1996; Cunningham et al., 2015), self or observer examination of educator practice (e.g., Downer, Locasale-Crouch, Hamre, & Pianta, 2009b; Putnam & Borko, 2000), online educational opportunities (e.g., Downer et al., 2009b; Mashburn, Downer, Hamre, Justice, & Pianta, 2010), and educators’ own inquiry/action research (e.g., Anderson, Herr, & Nihlen, 2007). Second, Buysse and colleagues noted that the early childhood workforce is widely diverse (see also Weber-Mayrer, Piasta, & Pelatti, 2015) and thus professional development must effectively serve this diverse population. Professionals working in early childhood settings include educators, assistant educators, special education educators, disability specialists, administrators, and curriculum specialists. In
addition, settings vary across public, private, home childcare, Prekindergarten, and Head Start environments. Third, Buysee and colleagues posit that the role of the educator is to actively engage in the professional development learning experiences in order to acquire professional knowledge, beliefs, and skills needed to apply knowledge to practice. In this context, engagement has been defined as interactions with learning materials, the instructor, and learners (Conrad, 2002). Fourth, Buysse and colleagues state that the role of the professional development facilitator is to organize and facilitate learning experiences and respond to and scaffold inquiry and dialogue regarding “problems in practice” (p. 238). Based on these four points, Buysse et al. (2009) proposed the following definition of professional development which serves as the definition for this dissertation study: “facilitated teaching and learning experiences that are transactional and designed to support the acquisition of professional knowledge, skills, and dispositions as well as the application of this knowledge in practice” (p. 239).

Over the past several decades, researchers of early childhood professional development have invested substantial time and effort in examining professional learning for educators. Yoon, Duncan, Lee, Scarloss, and Shapley (2007) reviewed this literature, examining over 1300 studies to determine the extent to which educator professional development affects child outcomes. Results of their review indicated that children enrolled in control condition classrooms “would have increased their achievement by 21 percentile points if their educators had received substantial professional development” (p. iii). Their review concluded that the provision of professional development had moderate effects on child outcomes, thus raising awareness of the importance of professional
learning for educators. Yet the Yoon et al. (2007) review focused only on links to child outcomes and did not substantiate an empirical link between professional development, educator learning, and practice. In addition, Yoon and colleague’s review did not examine early childhood settings before kindergarten, synthesized across a wide variety of professional development topics, and did not include recent studies (i.e., included studies were published between 1986 and 2003). Next, I will review the literature specific to professional development for early childhood educators relevant to the topic selected for this study, emergent literacy instruction.

**Professional Development to Improve Language and Literacy Instruction**

Researchers have established that emergent literacy skills are facilitated through specific child interactions with the environment, their peers, caregivers, and educators (Heath, 1982; Teale & Sulzby, 1986; Bowers & Vasilyeva, 2010; Guo, Justice, Kaderavek, & McGinty, 2012; Girard, Girolametto, Weitzman, & Greenberg, 2013). Conducting a systematic review of teaching literacy to preschool and kindergarten children, the National Early Literacy Panel (NELP, 2008), identified interventions, parent activities, and instructional practices for educators to promote the literacy learning of young children. Results of this analysis have served as a foundation for the development of literacy professional development for educators of young children, thus spurring a plethora of studies investigating impacts of emergent literacy professional development for educators and effects on child outcomes (e.g., Neuman & Cunningham, 2009; Powell et al., 2010; Lonigan, Farver, Phillips, & Clancy-Menchetti, 2011; Cunningham et al., 2015).
Landry et al. (2006) conducted an evaluation of the intensity of professional development associated with language and literacy curriculum implementation. Educators were randomly assigned to one of three conditions: (a) workshop with an emergent literacy curriculum, (b) workshop with curriculum mentoring/coaching, or (c) a control condition. The curriculum and professional development included a focus on building letter knowledge, phonological awareness, language, and motivation to read as well as related instructional approaches. The workshop trainings were conducted by facilitators employed by the curriculum publishing companies. Coaches provided technical support for the implementation of the assigned curricula. Results indicated that there were limited impacts from the professional development on classroom practices compared to the control group. Classroom practices were measured by the CIRCLE-Teacher Behavior Rating Scale (Landry, Crawford, Gunnewig, & Swank, 2002). This measure contained 50 items that “captured responsive teaching practices, key language and literacy instructional areas, the use of lesson plans and progress monitoring, as well as classroom structure and organization” (Landry et al., 2006, p. 477). Effect sizes for this study were small to medium regarding the impact of professional development on child outcomes (i.e. letter recognition, phonological awareness, vocabulary, receptive and expressive language). Although the children in the professional development classrooms showed gains on emergent literacy skills, such gains were dependent on the curriculum implemented. Therefore, it is difficult to disentangle effects of professional development without the curriculum as a moderator.
In a second large scale experimental study of early childhood professional development focused on language and literacy, Landry et al. (2009) randomly assigned educators to one of five conditions: (a) workshop plus coaching, and personal digital assistance (PDA) for online assessment, (b) workshop plus coaching, (c) workshop plus PDA, (d) workshop only, or (e) control. Educators in all professional development conditions received the same small group facilitated emergent literacy training along with equivalent training materials and supplemental literacy resources. The facilitators of the professional development conducted small group learning sessions and mentored educators assigned to coaching. The facilitated professional development included two workshop sessions per month for one academic year addressing nine topics, six of which related to emergent literacy. The coaching framework included onsite visits focused on helping educators with room arrangement, planning lessons, reflection, discussion, and feedback. Landry et al. (2009) reported that, collectively, educators who received training in all four formats demonstrated positive impacts on teaching behaviors (quantity and quality) over the control. However, results varied by condition. Being provided with coaching and detailed feedback on child progress yielded the highest quality ratings, and the groups with no mentor and no feedback were associated with the lowest quality scores. However, even the workshop only condition demonstrated higher teaching quality over the control condition. Even with the variability across the professional development conditions, this study revealed that professional development resulted in better educator outcomes than no professional development at all. Mixed findings were also reported for child outcomes and also varied upon condition. Conditions did not differ from control on
vocabulary outcomes. Letter knowledge scores were higher for the professional development condition compared to control and highest for children in the combination professional development, coach, and PDA classrooms. Together, children in all professional development conditions scored significantly higher on phonological awareness posttests as compared to control classrooms. Limitations to this study include the implementation of a wide array of early childhood topics into the professional development sessions (6 specific to emergent and 3 non-literacy specific topics) only allowing for two sessions per topic. The lack of time and depth spent on each topic could have contributed to the mixed results in educator behavior (quantity and quality) and child outcomes. Also, although Landry and colleagues acknowledged the importance of educators’ existing knowledge, beliefs, and experience, the study lacks explicit details as to how or whether these were addressed during the professional development and/or for each topic.

Neuman and Cunningham (2009) conducted an experimental study of the effects of professional development only, professional development plus coaching, and business as usual on educator knowledge and quality of emergent literacy practices. These researchers outlined a theoretical perspective for the context of their study based on three assumptions: (a) quality teaching plays an important role in language and literacy instruction, (b) early literacy teaching requires comprehensive content knowledge, and (c) professional development must contain content and pedagogical knowledge. The professional development included 45 hours of face to face workshop sessions focused on six research-based emergent literacy skills, strategies for working with second-language
learners, literacy assessments, parental role in early language and literacy development, and linkages between literacy and other aspects of the curriculum. Two weeks were devoted to each topic. A prescriptive model of coaching included onsite visits, reflection, and feedback. Results revealed neither treatment condition outperformed the control on educator knowledge posttest scores as measured by a researcher-created assessment of early language and literacy development. However, the researchers did see significant differences in the quality of language literacy practices in both professional development treatment conditions over the control condition as measured by the Early Language and Literacy Classroom Observation (ELLCO: Smith & Dickenson, 2002). One limitation of this study is that the professional development included a wide array of early childhood literacy topics, only allowing for two sessions per topic. The lack of time and depth spent on each topic could have contributed to the lack of significant shifts in educator knowledge. Also, although educators bring a wide variety of knowledge and experiences (Weber-Mayrer et al., 2015), the diversity among educators was not addressed.

Powell et al. (2010) examined the effects of professional development including workshop and coaching on educator and child outcomes and also examined the differential effects of implementing professional development in person or online. The professional development included two full day workshops and coaching over one semester. Emphasis of the professional development content consisted of strategies to improve children’s oral language, phonological awareness, and letter knowledge skills. Coaching provided individualized feedback to educators on evidence-based literacy practices emphasized during the 2 day workshop sessions. Coaching was based on an
observe-assess-recommend sequence and was implemented by expert coaches. Educators were randomly assigned to either a spring or fall professional development condition and a participation year (year 1 or year 2). Educators were then randomly assigned to onsite or remote coaching. In the first year of the study, one half of the spring condition was assigned as the control condition for fall. In year two all educators assigned to spring professional development served as the control condition for fall implementation. Results revealed positive effects of each professional development intervention on the literacy environment compared to controls on the General Preschool Environment and the Language, Literacy, and Curriculum subscales of the ELLCO (Smith & Dickenson, 2002) but showed no significant effects on educators’ practices to promote children’s vocabulary knowledge or oral language. Positive effects were also reported for children on four of the seven outcome variables compared to children in the control condition (i.e., letter knowledge, blending skills, and writing, but not receptive language, letter-word identification, or initial sound matching). Similar to other studies described above, it is unclear the extent to which the diverse backgrounds of early childhood educators including a wide variety of knowledge, beliefs, and experiences were taken into account in the design and implementation of professional development.

Lonigan et al. (2011) conducted an experimental study evaluating the effects of literacy curriculum and two types of professional development on the emergent literacy skills of preschool children and educator classroom measures. Preschool centers were randomly assigned to one of three conditions: (a) workshop and a literacy curriculum, (b) workshop plus literacy curriculum and coaching, or (c) control. The workshop
professional development included face to face sessions that took place at the beginning of the school year. These sessions included explanations of small group instructional strategies and key emergent literacy skills (e.g., vocabulary, phonological awareness, print awareness) related to the assigned curriculum. Sessions included hands-on and didactic/demonstration tasks. The classrooms assigned to the workshop plus coaching received once a week coaching sessions throughout the school year. Coaches observed, provided feedback on curriculum implementation, modeled activities, and problem solved with educators. Seven child measures assessing general cognitive ability, oral language, print knowledge, and phonological processing skills and two measures of classroom quality (i.e., ELLCO; Smith & Dickenson, 2002 and Early Childhood Classroom Observation Measure: ECCOM; Stipek & Byler, 2004) were conducted in the fall and spring of the school year. Lonigan et al. (2011) reported statistically significant effects for the curriculum and professional development on some child outcomes (e.g., expressive language and print knowledge) over children in the control condition but null effects for others (phonological awareness). There were virtually no differences between the two professional development conditions on child outcomes with the exception of print knowledge. In addition, null effects were reported for the effects of either professional development on both classroom quality measures. However, there were significant effects of the integrated literacy curriculum that altered the nature of the literacy interactions as measured by the ECCOM compared to the control. Overall, this study indicates some positive results for combining curriculum and professional development but cannot disentangle these effects and did not find evidence of an
advantage for one type of professional development over another (e.g., workshop and coaching, workshop alone). As was true for other research groups, Lonigan and colleagues did not explicitly take into account the variety of knowledge, beliefs, and practices early childhood educators bring to the learning settings.

In a very recent study, Cunningham et al. (2015) examined the effects of literacy professional development on educators’ phonological awareness knowledge, beliefs, and practices using a pretest-posttest design (no control). Educators volunteered to participate in a three year study. Six classrooms per year were randomly selected from the pool of volunteers to participate. The professional development format consisted of a one year educator study group. Study group sessions were conducted twice a month for two hours over 7-8 months. The sessions were facilitated by a doctoral level member of the research staff with expertise in emergent literacy development. Each study group session followed a 4-step process: (a) review, (b) content presentation, (c) practice, and (d) preparation. The professional development included five components thought to be effective: (a) scaffolding educator learning in a trusting environment, (b) offering a supportive, collaborative environment in which to build relationships with the facilitator and colleagues, (c) use of experience and expertise, (d) small group educator learning experiences, and (e) focusing the professional development on active learning experiences. Teacher knowledge and beliefs were assessed using the Teacher Knowledge and Beliefs Survey (TKABS; Cunningham, Wheeler, Platas, Boyle, & Schmidt-Raher, 2012). The quantity and quality of phonological awareness instructional practices were measured using the Teacher Behavior Rating Scale (TBRS; Landry, Crawford,
Gunnewig, & Swank, 2002). Child outcomes were measured using the Phonological Awareness subtest of the Test of Preschool Early Literacy (TOPEL; Lonigan, Wagner, Torgesen, & Rashotte, 2007). Analyses revealed significant changes from pretest to posttest in educators’ phonological awareness ability, knowledge, and pedagogical knowledge (targeted in the professional development) but not in other emergent literacy practices not covered in the professional development such as general knowledge of child development. In addition, the quantity and quality of phonological awareness activities in the classroom increased but not in print knowledge or read aloud activities. Cunningham et al. (2015) reported significant gains for children on a phonological awareness skills measure as compared to the expected progress of children the same age via national norms. This study suggests the promise of this form of professional development (study groups) in promoting educator knowledge, beliefs, and classroom practices. However, the lack of a control condition does not allow for a causal interpretation of the results.

As illustrated through the studies reviewed above, research indicates that the impacts of early childhood educator professional development on educator knowledge, beliefs, and practices, as well as impacts on child outcomes, are mixed. One explanation for why researchers do not see the changes intended through professional development efforts may be that very few studies acknowledge the fact that educators are adult learners or describe the processes taken during the adult learning experiences (see Landry et al., 2009; Cunningham et al., 2015). Explicitly stated in the theoretical framework of Landry and colleagues’ large scale study was the importance of acknowledging educator philosophies and collaborative problem solving in efforts to help educators better
understand new information. However, detailed information describing how educator philosophies and problem solving were integrated across the study conditions was not provided, nor did other studies (e.g., Lonigan et al., 2011; Neuman & Cunningham, 2009) acknowledge educators as adult learners. A notable exception was the Cunningham et al. (2015) study which incorporated five adult teaching practices included in adult learning theory; however, the extent to which these contributed to impacts for early childhood educators cannot be determined from that study. Although the studies described above may have implicitly included elements of adult learning theory (see Landry et al., 2009 and Cunningham et al., 2015) none have tested the explicit integration of specific adult teaching practices compared to professional development that did not include these practices. For example, Landry and colleagues may have integrated some of these practices in the 2009 study but they did not compare these to the other professional development. These researchers compared professional development to no professional development or to different versions of the professional development that were similar (e.g., face-to-face, and coaching). In addition, only two studies included a measure of educator knowledge (Neuman & Cunningham, 2009; Cunningham et al., 2015) and only one included a measure of educator beliefs (Cunningham et al., 2015). Thus, it is unclear whether educators understood the professional development content, or bought into and/or took ownership of the suggested teaching and learning practices presented. These studies provide little information as to how professional learning for early childhood educators might best support the acquisition of knowledge, beliefs, and practices through theoretical principles put forth by the adult learning research community.
Theories of Adult Learning

Adult education, as a professional field of practice, was established in the 1920s, yet there is still not one dominant theory or model that explains adult learners and the way they learn (Merriam, 2001). Andragogy has emerged as one of the prevailing frameworks for supporting adult learning. Importantly, it has become “synonymous with the education of adults” (Pratt, 1998, p. 160). Knowles (1998) defined andragogy as “an intentional and professionally guided activity that aims at change in an adult person” (p. 60). Over the past 40 years, many scholars have continued to investigate andragogy and its assumptions in order to identify (albeit descriptively and anecdotally) benefits and/or challenges to adopting and implementing adult learning strategies as these may contribute to adult learning (Taylor, 1998; Merriam & Kim, 2012). Learning has been defined as “a process of using prior interpretation to construe new or revised interpretations of the meaning of one’s experience as a guide to future action” (Mezirow, 2000, p. 5). To develop a deeper understanding of the concept of adult learning, it is helpful to consider various perspectives of the theorists whose work define what adult learning involves. This includes the perspectives of Knowles (andragogy; 1970), Mezirow (transformative learning; 1991), Merriam (pillars of andragogy; 2001), and Vella (dialogue education; 2008), all of whom point to particular principles of the adult learning experience as being important for learning.

Knowles: A framework of andragogy. Andragogy has become the umbrella term for the study of adult learning which highlights adult learner characteristics
(Merriam & Bierema, 2014). Knowles (1987) identified six assumptions of adult learning based on characteristics of his adult students. These assumptions are:

1. Adults need to know why they need to learn something before undertaking it.
2. Adult learners embrace a self-concept of being responsible for their own learning.
3. The adults’ varied life experiences play a major role in contributing to learning outcomes and serve as a rich resource for the learning environment.
4. Adults become ready to learn the things they need to know and be able to do in order to cope effectively with their real-life situations.
5. Adults exhibit an orientation to learning and a motivation to learn when they perceive that learning will help them perform tasks or deal with problems that they confront in their life situations.
6. Motivation to learn is in response to internal and external factors. (Knowles, 1984. p. 57-63).

These assumptions serve as guides to differentiate what facilitators of adult learning should do in order to successfully plan and facilitate adult learning experiences and learners’ readiness to learn (e.g., events in the learners’ life to trigger the “need to know”). With respect to readiness to learn, researchers have studied how life transitions spur an interest in learning (Aslanian, 2001; Mezirow, 1997; Moon, Kondo, Glymour, & Subramanian, 2011; Sands & Tennant, 2010). The events can be devastating and forced out of necessity, such as the loss of a spouse (Moon et al., 2011; Sands & Tennant, 2010) or a job loss (Aslanian, 2001). In contrast, learners may self-select programs or courses...
based on interests or needs, such as rock climbing (Cranton, 2000). In either case, Knowles (1998) stresses the importance of communicating clear learning objectives and discussing the relevance of the content (e.g., significance to everyday life/work as a result of a trigger or transition event).

Moreover, andragogy emphasizes the need for facilitators to identify strategies and teaching practices that best suit adults’ personal learning needs. The ultimate goal is for adults to become self-directed learners (Knowles, 1998). Self-directed learning as a form of study was introduced by Tough (1971). Self-directed learning has been defined as the process of self-instruction consisting of goal setting, development and implementation of a learning plan, and evaluation (Oddi, 1984). Past research has been primarily descriptive; current research focuses on model building, ethics, and goals of self-directed learning (Merriam, 2001). Scholars such as Merriam and Caffarella (1999) propose that self-directed learning may be influenced by various learner characteristics such as culture, age, education, and socioeconomic status. Merriam (2001) suggests that it is the facilitator’s responsibility to support adults in developing the capacity for self-directed learning. Therefore, when planning for self-directed learning, research suggests considering adult learning principles, phases of the learning process, content, reflection, learner characteristics, and social and environmental influences (Danis, 1992). Research specific to self-directed learning has focused primarily on developing measurement tools. In a descriptive study, Haggerty (2010) surveyed undergraduate students and found that they reported preferring instructor-directed formats as opposed to learner-directed formats. This study, however, cannot speak to whether or not learner-directed formats are
effective. Thus, no research to date has determined whether including these andragogical principles and adult teaching practices results in better adult learning experiences.

Andragogy also emphasizes the importance of acknowledging the prior experiences that adults bring to the learning process. Facilitators can use such experiences as individualized learning tools and to build positive perceptions concerning the success of the learning experience (Graham, Donaldson, Kasworm, & Dirkx, 2000). Perceptions may include motivation and engagement, self-confidence, and how learning experiences are interpreted (Donaldson & Graham, 1999). Moreover, prior experiences are posited to positively or negatively affect interactions and relationships with fellow learners and/or the facilitator (Knowles, 1998). Therefore, andragogy emphasizes the responsibility of the facilitator to carefully draw on experiences in order to encourage learners to participate in the problem solving process. This assumes that more effective learning may occur when the adult learner is able to transfer knowledge gained to real-life applications and move from a passive state of knowing to an active state of doing.

In addition to the six core assumptions, Knowles (1984) proposed seven adult learning design elements: climate setting (creating a stimulating physical and psychological climate for adult learning), mutual planning (involving the learners in planning), diagnosis of learning needs (attending to needs and interests), formation of objectives (involving learners in setting goals and objectives), designing a plan for learning (involve learners in program design), execution, and involving the learners in program evaluation (Knowles, 1984; Terehoff, 2002). These seven design elements are considered critical in creating teaching and learning experiences tailored to adult
learners’ characteristics. Moreover, the seven design elements help create a climate for learning inclusive of important adult learning principles such as a trigger event, prior experiences, self-directed learning, and relationship building. Yet, there is limited acknowledgement of the design elements presented by Knowles in studies of early childhood professional development (see Landry et al., 2009; Cunningham et al., 2015). Furthermore, in the professional field of adult learning studies, there remains considerable controversy as to the validity of these principles and design elements as put forth by Knowles (Misch, 2002).

Very few studies have attempted to empirically investigate the assumptions and/or principles of andragogy (Merriam, 2007). One study by Norrie and Dalby (2007) investigated the extent to which nursing students function as adult learners as they progressed through their program. These researchers developed a 12-item Likert scale questionnaire based upon Knowles’ six assumptions of andragogy. The research findings did not conform to predictions based upon Knowles’ model. Moreover, this study provided no evidence that nursing students gained more of the characteristics of andragogy as they progressed through their program (e.g., changing from instructor-oriented learning to self-directed learning). In fact, Norrie and Dalby (2007) reported that some learners became less willing to take responsibility for their own learning. This study was also severely limited by the low reliability (Cronbach’s α = .54) of the survey measure.

Additional studies of andragogy have focused on the application of andragogical principles to professional learning across disciplines in the fields of medicine (Bedi,
2004: Misch, 2002), education (Bolton, 2006), management (Forrest & Peterson, 2006), and police and criminal justice (Birzer 2003; Birzer 2004). These studies qualitatively describe the implementation of Knowles framework but do not measure learner outcomes, nor do they test assumptions or principles set forth in andragogy. One reoccurring argument is that due to the individual nature of learning, explicitly measuring andragogy proves challenging (Holton, Wilson & Bates, 2009).

Andragogy has been criticized for ignoring cultural and social influences on adult learners. Researchers have argued that due to the complexity of learning, it may not be possible to identify particular approaches that are “likely to always produce more effective results” for large groups of learners (Brookfield, 1986; Merriam, 1987) due to individual and social structures (Pratt, 1993). Therefore, it is the responsibility of the facilitator of the adult learning experience to include adult teaching practices such as prior experiences in addition to current, cultural, and social experiences within the learning setting (Halx, 2010). Researchers have expanded upon Knowles’ framework in order to provide pedagogical suggestions for working with adult learners.

**Merriam: An expansion of andragogy.** Merriam builds upon Knowles’ (1984) framework to argue that “incidents of learning experiences” shape the self-directed learner (Merriam, 2001, p. 94). In Merriam’s framework of adult learning theory, she revisits the five assumptions underlying andragogy and describes the adult learner as someone who “(1) has an independent self-concept and can direct his or her own learning, (2) has accumulated a reservoir of life experiences, (3) has learning needs closely related to changing social and environmental roles, (4) is problem-centered and
interested in immediate application of knowledge, and (5) is motivated to learn by internal rather than external factors” (Merriam, 2001, p.5). These descriptions support the need to explicitly address such andragogical principles and adult teaching practices such as creating a disorienting dilemma (the means by which a trigger event is created), use of prior experience, multiple forms of reflection, and the importance of relationship building. Merriam uses this framework for designing, implementing, and evaluating adult learning experiences. For example, in creating an adult learning environment, she suggests that the facilitator of the learning aim to create a setting that is conducive to acceptance, respect, and support in order to promote self-directed learning (Merriam, 2001).

**Mezirow: A theory of transformative learning.** Mezirow’s transformative learning theory has been the most widely researched adult learning theory studied over the past thirty years (Taylor, 2000). Mezirow (1997, p. 5) defines transformative learning as the process of effecting change in a frame of reference. He describes a frame of reference as the assumptions through which learners understand and make meaning of their experiences. Mezirow’s grounded theory work with women returning to higher education in the 1970’s led him to develop this theory of adult learning that focuses on experience as a meaning-making mechanism. Mezirow (1991) calls this *perspective transformation*. Mezirow posits that adult beliefs are comprised of attitudes, and assumptions learners acquire through life experiences. Mezirow (2012) argues that adults’ beliefs can both help and limit adult learners’ organization and sense-making of new information. This concept of meaning-making informed by prior and current
experiences maps onto the assumptions of andragogy as put forth by Knowles et al. (1998). According to Mezirow (1991), experience appears to be a basic concept common to the conceptualization of transformational learning.

Mezirow (1998) posits that transformative learning occurs in four ways. First, learning occurs when learners elaborate on existing frames of reference (what they currently know). Second, learners gain new frames of reference. Third, learners transform their current points of view. Finally, learners change their habits of mind, that is the complex feelings, beliefs, judgments, and attitudes they have regarding a specific topic (Mezirow, 1997 p. 6). In order for this learning to take place, Mezirow (1998) presents ten recursive stages of transformational learning: the disorienting dilemma, self-reflection, critical assessment, discontent, exploration of options, planning a course of action, acquisition of new skills, making provisional efforts, building competence, and finally, reentering. Mezirow posits that each stage plays a unique role in the process of adult learning.

Transformation theory suggests that processes of transformation begin when the adult learner experiences a disorienting dilemma or what Brookfield (1987) referred to as a “the trigger event.” A disorienting dilemma refers to an unexpected event leading to an uncomfortable, perplexing state, and thus, acts as a springboard for the learning process. Dilemmas then lead learners to undergo self-examination and motivation to reflect critically on their beliefs (Mezirow, 2000). Critical reflection is an important component of transformative learning theory (Mezirow, 1990).
Mezirow (1991) identifies three types of reflection: content (reflection on the actual experience and assumptions on content), process (reflection on how to handle the experience or procedures for problem solving), and premise (reflection on long-held socially constructed assumptions, beliefs, and values). Mezirow (1991) suggests that premise reflection results in a more profound transformation due to the learner evaluating personal value systems and current practices. Through dialogue, shared language is developed and leads to the expansion of alternative perspectives. Establishing communities of adult learning promotes the sharing of knowledge, beliefs, and intentional practices (Lave & Wenger, 1991; Stein, 1998; Stein & Imel, 2002).

The role of the facilitator of adult learning is to utilize teaching practices that promote dialogue among peers pointed toward critical reflection and problem-solving. Brookfield (1987) suggests three requirements for effective critical questioning (a) be specific, (b) work from detailed to general, and (c) be conversational. Researchers posit that critical reflection and the revision of belief systems promote learners to explore new roles and relationships (Mezirow, 2000). New ways of acting and collaborating are established based on open-ended activities that promote insight and learner confidence (Taylor, 1997). Learners set goals based on progress, competence, and confidence. Revisiting set goals may in fact generate additional disorienting dilemmas, thus initiating deeper reflection, and in turn influence adjustments of one’s habits of mind.

It is suggested that facilitators of adult learning scaffold learners from being passive (taking in information) to being active (testing and questioning what has been learned). Providing regular, ongoing dialogue and reflection is essential for learners
transformative learning to take place (Cranton, 1994; Vella, 2011). Mezirow’s theory of adult learning posits that creating a climate where adult learners are willing to take risks (e.g., through critical reflection) and apply newly acquired knowledge will lead to confidence.

Researchers have examined adult learning through qualitatively assessing critical thinking. Gilstrap and DuPree (2008) conducted a study to facilitate and assess critical thinking in a library instruction program. College students completed Critical Incident Questionnaires (CIQ: Brookfield, 1998) at the end of four library class sessions. At the conclusion of the course, CIQ responses were analyzed through a thematic approach and classified as shallow (e.g., “I understood everything”) or rich (e.g., “I think everything is becoming clearer…” and “The PowerPoint slides allowed me to think…” ) descriptions. Results suggested that when students were confused, critical reflection appeared to take place at a deeper lever (i.e., students wrote richer descriptions). In addition, critical reflection appeared to deepen as the sessions progressed; researchers noted that concepts students stated as “clearly understood” during session one reappeared as concepts they found difficult later. Gilstrap and Dupree (2008) posited that responses generated by students seemed to uphold the theory that critical reflection may take place as a result of critical incidents (e.g., disorienting dilemmas) and events during a learning session. However, descriptive statistics were used in an exploratory manner; therefore, further investigation is warranted in order to reveal causally-interpretable evidence as to whether or not such reflection results in better learning.
There are few studies that examine transformational theory with learner outcomes. Brown (2006) designed a mixed-methods study examining transformative learning for educational leaders interested in social justice and equity within the context of principal preparation programs. Two cohorts of pre-service leaders \( (n = 40) \) were enrolled in coursework that integrated strategies to promote transformative learning (e.g., interviews, presentations, and reflective journaling). Brown (2006) used the Cultural and Educational Issues Survey (Pettus & Allain, 1999) to quantitatively measure attitudes concerning cultural and educational issues. Qualitative analysis was used to explore the integration of transformative approaches on personal beliefs and attitudes toward diversity and the ability to connect theory to practice. Content analysis was conducted on reflective journals using an a priori codebook grounded in transformative learning theory. Results suggested that participation in transformative learning strategies may increase learner’s perceived growth in knowledge, beliefs, and practice toward social justice. Scores on the attitudes survey revealed a 14 point decline (smaller values were associated with more favorable positions) suggesting that taking part in transformative strategies may improve attitudes toward diversity in education. However this study had notable limitations. First, the authors recognize the limitations of a small sample size, limiting the amount of data that can be interpreted and thus limiting the generalizability of the findings. Second, instructor styles and course content were not taken into consideration and therefore may have confounded the results. Participant background information was not examined and could provide alternative explanations for the findings and more importantly, this study did not include a control group.
**Vella: Dialogue education.** Dialogue education is premised on theories of adult learning presented by Freire (1970) and Knowles (1970) in which learners consider prior experiences as the premise for their learning. Vella posits that dialogue education is a “system for addressing issues involved in adult learning” (Vella, 2008, p. 1). She outlines 12 principles that include learner needs and resources assessment, safety, sound relationships, sequence and reinforcement, praxis, action/reflection/action, respect, ideas/feelings/actions, immediacy, clear roles, teamwork, engagement, and accountability. She advocates the implementation of these principles and teaching practices, through the acknowledgment and inclusion of prior experiences (pre-course survey), purposeful inquiry (reflection) and dialogue with learners, to promote a learner-centered environment.

Consistent with the assumptions of andragogy (Knowles, 1984) and the ten stages of transformative learning theory (Mezirow, 1998), Vella proposes seven steps to designing adult learning: who, why, when, where, what, what for, and how. The first is to identify who are the participants in the learning. Vella posits that it is important to gather information regarding the learners before and throughout the learning. A Learner Needs and Resource Assessment (LNRA) can serve as a pre-course survey that gathers learner information on current, beliefs, and practices. The second step is to identify why the learning event will occur. Many andragogical principles may play a role in this stage such as a disorienting dilemma (Mezirow, 1991) or other trigger event (Brookfield, 1987). The when determines the timeframe of the learning events. As evidenced throughout the literature on emergent literary professional development, this design step may take place
over days, weeks, or years (e.g., Landry et al., 2009; Lonigan et al., 2011). The where is the purposeful selection of a learning location. For example, professional development in the form of coaching would take place in the classroom (e.g., Neuman & Cunningham, 2009), and a workshop format of professional development may take place off site. Still another location may be in the form of online professional development (e.g., Downer et al, 2009a, 2009b). The what (content) and what for (achievement based learning objectives) steps are addressed in tandem. These two design steps map onto the assumptions of andragogy that presumes adults become ready to learn in order to cope effectively with their real-life situations (Knowles, 1984). The fifth step is the how and addresses what Vella identifies as the operable state. These are the learning tasks that are designed to facilitate the learning. The learning task is about the learner not the instructor. The learning tasks are designed to promote an orientation to learning and a motivation to learn.

Vella (2008) suggests that learning tasks should be structured through four elements: inductive work (connecting content to learners’ real life and work experiences), input (presentation of new content), implementation (immediate use of new content), and integration (moving content into learners’ professional setting). Learning tasks serve to meet achievement-based learning objectives when a safe environment for learning has been established. The principles and practices set forth in Vella’s framework aim to promote relationship building (e.g., LNRA) in addition to acknowledging and using prior experiences and newly acquired knowledge to inform learning tasks. Open-ended questioning is viewed as an important strategy used in dialogue education to promote
self- and critical reflection. Studies of dialogue education focus on the various roles facilitators play in promoting dialogue.

Gunnnlaugson and Moore (2009) were interested in how expanding approaches to dialogue might support the emergence of transformative learning (Mezirow, 1998) in university classrooms. Gunnlaugson wrote about the experience of teaching an online course integrated with dialogue education strategies. Gunnlaugson focused on implementing reflective and generative dialogue (Scharmer, 2000). Generative dialogue moves learners from closed and less authentic conversations toward more reflective and creative dialogue. Learners were asked to post questions from readings as well as facilitate an online discussion for one week. Posts were graded using an “inquiry rubric” that measured the level of thoughtful and engaged responses. Anecdotal reflections of student experiences and the role of the instructor in promoting dialogue education were shared. However, the researchers did not examine how dialogue education may influence learner outcomes. This remains a void in the research.

**Commonalities across adult learning theories.** This review of adult learning theories reveals five commonalities across theoretical perspectives: a disorienting dilemma (trigger event), prior experience, forms of reflection, motivation/engagement, and relationships. The notion of a disorienting dilemma appears across all four of the theories reviewed above and is often a reason for learning to occur. The role of prior experience is also addressed in each of the theories. Knowles (1984), Merriam (1991), and Mezirow (1998) and Vella (2009) all acknowledge the importance of the facilitator’s role in tapping into learners prior experiences as a springboard for building on existing
knowledge, beliefs, and practices. Various forms of reflection are threaded throughout each theory. For example, Vella (2011) promotes the use of dialogue education to encourage critical reflection on prior and current experiences, and critical reflection has been identified as the foundation of transformative learning (Mezirow, 1991). Motivation and engagement are also principles common across theories. The theories posit that learning must be relevant to real-life application in order for learners to be motivated to take up new knowledge and transfer into practice (Knowles, 1984; Mezirow; 1991; Vella, 2011). Finally, the importance of building trusting relationships has been addressed across theories. Adult learning theorists posit that when trusting relationships are established, learners will be more likely to respond deeply to open ended questions (Vella, 2011) and participate in meaningful discussions (Merriam, 2001), thus promoting self- and critical reflection (Mezirow, 1991). In fact, elements of relationships such as trust, friendship, and support have been shown to be the most common themes among the studies included in Taylor’s (1998) review of adult learning theory.

**Adult learning theory and early childhood educators.** As reviewed above, theories of adult learning hypothesize that key adult teaching practices are important for promoting adult learning and change. When considered in conjunction with the mixed findings from the early childhood educator professional development literature, the lack of attention to these adult learning principles may provide one explanation of why current professional development efforts have not necessarily realized intended changes in early childhood educator outcomes. It is unclear if studies of early childhood professional development have incorporated theories that speak to how adults learn, namely: how
adults gain and use knowledge to inform practice, how adults change beliefs, and, ultimately, how adults change the way they work with young children. Theories of adult learning suggest that integrating adult teaching practices such as a disorienting dilemma (trigger event), prior experiences, reflection, motivation and engagement, and relationships would lead to increased engagement, changes in educators’ knowledge, beliefs, and classroom practices. Professional development has been identified as an opportunity for educators to learn and improve on aspects of research-based practices through the advancement of knowledge and reflective practice. Addressing how best to facilitate the learning of early childhood educators may reveal opportunities for educators to examine and improve current professional development practices.

The literature investigating emergent literacy professional development for early childhood educators does not specifically address principles and practices related to how adults learn. In some instances, studies related to coaching provide descriptions of professional development implementation that may align with adult teaching practices (e.g., building relationships and encouraging reflection); however, the extent to which including these practices may lead to better learner outcomes has not been tested within the context of early childhood educator professional development. Given the lack of empirical research concerning adult teaching practices derived from adult learning theories more generally (Holton et al., 2009), it is not clear whether explicitly attending to these principles and practices during educator professional development is associated with greater increases in engagement in professional development, gains in knowledge, and changes in beliefs. As suggested by Powell et al. (2010) perhaps the professional
development research has reached a point at which investigators must consider pedagogical differences in the design and delivery of professional development to advance and realize intended results. Integrating adult learning theory into professional development provides one avenue for changing design and delivery. No studies to date have experimentally examined the extent to which claims concerning key adult teaching practices hold true in terms of promoting adult learning outcomes, particularly with respect to promoting changes in early childhood educators’ engagement, knowledge, beliefs, or practices.

**Professional Development Content: Phonological Awareness Development and Instruction**

The early childhood community continues to promote the understanding of emergent literacy skills through professional development and research (Landry et al., 2009; Lonigan et al., 2011; Neuman & Cunningham, 2009; Cunningham et al., 2015). The selection of specific content for professional development plays an important role in the design and delivery of professional learning (Buysse et al., 2009; Knowles et al., 1984; Neuman & Cunningham, 2009). Fostering educators’ emergent literacy knowledge and skills is a complex process requiring in-depth examinations of developmental trajectories, knowledge of components and skills needed for future reading success, and understanding of evidence-based strategies to support young children’s learning (Cunningham et al., 2015). I propose phonological awareness as the content focus for this dissertation study. The professional development will focus on the developmental
components and skills of phonological awareness as well as effective instructional strategies.

**Phonological awareness.** Scarborough and Brady (2002) define phonological awareness as a “broad class of skills that involve attending to, thinking about, and intentionally manipulating the phonological [sound] aspects of spoken language” (p. 312). Phonological awareness has also been discussed as the sensitivity to sound segments within spoken language and referred to as one’s ability to recognize, discriminate, and manipulate the sound units of language (Anthony & Francis, 2005). Research has provided a sequence of phonological awareness development along a trajectory that suggests moving from recognizing and manipulating large (e.g., words) to small (e.g., phonemes; the smallest unit of sound) phonological units (see Phillips et al., 2008 for review). Young children first learn to detect and manipulate large phonological units such as words and syllables. These skills set the stage for detection and manipulation of smaller and more complex phonological units, for example onset-rime and individual phonemes in words (Anthony, Lonigan, Burgess, Driscoll, Phillips & Burgess, 2003; Anthony & Francis, 2007). Key phonological awareness skills identified by Scarborough and Bradley (2002) have been studied extensively by researchers conducting intervention studies aimed at increasing young children’s phonological awareness knowledge and skills (see Bradley & Bryant, 1983; Cisero & Royer; 1995; Bus & van Ijzendoorn, 1999; Anthony, Lonigan, Burgess, Driscoll, Bacon, et al., 2002; Anthony, Lonigan, Driscoll, & Phillips, 2003; Anthony & Francis, 2005; Catts, Adolf, & Weismer, 2006). These skills include rhyming, segmenting (e.g., onset-rime, sentence
segmentation, syllable segmentation, and phoneme segmentation), categorization (e.g.,
alliteration, syllables), synthesis/blending (e.g., sounds in words, alliteration), and
manipulation (e.g., sound deletion and substitution). Children are generally able to detect
similarities and differences in sounds before manipulating sounds and blending units
before segmenting units (Seymore & Evan, 1994).

Phonological awareness has been identified as one of the most important
precursory code-based skills leading to future reading success (Whitehurst & Lonigan,
1998; NELP, 2008). Code-based skills are those that facilitate children’s abilities to
decode (e.g., print awareness, alphabet knowledge, phonological awareness). Facilitating
growth in code-based skills promotes children’s accuracy and fluency of decoding
(Lonigan, Purpura, Wilson, Walker, & Clancy-Menchetti, 2013). Research reveals that
building phonological awareness skills in young children requires explicit instruction and
intentionally embedded experiences (Ryder, Tunmer, & Greaney, 2007). In order to
increase child developmental gains in explicitly taught skills such as phonological
awareness, interventions should include direct, systematic instruction (National Reading
Panel, 2000) in addition to embedded everyday opportunities (Justice & Pullen, 2003).
Strategies that best support the development of phonological awareness include
systematic and explicit instruction comprised of the following: instructional sequencing,
modeling, explaining the tasks, scaffolding, and providing corrective feedback (Phillips
et al., 2008, p. 6). Researchers who have identified effective practices posit that educators
should also appropriately model articulation, scaffold learning using verbal and
nonverbal cues, utilize props, and incorporate multiple choice activities (Ryder, Tunmer, & Greaney, 2007; Phillips et al., 2008).

**Need for further professional development.** Although research clearly indicates that phonological awareness can and should be taught in early childhood settings, early childhood educators may need additional professional development to support their understanding of phonological awareness and implementation of best practices on this topic (Cunningham et al., 2009). The need for further phonological awareness professional development is justified for three reasons.

First, research has revealed little phonological awareness instruction taking place in early childhood classrooms. Pelatti et al. (2013) investigated the language and literacy opportunities in early childhood classrooms and found relatively few opportunities for children to learn phonological awareness skills. On average, children experienced .32 min (range: 0 to 9.02) of phonological awareness learning opportunities. These opportunities consisted mostly of rhyming (0.20 min; range: 0 to 8.73), with considerably less time spent on more complex concepts such as syllable and phoneme counting (0.08 min; range: 0 to 6.32) and segmenting (0.03; range: 0 to 1.80). Other phonological awareness concepts (e.g., blending, elision) rarely occurred. Additionally, 70 of the 81 classrooms provided zero opportunities for phonological awareness development. In another study, Cunningham et al. (2015) reported low levels of phonological awareness practices taking place in the early childhood classrooms. Only 32% of the educators in their study engaged in any phonological awareness activities and the number of phonological awareness activities ranged from 0 to 2. Educators spent an average of less than two
minutes ($M = 1.74$, $SD = 3.20$) on phonological awareness instruction. These recent studies show the paucity of phonological awareness instruction taking place in early childhood settings.

Second, research has revealed a lack of educator phonological awareness abilities and knowledge. Researchers have emphasized the importance of educator knowledge of phonological awareness and ability to understand various phonological awareness skills and components (e.g., word, syllables, onset-rime, phoneme) in order to plan for and facilitate phonological awareness learning for young children (Cunningham et al., 2009; Cunningham et al., 2015). Snow et al. (2005) suggested that due to the complexities of reading instruction, educators should have a “working knowledge of the phonological system of English” (as cited in Cunningham et al., 2009, p. 491). Providing effective instruction is dependent on educators’ detailed knowledge of the English speech sound system. If educators are not knowledgeable about specific skills and components of phonological awareness themselves, then they may find it extremely challenging to respond to struggles young children may encounter with phonological awareness development. Prior research examining the phonological awareness knowledge of early childhood educators revealed that educators have difficulty with very basic items such as syllable, morpheme (smallest units of meaning in a word), and phoneme identification (Crim et al., 2008; Cunningham et al., 2009, 2015). Educators’ own phonological awareness ability will effect whether or not or how well they will include phonological awareness instruction in their daily interactions with children (Binks-Cantrell, Washburn, Joshi, & Hougen, 2012). Educators also need to know how phonological awareness skills
develop and appropriate teaching strategies for fostering child phonological awareness development. As suggested by Phillips and Piasta (2013), educators of young children need to be able to support phonological awareness learning across the continuum of development given that there is no empirical evidence suggesting that one level should be mastered before addressing another. Yet, early childhood educators appear to have limited content and pedagogical knowledge about phonological awareness (Cunningham et al., 2009, 2015). This might provide one explanation as to why educators of young children provide limited phonological awareness learning opportunities beyond rhyming.

Third, research has shown minimal effects of professional development on early childhood educator phonological awareness knowledge and use. Landry et al. (2006) examined the change in teaching behaviors based on language and literacy content presented in professional development. One area that tended to show less improvement was educators’ implementation of phonological awareness skills and strategies. These researchers hypothesized this may have resulted from limited knowledge gained during professional development sessions regarding the developmental trajectory and more complex components of phonological awareness. In a subsequent study, Landry et al. (2009) examined the quantity and quality of teaching behaviors based on phonological awareness, written instruction, book reading, and print and knowledge instruction presented though four professional development intervention groups. All four groups demonstrated significantly higher quality across all domains compared to the controls. However, the frequency within which phonological awareness instruction took place was less than desirable. Educator knowledge was not measured. Neuman and Cunningham
(2009) conducted a study examining educator literacy knowledge and practice outcomes based on two forms of professional development. Results of this study revealed that neither professional development treatment condition significantly outperformed the control on knowledge measures. In contrast to these studies, one very recent study (Cunningham et al., 2015) showed promising increases in educator phonological awareness knowledge and practice but cannot be interpreted causally as there was no control group.

Hence, even though phonological awareness has been identified as an important precursory skill for future reading success, current research indicates that children in early childhood settings are not being offered sufficient opportunities to engage in phonological awareness activities and that educators of young children would perhaps benefit from greater understanding of the phonological structures of language, phonological awareness development, and phonological awareness instructional strategies. Phonological awareness is thus an important focus for early childhood educator professional development (Cunningham et al., 2015) and the context in which I propose to test whether the integration of adult teaching practices derived from adult learning theories lead to better educator outcomes.

**The Current Study**

This study determined the extent to which the integration of adult teaching practices common to adult learning theories into early childhood educator professional development promoted (a) engaged participation in professional development activities, (b) increase in phonological awareness abilities, (c) increase in phonological awareness
knowledge, and (d) change in beliefs. Specifically, I integrated the following key adults teaching practices into phonological awareness professional development: (a) a disorienting dilemma/trigger event, (b) use of experience, (c) reflection, and (d) relationship building (Knowles, 1970; Mezirow, 1991; Merriam, 2001; Vella, 2008). I compared an adult-learning-theory-integrated professional development (ALT treatment) to a more traditional professional development (comparison) as well as a control (no professional development) and assessed the relative impacts on educator engagement, phonological awareness abilities, phonological awareness knowledge, and beliefs regarding phonological awareness instruction. Based on the adult learning literature, I expected that by integrating common adult teaching practices into professional development, I would see an increase in engagement, increase in abilities and knowledge, and change in beliefs as compared to more traditional professional development delivery (comparison) and that of the control.

This study makes considerable contributions to research and theory, with respect to adult learning theory and early childhood educator professional development. Currently, research pertaining to adult learning theory is limited in its methodological rigor and examination of the impact of andragogical and transformative learning teaching behaviors on adult and student learning outcomes (Pratt, 1993; Holton et al., 2009). Researchers have been examining adult learning theory through the use of descriptive processes (Taylor & Kroth, 2009); however, some have proposed the need for more causally interpretable studies of the effects of andragogy as well as the presence of andragogy in instructional design (Holton et al., 2009; Rachel, 2002; Taylor & Kroth,
Researchers such as Powell and Diamond (2013) and Cunningham et al. (2015) call for studies that more closely examine early childhood professional development and identify processes of adult learning associated with changes in educator outcomes. This study empirically tested the efficacy of ALT integrated professional development for educators of young children and thereby addresses important research questions in both the adult learning theory and early childhood educator professional development literatures.

In addition, this study benefits the local and broader community of educators. Early childhood educators within the immediate community will hopefully benefit from the opportunity to receive intensive professional development on phonological awareness. More broadly, knowing if the integration of adult teaching practices derived from learning theories into early childhood professional development improves educator outcomes will inform the development of future professional development. If the ALT integrated professional development is more effective than traditional professional development, researchers and professional development facilitators may need to more fully and explicitly incorporate adult teaching practices into future professional development offerings. If the ALT integrated professional development is not more effective, then other avenues for realizing the intended impacts of professional development will need to be explored.
Chapter 3: Methodology

This study involved an experimental pretest/posttest comparison group design with the addition of a quasi-experimental non-equivalent comparison acting as a control that received no professional development. I implemented a six-week professional development module (five, 3-hour sessions) focused on phonological awareness content. I tested whether the integration of adult learning practices derived from adult learning theories integrated into early childhood professional development would result in significantly better educator outcomes. Forty-two English-speaking ECEs who teach preschool-age children were randomly assigned to the adult learning theory (ALT) integrated professional development or professional development in a traditional form (comparison). Educators participating in professional development (ALT treatment and comparison) were compared with respect to (a) engagement, (b) gains in phonological awareness ability, (c) gains in phonological awareness knowledge, and (c) changes in beliefs pertaining to phonological awareness instruction. ALT treatment and control were compared with respect to all of the above with the exception of engagement.

Educator Sample

I conducted a power analysis in GPower (Faul, Erdfelder, Lang, & Buchner, 2007) to determine the intended number of participants. I used an ANOVA: repeated measures, within and between interaction to run the power analysis. The within measure
was time because I examined educator gains from pretest to posttest. The between
measure was condition (i.e., ALT treatment to comparison and ALT treatment to control).
The interaction between these two factors was of interest because I hypothesized that
educators in the ALT treatment condition would make greater gains over time than those
in the comparison or control conditions. The effect size used was a Cohen’s $d$ of 0.50 (a
moderate effect size) with an alpha level of .05 at .80 power. Results of the analysis
yielded a sample size of 34 (17 educators per condition) for a 2 group design using 2 time
points. A total of 64 educators were recruited to participate in this study. The first round
of recruitment included 43 educators that were randomly assigned to participate in one of
two professional development conditions (ALT treatment or comparison).

An additional quasi-experimental control group was recruited ($n = 20$) through
convenience sampling. These educators completed all study assessments (with the
exception of the engagement and professional development design surveys) including the
same pretest and posttest assessments spaced within a six week window. This sample did
not participate in any professional development intervention during these six weeks and
served as a guard against maturation and as a comparison as to what educators may
typically learn in a six week span if they would choose to explore phonological
awareness on their own. Additional threats to internal and construct validity are
addressed in Appendix A. I opted to maximize addressing threats to internal validity at
the expense of external validity, given that this is the first study to explicitly examine
adult teaching practices derived from adult learning theories integrated into early
childhood educator professional development.
In order to be eligible for the study, educators were required to (a) hold the position of lead or co-lead educator in a classroom setting, (b) teach preschool-age children, (c) use English as their primary language in which lessons are delivered, and (d) score below ceiling on a brief phonological awareness abilities pretest. Lead and co-lead teachers are typically responsible for the general planning and delivery of instructional activities in the early learning setting. Adhering to the requirement that educators teach preschool age children ensured the professional development content was relevant and aligned with evidence set forth in the emergent literacy research (Whitehurst & Lonigan, 1998; NELP, 2008). The professional development focused specifically on the phonological awareness structures of American English; therefore, educators were required to use English as the language in which lessons were delivered. In order for the professional development to be useful for the educator and for monitoring growth over time educators who score a perfect or near perfect score on the initial test of phonological awareness abilities will not qualify for the study. Recruiting educators who served similar populations (i.e., English-speaking preschool-age children) provided a common ground upon which to discuss concepts, skills, and problems that arise in early childhood classrooms as well as in the professional development setting (Garet et al., 2001). No other exclusionary criteria were applied. By not setting exclusion criteria such as educator or program characteristic (e.g., educator level of education, or public, private, and Head Start programming), results of this study are more generalizable to the early childhood educator workforce including educators with a range of education levels and program types.
Recruitment took place in partnership with Learn4Life and Action for Children, two local non-profit organizations dedicated to improving the quality of early childhood settings and educator and child outcomes. Partnering with these organizations ensured that the proper audience was being targeted. In order to enroll in the study, all interested educators received a flyer describing the study as well as a consent form. Educators who were interested in enrolling were visited by the researcher who provided details of the study and completed the consent process.

A total of 61 educators participated in professional development study activities and contributed data to the present analyses. Originally, 64 educators consented to participate, but two educators withdrew prior to the beginning of study activities, due to personal or scheduling conflicts, and one educator withdrew midway through the study due to personal changes. The educator who withdrew midway through the study did not complete posttest data and therefore was not included in the analyses. Attrition rates were not differential among the three study conditions (5%, 5 %, and 5% for ALT treatment, comparison, and control conditions respectively). All educators completed a demographic survey and a brief survey of phonological awareness abilities at the time of consent.

All consent materials, initial demographic survey, and brief phonological awareness abilities survey were collected by the researcher. The 42 educators recruited to participate in professional development were then randomly assigned to one of two conditions (a) ALT integrated (ALT treatment) or (b) traditional (comparison). Randomly assigning to groups ensured that if group differences existed it was due simply to chance. Random assignment addressed potential threats to internal validity, including maturation,
regression, and history effects (Shadish, Cook & Campbell, 2002). The 20 educators recruited through convenience sampling to serve as the control did not participate in any professional development.

All participants were lead or co-lead educators in the classroom. The majority were female (95%) and non-Hispanic/Latino (89%); 53% were Black, 42% were White, and 5% were of other or multiple races. On average, educators were 38 years of age ($SD = 10.90; \text{range} = 19 \text{ to } 61$) and had 10 years of early childhood teaching experience ($SD = 7.49; \text{range} = 0 \text{ to } 35$). Forty-two percent held early childhood teaching certification of some kind (i.e., state teaching license). Twenty-nine percent held an associate’s degree, thirty-five percent held a bachelor’s degree, thirteen percent of the educators held a master’s degree or higher. Educators taught in a range of early childhood programs, including private center-based childcare (23%) and publicly-funded center-based childcare (62%). Many taught in Head Start programs (52%) given that this comprises the majority of publicly-funded programs in the state. Most educators reported using Creative Curriculum (77%) or locally created curriculum based on state standards (19%), with 4% not using any particular curriculum. Additional descriptive information is presented in Table 1 by condition. I ran independent $t$-tests on the continuous variables and chi-square tests of independence on categorical variables to examine differences across conditions (ALT and comparison; ALT and control), and educators did not significantly differ on any reported demographic characteristics with the exception of the type of curriculum used in the classroom as examined between ALT treatment and control. The majority of the curriculum reported by the ALT treatment, comparison, and control was
commercially produced (96%, 80%, and 55%, respectively). The ALT treatment also reported using no curriculum (4%). The comparison reported using a locally created curriculum (15%) or no curriculum (5%). The control reported using a state-developed curriculum, (40%) or locally developed curriculum (5%).

In addition to collecting demographic data, educators in all three conditions completed an initial 25-item Brief Survey of Language Knowledge (Moats, 2010) of phonological awareness abilities to test for ceiling effects. Items included questions pertaining to phonological awareness skills used to decode words such as “Count the number of phonemes in the word thrill.” Cronbach’s alpha was .83 for this measure. Results indicated that overall educators had a mean score of 11.33 ($SD = 4.54$; range = 3 to 24) out of a possible score of 25. When examined by condition, the ALT treatment mean score was 10.96 ($SD = 4.54$; range = 3 to 21), comparison means score was 11.10 ($SD = 4.52$; range = 5 to 21), and the control mean was 12.00 ($SD = 5.16$; range 5 to 24). None of the educators recruited hit the ceiling threshold and all were considered eligible for the study. The independent $t$-test indicated that the scores on the phonological awareness abilities prescreening were not statistically different between the ALT treatment the comparison ($t = .109, df = 40, p = .913$) or between the ALT treatment and the control ($t = -.730, df = 40, p = .470$).

**Procedures**

Prior to the first professional development session, a Learner Needs and Resource Assessment (LNRA) was emailed to each participant in the ALT treatment condition. This assessment consisted of four open-ended questions to gather information regarding
participant background and experiences with phonological awareness. Educators in the two experimental conditions (ALT treatment and comparison) completed pretest measures of phonological awareness ability, phonological awareness knowledge, and beliefs regarding phonological awareness instruction immediately prior to the beginning of session one. Thirty minutes was added to the beginning of the first professional development session to allow time for the completion of this measure. Each measure was collected by a volunteer who checked for completion.

After the completion of the pretest, educators in the experimental conditions (ALT treatment and comparison) participated in a series of five, 3-hour sessions of phonological awareness professional development. Professional development sessions were video recorded for use in fidelity implementation and levels of educator engagement as scored by an outside observer, further described below. Due to technical difficulties only 2 of the 5 video recorded sessions were available for analysis. The professional development was scheduled for one session per week over six weeks with two weeks in between the first and second sessions due to scheduling conflicts. A 15-hour phonological awareness professional development workshop series was selected based on research indicating that professional development is most effective when it is intensive, sustained, and of at least a 14-hour duration (Yoon, Duncan, Lee, Scarloss, & Shapley, 2007). A structured workshop series was selected because in a comprehensive analysis of the effects of professional development on student outcomes, Yoon et al. (2007) reported that all of the studies that showed positive outcomes were in a workshop or summer institute format. The control condition did not participate in any
professional development during the six weeks between their pretest and posttest data collection period.

The ALT treatment and comparison professional development conditions were equated in terms of content and total professional development time. Educators attended 15 hours of professional development, spanning six weeks. Purposefully planning the duration of professional development was important as literature suggests professional development should be sustained over time (Yoon et al., 2007; Guskey & Yoon, 2009). This is important as research posits that professional development of greater duration provides more opportunities to address (a) a topic in-depth (e.g., phonological awareness), (b) educator conceptions or misconceptions (e.g., beliefs/meaning perspectives) concerning a topic, and (c) opportunities to reflect on classroom practices and strategies specific to a topic (Garet et al., 2001). Educators in both conditions received exactly the same phonological awareness-specific materials for teaching and learning. These materials included a comprehensive evidence-based phonological awareness professional development guide consisting of definitions, developmental trajectory, teaching and learning resources, sample lessons, strategies to engage preschoolers in high-quality learning activities, and resources for assessment. Researchers have reported that professional development programs focused primarily on educator behavior demonstrated smaller influences on student learning than did professional development that focused on building educator knowledge of a specific content area and how children learn that content (Kennedy, 1998). Thus, professional development offered through this study not only focused on building educator practice,
but also on knowledge and changes in beliefs of a specific emergent literacy skill, namely phonological awareness.

Following the completion of the professional development series, all educators in the experimental conditions (ALT treatment and comparison) completed a posttest packet consisting of the same battery from the pretest. These measures were collected by a volunteer blind to the conditions and checked for completion. An additional 30 minutes was added to the final professional development session in order to complete these measures. In order to minimize any testing effects that may occur, questions were reordered on each posttest assessment. The control (receiving no professional development) completed the pretest and posttest packets within a six week time period that was not concurrent with the experimental conditions. The potential bias of testing effects was minimized by having participants in all conditions complete the same pretest and posttest measures within the same time between completions of pretest and posttest; therefore any testing effects should occur equally over conditions and not bias comparisons. A timeline of activities is illustrated in Table 2.

**Professional development for educators assigned to experimental conditions.**

Yoon and colleagues’ comprehensive analysis of professional development effects indicated three components characteristic of effective professional development: (a) the implementation of evidence-based instructional practices, (b) involvement of active-learning experiences for educators, and (c) opportunities for educators to adapt practices to their unique classroom situations (Guskey & Yoon, 2007). Complementary to these findings, the phonological awareness content delivered in this study focused on evidence-
based phonological awareness skills and components identified as strong predictors of future reading success, such as alliteration, blending, phoneme identity, rhyme, segmenting, syllable, onset-rime, deletion, and word awareness (Whitehurst & Lonigan, 1998; NELP, 2008; Phillips, Clancy-Menchetti, & Lonigan, 2008). Active learning experiences included hands-on phonological awareness instructional materials for educators to engage with throughout the professional development, reflective journaling, small and large group discussions, and participation in partnered-learning tasks. Additionally, effective phonological awareness classroom practices were integrated into the professional development sessions as suggested by Guskey and Yoon (2007) including content specific to evidenced-based classroom instruction (e.g., explicit instruction; individual, small, and large group instruction) that promotes positive child outcomes (O’Connor, Jenkins, Leicester, & Slocum, 1993; Roth, Troia, Worthington, & Dow, 2002; Whitehurst, Zevenbergen, Crone, Schultz, Velting, & Fischel, 1999).

The professional development delivered in this study followed a four part structure. For educators assigned to the ALT treatment condition, each session followed a general structure of (1) addressing the disorienting dilemma, (2) acknowledging prior experiences by drawing on the LNRA completed prior to the first professional development session, evidence collected through the critical incident questionnaires (CIQ), and comments made in journal responses, (3) presenting and discussing phonological awareness content and practice, and (4) reflecting on current practice, reflecting on new information presented, and generating follow-up reflection questions for the following week. The traditional professional development (comparison) sessions
began with extended introductions and overview of content during Session 1 (to compensate for substantial time spent on the disorienting dilemma and LNRA in the ALT treatment condition). Each subsequent session followed a general structure of (1) review of the prior week and overview of new content including a journal prompt, (2) presentation of content, (3) make-and-take, and (4) revisiting the journal prompt. In this way, the general structure and overall duration of professional development was similar for educators in both conditions.

**Phonological awareness content.** For this study, I selected phonological awareness as the content focus for the professional development. Content presented during professional development sessions included knowledge of phonological awareness skills and components as well as the developmental trajectory. Moreover, the professional development addressed effective strategies and behaviors for teaching phonological awareness skills and components to preschool children as set forth in the literature (Justice & Pullen, 2003; NELP, 2008; Phillips et al., 2008). An outline of each session including major topics and references as well as the content and objectives for each phonological awareness professional development session is documented in Appendix B. The professional development conditions differed only in the integration of adult teaching practices into the treatment condition.

**Adult teaching practices.** The ALT treatment condition included four key adult teaching practices derived from adult learning theories: (a) a disorienting dilemma, (b) use of experience, (c) reflection, and (d) relationship building (Knowles, 1970; Mezirow, 1991; Merriam, 2001; Vella, 2008). These practices coincide with Vella’s
(2008) suggested elements of dialogue education premised on a structured system which includes specific learning tasks targeting (a) inductive work (relating content to educators’ current experiences), (b) input (presenting new content), (c) implementation (educators use new of content in the professional development), and (d) integration (educators move the content into planning and implementation).

*The disorienting dilemma.* Mezirow’s (2000) theory of adult learning suggests that the process of learning begins when the adult learner experiences a disorienting dilemma or what Brookfield (1987) refers to as “the trigger event.” This is an unexpected event that leads to an uncomfortable, often perplexing state, and acts as the springboard for the learning process. Participants assigned to the ALT treatment condition participated in discussions related to pretest measures. The pretest was used to create a disorienting dilemma. During the first professional development session, a discussion focused on educators’ thoughts and feelings after just having completed the pretest assessments. Examples from the assessment (e.g., “Count the number of simple speech sounds you hear in the word ‘bit’ and ‘shipping’, “Phonemic awareness refers to…”, and “Select the sequence that correctly orders phonological awareness skills from easiest to hardest for 4-year-old children”) were shared and educators were asked to reflect on how they answered each (e.g., “Did you answer the question correctly?”, “Which questions were confusing?”, and “What do you do currently to address these skills with the children in your classrooms?”). These examples aimed to promote reflection on early childhood educators’ phonological awareness ability, phonological awareness content knowledge, and phonological awareness pedagogical knowledge. Furthermore, as the professional
development progressed, each session provoked additional discomfort and feelings of disorientation as new content was presented and strategies for implementing phonological awareness practices with young children were introduced and practiced (Taylor & Snyder, 2012). Therefore, each of the five sessions began with a discussion of educators’ knowledge, practice, and discomfort with each phonological awareness topic. During this time educators in the comparison condition participated in a review of the prior weeks’ content, overview of the current session, and responded to an opening journal prompt related to the session topic.

**Educator experience.** Prior experience teaching in early childhood settings may provide a foundation for educators to connect new learning to prior experiences. In order for educators to make changes in beliefs of how children learn and how best to support learning, adult learning theorists posit that facilitators must acknowledge prior experiences learners bring to the learning setting and use these to inform the professional development (Vella, 2008). Several tasks were integrated into each ALT treatment session to access experience. These tasks centered around (1) LNRA data and (2) practice teaching episodes.

First, educators assigned to the ALT treatment condition were invited to complete a LNRA to gather information related to prior experiences with the professional development content. Although the content of the professional development was established a priori, data from the LNRA were used to design learning tasks and influence how the content was presented (e.g., designing a basic introduction to phonological awareness serving various levels of knowledge). The LNRA was emailed to
each participant in the ALT treatment two weeks prior to the first session. The LNRA (see Appendix C) provided information pertaining to educators’ current perceptions of phonological awareness knowledge (e.g., how they define phonological awareness, strategies they use that they think support phonological awareness, and resources they access to support instruction). Completed LNRAs were emailed to the researcher one week prior to the start of the professional development. Data collected was analyzed using a thematic approach. The data was read through first to identify recurring themes and patterns (Glesne, 2011). Once themes had been identified for each of the four questions, each response was reviewed a second time to identify data exemplifying themes and patterns using direct quotes in addition to counting the number of times a particular word appears. During the first professional development session, LNRA data was shared with the ALT treatment condition as comprehensive responses relating the professional development content to educators’ current experiences (e.g., presenting a compilation of phonological awareness activities they currently implement in their classrooms and highlighting those mentioned most often). The sharing of data prompted discussion about current practices and was used later in the professional development to address confusion of phonological awareness terms and concepts. In addition, data collected through the LNRA pertaining to each session topic were revisited during subsequent sessions. Incorporating the LNRA acknowledged issues, ideas, and experiences educators brought to the professional development setting.

Second, during each ALT treatment session, educators engaged in teaching episodes with each other and offered feedback, engaged in joint problem-solving, and
drew from each other’s experiences and expertise (Cunningham et al., 2015; Merriam & Bierema, 2014). Opportunities were provided to integrate new knowledge into instructional activities as educators collaborated in practicing newly acquired phonological awareness skills and strategies. Educators alternated teaching and practicing phonological awareness skills with partners, and provided feedback in the form of verbal and written notes. Educators reflected on partner experiences through a quick write (i.e., 5 to 10 min. journaling) about what they learned and how they might integrate specified new skills and strategies into their everyday teaching and learning settings.

Educators in the comparison condition did not participate in a LNRA; alternatively, they engaged in journal prompts related to each professional development topic (e.g., Session 1: Please list activities you perceive as appropriate phonological awareness activities for preschool children). Educators in the comparison condition listed examples from journal entries on large chart paper and talked in small groups about the activities shared. An opening journal activity took place during each subsequent session. Information from journal responses was not used to change or design learning activities during professional development session. As a substitute to the practice teaching episodes used in the ALT treatment, educators in the comparison condition participated in make-and-take sessions of phonological awareness activities. Make-and-take materials were provided for the ALT treatment condition to ensure equivalency; however, time was not built into the session to create these activities.

Three types of self-reflection were integrated throughout the ALT treatment professional development: (a) content reflection, (b) process reflection, and (c) premise reflection (Mezirow, 1991). According to adult learning theory, these three types of self-reflection focus educators on (beliefs pertaining to the content (e.g., phonological awareness) and how to teach it. Time was allotted for the ALT treatment condition to examine the current effectiveness of phonological awareness instruction and to reflect on beliefs, knowledge, and practices. Reflection took place through the inclusion of three learning tasks: (a) an initial LNRA, (b) multiple journal entries, and (c) ongoing CIQs.

Content reflection, or reflection on the actual experience and assumptions related to content, is promoted through the use of what questions in order to raise the educators’ awareness of meaning perspectives/beliefs and schemes (Cranton, 1994). To promote content reflection, the ALT treatment responded to journal prompts such as “What do you see as your skills in the area of phonological awareness?” or “What are the consequences of promoting phonological awareness skills in young children?” This type of self-reflection encouraged educators to consider actions taken pertaining to phonological awareness instruction and whether these are consistent with their understanding of phonological awareness. The LNRA promoted initial content reflection before the start of the professional development (e.g., “What Phonological Awareness/listening activities do you currently implement in your classrooms?”). Responses from the LNRA informed future journal prompts.

Process reflection, or reflection on how to handle the new learning experience, is promoted through the use of how questions in order to promote problem solving
strategies and inference making regarding phonological awareness development and instruction (Cranton, 1994). To encourage process reflection, educators in the ALT treatment condition responded to journal prompts such as “How do you see phonological awareness fitting into your daily practices with young children?”, “How will children in your classroom respond to phonological awareness instruction?”, or “How will you address the various phonological awareness levels of children in your classroom?” The LNRA provided opportunities for process reflection (e.g., “How do/would you assess the effectiveness of these activities?”), and responses were used to guide discussions/learning tasks and inform future journal prompts.

Premise reflection, or reflection on long-held socially-constructed assumptions, beliefs, and values, is promoted through the use of why questions in order to facilitate new interpretations of phonological awareness instruction and thereby elaborate, differentiate, and reinforce educators’ current meaning perspectives or create new meaning perspectives (Mezirow, 1990). To encourage premise reflection, educators in the ALT treatment responded to journal prompts encouraging them to think about how phonological awareness knowledge is acquired, educators’ roles in helping learners acquire phonological awareness skills, and effective use of phonological awareness teaching and learning practices (e.g., “Why are phonological awareness skills relevant to your work with preschoolers?”). Mezirow (2001) posits that premise reflection results in more profound learning due to the learner evaluating personal and social value systems and current practices.
Journal prompts encouraging all three types of reflection were assigned throughout each of the five professional development sessions in the ALT treatment condition. Prompts stemmed from content, discussions, and learning tasks taking place during ALT treatment sessions (e.g., partner teaching tasks). Phonological awareness content for journal prompts aligned with the content presented during each session. Throughout ALT treatment sessions educators shared ideas and practiced concepts with a partner, the researcher interacted with pairs of educators and served as a model to promote critical reflection by using probing questions to further develop critical reflection individually and as a group (Cranton, 1994).

Reflection was also encouraged via the use of a CIQ (Brookfield, 1998). The CIQ was completed in between each ALT treatment session via email. Five open-ended questions encouraged reflection on critical moments or actions that took place during professional development content delivery, discussions, and/or learning tasks/sessions (see Appendix D). CIQs were read and analyzed by the researcher using a thematic approach (Glesne, 2011) to identify themes, make notes, and document verbatim quotes from participants. This information was organized and used to inform opening discussions for subsequent sessions. Brookfield suggests that incorporating and following up with a CIQ has several advantages: highlighting problems with the professional development that may need to be addressed, providing the facilitator an accurate reading of what is taking place, promoting reflection, building trust, modeling critical reflection, justifying diverse teaching methods, and demonstrating responsiveness. Together, information gathered in response to the LNRA, journal prompts, and CIQ provided
opportunities for educators to self-reflect (content, process, and premise) on existing knowledge and meaning perspectives/beliefs about phonological awareness, and what they hoped to learn and change pertaining to their phonological awareness abilities, knowledge, and intended practices. In turn, this information was used to inform dialogue between the researcher and educators during the face-to-face sessions (Vella, 2008).

Educators in the comparison condition did not engage in forms of self-reflection as described above. Alternatively, they responded to journal prompts at the beginning and end of each session. Journal prompts included questions promoting more straightforward knowledge responses to elicit information (e.g., “What rhyming activities you do in your classroom?”). Journal prompts were presented at the closing of each session (e.g., “Discuss a new rhyming activity you will incorporate into your learning setting.”). These prompts served as traditional forms of reflective practice, through which educators drew on existing knowledge in order to change action by looking back on content or procedural assumptions (Mezirow, 1990).

*Relationships.* Researchers have proposed that establishing relationships is one of the essential principles and practices in an adult learning experience (Taylor 1998). I began establishing relationships with the ALT treatment condition by first implementing the LNRA. The LNRA included a brief welcome letter introducing the researcher/facilitator (Vella, 2008). Educators were invited to respond to the LNRA and introduce themselves by including background information such as how long they have been working with young children, level of comfort with phonological awareness, and information about their early learning setting. Introductory information was used in
conjunction with a synthesis of results from the LNRA to stimulate opening discussions regarding personal (e.g., How did you learn phonological awareness skills?) and professional (e.g., How do you implement phonological awareness learning in your classroom?) experiences and served as a precursor to the pretest discussion. The comparison condition participated in introductions during their first face-to-face session, sharing the same information as the ALT treatment, but the researcher/facilitator did not build these characteristics into prompts for the opening learning task.

The ALT treatment was encouraged to participate in email communication between sessions with the researcher/instructor and each other (e.g., partners from learning tasks). These communications aimed to further foster relationships by extending session discussions, addressing additional questions, discomforts, or break-through moments regarding phonological awareness instruction. Educators in the comparison condition did not participate in organized virtual conversations. However, when an educator assigned to the comparison condition contacted the researcher regarding a question pertaining to course content, the researcher responded appropriately. See Table 2 for comparison of the two professional development conditions.

**Fidelity of Professional Development Implementation**

Fidelity is defined as the extent to which specific content, learning tasks, and delivery strategies have been implemented as intended (Hulleman, Rim-Kaufman, & Ambry, 2013). Five components for measuring intervention fidelity have been identified by O’Donnell (2008). For the purposes of this study, three were included: (a) duration, or the number and length, of the intervention sessions implemented, (b) adherence, or the
extent to which components of the intervention are delivered as designed, and (c) 
differentiation, or the extent to which critical features are present to distinguish the ALT 
treatment from the comparison condition (O’Donnell, 2008). Data concerning duration 
and adherence was coded from the videotapes of professional development sessions (two 
available for analysis), and data concerning differentiation was reported by participating 
educators via questionnaire. In addition, attendance for both conditions will be tracked 
throughout the professional development.

**Duration.** Duration was computed using start and stop time for each professional 
development session. Intended duration of professional development for the ALT 
treatment and comparison conditions was 15 hrs. Two videoed sessions confirmed equal 
amounts of time across conditions. Session 4 for the comparison lasted 183 minutes and 
the ALT treatment session lasted 182 minutes. Session 5 for the comparison lasted 180 
minutes and the ALT treatment lasted 182 minutes not adding in the extra 30 minutes to 
complete posttest assessments. Attendance was tracked for all sessions and revealed that 
nineteen out of the twenty two educators in the ALT treatment had 100% attendance, two 
educators missed one session, and one educator dropped from the study after the second 
session. Twelve out of twenty educators in the comparison condition had 100% 
attendance and eight educators missed one session. Videos for sessions 1 through 3 were 
not available for analysis due to technical difficulties.

**Adherence.** Adherence was measured using a two-part checklist completed by 
one independent coder blind to condition. Part one of the check-list contained items that 
measured adherence to the intended delivery of each professional development session.
These items differed based on condition because the delivery is intentionally different, given the integration of adult teaching practices into the treatment condition. For example, an item for the ALT condition was “The facilitator presented results from the LNRA to promote discussion of differing perspectives on phonological awareness abilities, content knowledge, and pedagogical knowledge.” whereas an item for the comparison condition will be “There was a make and take task completed.” Part one also included a 5 item facilitator responsiveness scale that was scores on a 5 point Likert scale (0 = strongly disagree to 4 strongly agree) for items such as “The facilitator of the professional development addressed questions as they arose” and “The facilitator of the professional development treated participants with respect.” Part two of the checklist contained items that measured adherence to the intended content of the professional development. These items were the same across conditions due to the content being held constant. Items were coded as yes/no regarding the inclusion of professional development delivery components and content addressed (see Appendix J). The percentage of items marked as “yes” was expected to be high and fairly equivalent across conditions.

The two videotaped sessions available for analysis were coded for adherence. For part one, adherence for the ALT treatment condition was 96% (22 out of 23 items coded as observed) for session 4 and 93% (25 out of 27 items coded as observed) for session 5. Facilitator responsiveness was high and averaged 3.80 for session 4 and 4.00 for session 5 for the ALT treatment condition. Adherence to professional development delivery for the comparison condition was 95% (20 out of 21 items coded as observed) for session 4 and 100% (19 out of 19 coded as observed) for session 5. Facilitator responsiveness was
high and averaged 4.00 (strongly agree) for both sessions 4 and 5 for the comparison condition.

Part two of the checklist addressed adherence to the content delivered. The percentage of items marked as “yes” was high across conditions for content delivered. Adherence was 100% for the ALT treatment condition (14 out of 14 coded as observed) for session 4 and 88% (14 out of 16 coded as observed) for session 5. Adherence to content delivered for the comparison was 100% (14 out of 14 coded as observed) for session 4 and 94% (15 out of 16 coded as observed) for session 5. Adherence data showed that content was consistent across both conditions.

**Differentiation.** Differentiation was assessed using an adapted version of the Andragogical Practices Inventory (Wilson, 2006; Holton, Wilson, & Bates, 2009). For the purpose of this study, this measure was titled *Professional Development Design Survey* as a more general title that served both the ALT treatment and comparison conditions. The original survey included 77 Likert scale items surveying college student responses in two areas: agreement with andragogical principles and perceptions of the instructor’s andragogical behaviors and learning design. Andragogical principles included five subscales (motivation, experience, need to know, readiness to learn, and self-directedness). Learning design included six subscales (setting of learning objectives, climate setting, evaluation, prepare the learner, designing the learning experience, and learning activities). Items were rated on a four point Likert-scale ranging from 0 (*strongly disagree*) to 4 (*strongly agree*). A sample of 21 items was selected and adapted from the Wilson (2006) full assessment (see Appendix K). These items were selected based on
their alignment to andragogical principles and adult teaching practices selected for this dissertation study. Sample items include “My life and work experiences were a regular part of the learning experience” and “There were mechanisms in place to collaboratively design which learning activities would be used.” All ECEs in this study completed the professional development Design Survey at the end of each professional development session. Composite scores were calculated as the mean across items and composite scores from all five professional development sessions were averaged for a total composite score. The composite score for the ALT treatment condition was expected to be higher than the composite score for the comparison condition. Cronbach’s alpha for 21-item scale for the present study was .90.

Results from the educator self-report of the design of the professional development indicated that the ALT treatment and the comparison condition rated the professional development design as relatively high on a scale of 0 to 4. The mean score for the ALT treatment was 3.25 (SD = .29; range 2.80 to 3.80) and the mean score for the comparison condition was 3.29 (SD = .29, range 2.79 to 3.93). An independent sample t-test was conducted to determine if the mean scores on professional development design differed between the ALT treatment and the comparison conditions. The assumption of normality was tested for both conditions and distributional assumptions were met. There was not a statistically significant difference in the educator self-reported professional development design scores between the ALT treatment and comparison conditions; $t(40) = .387, p = .701$. Educators did not perceive the ALT professional development as exhibiting more components of ALT than the comparison professional development.
Measures

Demographics. Educators completed a demographic survey at the time of consent. The demographic survey provided information used to describe the sample with respect to educator background, qualifications, and the settings in which they worked. These items were largely adapted from the Early Childhood Longitudinal Study—Kindergarten (ECLS-K, 1999) Teacher Questionnaire (see Appendix E).

The demographic survey also included a measure of educators’ openness to change adapted from Vannatta and Fordham (2004) and Neuman and Cunningham (2009). This measure was included as Knowles’ (1984) framework of andragogy posits that adults choose when they are ready to learn. Openness to change thus was posited to be a potentially important covariate to include in the analyses. Seven items measuring openness to change aimed to capture educator thoughts regarding new methods of teaching young children (e.g., “I am comfortable trying new things even when I will probably make mistakes,” and “I am interested in learning more about how to support children’s language development”). Educators responded to each item by indicating how strongly they agreed with the items on a scale ranging from 0 (strongly disagree) to 5 (strongly agree). Arthur et al. (2012) found that the seven items created a reliable composite openness to change score, calculated as the mean across items; Cronbach’s alpha was .80. For this study Cronbach’s alpha was .75.

Educator engagement. Facilitators of professional development depend on engagement and work toward its presence through educators’ explicit and implicit active participation in the learning process (Conrad, 2002). Engagement in professional
development was measured in two ways. First, educators in both conditions completed a self-report of their level of engagement during the professional development at the conclusion of each professional development session (see Appendix F). To my knowledge, there are no research measures developed to specifically measure educator engagement in the professional development. I reviewed instruments used to measure student engagement (Appleton, Christenson, Kim, & Reschly, 2006; Carini, Kuh, & Klein, 2006; Kuh, 2001; Martin, 2009) and educator workplace engagement (Parker & Martin, 2009; Parker, Martin, Colmar, & Liem, 2012). I selected instruments used by the National Survey of Student Engagement (NSSE; 87 items; Kuh, 2001) and Carini, Kuh, and Klein (62 items; 2006) and carefully reviewed all items with respect to the extent to which items aligned with specific andragogical principles and adult learning theory design elements related to engagement. I selected 16 items (12 from NSSE; 4 from Carini et al., 2006) that mapped onto these principles/elements, adapted these items to fit the adult learning/ professional development context, and created three additional questions for a total of 19 engagement questions. For example, “Mark the extent to which you frequently asked questions in class or contributed to class discussions during the current school year” (Carini et al., 2006) was adapted to “I frequently asked questions during the professional development or contributed to professional development discussions” and “Learned something that changed the way you understand an issue or concept” (NSSE) was adapted to “I learned something that has changed the way I understand phonological awareness content, development, and/or instructional strategies.” Three items were added to represent aspects of engagement drawn from adult learning theory that were not
present in the Carini et al. (2006) measure (e.g., “I shared my own experiences during the professional development session.” “My mind wandered frequently during the professional development session” and “I am motivated to seek out additional skills and strategies to support my work with young children and their families”). Educators responded by indicating how strongly they agreed with each item on a five-point Likert-scale ranging from 0 (strongly disagree) to 4 (strongly agree). Composite scores for engagement were calculated as the mean across items, with some items reverse coded, such that high scores indicate a high level of educator engagement for a given professional development session. The five session scores were then averaged to arrive at a total composite score of engagement across all professional development sessions.

Cronbach’s alpha for the Engagement in professional development was .60. Because this survey had not been previously used with early childhood educators, prior to use in the larger study, I recruited 20 early childhood educators to examine the measure and provide feedback on clarity, understanding, and the perceived relevancy of the items; data from this pilot work were used solely to refine the engagement measures and are not be included in the results of this dissertation study. Only one educator completed the form in reverse order. There were no suggestions on the rewording of questions.

Second, an independent observer completed an Observer Measure of Engagement Survey on two of the five professional development sessions for both the ALT treatment and the comparison conditions. This observer had a background in education/teacher development but was blind to the conditions and purpose of the study. The observer watched the two available video recorded sessions and completed an adapted version of
the educator self-report of engagement intended to collect his/her perception of the overall engagement of the ECEs as they participated in professional development (see Appendix G). The observer responded to each item by indicating how strongly she agreed with the item on a five-point Likert-scale ranging from 0 (strongly disagree) to 4 (strongly agree). Composite scores for observed engagement were calculated as the mean across items, with some items reverse scored, such that high scores indicate a high level of educator engagement for a given professional development session. The session scores were averaged to arrive at a total composite score of engagement across professional development sessions for each condition.

**Educator phonological awareness ability.** Educators’ phonological awareness abilities (i.e., knowledge of English phonology) were measured through a pretest and posttest measure taken from the Teacher Knowledge and Beliefs Survey (TKABS; Cunningham, Wheeler, Platas, Boyle, & Schmidt-Raher, 2012; Cunningham et al., 2015). Educators completed 23 items pertaining to their own phonological awareness abilities. Items included correctly identifying the number of syllables in words, the number of phonemes in a word, and identifying target sounds (e.g., “How many simple speech sounds do you hear in the word *bit*?”). Each correct response received one point for a total possible score of 23 points. Cunningham et al. (2015) reported a Cronbach’s alpha of .80 for this subscale. The TKABS educator phonological awareness abilities subscale has two available forms (see Appendix H). One half of each condition received form A at pretest and form B at posttest. The other half received form B at pretest and form A at posttest. Counterbalancing the forms accounted for testing effects. Results from this
study indicated a Cronbach’s alpha of .70 for the phonological awareness abilities measure.

**Educator knowledge regarding phonological awareness.** A general measure of educator knowledge of phonological awareness was completed by educators in all three conditions at pretest and posttest. General knowledge of phonological awareness was assessed by combining two subscales from the Teacher Knowledge and Beliefs Survey (TKABS content knowledge subscale and pedagogical knowledge subscale; Cunningham et al., 2012; Cunningham et al., 2015) into one measure of educators’ general knowledge of phonological awareness instruction. The original 17 item TKABS scale included 6 items related to educator beliefs. For this study, I extracted the 11 knowledge items and included the remaining six belief items in the educator belief measure discussed below. The TKABS includes two available forms (see Appendix H). One half of each condition received form A at pretest and form B at posttest. The other half received form B at pretest and form A at posttest. Counterbalancing the forms accounted for testing effects.

The adapted general knowledge subscale included 11 multiple choice items that required educators to correctly identify definitions and examples of various phonological awareness terms (e.g., “A phoneme refers to…” and “Phonemic awareness is…”) as well as phonological awareness pedagogy (e.g., “When teaching phonological awareness to 4-yr-old children, in which order would you introduce the following concepts? separating words, blending words, deleting words”). Correct responses on the knowledge items were awarded one point. Cronbach’s alpha for the full 16-item scale was .72 (Cunningham et al., 2015). Cronbach’s alpha for the adapted 11-item scale for the present study was .60.
In addition, a proximal measure of educators’ phonological awareness content and pedagogical knowledge was developed to align directly with the content presented during the five professional development sessions. This measure consisted of 18 multiple choice questions that directly mapped onto the objectives set forth in the design and implementation of the professional development and is listed in Appendix B. Educators in the comparison, ALT, and control treatment condition completed this scale only at posttest. Cronbach’s alpha for 18-item scale for was .75.

**Educator beliefs.** Educators’ beliefs consist of the attitudes, and assumptions they have acquired through their experiences teaching young children (Mezirow, 1991). Beliefs were assessed at pretest and posttest and measured in two ways. First, I created a 16 item measure of educators’ beliefs concerning phonological awareness instruction based on two existing measures (Hindman & Wasik, 2008; Cunningham et al., 2015) and additional items drawn from Phillips, Clancy-Menchetti, and Lonigan, 2008). Six educator belief items were selected from the Preschool Teacher Literacy Belief scale (Hindman & Wasik, 2008) as those that were specific to teachers’ beliefs concerning phonological awareness instruction (e.g., “As an educator I believe preschool children learn ending sounds by circling pictures of things that rhyme on worksheets.”). Another six items were extracted from the original 11-item knowledge/belief subscale of the TKABS (Cunningham et al., 2015) and specifically assess educators’ beliefs regarding their role in the development of children’s phonological awareness skills (e.g., Teachers should regularly assess children’s literacy and language development) with some items (like the example) reverse scored. Four additional items were developed to assess beliefs
concerning the development of phonological awareness skills (e.g., “As an educator I believe children should learn phonological awareness skills from explicit explanation, modeling, and support.”) based on the developmental trajectory of phonological awareness skills presented in Phillips et al. (2008). For all 16 items, educators indicated how much they agreed or disagreed on a 5 point Likert scale, ranging from 0 (*strongly disagree*) to 4 (*strongly agree*). A composite score was calculated as the mean across items to arrive at a total belief score. Cronbach’s alpha for the 16 items in the present study was .60.

Second, educator self-efficacy was measured using the instructional efficacy items adapted from the original Bandura Self-Efficacy scale (Bandura, 1997). Perceived self-efficacy is concerned with educators’ beliefs in their capabilities to produce given attainments (Bandura, 1997). The original scale was adapted by Justice et al. (2008) to select items most relevant to early childhood educators. Recent psychometric work has further reduced the scale to the seven items that will be used in this study (Arthur et al., 2012). Educators rated their ability to teach effectively using a 5 point Likert-scale (0 = no feelings of efficacy to 4 = very strong feelings of efficacy). Example items include “How much can you do to keep children on task on difficult learning activities?”, and “How much can you do to motivate children who show low interest in learning activities?” (see Appendix I). Items were scored by averaging across the seven instructional efficacy responses. Cronbach’s alpha for the 7 items was .71 (Arthur et al., 2012). Cronbach’s alpha for the 7 items in the present study was .82.
**Data Analysis.** The four aims of this study were to determine the extent to which the integration of adult teaching practices derived from adult learning theories into early childhood professional development (a) engaged participation in professional development activities, (b) gains in phonological awareness abilities, (c) gains in phonological awareness knowledge, and (c) changes in beliefs. I hypothesized that integrating adult teaching practices derived from adult learning theories into early childhood educator phonological awareness professional development would contribute to higher levels of educator engagement, greater increases in phonological awareness abilities, knowledge, and greater changes in beliefs over the comparison condition and the control. For all analyses, I used one-tailed significance tests due to the directional hypotheses that the ALT treatment condition would outperform the comparison condition and the control. To account for family-wise Type 1 error rates (Lomax & Hahs-Vaughn, 2012), I evaluated all analyses using \( p = .01 \) in a one-tailed test. I also report and discuss effect sizes as researchers are concerned with the reliance of \( p \)-values only (Wasserstein, 2016) in addition to empirical benchmarks for interpreting effect sizes (Hill, Bloom, Black, & Lipsey, 2008).

The impact on educator engagement was analyzed using one way ANOVA comparing the composite engagement scores (dependent variable) of educators assigned to the ALT treatment to that for the comparison. The impact on educator proximal knowledge was analyzed using a one way ANOVA due to the fact that this assessment was only administered at posttest. The impact on educator phonological awareness abilities, phonological awareness general knowledge, and beliefs was analyzed using a 3
X (2 X S) mixed analyses of variance (ANOVA) to examine the pretest to posttest change between educators participating in the three conditions (Maxwell & Delaney, 2004). The design is a within-subject (Time: pretest or posttest) and between subject (conditions: ALT treatment, comparison, or control) analysis of variance. The dependent variables were scores on each subscale at posttest. Significant condition x time interactions signify differential change across conditions. For significant interactions, post hoc follow-up tests were conducted to examine pairwise comparisons among the ALT treatment and comparison and the ALT treatment and the control conditions. Given that this dissertation study was the first to specifically examine adult learning theory in regard to early childhood educator professional development, I also computed effect sizes to consider practical significance. In order to compute effect sizes, I used Cohen’s $d$. This was computed as the mean posttest score for ALT treatment educators minus the mean posttest score for either comparison or the control teachers divided by the pooled standard deviation. Effect sizes were interpreted in the traditional manner, as .3 is small, .5 is medium, and .8 is large (Cohen, 1988), and also interpreted as to whether they were practically important. This is important given that this is the first study to empirically test the integration of adult teaching practices into professional development for early childhood educators. In addition, practical significance is of interest to policy makers and program officials (Hill et al., 2008).
Chapter 4: Results

Descriptive statistics for all outcomes are presented in Table 5. Prior to examining the main research questions, I conducted preliminary analyses examining educators’ scores on the Openness to Change assessment as well as all pretest variables. Educators in all three conditions completed the Openness to Change assessment at the onset of the study. The ALT treatment, comparison, and control all scored high on a scale from 0 to 5 in regard to educator comfort and excitement when trying new methods of instruction ($M = 4.18, SD = .78$; $M = 4.29, SD = .30$; and $M = 4.16 SD = .61$, respectively). The independent $t$-test indicated that the scores on Openness to Change were not statistically different between the ALT treatment and comparison $t(40) = 0.593, p = .278$ or between the ALT treatment and the control $t(40) = 0.051, p = .480$. Due to the near equal means for each of the conditions, I would not expect scores on Openness to Change to influence variation in outcomes and therefore I did not test this as a covariate for educator outcomes.

Preliminary analyses examining pretest scores were conducted via independent $t$-tests. This allowed me to test whether the pretest means on educator phonological awareness abilities, phonological awareness knowledge, language and literacy beliefs, and educator self-efficacy were significantly different from each other between the ALT treatment and comparison and ALT treatment and control. The assumptions of
homogeneity of variance and normality were tested and met for the distributional shapes of all four pretest variables. There was no statistically significant difference for phonological awareness abilities between the ALT treatment and comparison conditions $t(39) = -0.495, p = .312$ or the ALT treatment and control condition $t(39) = 1.388, p = .087$. There was no statistically significant difference for phonological awareness general knowledge between the ALT treatment and the comparison condition $t(39) = .344, p = .387$ or between the ALT treatment and control $t(39) = -0.243, p = .404$. There was no statistically significant difference for language and literacy beliefs between the ALT treatment and comparison $t(39) = .127, p = .450$. However, there was a statistically significant difference between ALT treatment and control $t(39) = 3.136, p = .002$ favoring the control condition at pretest. This nonequivalency is the risk of convenience sampling as educators were not randomly assigned to the control as they were for the ALT treatment and comparison conditions. Finally, there was no statistically significant difference between the ALT treatment and comparison for educator self-efficacy $t(39) = .874, p = .482$ or between ALT treatment and control $t(37) = .358, p = .362$. Thus, with one exception, in which the educators in the control condition had initially lower scores on the language and literacy beliefs measure as compared to educators in the PD condition, educators assigned to ALT treatment condition were comparable at pretest to those in the comparison and control conditions.

**Research Question 1: To What Extent Does the Integration of Adult Teaching Practices into Early Childhood Educator Professional Development Increase Engagement?**
Educator engagement was measured in two ways. First, the impact on educator engagement was examined using composite scores averaged across the five educator self-reports of engagement (1 per session). Levels of engagement were relatively high for the ALT treatment ($M = 3.20$, $SD = 0.33$) and the comparison ($M = 3.23$, $SD = 0.31$) on a scale of 0 to 4 with higher scores indicating a higher level of engagement. Prior to conducting analyses, I examined scores to ensure that this outcome met statistical assumptions concerning normality, homogeneity of variance, and independence. The assumption of normality was tested and met. Review of the S-W test for normality ($SW = .966$, $df = 32$, $p = .236$), skewness (-.029) and kurtosis (-.295) statistics suggested that normality was a reasonable assumption. The boxplot suggested a relatively normal distribution (with no outliers). The Q-Q plot and the histogram also suggested normality was reasonable. According to the Levene’s test, the homogeneity of variance assumption was satisfied [$F(1, 40) = .054$, $p = .817$]. Additionally, a scatterplot of scores against the level of independent variable was reviewed. A random display of points around zero provided further evidence that the assumption of independence was met.

The prediction that the ALT treatment would have higher engagement scores over the comparison was tested using one-way ANOVA comparing the composite engagement scores (dependent variable) of educators assigned to the ALT treatment to that for the comparison. The one-way ANOVA (see Table 6) revealed no significant differences between the two conditions on educator overall engagement [$F(1, 40) = .066$, $p = .798$]. The ALT treatment and comparison conditions rated themselves almost equal for engagement in the professional development sessions (Cohen’s $d = 0.09$).
Second, engagement was assessed by an independent observer through the completion of an Observer Measure of Engagement Survey at the end of two professional development sessions. Levels of engagement were relatively high for the ALT treatment condition \((M = 3.78, SD = 0.55)\) and the comparison \((M = 3.29, SD = 0.75)\) on a scale of 0 to 4 with higher scores indicating a higher level of engagement. Engagement appeared to be high for both conditions when scored by an outside observer blind to conditions. A one-way ANOVA was conducted to determine if the observed scores on engagement differed between the ALT treatment and the comparison condition. There was a statistically significant difference in the Observer Measure of Engagement scores between conditions \([F(1, 68) = 9.577, p = .003]\). The ALT treatment condition appeared to have a higher level of engagement based on standard effect size guidelines relative to the comparison (Cohen’s \(d = 0.73\)).

**Research Question 2: To What Extent Does the Integration of Adult Teaching Practices into Early Childhood Educator Professional Development Increase Educators’ Phonological Awareness Ability?**

Educators completed a pretest and posttest measure of phonological awareness abilities. Educators in the ALT treatment condition increased their mean score by 4.30, the comparison increased by 2.35, and control decreased by 0.40 (see Table 5). Prior to conducting analyses, I examined scores to ensure that this outcome met statistical assumptions concerning normality, homogeneity of variance, and independence. The assumption of normality was tested via examination of the S-W test for normality for all conditions. Examining normality for the ALT treatment, comparison, and control \((SW = \)
.960, df = 21, p = .327; SW = .922, df = 20, p = .107; SW = .916, df = 20, p = .081, respectively), skewness (-.491, -.144, .217, respectively) and kurtosis (-.408, -1.304, -1.448, respectively) suggested that normality at posttest was a reasonable assumption. The boxplots and histograms suggested a relatively normal distributional shape (with no outliers). The boxplot and Q-Q plots for the posttest suggested normality. Homogeneity of variance was tested to determine if as educator scores changed from pretest to posttest, the variance on outcome variables did not change. The assumption of homogeneity of variance for time was met \([F(2, 59) = 2.345, p = .105]\). Additionally, a scatterplot of the scores against the levels of between-subject factors (condition) was reviewed. A relatively random display of points around zero provided further evidence that the assumption of independence was met.

Results from the 3 X (2 X S) mixed ANOVA for educator phonological awareness abilities are presented in Table 7. Results revealed a main effect of time on the overall average increase from pretest to posttest but no main effect of condition. There was a statistically significant interaction of time x condition. I conducted a posthoc analysis to examine whether the change in phonological awareness abilities from pretest to posttest was different (a) between ALT treatment and comparison and (b) between ALT treatment and control. The change between the ALT treatment and comparison was a difference of 1.83 and was not statistically significant \((p = .052; \text{Cohen’s } d = 0.30)\). The difference in change between the ALT treatment and the control was 3.24. This difference was statistically significant and of a large magnitude based on standard effect size guidelines \((p < .001; \text{Cohen’s } d = 0.77)\). Educators in the ALT treatment condition
showed greater change in their phonological awareness abilities as compared to those in the control (see Figure 1).

**Research Question 3: To What Extent Does the Integration of Adult Teaching Practices into Early Childhood Educator Professional Development Increase Educators’ Phonological Awareness Knowledge?**

Educator knowledge was measured in two ways. First, the impact on educator knowledge was examined using a general measure of phonological awareness knowledge including skills, strategies, and pedagogy. Mean scores on the general phonological awareness knowledge measure increased 3.95 points for the ALT treatment, 1.95 for the comparison, and 1.20 for the control (see Table 7). Prior to conducting analyses, I examined scores to ensure that this outcome met statistical assumptions concerning normality, homogeneity of variance, and independence. The assumption of normality was tested via examination of the S-W test for normality for all conditions. Examining normality for posttest for the ALT treatment, comparison, and control ($SW = .946, df = 21, p = .280; SW = .957, df = 20, p = .493; SW = .964, df = 20, p = .081$, respectively), skewness ($-0.649, 0.024, 0.749$, respectively) and kurtosis ($0.061, -0.792, -1.528$, respectively) suggested normality. According to the Levene’s test, the homogeneity of variance assumption was satisfied [$F(2, 58) = .963, p = .388$] for posttest. The boxplots and histograms suggest a relatively normal distributional shape (with no outliers). The boxplot and Q-Q plots for the posttest suggested normality. The assumption of homogeneity of variance time was met [$F(2, 59) = 2.458, p = .0945$] for pretest. Additionally, a scatterplot of the scores against the levels of between-subjects factors
(condition) was reviewed. A relatively random display of points around zero provided further evidence that the assumption of independence was met.

Results from the 3 X (2 X S) mixed ANOVA (Table 7) revealed a main effect of time indicating that, averaged across conditions, there was a difference from pretest to posttest. There was also a main effect of condition indicating significant differences between conditions when averaging over pretest and posttest. As predicted, there was a statistically significant interaction of time x condition. I conducted a posthoc analysis to examine whether the change in phonological awareness general knowledge from pretest to posttest was different (a) between ALT treatment and comparison and (b) between ALT treatment and control. The difference in phonological awareness knowledge change from pretest to posttest was 2.15 indicating a greater change for the ALT treatment relative to the comparison, and this was statistically significant ($p < .001$). The difference in phonological awareness knowledge change from pretest to posttest between the ALT treatment and the control was 3.24 and was statistically significant ($p < .001$). Effect sizes were large based on standard guidelines for the significant effects between ALT treatment and comparison (Cohen’s $d = 1.08$) and ALT treatment and control (Cohen’s $d = 1.54$).

Second, educator proximal knowledge was examined and the assumption of normality was tested. Review of the S-W test for normality for the ALT treatment, the comparison, and control ($SW = .879, df = 21, p = .014$; $SW = .944, df = 20, p = .287$; $SW = .964, df = 20, p = .625$, respectively), skewness ($-.642, -512, -.084$, respectively) and kurtosis ($-.596, -.256, -.794$, respectively) statistics suggested that normality was not a
reasonable assumption. Although the S-W test indicated that the ALT treatment condition was not normal, a closer look at the boxplot suggested a relatively normal distribution (with no outliers). The Q-Q plot and the histogram suggested normality was reasonable. According to the Levene’s test, the homogeneity of variance assumption was satisfied \([F(2, 58) = .963, p = .388]\). Additionally, a scatterplot of scores against the level of independent variables was reviewed. A random display of points around zero provided further evidence that the assumption of independence was met and thus the assumption of normality was reasonably satisfied.

Educator proximal knowledge was assessed at posttest only, and therefore I analyzed this outcome via a one-way ANOVA. The results of the one-way ANOVA (see Table 6) suggested that scores on educators’ proximal knowledge were statistically different across conditions \([F(2, 58) = 26.642, p < .001]\). Follow up tests revealed that means were not significantly different at posttest for the ALT treatment and comparison \((p = 1.00)\). Means were statistically significant between the ALT treatment and control \((p < .001)\). The effect size between ALT treatment and control was large based on standard guidelines (Cohen’s \(d = 1.89\)) and small for the nonsignificant difference between ALT treatment and comparison (Cohen’s \(d = 0.11\)).

**Research Question 4: To What Extent Does the Integration of Adult Teaching Practices into Early Childhood Educator Professional Development Change Educators’ Beliefs?**

Educators’ beliefs were measured in two ways. First, I examined the impact on educator language and literacy beliefs comparing composite scores from a pretest and
posttest survey. Mean scores increased 0.37 for the ALT treatment, 0.42 for the comparison, and 0.26 for the control. Prior to conducting analyses, I examined scores to ensure that this outcome met statistical assumptions concerning normality, homogeneity of variance, and independence. The assumption of normality was tested via examination of the S-W test for the all conditions. Examining normality for posttest for the ALT treatment, comparison, and control (SW = .973, df = 21, p = .235; SW = .956, df = 20, p = .396; SW = .945, df = 20, p = .150, respectively), skewness (-.076, .372, -.323, respectively) and kurtosis (-.236, -.579, -.913, respectively) suggested normality for each condition on posttest was a reasonable assumption. The boxplots and Q-Q plots as well as the scatterplots suggested normality for all three conditions. According to the Levene’s test, the homogeneity of variance assumption was not satisfied \([F(2, 8) = 3.560, p = .035]\); however, the effect of violations of the homogeneity assumption is minimal with equal or nearly equal sample sizes (Lomax & Hauhs-Van, 2012). Given that the data did not violate any of the other assumptions of ANOVA and each condition had nearly equal sample sizes \((n = 21, 20, 20)\), I retained the 3 X (2 X S) mixed ANOVA as my final analysis.

Results from the 3 X (2 X S) mixed ANOVA (Table 7) revealed a main effect of time indicating that averaged across conditions, there was a difference from pretest to posttest. There was also a main effect of condition indicating significant differences between conditions when averaging over pretest and posttest. There was no statistically significant interaction for time and condition for educator language and literacy beliefs (see Figure 3). The effect sizes for the nonsignificant difference between ALT treatment
and comparison were small based on standard guidelines (Cohen’s $d = 0.12$), whereas the ALT treatment and control was large (Cohen’s $d = 1.11$).

A second belief outcome was the measure of educator self-efficacy. I examined the self-efficacy data and found three cases of missing data in the control condition. Two educators skipped this section on the pretest and one educator skipped this section on the posttest. I conducted Little’s MCAR test and results provided support that the data were missing completely at random ($\chi^2 = 94.91, df = 67, p = .014$); thus, listwise deletion of these cases was acceptable (Tabachnick & Fidell, 2013). Mean scores for self-efficacy increased 0.32 for the ALT treatment, 0.32 for the comparison, and 0.23 for the control. According to the Levene’s test, the homogeneity of variance assumption was satisfied [$F(2, 55) = .972, p = .385$]. The assumption of normality was tested via examination of the S-W test for the all conditions. Review of the of the S-W test for normality for each condition: ALT treatment, comparison, and control ($SW = .985, df = 21, p = .980; SW = .930, df = 20, p = .154; SW = .974, df = 17, p = .882$, respectively), skewness (.132, .910, .279, respectively) and kurtosis (.089, .384, .660, respectively) suggested that normality for each condition on pretest was a reasonable assumption. Examining normality for posttest for the ALT treatment, comparison, and control ($SW = .961, df = 21, p = .531; SW = .893, df = 20, p = .030; SW = .987, df = 17, p = .996$, respectively), skewness (.419, .396, .005, respectively) and kurtosis (-.194, -1.339, -1.557, respectively) suggested normality. The boxplots and histograms suggest a relatively normal distributional shape. The boxplot and Q-Q plots suggested normality. Additionally, a scatterplot of the scores against the levels of between-subjects factors (condition) was reviewed. A relatively
random display of points around zero provided further evidence that the assumption of independence was met.

Results from the 3 X (2 X S) mixed ANOVA (Table 7) revealed a main effect of time indicating that averaged across conditions, there was a difference from pretest to posttest. There was also a main effect of condition indicating significant differences between conditions when averaging over pretest and posttest. Additionally, there was no statistically significant interaction of time x condition for educator self-efficacy (see Figure 4). The effect sizes for the nonsignificant difference between ALT treatment and comparison as well as the ALT treatment and control were small based on standard guidelines (Cohen’s $d = 0.18$, $d = 0.32$, respectively).

**Summary of Results**

To summarize, the current study yielded four major results. First, educators in the ALT treatment condition had higher observed engagement compared to the comparison condition with a large effect size. In contrast, conditions did not differ on educators’ self-reports of engagement with a small effect size. Second, educators in the ALT treatment condition showed greater change in phonological awareness abilities compared to control with a large effect size, but not compared to the comparison condition. However, the difference between the ALT treatment and the comparison approached significance and the magnitude of the effect size suggests practical significance (Hill et al, 2008; Wasserstein, 2016). Third, educators in the ALT treatment condition showed greater gains on general knowledge of phonological awareness compared to both the comparison and control conditions with very large effect sizes. However, differences in posttest
scores for proximal knowledge were only significant between the ALT treatment and control with a large effect size. Finally, educators in the ALT treatment did not differ from either the comparison or control on language and literacy beliefs or self-efficacy.
Chapter 5: Discussion

The purpose of this study was to examine whether integrating adult teaching practices derived from adult learning theory into early childhood educator professional development would result in better gains in educator engagement in professional development, phonological awareness abilities, phonological awareness knowledge, and change in language and literacy beliefs. In doing so, this study addressed a number of gaps in the literature. Early childhood educators typically gain knowledge of specific content and instructional strategies for educating young children via face-to-face professional development. Although professional development format (face-to-face, online workshop sessions, and coaching) has been a continued topic of research, results vary pertaining to educator outcomes (Landry et al., 2006; Landry et al., 2009, Neuman & Cunningham 2009; Neuman & Wright, 2010). Studies of the effects of professional development on educator outcomes reveal that educators themselves have varied skills and knowledge related to emergent literacy, such as phonological awareness, needed in order to facilitate effective classroom instruction (Cunningham et al., 2009; Cunningham et al., 2015). Further, current research related to theories of adult learning tend to not focus specifically on educator professional development; rather this has been a topic of study in higher education and medical settings (Bedi, 2004; Bolton, 2006; Gilstrap & Dupree, 2008; Misch, 2002; Norrie & Dalby, 2007). Importantly, studies of adult
learning have utilized qualitative methodology and therefore, have not experimentally tested whether the integration of adult teaching practices specific to supporting adult learning are related to outcomes. In this study, I posited that researchers should look beyond basic professional development format and examine andragogical principles and adult teaching practices derived from adult learning theory posited to promote gains in educator outcomes (Knowles, 1970; Mezirow, 1991; Meriam, 2001; Vella, 2008). Study results revealed important findings about the educator engagement, phonological awareness abilities, knowledge, and language and literacy beliefs. Moreover, findings concerning the impact of integrating adult teaching practices in professional development design are particularly important, given that, to the best of my knowledge, no early childhood professional development study has systematically investigated how the inclusion of these practices may be related to educator outcomes. Below, I first discuss and interpret each of the study’s findings as related to discrete outcomes and the research questions. I then turn to my overall interpretation of the pattern of results concerning the efficacy of the ALT treatment professional development.

**Educator Engagement**

The first aim of this study was to investigate whether integrating adult teaching practices into early childhood professional development would result in increased educator levels of engagement. Two key findings regarding engagement in professional development warrant further discussion. First, educators were highly engaged in professional development, regardless of condition. Second, educators appeared to be
slightly more highly engaged in the ALT professional development but only when measured via observer and not via educator self-reports.

Educators’ self-reports of engagement were virtually equal between the ALT treatment and the comparison conditions, with high scores indicating a higher level of engagement. Study findings therefore show that regardless of professional development condition, educators reported themselves as highly engaged throughout the professional development series. It is important to note that educators were not aware of the differences between the two professional development conditions. The instructor, phonological awareness content, and materials remained the same across conditions. The only difference was the inclusion of specific adult teaching practices into the ALT treatment condition. Teaching practices derived from adult learning theories are posited to promote a learner-centered approach and were integrated in such a way that learners were likely unaware of the differences in the delivery of the professional development and thus groups did not see themselves as more engaged than the other. This may have resulted in the nearly equal self-reported levels of engagement across the professional development conditions.

Importantly, when professional development sessions were observed by an objective outside observer (blind to the aims of the study) results revealed that engagement in the professional development was different based on condition. Results indicated that observed scores of engagement were higher on several survey items for the ALT treatment condition. For example, educators in the ALT condition asked more questions, discussed ideas, and made judgments pertaining to current planning and
classroom practices. In addition, educators in the ALT treatment condition scored higher on items pertaining to self-examination. These included educators’ self-examination of strengths and weaknesses of current phonological awareness instruction and included the willingness to openly discuss changes in the way they understood phonological awareness skills and concepts. Perhaps this observed higher level of engagement was due to the integration of adult teaching practices such as process and premise reflection as well as specific topics targeted during the paired dialogue activities. Adult learning theorists suggest that engaging in reflection and dialogue throughout learning experiences promotes a shared language that leads to the expansion of alternative perspectives (Mezirow, 1991; Vella, 2008). Results of the observed levels of engagement are important and reveal that it is possible that the integration of specific adult teaching practices may promote higher levels of engagement during educators’ professional development experiences. Continued research is needed in order to explain adult teaching practices that may encourage higher levels of professional development engagement.

Furthermore, the mixed results revealed through self-reported and observer-reported engagement suggest that a closer examination of measures of engagement tools may be warranted. To the best of my knowledge, there is limited research and no measures specific to early childhood professional development engagement beyond satisfaction surveys or interviews (Cunningham et al., 2015; Geijssel, Sleegers, Stoel, & Krüger, 2009; Martinussen, Ferrari, Aitken, & Willows, 2014). The survey for this study was created by adapting measures of student engagement (Appleton et al., 2006; Carini et al., 2006; Kuh, 2001; Martin, 2009) and educator workplace engagement (Parker &
Martin, 2009; Parker et al., 2012). Items were created to align with andragogical principles. Perhaps questions of were not specific enough to capture differences across professional development such that engagement may be perceived differently. A closer look at each item and the relation with andragogical principles as well as educator engagement may yield a more effective measure to capture differences in educators’ self-reports of engagement. Collectively these results indicate a need for future research measuring the presence of adult teaching practices as these practices may indeed lead to greater engagement in PD.

**Educator Phonological Awareness Abilities**

The second aim of this study was to investigate whether integrating specific adult teaching practices into early childhood professional development would result in increased educator phonological awareness abilities. Study results revealed two key findings regarding educators’ phonological awareness abilities. First, educators in all three conditions had limited phonological awareness abilities at the onset of the study. Second differences between the ALT treatment condition and the comparison condition were practically significant (and approached statistical significance), and there were significant differences between ALT treatment condition and the control condition. In regard to my first finding of limited phonological awareness abilities, I found that, on average, educators scored an overall 54% correct at pretest. These findings are consistent with prior research documenting educators’ relatively low levels of basic phonological awareness skills (Crim et al., 2008; Cunningham et al., 2009; Cunningham et al., 2015) prior to participating in targeted phonological awareness professional development.
Results of the current analysis of increases in phonological awareness abilities provide further evidence that educators can increase their abilities through explicit instruction of targeted concepts and skills compared to educators who do not receive professional development (Cunningham et al., 2009). Importantly, the integration of adult teaching practices into professional development to promote change in educator phonological awareness abilities may have practical significance when the effect size is interpreted based on the use of empirical benchmarks (Hill et al., 2008). According to Hill and colleagues, it is important to interpret the effect size estimate in respect to normative expectations for change, policy-relevant performance gaps, and observed effect sizes for similar studies. In fact, scholars are increasingly concerned with overreliance on p-values, as this poses problems with misinterpretation and issues with replication, (Wasserman, 2016). Hill and colleagues (2008) argue that an effect size greater than .25 can be meaningful depending on the intervention, the outcomes being measured, and the subgroups being studied. It is important to consider effect sizes as an indicator of practical significance (Hill et al., 2008; Wasserstein, 2016). According to this criterion, the difference between the ALT treatment and the comparison condition, with an effect size of .30, may be considered practically significant, especially given that $p = .052$. When considering findings from previous research it is important to note that, with respect to phonological awareness abilities and knowledge, researchers reported small effect sizes ranging from .03 to .20 (see Neuman & Cunningham, 2009). The Neuman and Cunningham (2009) study did not yield a significant p-value for educators’ abilities and knowledge, and their effect size was small (.20) with a larger sample. Therefore an
effect size of .30 such as that found in this study, coupled with an approaching significant 
*p*-value (.052) these results could be interpreted as an educationally meaningful 
difference as it is above the range found in prior which included a larger sample.

An additional point regarding increases in phonological awareness abilities 
pertaining to this study will be discussed in more detail in a subsequent section, it is also 
likely that increases in phonological awareness abilities are attributed to building 
educators’ confidence through exposure and practice of their own phonological 
awareness skills rather than reflective practices or targeted discussions. Consequently, 
increasing educators’ phonological awareness abilities may or may not require the 
integration of adult teaching practices. However, results based on the statistical analysis 
would suggest that there is promise for the implementation of adult learning practices vs 
not. Additional research investigating specific teaching practices that promote an increase 
in phonological awareness abilities and whether they are aligned with andragogical 
principles is worth investigation.

**Educator Knowledge**

The third aim of this study was to investigate whether integrating adult teaching 
practices into early childhood professional development would result in increased 
educator phonological awareness knowledge of skills and pedagogy. Study results 
revealed three important findings related to educator knowledge. First, overall levels of 
phonological awareness knowledge appeared to be low at the onset of the study. Second, 
the ALT treatment condition had greater gains in general phonological awareness 
knowledge compared to both the comparison and the control based on both *p*-values and
effect sizes. Third, the ALT treatment condition resulted in greater gains in phonological awareness proximal knowledge only as compared to the control condition.

My first finding regarding educators’ phonological awareness knowledge revealed that educators scored an overall 39% correct at pretest. Similar to educator level of phonological awareness abilities, this finding is consistent with the current professional development literature suggesting that educators have low levels of knowledge specific to phonological awareness content and pedagogy (Cunningham et al., 2006; Cunningham et al., 2015) prior to participating in targeted professional development. Results of the current analysis showing increases in phonological awareness knowledge provide further evidence that educators can increase phonological awareness knowledge through participation in professional development compared to educators who do not receive professional development (Cunningham et al., 2009). Importantly, the ALT treatment condition nearly doubled their scores from 4.77 to 8.71 on this knowledge measure. This increase was 2 full points higher than the comparison condition and nearly 3 points higher than the control. These findings suggest that educator knowledge of phonological awareness is low and can be improved. Moreover, these results imply that perhaps educators may not have opportunities to learn this specific content in preservice coursework or in continuing professional development contexts. In fact, as Binks-Cantrell and colleagues have shown, instructors responsible for preparing preservice and in-service educators may not possess knowledge of specific content themselves and therefore cannot prepare educators with an understanding of these constructs (Binks-Cantrell et al., 2012).
The second important finding revealed that the ALT treatment condition showed greater gains in phonological awareness knowledge compared to both comparison and control conditions. Across the professional development conditions, educator general knowledge included knowledge regarding definitions and examples of phonological awareness terms, young children’s development of phonological awareness skills, and knowledge of appropriate instructional strategies. Adult learning theorists suggest that when adults participate in extended reflection that includes planning and implementing phonological awareness instruction, identifying procedures for how to address problems when they arise (process reflection), and reflecting on beliefs and assumptions about how children learn (premise reflection) they begin to evaluate current knowledge and thus may have more profound learning experiences (Mezirow, 1991). Prior research examining strategies for promoting change in adult learning suggests that participation in adult learning strategies such as process and premise reflection or shared dialogue may increase learners’ growth in knowledge (Brown, 2006) and critical thinking (Gilstrap & DuPree, 2008). In addition, professional development formats and adult teaching practices concerning how to effectively support early childhood educators in gaining strong content knowledge, understanding how these skills develop in young children, and gaining knowledge of high-quality instructional practices remain uncertain (Cunningham et al., 2015). The results from the current study showing increased gains in educator general knowledge through the inclusion of adult teaching practices derived from adult learning theories are promising for increasing educator more broad knowledge of Pa strategies and instruction. Given that this is the first study to explicitly examine adult
teaching practices (including various forms of reflection based on theories of adult learning) within professional development to increase educator knowledge, these findings present evidence that the integration of specific teaching practices may promote greater change in general knowledge. Although some researchers may posit that this result should be interpreted with caution due to the fact that it was one of the few statistically significant differences between the ALT treatment and comparison conditions, others would interpret the large effect size as being practically significant (Wassenstein, 2016). Nonetheless, more research is needed testing the integration of adult teaching practices that may lead to greater increases in educator knowledge.

The third important finding was related to educators’ proximal knowledge. Analysis of the proximal knowledge measure revealed that the ALT treatment condition had significantly higher posttest scores compared to the control condition but was relatively equal to the comparison condition. It is important to acknowledge that educators did not complete the proximal knowledge measure at pretest. However, based on results from preliminary analyses showing that educators did not differ on the general knowledge measure at pretest and that the conditions did not differ across descriptive variables, it is likely that groups would have been similar on the proximal measure at pretest. Based on the results of general knowledge at pretest, it is also likely that all three conditions would have had low levels of proximal knowledge at pretest. Prior literature has recognized that effective professional development is specific and targeted (Domitrovich, Gest, Gill, Jones, & DeRousie, 2009; Landry et al., 2006). Moreover, it appears that the inclusion of adult teaching practices were not associated with greater
increases in phonological awareness proximal knowledge. One explanation for this finding could be that the proximal knowledge measure was directly aligned with the professional development content. Importantly, the professional development content was carefully equated across the two professional development conditions and may have contributed to nonsignificant differences between the two. Therefore I would expect an increase in educators’ proximal knowledge for those who participated in professional development compared to this who did not.

**Educator Beliefs**

The fourth aim of this study was to investigate whether integrating adult teaching strategies into early childhood professional development would result in changes in educator phonological beliefs. Study results revealed little evidence of change in beliefs and no differential change across conditions, suggesting that the integration of adult teaching practices did not affect beliefs. One possible explanation as to why the integration of these practices did not affect beliefs is that, theoretically, beliefs are hard to change (Guskey, 2002; Mezirow, 2012). Researchers posit that educator beliefs should be aligned with research and theory regarding literacy development (Ottley, Piasta, Mauck, O'Connell, Weber-Mayrer, & Justice, 2015; Ure & Raben, 2001); however, adult learning theory describes beliefs as a more complex construct that includes deep-rooted assumptions that adults have acquired through their experiences (Knowles, 1991; Mezirow, 2012). Individual experiences may be based on the ways that individual adult learners (educators) themselves learned or the beliefs promoted in the early childhood settings in which they work (i.e., Head Start, private childcare settings, public school...
systems), and therefore may be more challenging to change (Hindman & Wasik, 2011; Powell, Diamond, Boiczyk, & Gerde, 2008). Adult learning theorists suggest that changes in beliefs involve becoming critically aware of how and why personally held assumptions have come to constrain the way we interpret new understandings (Mezirow, 1991). Perhaps the adult teaching practices integrated into the professional development did not adequately address this and more time for educators to elaborate and reflect on existing assumptions of learning and the influences of work setting beliefs is needed in order to promote significant changes in beliefs as well as other educator outcome variables (Powell et al., 2010).

Another explanation for the lack of change in educators’ beliefs involves the intended goals of professional development and features that promote change. Researchers have suggested that the three primary goals of professional development are to change classroom practices, change educator attitude and beliefs, and change student learning outcomes (Griffin, 1983; Guskey, 2002). Guskey (2002) suggested a “Model of Teacher Change” (p. 383) that posits educator change in beliefs occurs only after they see evidence of improvements in student learning. They view the improvements as a result of modified instructional practices influenced by their knowledge gained. For example, studies have shown that educators who saw improvements believed they had more powerful influence on student learning outcomes (Fullan, 1985; Guskey, 1984). Therefore, critical features that promote change in educator beliefs may not be participation in professional development only but rather experiencing successful implementation of newly acquired knowledge and evidence of student change (Guskey,
2002). Based on Guskey’s (2000) model of educator change, this could explain the lack of change in educator beliefs as there were no opportunities to observe successful implementation of phonological awareness practices or clear evidence of improvement student outcomes (Guskey, 2002). This model of change aligns with andragogical principles set forth across adult learning theories that posit to promote adult learning as the change model is predicated on the idea that change in based on educators’ experiences (Guskey, 2002). This study did not test whether the integration of adult teaching practices would result in increases in classroom practice or increases in student outcomes and this could be an explanation for the lack of change in beliefs as the change theory suggests.

**Overall Pattern of Results**

To my knowledge, this is the first experimental investigation of the effects of the integration of adult teaching principles into early childhood professional development on educator outcomes. Although there is a strong theoretical argument for the premise of this study, and effect sizes for increases in early childhood educators’ observed engagement, phonological awareness abilities, and general knowledge were practically significant, it is important to acknowledge that the overall pattern of results did not show a consistent advantage of integrating adult teaching practices into early childhood professional development as a means of promoting greater change in educator outcomes. Below, I offer three explanations of this finding and suggest implications for future research.

The first potential explanation for why I did not find consistent differences between the ALT treatment and the comparison condition was that professional
development conditions may not have been different enough in respect to the key manipulation adult teaching practices (integration of the disorienting dilemma, use of experience, reflection, and relationships). This is indicated by the fact that I found no differences between the professional development conditions on the self-reported professional development design survey. The professional development design survey was created to capture the extent to which aspects of adult teaching practices were or were not present in the conditions. Despite the fact that extreme care went into the design and delivery of the professional development, manipulation of these adult teaching practices may not have been strong enough to promote change. I would suggest that in future studies such practices such as promoting a disorienting dilemma, use of prior experience, inclusion of reflection may need to be implemented with greater intensity than they were in the present study. Nonetheless, the results show that the inclusion of these adult teaching practices with this sample did reveal significant differences on three of the seven outcome measures between the ALT treatment and comparison.

It is notable that this study showed that educators participating in both professional development conditions perceived adult teaching practices to be present. Thus, the possibility remains that the integration of specific adult teaching practices may matter for the design of early childhood professional development. Continued investigation into the extent to which adult teaching practices should be integrated into professional development to improve educator outcomes is warranted. In addition, attention to specific teaching practices that may be more effective in increasing targeted
outcomes may provide an important contribution to the theoretical perspectives on adult learning, especially in respect to professional development.

The second potential explanation for lack of consistent findings across outcome variables is that perhaps certain adult teaching practices are not necessary for promoting certain aspects of educator change, such as proximal knowledge or phonological awareness abilities. As discussed above, results of this study revealed educators in both professional development conditions made significant gains in their proximal knowledge and phonological awareness abilities. Exposure to and practice of phonological awareness skills during the professional development appeared to account for consistent gains across both conditions. Martinussen and colleagues suggest that the amount of exposure to the relevant constructs during the professional development may affect educator outcomes (Martinussen et al., 2014). Perhaps it was repetitive exposure to (5 sessions) and practice of these skills during the sessions that promoted gains in educators’ phonological awareness abilities rather than adult teaching practices such as tapping into experiences and promoting reflection. Adult teaching practices such as these may not be needed in order to effect change in the development of phonological awareness abilities.

A third and real possibility is that integrating adult teaching practices into professional development for early childhood educators does not lead to better engagement, increase in phonological awareness abilities, increase in knowledge, or changes in beliefs. However, at this point in time such a strong conclusion seems premature for two reasons. First, additional studies are needed given that this is the first study aimed at examining adult teaching practices in an early childhood professional
development setting. Second, such studies should include not only measures of engagement, abilities, knowledge, and beliefs, but also practice, given that classroom implementation is the ultimate goal of professional development. What remains uncertain is whether integration of adult teaching practices promotes change in practice. Educator practice was not measured in the current study. However, Knowles (1984) identified assumptions of adult learning that include (a) being ready to learn in order to cope with real-life situations (classroom practice) and (b) motivation to learn when learners perceive that the learning will help them perform a task (classroom instruction). In addition, Mezirow (1998) identified 10 recursive stages that, he posited play unique roles in the process of adult learning. These include critical assessment of the current situation (classroom practice), exploration of options to implement, planning a course of action, making provisional efforts (implementing), building competence through practice, and finally, putting new practices in place in the current setting. Nevertheless, there remains limited evidence as to whether attending to these adult teaching practices in early childhood professional development have an association with increased use of effective classroom practices (Cunningham et al., 2015). This is worth pursuing because we do not know if changes in practice require first changing knowledge or beliefs, or whether change to either of these areas is even a prerequisite for changing practice. Moreover, professional development research continues to show mixed findings in regard to educator change pertaining to knowledge, belief, and practice. Some show change in practice but not knowledge (Neuman & Wright, 2010) whereas others show change in both (Neuman & Cunningham, 2009; Cunningham et al., 2015), and still others only
examine educator practice (Landry et al., 2006; Landry et al., 2009). Therefore, an important future line of research would be to replicate this study to see if the integration of specific adult teaching practices into professional development promotes changes in educator practice.

**Limitations**

A number of study limitations are notable. First, as alluded to above, greater intensity of adult teaching practices into early childhood professional development may be warranted given that educators did not perceive differences in the adult teaching practices between conditions. This study was carefully designed in order to equate content across the professional development conditions. Perhaps greater manipulation of the adult teaching practices is needed in order to promote change in educator outcomes.

Second, although the ALT treatment and the comparison conditions were randomly assigned, the control condition was not. The control condition showed a difference on the general knowledge measure at pretest. This difference was 1 point lower than the ALT treatment condition; therefore these two conditions were not equal at pretest on this measure. However, all conditions were equal in respect to all other measures at pretest. The control was recruited at a later date than the professional development conditions as a convenience sample. This poses a threat to potential selection bias. In addition, given the difference in timing of pretest and posttest assessments (control condition recruited a month later that the professional development conditions) there is also potential for a history effect. Future studies should randomly assign to all three conditions at the onset of the study to address these potential threats.
The third limitation concerns a threat to construct validity in regard to the measurement of adult teaching practices. Only one researcher-created measure of differentiation for the professional development design was utilized. This measure was also a self-reported measure of educators’ perceived inclusion of adult teaching practices. Although this survey was carefully adapted from the Andragogical Practices Inventory (Wilson, 2005; Holton et al., 2009), the original scale included 77 items surveying learner agreement with andragogical principles and their perceptions of the instructor’s andragogical behaviors and learning design. The adapted version of this survey included 21 items that may not be sensitive enough to capture the intended differences between the professional development conditions as perceived by educators. As this was a first attempt to capture differences in professional development design by identifying the presence of adult teaching practices and questions were adapted from a student survey, a closer examination of this measurement tool is warranted. Additionally, perhaps, like the engagement survey, an observed professional development design survey completed by an objective observer in addition to the educator self-reported measure, may capture differences in design. This is an avenue for future research into the identification of specific adult teaching practices in a professional development setting.

Fourth, calculated effect sizes for this study were small on some outcomes. Because I initially based my power analysis on having medium effect sizes, I may not have been adequately powered to detect some of the smaller effects. In addition, it is important to note that some of the outcome measures showed great variability. Thus, a larger sample size perhaps would have been able to detect more differences among the
conditions. Low power, by definition, means that the chance of discovering effects that are genuinely true is low (Shadish et al., 2002).

Finally, although this study was an examination of early childhood educators from various settings, it was limited to a small geographical region (one county in a Midwest state) and each study condition included a small sample size. Moreover, this professional development condition samples self-selected to participate in the intervention. Educators that choose to participate in research may be qualitatively different than educators who do not choose to participate in research. In sum, results revealed in this study may not generalize to other populations of early childhood educators. Nonetheless, the present findings indicate that educators who elect to participate in professional development are propelled to expand their knowledge. What remains uncertain is whether andragogical principles and adult teaching practices embedded into the learning experience promote other aspects of educator change.

Conclusion

Whereas there are a plethora of studies examining the effectiveness of professional development on educator outcomes (Cunningham et al., 2015; Landry, 2006, 2009; Neuman & Cunningham, 2009), this study is the first to consider adult teaching practices derived from adult learning theories. The purpose of this study was to expand knowledge in the field of early childhood professional development by intentionally integrating adult teaching practices derived from adult learning theories into professional development and examining effects on educator outcomes. If we are to improve early childhood educators’ knowledge and skills particular to important emergent literacy
practices — especially those serving children identified as “at risk”— we will need to ensure that educators have a solid foundation in early literacy development and aspects of phonological awareness as it relates to future literacy success. Whether new to the profession, or already in the field, early childhood educators will continue to receive professional development in order to increase their knowledge and make improvements in classroom practices that reflect the latest research. As such, evidence from this study suggests that the integration of adult teaching practices derived from adult learning theories may be a promising pedagogical practice to support the continued learning of educators. Results are promising and suggest that perhaps paying closer attention to specific adult teaching practices when facilitating professional development for educators may be important for select educator outcomes. Thus, this study is a step forward in understanding practices that may or may not contribute to better professional development outcomes for early childhood educators in addition to testing theoretical ideas posited to promote adult learning.
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common-statistical-test-all-wrong-statisticians-want-to-fix-that/

professional development for ECEs: Who participates and associated
implications for future offerings. *Journal of Early Childhood Teacher
Education*, 36(1), 44-60.

*Child Development*, 69, 848–872.

Whitehurst, G. J., Zevenbergen, A. A., Crone, D. A. Schultz, M. D., Velting, O. N., &
Fischel, J. E. (1999). Outcomes of an emergent literacy intervention from Head


Appendix A: Tables

Table 1

Descriptive Statistics for Educator Demographics by Condition (n= 61)

<table>
<thead>
<tr>
<th></th>
<th>ALT Treatment</th>
<th>Comparison</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>n</strong></td>
<td>n</td>
<td>n</td>
<td>n</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>20 (95%)</td>
<td>19 (95%)</td>
<td>19 (95%)</td>
</tr>
<tr>
<td>Male</td>
<td>1 (5%)</td>
<td>1 (5%)</td>
<td>1 (5%)</td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>14 (68.2%)</td>
<td>8 (40.0%)</td>
<td>10 (50.0%)</td>
</tr>
<tr>
<td>White</td>
<td>5 (22.7%)</td>
<td>11 (55.0%)</td>
<td>10 (50.0%)</td>
</tr>
<tr>
<td>Other</td>
<td>2 (09.1%)</td>
<td>1 (05.0%)</td>
<td>0 (00.0%)</td>
</tr>
<tr>
<td><strong>Ethnicity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hispanic</td>
<td>3 (13.6%)</td>
<td>3 (15.0%)</td>
<td>4 (20.0%)</td>
</tr>
<tr>
<td>Non-Hispanic</td>
<td>7 (36.4%)</td>
<td>7 (35.0%)</td>
<td>3 (15.0%)</td>
</tr>
<tr>
<td><strong>Ed level</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>3 (13.6%)</td>
<td>3 (15.0%)</td>
<td>4 (20.0%)</td>
</tr>
<tr>
<td>AA</td>
<td>7 (36.4%)</td>
<td>7 (35.0%)</td>
<td>3 (15.0%)</td>
</tr>
<tr>
<td>BA</td>
<td>9 (40.1%)</td>
<td>7 (35.0%)</td>
<td>6 (30.0%)</td>
</tr>
<tr>
<td>MA</td>
<td>2 (9.1%)</td>
<td>3 (15.0%)</td>
<td>3 (15.0%)</td>
</tr>
<tr>
<td><strong>Curricula</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Creative</td>
<td>17 (82%)</td>
<td>16 (80%)</td>
<td>11 (65%)</td>
</tr>
<tr>
<td>curriculum</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Locally created</td>
<td>3 (15%)</td>
<td>3 (15%)</td>
<td>7 (35%)</td>
</tr>
<tr>
<td>No curriculum</td>
<td>1 (3%)</td>
<td>1 (5%)</td>
<td>2 (10%)</td>
</tr>
</tbody>
</table>

(Continued)
<table>
<thead>
<tr>
<th>Center type</th>
<th>Private center-based</th>
<th>Public center-based</th>
<th>Other Certificate</th>
<th>Other Head Start</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>7 (32%)</td>
<td>3 (15%)</td>
<td>4 (20%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>13 (64%)</td>
<td>15 (75%)</td>
<td>16 (80%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 (4%)</td>
<td>2 (10%)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7 (31.8%)</td>
<td>8 (40.0%)</td>
<td>6 (30.0%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10 (50.0%)</td>
<td>12 (60.0%)</td>
<td>9 (45.0%)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>$M$</th>
<th>$SD$</th>
<th>$M$</th>
<th>$SD$</th>
<th>$M$</th>
<th>$SD$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>38.59</td>
<td>(10.92)</td>
<td>40.30</td>
<td>(11.80)</td>
<td>36.11</td>
<td>(10.03)</td>
</tr>
<tr>
<td>Years of experience</td>
<td>10.52</td>
<td>(7.58)</td>
<td>11.00</td>
<td>(6.31)</td>
<td>7.65</td>
<td>(8.37)</td>
</tr>
<tr>
<td>PA basic skills</td>
<td>10.95</td>
<td>(4.10)</td>
<td>11.10</td>
<td>(4.52)</td>
<td>12.00</td>
<td>(5.16)</td>
</tr>
<tr>
<td>Openness to Change</td>
<td>4.18</td>
<td>(.78)</td>
<td>4.29</td>
<td>(.30)</td>
<td>4.16</td>
<td>(.61)</td>
</tr>
</tbody>
</table>

*Note.* Freq = frequency. ALT = Adult Learning Theory. PA = Phonological Awareness. AA = Associate’s Degree. BA = Bachelor’s Degree. MA = Master’s Degree.
<table>
<thead>
<tr>
<th>Session</th>
<th>Activities and Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two weeks prior to Session 1</td>
<td>LNRA emailed to educators (ALT condition only)</td>
</tr>
</tbody>
</table>
| One week prior to Session 1 | Completed LNRA emails back to the researcher (ALT condition only)  
| | LNRA analysis |
| Session 1 | Pretest and Demographic and Openness to Change Questionnaire  
| | Introduction of the levels of PA  
| | Definitions  
| | Trajectories/continua/progression of PA development  
| | Significance for future reading success  
| | Listening  
| | Addressing educator PA abilities  
| | Explicit teaching of the sound structures of the English language  
| | PA instruction  
| | Ohio’s Early Learning Development Standards (ELDS)  
| | Journal responses  
| | Level of engagement survey  
| | CIQ (ALT condition only) |
| Session 2 | Trajectories/continua/progression of PA development  
| | Addressing educator PA abilities with respect to:  
| | Word Awareness  
| | Syllable Awareness  
| | PA instruction specific to word and syllable awareness  
| | Ohio’s ELDS  
| | Journal responses  
| | Level of engagement survey  
| | CIQ (ALT condition only) |
| Sessions 3 | Trajectories/continua/progression of PA development  
| | Addressing educator PA abilities with respect to:  
| | Rhyming  
| | Onset-rime  
| | PA instruction specific to word and syllable awareness  
| | Ohio’s ELDS  
| | Journal responses  
| | Level of engagement survey  
| | CIQ (ALT condition only) |

(Continued)
Table 2: Continued

<table>
<thead>
<tr>
<th>Sessions 4</th>
<th>Trajectories/continua/progression of PA development</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Addressing educator PA abilities with respect to:</td>
</tr>
<tr>
<td></td>
<td>Phoneme Awareness</td>
</tr>
<tr>
<td></td>
<td>PA instruction specific to word and syllable awareness</td>
</tr>
<tr>
<td></td>
<td>Ohio’s ELDS</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Journal responses</td>
</tr>
<tr>
<td></td>
<td>Level of engagement survey</td>
</tr>
<tr>
<td></td>
<td>CIQ (ALT condition only)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sessions 5</th>
<th>Review PA skills, components, and pedagogy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Review trajectories/continua/progression of PA development</td>
</tr>
<tr>
<td></td>
<td>Instruction to address Ohio’s ELDS pertaining to PA</td>
</tr>
<tr>
<td></td>
<td>PA assessments</td>
</tr>
<tr>
<td></td>
<td>Differentiating instruction based on assessment outcomes</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Journal responses</td>
</tr>
<tr>
<td></td>
<td>Level of engagement survey</td>
</tr>
<tr>
<td></td>
<td>Posttest</td>
</tr>
</tbody>
</table>

*Note.* ALT = Adult Learning Theory. LNRA = Learner Needs and Resource Assessment, PA = Phonological Awareness. CIQ = Critical Incident Questionnaire. ELDS = Early Learning and Development Standards.
<table>
<thead>
<tr>
<th>ALT Treatment</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Five 3-hour PD sessions</td>
<td>Five 3-hour PD sessions</td>
</tr>
<tr>
<td>Phonological awareness skills &amp; components</td>
<td>Phonological awareness skills &amp; components</td>
</tr>
<tr>
<td>LNRA</td>
<td>No LNRA</td>
</tr>
<tr>
<td>Introductions and data shared from LNRA</td>
<td>Introductions</td>
</tr>
<tr>
<td>Disorienting dilemma and content reflection journal entry</td>
<td>Review and initial journal entry</td>
</tr>
<tr>
<td>New content delivery</td>
<td>New content delivery</td>
</tr>
<tr>
<td>Paired practice of PA strategies</td>
<td>Introduce and review PA activities</td>
</tr>
<tr>
<td>Process and premise reflection in pairs and quick writes</td>
<td>Make &amp; take</td>
</tr>
<tr>
<td>Journal and CIQ</td>
<td>Revisit initial journal entry</td>
</tr>
</tbody>
</table>

*Note: PD = Professional Development, LNRA = Learner Needs and Resource Assessment, PA = Phonological Awareness, CIQ = Critical Incident Questionnaire*
### Table 4

**Construct and Measures**

<table>
<thead>
<tr>
<th>Construct</th>
<th>Measure</th>
<th>Dependent variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engagement in PD</td>
<td>Educator Engagement survey completed after each PD session</td>
<td>Composite score that is the average across all 5 engagement surveys</td>
</tr>
<tr>
<td></td>
<td>Observer Engagement survey completed after observing each PD session</td>
<td>Composite score that is the average across all 5 engagement surveys</td>
</tr>
<tr>
<td>Improve PA ability</td>
<td>Subscale A of TKABS: Cunningham et al., 2015 measure. 23 items completed at pre and posttest</td>
<td>1 point for each correct response for a total score of 23 points.</td>
</tr>
<tr>
<td></td>
<td>Sum scores at pre and posttest</td>
<td></td>
</tr>
<tr>
<td>Improve knowledge of PA content and development</td>
<td>Proximal knowledge scale (20 questions – one per PD objective)</td>
<td>1 point awarded for each correct response for a total of 20 points.</td>
</tr>
<tr>
<td></td>
<td>Distal knowledge subscale of the TKABS: Cunningham et al., 2015 measure (6 items)</td>
<td>1 point awarded for each correct response for a total of 6 points.</td>
</tr>
<tr>
<td></td>
<td>Sum scores at pre and posttest</td>
<td></td>
</tr>
<tr>
<td>Improve knowledge of PA pedagogy</td>
<td>Subscale C of TKABS: Cunningham et al., 2015. 5 items completed at pre and posttest</td>
<td>1 point for each correct response for a total of 5 points.</td>
</tr>
<tr>
<td></td>
<td>Sum scores at pre and posttest</td>
<td></td>
</tr>
<tr>
<td>Impose a stronger value on supporting children’s PA – Educator beliefs</td>
<td>Educator Belief scale 16 items concerning PA adapted from Hindman &amp; Wasik, 2008 and Cunningham et al., 2015) 5 point Likert scale</td>
<td>Composite score calculated as a mean across items to arrive at a total belief score. Pre and posttest</td>
</tr>
<tr>
<td>More confidence in supporting children’s PA</td>
<td>Educator Self-Efficacy scale (Bandura, 1997; Justice et al., 2008). 7 items rated on a Likert scale.</td>
<td>7 items averaged pre and posttest</td>
</tr>
</tbody>
</table>
Table 5

Descriptive Statistics for Educator Outcomes by Condition \((n = 61)\)

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>ALT</th>
<th>Comparison</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(M (SD))</td>
<td>Range</td>
<td>(M (SD))</td>
</tr>
<tr>
<td>Educator self-report of engagement</td>
<td>3.23 (.31)</td>
<td>2.68 – 3.71</td>
<td>3.20 (.33)</td>
</tr>
<tr>
<td>Proximal Knowledge</td>
<td>Posttest 12.05 (2.46)</td>
<td>7.00 – 16.00</td>
<td>11.76 (3.03)</td>
</tr>
<tr>
<td></td>
<td>Pretest 12.00 (4.30)</td>
<td>5.00 – 20.00</td>
<td>12.70 (5.16)</td>
</tr>
<tr>
<td></td>
<td>Posttest 16.47 (4.20)</td>
<td>8.00 – 23.00</td>
<td>15.05 (5.46)</td>
</tr>
<tr>
<td>PA abilities</td>
<td>Pretest 4.77 (2.20)</td>
<td>1.00 – 9.00</td>
<td>4.45 (1.73)</td>
</tr>
<tr>
<td></td>
<td>Posttest 8.71 (2.24)</td>
<td>3.00 – 11.00</td>
<td>6.40 (2.04)</td>
</tr>
<tr>
<td>Language &amp; literacy beliefs</td>
<td>Pretest 2.50 (.18)</td>
<td>1.94 – 3.06</td>
<td>2.51 (.28)</td>
</tr>
<tr>
<td></td>
<td>Posttest 2.88 (.34)</td>
<td>2.25 – 4.00</td>
<td>2.93 (.49)</td>
</tr>
</tbody>
</table>

(Continued)
Table 5: Continued

<table>
<thead>
<tr>
<th></th>
<th>Pretest</th>
<th>2.00 – 4.00</th>
<th>Posttest</th>
<th>2.25 – 4.00</th>
<th>2.13 – 4.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-efficacy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pretest</td>
<td>2.73 (.52)</td>
<td>2.00 – 4.00</td>
<td>2.77 (.55)</td>
<td>1.71 – 3.71</td>
<td>2.67 (.44)</td>
</tr>
<tr>
<td>Posttest</td>
<td>3.04 (.59)</td>
<td>2.25 – 4.00</td>
<td>3.04 (.50)</td>
<td>2.13 – 4.00</td>
<td>2.87 (.60)</td>
</tr>
</tbody>
</table>

*Note.* ALT = Adult Learning Theory. PA = Phonological Awareness.
Table 6

ANOVA Results for Engagement and Proximal Knowledge by PD

<table>
<thead>
<tr>
<th>Outcome</th>
<th>$F$</th>
<th>$df$</th>
<th>$p$</th>
<th>$d$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-reported engagement</td>
<td>0.066</td>
<td>1</td>
<td>.798</td>
<td>.094</td>
</tr>
<tr>
<td>Observed engagement</td>
<td>9.577</td>
<td>1</td>
<td>.003</td>
<td>.731</td>
</tr>
<tr>
<td>Educator proximal knowledge</td>
<td>26.642</td>
<td>2</td>
<td>.000</td>
<td>.105</td>
</tr>
</tbody>
</table>

*Note. Alpha level set as $p < .01.$*
Table 7

3 X (2 X S) Mixed Analysis of Variance of PA Abilities, PA Knowledge, Literacy Beliefs, and Educator Self-Efficacy

<table>
<thead>
<tr>
<th>Outcome</th>
<th>$F$</th>
<th>$df$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>PA abilities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>18.731</td>
<td>1</td>
<td>.000</td>
</tr>
<tr>
<td>Condition</td>
<td>0.799</td>
<td>2</td>
<td>.228</td>
</tr>
<tr>
<td>Time x Condition</td>
<td>8.055</td>
<td>2</td>
<td>.000</td>
</tr>
<tr>
<td>PA knowledge</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>76.493</td>
<td>1</td>
<td>.000</td>
</tr>
<tr>
<td>Condition</td>
<td>8.012</td>
<td>2</td>
<td>.001</td>
</tr>
<tr>
<td>Time x Condition</td>
<td>9.341</td>
<td>2</td>
<td>.000</td>
</tr>
<tr>
<td>Language and literacy beliefs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>70.791</td>
<td>1</td>
<td>.000</td>
</tr>
<tr>
<td>Condition</td>
<td>7.800</td>
<td>2</td>
<td>.001</td>
</tr>
<tr>
<td>Time x Condition</td>
<td>1.220</td>
<td>2</td>
<td>.151</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>17.981</td>
<td>1</td>
<td>.000</td>
</tr>
<tr>
<td>Condition</td>
<td>0.247</td>
<td>2</td>
<td>.391</td>
</tr>
<tr>
<td>Time x Condition</td>
<td>0.157</td>
<td>2</td>
<td>.428</td>
</tr>
</tbody>
</table>

Note. Alpha level set as $p < .01$. PA = Phonological Awareness.
Appendix B: Figures

Estimated Pretest-Posttest Means of Educator PA Abilities

*Figure 1 Estimated Pretest and Posttest Means of PA Abilities by Condition.* Mean difference values presenting increase in phonological awareness abilities from pre to posttest for the three conditions. Change from pretest to posttest was not statistically different between ALT treatment and the comparison condition. Change from pretest to posttest was statistically significantly higher for the ALT treatment compared to the control.
Figure 2. Estimated Pretest Posttest Means of PA Knowledge by Condition. Mean difference values presenting increase in phonological awareness knowledge from pre to posttest for the three conditions. Change from pretest to posttest was statistically significantly higher for the ALT treatment compared to the comparison and the ALT treatment compared to the control.
Figure 3. Estimated Pretest-Posttest Means of Educator Language and Literacy Beliefs by Condition. Mean difference values presenting increase in language and literacy beliefs from pretest to posttest for the three conditions. Change from pretest to posttest was not statistically significantly different between the ALT treatment compared to the comparison or the ALT treatment compared to the control.
Figure 4. Estimated Pretest-Posttest Means of Educator Self-Efficacy by Condition. Mean difference values presenting increase in educator self-efficacy from pretest to posttest for the three conditions. Change from pretest to posttest was not statistically significantly different between the ALT treatment compared to the comparison or the ALT treatment compared to the control.
Appendix C

Threats to Validity

<table>
<thead>
<tr>
<th>Threat</th>
<th>Addressed</th>
<th>Page # addressed in proposal</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Internal Validity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ambiguous Temporal Validity</td>
<td>Eliminated via the experimental design; I manipulate the IV such that it precedes the DV.</td>
<td></td>
</tr>
<tr>
<td>Selection</td>
<td>Randomization to treatment/control.</td>
<td>Page 43 Procedures</td>
</tr>
<tr>
<td>History</td>
<td>Eliminated by experimental design; any history effects would apply equally to both treatment/control and thus does not bias the impact estimate comparing these conditions.</td>
<td>Page 44-45 Procedures</td>
</tr>
<tr>
<td>Maturation</td>
<td>Eliminated by experimental design; any history effects would apply equally to both treatment/control and thus does not bias the impact estimate comparing these conditions. In addition a convenience sample of an additional 25 educators will be recruited as an additional quasi-experimental control. These educators will complete all pre post measures.</td>
<td>Page 44 Procedures</td>
</tr>
<tr>
<td>Regression to the mean</td>
<td>Eliminated by experimental design; any history effects would apply equally to both treatment/control and thus</td>
<td>Page 44 Procedures</td>
</tr>
<tr>
<td>Threat</td>
<td>Addressed</td>
<td>Page # addressed in proposal</td>
</tr>
<tr>
<td>----------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>--------------------------------</td>
</tr>
<tr>
<td></td>
<td>does not bias the impact estimate comparing these conditions In addition the use of mostly established measures with high reliability will also address this issue.</td>
<td></td>
</tr>
<tr>
<td>Attrition</td>
<td>Plan to recruit up to 50 educator participants in order to account for attrition (power analysis revealed 34 for adequate power) Incentives for participation may encourage attendance. Educators will commit to attending the 15 hours of PD in the consent process. Dates will be scheduled ahead of time, such that participants will know the commitment. Outcome measures will be completed during the first and last PD sessions. An independent observer will check to see if there is a completed assessment for each participant.</td>
<td>Page 41Participant</td>
</tr>
<tr>
<td>Testing</td>
<td>Testing effects are eliminated by the experimental design. Any effects will be equal across conditions will apply equally to both conditions and thus does not bias the impact estimate. In addition, educator knowledge assessments will include a form A and a form B. Educators will receive one</td>
<td>Page 45 Procedures</td>
</tr>
<tr>
<td>Threat</td>
<td>Addressed</td>
<td>Page # addressed in proposal</td>
</tr>
<tr>
<td>---------------------------------------------</td>
<td>---------------------------------------------------------------------------</td>
<td>------------------------------</td>
</tr>
<tr>
<td>Threat Addressed at pre and the other at post (counterbalancing). One half of each group will receive A and the other B at pretest and will receive the other at posttest.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instrumentation</td>
<td>Pre and post assessment items will remain the same with the exception of reordering items.</td>
<td></td>
</tr>
<tr>
<td>Additive and Interactive Effects</td>
<td>I plan to have enough information provided through the demographics questionnaire before randomization so that I may be able to control for multiple confounds in the final analyses.</td>
<td>Page 43 Procedures</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Threats</th>
<th>Addressed</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Construct Validity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inadequate Explication of Constructs</td>
<td>Carefully identifying and explaining the constructs of the study through prior research</td>
<td>Page 2 Chapter 2 literature review And Page 45 Chapter 3 Methods PD events</td>
</tr>
<tr>
<td>Construct Confounding</td>
<td>Constructs have been specifically explained and identified measures are matched to each construct.</td>
<td>Appendix A</td>
</tr>
<tr>
<td>Mono-Operation Bias</td>
<td>Mono-operation bias is a threat to this study because most constructs are assessed via only 1 measure. However, in order to successfully recruit participants and accomplish assessments in a timely fashion, I have elected to not overwhelm educators with</td>
<td></td>
</tr>
</tbody>
</table>

Continued
<table>
<thead>
<tr>
<th>Threats</th>
<th>Addressed</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construct Validity</td>
<td>multiple measures for each construct. In addition, few measures to date exist which measure the constructs set forth in this study. This limitation will be acknowledged in the discussion chapter of this dissertation.</td>
<td>Page 55 Measures</td>
</tr>
<tr>
<td>Mono-Methods Bias</td>
<td>Mono-methods bias is a potential threat to all constructs but engagement as they are all self-reported measures. However, similar to mono-operation bias there are few measures of the proposed constructs and those selected for this study have high reliability. This too will be acknowledged as a limitation in the discussion chapter of this dissertation.</td>
<td>Page 55 Measures</td>
</tr>
<tr>
<td>Confounding Constructs with Levels of Constructs</td>
<td>Ensure measures are sensitive to the range of skills which is why I selected valid and reliable measures.</td>
<td>Page 41 Participants</td>
</tr>
<tr>
<td>Treatment Sensitive Factorial Structure</td>
<td>Using valid and reliable measures should ensure that the scoring remains the same even if performance on the measures changes. Content for both PDs will be equivalent</td>
<td>Page 44 Procedures</td>
</tr>
<tr>
<td>Reactive Self-Report Change</td>
<td>This threat will be minimized as much as possible. The content between the treatment and control condition will be the</td>
<td>Continued</td>
</tr>
<tr>
<td>Threats</td>
<td>Addressed</td>
<td>Page</td>
</tr>
<tr>
<td>-------------------------------------</td>
<td>---------------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td><strong>Construct Validity</strong></td>
<td>same. In addition, the educators will be completely blind to the independent variable</td>
<td></td>
</tr>
<tr>
<td></td>
<td>This threat does not apply to the engagement outcome.</td>
<td></td>
</tr>
<tr>
<td>Reactivity to the Experimental Situation and experimental expectancies.</td>
<td>PD content will be equal for both conditions including materials and total time of PD. Thus reactivity should be equal across conditions.</td>
<td></td>
</tr>
<tr>
<td>Educator reactivity</td>
<td>The independent dependent variable should not be obvious to the conditions as educators will not know the hypothesis.</td>
<td></td>
</tr>
<tr>
<td>Facilitator reactivity</td>
<td>The same facilitator will provide both PD conditions so as not to completely confound condition with facilitator (as would happen with 2 facilitators – 1 for ALT treatment and 1 for control). However, this introduces the potential threats of facilitator reactivity and expectancy because the facilitator is not blind to the purpose of the study. To address these threats: 1. Standardized PowerPoints and content will be created for the PD. The facilitator will adhere to these. 2. Fidelity will be closely monitored to capture any deviations from the intended protocol/content. 3. Manipulation via the PD</td>
<td></td>
</tr>
</tbody>
</table>

Continued
<table>
<thead>
<tr>
<th>Threats</th>
<th>Addressed</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Construct Validity</strong></td>
<td>Design Survey. This will provide a measure of the extent to which aspects of adult learning theory were/were not present in the control condition. 4. As part of the fidelity observation rating of the facilitator to measure the extent to which the facilitator was warm and responsive in both conditions. In addition, I will include a control condition that receives no PD but completes knowledge and belief assessments.</td>
<td></td>
</tr>
<tr>
<td><strong>Novelty and Disruption Effects</strong></td>
<td>PD is a regular form of extended educator learning and language and literacy is a consistent topic of PD. Therefore, it will not be seen as a novelty because educators are used to this form of continued learning.</td>
<td></td>
</tr>
<tr>
<td><strong>Compensatory Equalization</strong></td>
<td>Treatment and control will be equated in time and content that will be delivered.</td>
<td></td>
</tr>
<tr>
<td><strong>Compensatory Rivalry</strong></td>
<td>Equating measures, amount of time, and content.</td>
<td></td>
</tr>
<tr>
<td><strong>Resentful Demoralization</strong></td>
<td>Equating measures, amount of time, and content.</td>
<td></td>
</tr>
<tr>
<td><strong>Treatment Diffusion</strong></td>
<td>Treatment diffusion is a potential limitation of this study. However, in order to minimize this threat I will</td>
<td></td>
</tr>
</tbody>
</table>
Threats Addressed Page

**Construct Validity**

ask educators to please not talk with those in the treatment condition until after the study and measures are all completed. Even if educators interact they will be blind to the independent variable and would most likely engage in talk pertaining to content which will be exactly the same. This limitation will be acknowledged in the discussion chapter of this dissertation.
## Appendix D

### Phonological Awareness PD Outline of Major Topics and References

<table>
<thead>
<tr>
<th>Session</th>
<th>PA Skills</th>
<th>PA Components</th>
<th>Objectives/Goals</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Listening – attending to and manipulating sounds in oral language - must know how to listen</td>
<td>Elements of PA instruction</td>
<td>Understand why intentional teaching of PA skills is important</td>
<td>NELP, 2008</td>
</tr>
<tr>
<td></td>
<td>Developmental properties of PA</td>
<td>Rhyming, alliteration, onset-rime, syllables, phoneme segmenting, blending, deletion and elision</td>
<td>Identify the different skills involved in PA activities and where they fall in the developmental continuum.</td>
<td>Melby-Lervåg, M., Lyster, S. A. H., &amp; Hulme, C. (2012).</td>
</tr>
</tbody>
</table>

Continued
<table>
<thead>
<tr>
<th>Session</th>
<th>PA Skills</th>
<th>PA Components</th>
<th>Objectives/Goals</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(ELCS) with respect to PA (Sound structures of the English Language – Features of English orthography)</td>
<td>Identify Ohio’s six PA ELCS for three to five year olds. Identify the four standards from birth to age three. Identify the four languages of English origin and features of words.</td>
<td>Stahl, Stahl, &amp; Mckenna, (1999)</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Word Awareness</td>
<td>Word awareness</td>
<td>Differentiate between purely PA skills and activities vs skills and activities that overlap (e.g., alphabetic principle or print awareness). Define and identify word level PA skills.</td>
<td>Anthony, J. L., Lonigan, C. J., Burgess, S. R., Driscoll, K., Phillips, B. M., &amp; Cantor, B. G. (2002).</td>
</tr>
</tbody>
</table>

Continued
<table>
<thead>
<tr>
<th>Session</th>
<th>PA Skills</th>
<th>PA Components</th>
<th>Objectives/Goals</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Onset-rime</td>
<td>Rhyming recognition vs production</td>
<td>Define onset-rime.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Onset-rime concepts</td>
<td>Understand and identify the difference between rhyme and onset rime.</td>
<td>Carroll, J. M., Snowling, M. J.,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Analogy/word families</td>
<td>Identify rhyming and onset-rime level PA skills.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Onset-rime blending</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Onset-rime segmenting</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Onset-rime manipulation</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rhyming</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Phoneme concepts</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Phoneme segmenting</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Phoneme blending</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Phoneme deletion</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Phoneme substitution</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Count the phonemes in words and determine the number of boxes needed to map the word.</td>
<td>McGee, L. M., &amp; Dail, A.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Continued</td>
</tr>
<tr>
<td>Session</td>
<td>PA Skills</td>
<td>PA Components</td>
<td>Objectives/Goals</td>
<td>References</td>
</tr>
<tr>
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<td>---------------</td>
<td>-----------------</td>
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</tr>
<tr>
<td></td>
<td>and</td>
<td>Onset-rime</td>
<td>Identify the order of appropriate instructional practices pertaining to PA when teaching preschool Children (ages 3-5).</td>
<td>McKenna M. C., &amp; Stahl, K.A.D., (2012).</td>
</tr>
<tr>
<td></td>
<td>components</td>
<td>Phonemic awareness</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Continued
<table>
<thead>
<tr>
<th>Session</th>
<th>PA Skills</th>
<th>PA Components</th>
<th>Objectives/Goals</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Significance for future reading success</td>
<td>Differentiating instruction based on assessment outcomes.</td>
<td>Understand the significance of phonological awareness based on assessment results.</td>
<td>Identify specific strategies for differentiation instruction based on PA assessment results.</td>
<td></td>
</tr>
</tbody>
</table>
Appendix E

Learner Needs and Resource Assessment Questions

1. What listening activities do you currently implement in your classroom? How do you assess the effectiveness of these activities?

2. What Phonological Awareness activities do you currently implement in your classroom? How do/would you assess the effectiveness of these activities? As you try to use Phonological Awareness/listening skills and strategies in your teaching, what are the areas of difficulty that you face?

4. When researching Phonological Awareness/listening resources or websites, what have you found most useful? (Do you have a favorite resource to share?)

5. What questions or comments do you have pertaining to Phonological Awareness? Consider both the teaching and learning of Phonological Awareness.
Appendix F

Critical Incident Questionnaire

1. At what moment in the session this week were you most engaged as a learner?

2. At what moment in the PD session were you distant as a learner?

3. What individual action/s occurred during the PD this week (initiated by yourself, the facilitator, or other PD participants) did you find the most affirming or helpful?

4. What individual action/s occurred during the PD this week (initiated by yourself, the facilitator, or other PD participants) did you find the most puzzling or confusing?

5. What surprised you most about the session this week?

Appendix G

Educator Background Questionnaire

Teacher Name: _____________________________
Teacher ID: ________________________________

To complete the questionnaire, please answer every item to the best of your ability and keep the following points in mind:

√ Fill in circles completely
√ Print legibly
√ Use pencil if possible and erase any mistakes completely
√ Please do not skip items
√ Give only one response when asked to do so

All of your data is confidential and will not be shared outside of the project. Thank you for your continued participation!

1. Today’s Date: __________/________/________

Please fill in the appropriate circle for each question. Please indicate one response per question unless instructed otherwise. Note that throughout this questionnaire we use the term “preschool” to refer to the early childhood program in which you teach.

Professional/Demographics
This first set of questions is designed to learn more about you and your teaching background.

2. What is the highest level of education you have completed? Select only one.

<table>
<thead>
<tr>
<th>☐ Eighth grade or less</th>
<th>☐ Bachelor’s degree</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ Some high school but no diploma</td>
<td>☐ At least one year of course work beyond a B.A. or B.S.</td>
</tr>
<tr>
<td>☐ High school diploma or equivalent</td>
<td>☐ Master’s degree</td>
</tr>
<tr>
<td>☐ High school diploma or equivalent, plus technical training or certificate</td>
<td>☐ Education specialist or professional diploma based on at least</td>
</tr>
</tbody>
</table>
1. What is your highest degree?

- [ ] Some college but no degree
- [ ] Doctoral degree
- [ ] A.A., A.S., two-year degree
- [ ] Other:
  - Specify: ____________________

2. How much course work did you complete beyond your highest degree?

- [ ] One year of course work beyond MA

3. What was your major when you received your highest degree? Select all that apply.

- [ ] a. Early childhood education
- [ ] b. Elementary education
- [ ] c. Special education
- [ ] d. English Language Learner
- [ ] e. Child development
- [ ] f. N/A (no degree)
- [ ] g. Other: Specify: ____________________

4. Do you have a Child Development Associate credential (CDA)?

- [ ] Yes
- [ ] No

5. Do you have a certification from your state education agency that qualifies you to teach any of the following (i.e., a teaching license/certificate)? Please respond “No” if not.

- [ ] a. ...children younger than 4 years old?
  - [ ] Yes
  - [ ] No
- [ ] b. ...4-year old children?
  - [ ] Yes
  - [ ] No
- [ ] c. ...Kindergarten?
  - [ ] Yes
  - [ ] No
- [ ] d. ...other early elementary grades?
  - [ ] Yes
  - [ ] No
- [ ] e. ...special education or work as an early interventionist?
  - [ ] Yes
  - [ ] No
- [ ] f. ...children with Limited English Proficiency (LEP) or teach English as a Second Language (ESL)?
  - [ ] Yes
  - [ ] No
- [ ] g. ...any other levels or special subjects?
  - [ ] Yes
  - [ ] No

If yes, please specify: ____________________
6. List your years of experience working professionally with children at each of the following levels. *Enter 0 if no experience.*
   a. Prior to kindergarten entry  
   b. Kindergarten  

7. How many years have you spent working as the lead or senior teacher?  
   *Enter 0 if no experience.*

8. In what year were you born? 19  

9. What is your gender?  
   - Female  
   - Male

10. Fill in the circle that best describe your ethnicity.

   - a. Hispanic or Latino
   - b. Not Hispanic or Latino
11. Fill in the circle(s) that best describe your race.

<table>
<thead>
<tr>
<th></th>
<th>Race</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>Black/African-American</td>
</tr>
<tr>
<td>b.</td>
<td>Native American/Indian</td>
</tr>
<tr>
<td>c.</td>
<td>White/Caucasian</td>
</tr>
<tr>
<td>d.</td>
<td>Native Hawaiian or Other Pacific Islander</td>
</tr>
<tr>
<td>e.</td>
<td>Asian</td>
</tr>
</tbody>
</table>

12. Please indicate the number of hours of language and literacy PD you have attended during the last academic year.

For example, if you attended a 3-credit college course that met for a total of 36 hours plus a 3-hour one-day workshop, your total would be 39 total hours.

__ years

Your Program and Classroom

13. How many preschool classrooms (including your own) are on site in your school/center?

__ Classrooms

The following questions address organizations with which your program is affiliated.

14a. Is your program affiliated with the Step Up to Quality program?

○ Yes  ○ No  ○ I don’t know

14b. If yes, please indicate your current rating:

○ no stars  ○ 1-star  ○ 2-stars  ○ 3 stars  ○ 4-stars  ○ 5-stars

15. Is your program NAEYC accredited?  ○ Yes  ○ No  ○ I don’t know
The following questions address the composition of your classroom.

16. How many teachers are there in your classroom, including yourself?
   a. lead or co-lead teachers
   b. assistant teachers
   c. other adults (that are in your classroom on a regular basis; e.g., student teachers)

17. What is the total enrollment of children in your current classroom? *If you teach two classes (e.g., am and pm class), please note the average number of children that you teach. For example, if there are 12 children in your am class and 16 in your pm class, put 14 children.*

Children

18. Please specify the age range of children served in your classroom as of Sept 1:
   [ ] years, [ ] months TO [ ] years, [ ] months

19a. Do you have children with limited English Proficiency (LEP) in your class? (LEP children are children whose native language is a language other than English and have difficulties listening speaking, reading, or writing English. Consequently, they have a difficult time understanding school instruction in English.)
   ○ Yes  ○ No

19b. If so, how many LEP children are in your class? [ ]
20. Do you have children with Individualized Education Programs (IEPs) in your classroom?
   ○ Yes   ○ No
   a. If so, how many children with IEPs are in your class? [ ]

21. Is your program half day, full day, or both? Select only one.
   ○ half   ○ full   ○ both

22. How many days do children attend your program?
   ○ all children attend two days
   ○ all children attend three days,
   ○ all children attend four days
   ○ all children attend five days
   ○ other
   a. If other, please specify __________________________

23. Please identify the Language and Literacy curricula you used in your classroom during the current school year and list by name.

<table>
<thead>
<tr>
<th>Option</th>
<th>Please list by name:</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. No curriculum</td>
<td></td>
</tr>
<tr>
<td>b. State-developed curriculum</td>
<td>1.</td>
</tr>
<tr>
<td>c. Locally-developed (e.g., district)</td>
<td>2.</td>
</tr>
<tr>
<td>d. Commercial curriculum</td>
<td>3.</td>
</tr>
</tbody>
</table>

24. Did you receive training specific to your curriculum? ○ Yes ○ No

25. Do you receive ongoing support in the use of your curriculum? ○ Yes ○ No

26. Does your curriculum contain Phonological Awareness content and lessons?
   ○ Yes   ○ No
27. On average, how much time per day **(in minutes)** do you estimate that you spend planning and focusing on Phonological Awareness?

   [ ] [ ] Mins.

28. How much time per week **(in minutes)** do you estimate you spend planning and focusing on Phonological Awareness?

   Mins. [ ] [ ]

29. In a typical day, how much time do children in your classroom spend in the following activities? *Please fill-in one number per line and do not include lunch or recess breaks.*

<table>
<thead>
<tr>
<th>Activity</th>
<th>No time</th>
<th>Half-hour or less</th>
<th>About one hour</th>
<th>About two hours</th>
<th>Three hours or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Teacher-led, whole group activities</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>b. Teacher-led small group activities</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>c. Teacher-led individual activities</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>d. Child-selected activities (centers/stations)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>e. Child-selected activities (free play)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

Continued
30. Which of the following interest areas or centers do you have in your classroom?

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Reading area with books</td>
<td>○ Yes</td>
<td>○ No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Listening center</td>
<td>○ Yes</td>
<td>○ No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Writing center or area</td>
<td>○ Yes</td>
<td>○ No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Area for puzzles and games</td>
<td>○ Yes</td>
<td>○ No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. Computer area</td>
<td>○ Yes</td>
<td>○ No</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

31. Beliefs Regarding New Instructional Practices

*With the next set of items, we wish to learn more about teachers’ thoughts on new methods for teaching young children. Please fill in the answer that indicates how strongly you agree with the following statements.*

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Mildly Disagree</th>
<th>Slightly Disagree</th>
<th>Slightly Agree</th>
<th>Mildly Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

- a. When exploring new instructional methods, I try to find ones that require little change

- b. I am comfortable trying new things even when I will probably make mistakes.

- c. I feel excited when I try new instructional techniques.
<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Mildly Disagree</th>
<th>Slightly Disagree</th>
<th>Slightly Agree</th>
<th>Mildly Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>d.</td>
<td>I don’t mind making mistakes since I can learn from them.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>e.</td>
<td>I enjoy learning about new ways to teach early reading and writing skills.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>f.</td>
<td>I am interested in learning more about how to support children’s language development.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>g.</td>
<td>Learning new ways to support children’s phonological awareness would be useful to me.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>
Appendix H

Engagement in PD Survey

**PD Session Evaluation**

Name __________________________  ID ________________

Please complete the following survey indicating your level of engagement during today’s PD session.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree or Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I frequently asked questions during the PD or contributed to PD discussions.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>2. I did not discuss ideas with other participants in the PD session.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>3. I shared my own experiences during the PD session.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>4. My mind wandered frequently during the PD session.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>5. I am motivated to seek out additional skills and strategies to support my work with young children and their families.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>
6. During the PD session, I was able to make judgments about the content presented and how it may contribute to my planning and work with young children.

7. I did not feel comfortable asking questions when I was confused.

8. During the PD session I analyzed basic elements of an idea, experience, or theory.

9. I was interested in the facilitator’s personal feedback.

10. I was not interested in the facilitator’s feedback to others.

11. I frequently worked with other educators during the PD.

12. The session motivated me to think about my current practices with young children.

13. I explained PD material to another educator during the PD session.

14. I examined strengths and weaknesses of my own views on PA.

15. I changed the way I understand PA with regard to concepts discussed today.
<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>16. I took detailed notes during the session to remember important details that will help me in my work with young children and families.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. I learned something that has changed the way I understand PA content, development, and/or instructional strategies.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18. I will follow up with the facilitator or another PD participant to continue discussion focused on this topic.</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>19. I will use an electronic medium to discuss and/or gather further information about this topic.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Additional comments or questions would you like to share about the session?
Session number: ______

Please complete the following survey indicating the observed level of engagement during today’s PD session.

<table>
<thead>
<tr>
<th>As a result of the PD:</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Uncertain</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Participants frequently asked questions in the PD or contributed to PD discussions.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>2. Participants discussed ideas with other participants in the PD session.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>3. Participants shared their experiences during the PD session.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>4. Participants appeared to not pay attention during the PD session.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Participants stated they may seek out additional skills and strategies to support their work with young children and families.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>
5. During the PD session, participants made judgments about the content presented and how it may contribute to their planning and work with young children.

6. Participants frequently asked questions.

7. During the PD session, participants analyzed basic elements of an idea, experience, or theory.

8. Participants were interested in the facilitator’s personal feedback.

9. Participants were not interested in the facilitator’s feedback to others.

10. Participants frequently worked with other educators during the PD.

11. Participants openly talked about current practices with young children.

12. Participants explained PD material to each other during the PD session.

<p>| | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>5.</td>
<td>During the PD session, participants made judgments about the content presented and how it may contribute to their planning and work with young children.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Participants frequently asked questions.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>During the PD session, participants analyzed basic elements of an idea, experience, or theory.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Participants were interested in the facilitator’s personal feedback.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Participants were not interested in the facilitator’s feedback to others.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Participants frequently worked with other educators during the PD.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>Participants openly talked about current practices with young children.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>Participants explained PD material to each other during the PD session.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Continued
13. Participants examined the strengths and weaknesses of their own views on PA.

14. Participants openly discussed changes in the way they understand PA.

15. Participants took detailed notes during the session.

16. Participants openly discussed changes in the way they understand PA content, development, and/or instructional strategies.

17. Participants requested additional/clarifying information from the facilitator or another PD participant to continue discussion focused on this topic.

18. Participants discussed the benefits of using an electronic medium to discuss and/or gather further information about this topic.

Continued
Additional observations about the session.
Appendix J

Educator Phonological Awareness Knowledge Survey (Form A)

Count the number of simple speech sounds you hear in each of the words below. Then circle the number of sounds you hear. Please do this for every word listed. For example, *cat* has three sounds, /c/ /a/ /t/.

1. **bit**
   a. one sound  
   b. two  
   c. three  
   d. four  
   e. five  
   f. six

2. **fraught**
   a. one sound  
   b. two  
   c. three  
   d. four  
   e. five  
   f. six

3. **tie**
   a. one sound  
   b. two  
   c. three  
   d. four  
   e. five  
   f. six

4. **post**
   a. one sound  
   b. two  
   c. three  
   d. four  
   e. five  
   f. six

5. **couch**
   a. one sound  
   b. two  
   c. three  
   d. four  
   e. five  
   f. six

6. **shipping**
   a. one sound  
   b. two  
   c. three  
   d. four  
   e. five  
   f. six

7. **exit**
   a. one sound  
   b. two  
   c. three  
   d. four  
   e. five  
   f. six

Say each of the following words out loud. Then reverse the order of the sounds, and say the new English word that results. ON THIS FORM please write the new word with its conventional (correct) English spelling. (Do this for every word.) (Ex. *age* → *jay*)

8. **ice**
   ____________________________

9. **tub**
   ____________________________

10. **face**
    ____________________________

11. **checks**
    ____________________________

12. **judge**
    ____________________________

13. **meat**
    ____________________________

For each word on the left below, circle the number of syllables. For example, *elephant* has 3 syllables /el/ /e/ /phant/

14. **salamander**
    a. three syllable  
    b. four  
    c. five  
    d. six  
    e. seven

15. **finger**
    a. one syllable  
    b. two  
    c. three  
    d. four  
    e. five

16. **biodegradable**
    a. one syllable  
    b. two  
    c. three  
    d. four  
    e. five

17. **pies**
    a. one syllable  
    b. two  
    c. three  
    d. four  
    e. five

18. **attached**
    a. four syllable  
    b. five  
    c. six  
    d. seven  
    e. eight
19. koala 

- a. one syllable
- b. two
- c. three
- d. four
- e. five

Read the first word in each line, and note the sound that is represented by the underlined letter or letters. Then circle the word to the right that contains the same sound.

20. paper
- a. village
- b. father
- c. pat
- d. sleigh

21. return
- a. smashed
- b. settle
- c. listen
- d. castle

22. even
- a. phrase
- b. soften
- c. of
- d. find

23. nurse
- a. our
- b. percent
- c. poor
- d. near

Please check the options that best answer the following questions.

24. Which of the following are examples of a compound word? (Check all that apply.)
- Government
- Eyeball
- Psychology
- Teddy Bear
- Peppermint
- I don’t know

25. Which of the following are examples of onset-rime? (Check all that apply.)
- /s/ + lip
- sip, rip, dip
- sip, sock, sister
- /s/ + ip
- ele + phant
- I don’t know

26. Which of the following are examples of blending? (Check all that apply.)
- /s/ + un becomes sun
- popcorn without corn becomes pop
- bat becomes /b/ + at
- butterfly becomes butter + fly
- mice without /m/ becomes ice
- I don’t know
27. A phoneme refers to: (Check only one.)
   ○ A single letter
   ○ A single speech sound
   ○ A single unit of meaning
   ○ A grapheme
   ○ I don’t know

28. Phonemic awareness is: (Check only one.)
   ○ The same as phonological awareness
   ○ The understanding of how letters and sounds are put together to form words
   ○ The ability to break down and manipulate the individual sounds in spoken language
   ○ The ability to use sound-symbol correspondences to read new words
   ○ I don’t know

29. A requirement of a syllable is that: (Check only one.)
   ○ It contains at least one consonant letter
   ○ It contains no more than one vowel letter
   ○ It be a pronounceable unit
   ○ It contains no more than one speech sound
   ○ I don’t know

Please check the option(s) that best answer the questions.

30. You are trying to teach your preschool students to notice alliteration (similar beginning sounds in words such as with the spoken words sun, city, sand). Which instructional strategies below would be an effective way to help your students master alliteration? (Check all that apply.)
   ○ Use cards with pictures of thing on one side and the letter that starts that thing on the other side (for example, F for fan, S for sun).
   ○ Practice sorting picture of objects according to their beginning sound.
   ○ Have children find the letter “S” in words written in the classroom.
   ○ Play “I SPY” and have children find all the objects in the room that start with a certain sound.
   ○ I don’t know
31. Which of the following will typically be easiest for young children to do? (Check only one.)
   ○ When you say, “r” [pause] “ain” and ask what word you made, they say you made the word “rain.”
   ○ When you say “rain” [pause] “bow” and ask what big word you made, they say “rainbow”
   ○ When you say the word “rain” and ask what sounds are in the word, they say “/r/ /ay/ /n/.”
   ○ When you say the sounds “/r/ /ay/ /n/” and ask what word you made, they say you made the word “rain.”
   ○ I don’t know.

32. Select the sequence below that correctly orders these skills from easiest to hardest for 4-year-old children: (Check the correct sequence below.)
   A. Blending “foot” and “ball” into “football”
   B. Blending /p/ /i/ /g/ into “pig”
   C. Blending /cr/and /eam/ into “cream”
   ○ B,C,A
   ○ A,B,C
   ○ B,A,C
   ○ A,C,B
   ○ I don’t know

33. When teaching phonological awareness to 4-year-old children, in which order would you introduce the following concepts? (Check the correct sequence below.)
   A. Separating words like “popcorn” into ‘pop’ and “corn”
   B. Blending words like “pop” and “corn” into “popcorn”
   C. Deleting the word “pop” from “popcorn” to make “corn”
   ○ A,B,C
   ○ B,C,A
   ○ A,C,B
   ○ B,A,C
   ○ I don’t know
34. Teaching preschool children to be sensitive to and manipulate the sounds in spoken language is most helpful with acquiring which of the following skills? (Check only one.)

- ☐ Knowledge of letter names
- ☐ Reading motivation
- ☐ Increasing vocabulary
- ☐ Reading comprehension
- ☐ Sounding out words
- ☐ I don’t know
Educator Phonological Awareness Knowledge Survey (Form B)

Count the number of simple speech sounds you hear in each of the words below. Then circle the number of sounds you hear. Please do this for every word listed. For example, *cat* had three sounds, /c/ /a/ /t/.

1. pod  
   a. one sound  
   b. two  
   c. three  
   d. four  
   e. five  
   f. six

2. cheap  
   a. one sound  
   b. two  
   c. three  
   d. four  
   e. five  
   f. six

3. brought  
   a. one sound  
   b. two  
   c. three  
   d. four  
   e. five  
   f. six

4. axis  
   a. one sound  
   b. two  
   c. three  
   d. four  
   e. five  
   f. six

5. bay  
   a. one sound  
   b. two  
   c. three  
   d. four  
   e. five  
   f. six

6. shedding  
   a. one sound  
   b. two  
   c. three  
   d. four  
   e. five  
   f. six

7. gasp  
   a. one sound  
   b. two  
   c. three  
   d. four  
   e. five  
   f. six

Say each of the following words out loud. Then reverse the order of the sounds, and say the new English word that results. ON THIS FORM please write the new word with its conventional (correct) English spelling. (Do this for every word.) (Ex. age → jay)

8. bat  
   ______________________

9. name  
   ______________________

10. coach  
    ______________________

11. dice  
    ______________________

12. ace  
    ______________________

13. known  
    ______________________

For each word on the left below, circle the number of syllables. For example, *elephant* has 3 syllables /el/ /e/ /phant/

14. seas  
    a. one syllable  
    b. two  
    c. three  
    d. four  
    e. five

15. hanger  
    a. one syllable  
    b. two  
    c. three  
    d. four  
    e. five

16. viola  
    a. one syllable  
    b. two  
    c. three  
    d. four  
    e. five

17. happened  
    a. one syllable  
    b. two  
    c. three  
    d. four  
    e. five

18. responsibility  
    a. four syllable  
    b. five  
    c. six  
    d. seven  
    e. eight

19. caterpillar  
    a. three syllable  
    b. four  
    c. five  
    d. six  
    e. seven

Read the first word in each line, and note the sound that is represented by the underlined letter or letters. Then circle the word to the right that contains the same sound.

20. hoping  
    a. bottle  
    b. toy  
    c. melon  
    d. although

21. rodent  
    a. rigged  
    b. backed  
    c. badge  
    d. batting
22. **breezy**  
   a. seed  
   b. closed  
   c. brace  
   d. pleasure

23. **first**  
   a. or  
   b. purchase  
   c. tire  
   d. four

Please check the options that best answer the following questions.

24. Which of the following are examples of a *compound* word? (Check all that apply.)
   - Astronomy
   - Meatloaf
   - Internship
   - Grandmother
   - Apple sauce
   - I don’t know

25. Which of the following are examples of *onset-rime*? (Check all that apply.)
   - *dim, dark, daring*
   - *rim, dim, him*
   - */r/ + im
   - */t/ + rim
   - *ela + stic*
   - I don’t know

26. Which of the following are examples of *blending*? (check all that apply.)
   - pair without /p/ becomes *air*
   - *basketball* becomes *basket + ball*
   - airplane without *plane* becomes *air*
   - car becomes */c/ + *ar*
   - */h/ + *op* becomes *hop*
   - I don’t know

27. A phoneme refers to: (check only one.)
   - A single speech sound
   - A single letter
   - A single unit of meaning
   - A grapheme
   - I don’t know
28. Phonemic awareness is: (Check only one.)

- The ability to break down and manipulate the individual sounds in spoken language
- The same as phonological awareness
- The ability to use sound-symbol correspondences to read new words
- The understanding of how letters and sounds are put together to form words
- I don’t know

29. A requirement of a syllable is that: (Check only one.)

- It contains at least one consonant letter
- It be a pronounceable unit
- It contains no more than one speech sound
- It contains no more than one vowel letter
- I don’t know

Please check the option(s) that best answer the questions.

30. You are trying to teach your preschool students to notice alliteration (similar beginning sounds in words such as with the spoken words sun, city, sand). Which instructional strategies below would be an effective way to help your students master alliteration? (Check all that apply.)

- Use cards with pictures of thing on one side and the letter that starts that thing on the other side (for example, F for fan, S for sun).
- Play “I SPY” and have children find all the objects in the room that start with a certain sound.
- Practice sorting picture of objects according to their beginning sound.
- Have children find the letter “S” in words written in the classroom.
- I don’t know

31. Which of the following will typically be easiest for young children to do? (Check only one)

- When you say the word “rain” and ask what sounds are in the word, they say “/r/ /ay/ /n/.”
- When you say “rain” [pause] “bow” and ask what big word you made, they say “rainbow.”
- When you say, “r” [pause] “ain” and ask what word you made, they say you made the word “rain.”
- When you say the sounds “/r/ /ay/ /n/” and ask what word you made, they say you made the word “rain.”

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32. Select the sequence below that correctly orders these skills from easiest to hardest for 4-year-old children: (check the correct sequence below)
   A. Blending “foot” and “ball” into “football”
   B. Blending /p/ /i/ /g/ into “pig”
   C. Blending /cr/ and /eam/ into “cream”
      ○ A,C,B,
      ○ B,C,A
      ○ B,A,C
      ○ A,B,C
      ○ I don’t know

33. When teaching phonological awareness to 4-year-olds children, in which order would you introduce the following concepts? (check the correct sequence below).
   A. Separating words like “popcorn” into ‘pop’ and “corn”
   B. Blending words like “pop” and “corn” into “popcorn”
   C. Deleting the word “pop” from “popcorn” to make “corn”
      ○ A,B,C
      ○ A,C,B
      ○ B,C,A
      ○ B,A,C
      ○ I don’t know

34. Teaching preschool children to be sensitive to and manipulate the sounds in spoken language is most helpful with acquiring which of the following skills? (check only one)
      ○ Increasing vocabulary
      ○ Reading motivation
      ○ Sounding out words
      ○ Knowledge of letter names
      ○ Reading comprehension
      ○ I don’t know
Appendix K

Preschool Educator Language and Literacy Beliefs

I am interested in learning about your beliefs concerning phonological awareness practices in preschool. Fill in the bubble that corresponds to your feelings for each statement.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree or Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>As an educator I believe:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Preschool children need plenty of drill and practice to learn the sounds of letters.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>2. Preschool children learn ending sounds by circling pictures of things that rhyme on worksheets.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>3. Preschool children learn ending sounds in words by listening to nursery rhymes.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>4. Preschool children should be taught to hear sounds in their environment before they are taught to hear sounds in words.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>5. Preschool children should play with words, such as making up rhymes or jump rope chants, to learn to hear ending sounds in words.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>
6. Preschool children should learn to identify beginning and ending sounds in words.  

7. Preschool children should be taught how to manipulate small units of sounds such as syllables.  

8. Preschool children should use visual props when learning phonological awareness.  

9. Preschool children should learn phonological awareness in a particular sequence.  

10. Preschool children should learn phonological awareness skills from explicit explanation, modeling, and support.  

11. In allowing children to develop awareness of speech sounds on their own is more supportive of their literacy development than teacher-directed.  

12. Teachers should regularly assess children’s literacy and language development.  

13. Young children’s ability to manipulate speech sounds will affect their ability to learn to read and spell in the early years.  

14. Devoting specific time to explicit and structured word play is developmentally appropriate.
15. Phonological awareness is best learned by merely exposing children to nursery rhymes and songs that rhyme.

16. Direct instruction in how to manipulate speech sounds should not be done until elementary school.

Hindman & Wasik, 2008; Cunningham et al., 2015

## Educator Self-Efficacy Scale

“Efficacy” refers to your feelings of being able to enact change or to be effective/successful with various tasks. I am interested in your opinions regarding each statement. Fill in the bubble of the number that matches your feelings of effectiveness.

<table>
<thead>
<tr>
<th>Statement:</th>
<th>No feelings of efficacy</th>
<th>Very little feelings of efficacy</th>
<th>Moderate feelings of efficacy</th>
<th>Feelings of efficacy</th>
<th>Very strong feelings of efficacy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instructional Self-Efficacy</td>
<td></td>
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</tr>
<tr>
<td>1. How much can you do to get through to the most difficult children?</td>
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<tr>
<td>2. How much can you do to promote learning where there is a lack of support from home?</td>
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<tr>
<td>3. How much can you do to increase children’s memories of what they have learned?</td>
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<tr>
<td>4. How much can you do to motivate children who show low interest in learning activities?</td>
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<tr>
<td>Question</td>
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<tr>
<td>5. How much can you get children to work together?</td>
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<tr>
<td>6. How much can you do to overcome the influence of adverse community conditions on children’s learning?</td>
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<tr>
<td>7. How much can you do to promote the language and literacy development of the most challenging students?</td>
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<tr>
<td>8. How much can you do to keep students on task?</td>
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</tr>
</tbody>
</table>

NICHD Study of Early Child Care; Bandura, 1986
Appendix L

PD Fidelity Adherence Checklist

<table>
<thead>
<tr>
<th>Fidelity Adherence ALT Treatment Checklist</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SESSION 1</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>PD Delivery</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Facilitator used results from the Learner Needs and Resource Assessment to guide the opening discussion of the educators’ experiences with PA.</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>2. Facilitator used the pretest assessment as a springboard for discussion regarding varying perspectives pertaining to PA.</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>3. Time was allocated for educators to identify their own learning objectives for the session.</td>
<td></td>
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</tr>
<tr>
<td>4. Facilitator allowed time for educators to complete an opening journal prompt reflecting on the content of current PA practices.</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>5. Facilitator used a PPT to introduce PA content.</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>6a. Educators participated in paired practice teaching episodes pertaining to PA skills and components.</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>6b. During the paired sessions (randomly select 5 pairs to observe):</td>
<td></td>
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</tr>
<tr>
<td>Pair 1 <em>(place a ( \sqrt{___} ) under to yes or no)</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Educators were offered various skills to practice</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B. Educator 1 practiced new skills</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Educator 2 provided feedback</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Educator 2 practiced new skills</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E. Educator 1 provided feedback</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pair 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Educators were offered various skills to practice</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B. Educator 1 practiced new skills</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Educator 2 provided feedback</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Educator 2 practiced new skills</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E. Educator 1 provided feedback</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pair 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Educators were offered various skills to practice</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B. Educator 1 practiced new skills</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Educator 2 provided feedback</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Educator 2 practiced new skills</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Pair 4
A. Educators were offered various skills to practice
B. Educator 1 practiced new skills
C. Educator 2 provided feedback
D. Educator 2 practiced new skills
E. Educator 1 provided feedback

Pair 5
A. Educators were offered various skills to practice
B. Educator 1 practiced new skills
C. Educator 2 provided feedback
D. Educator 2 practiced new skills
E. Educator 1 provided feedback

7. Facilitator interacted a minimum of 5 pairs providing:
(\text{\bf{place a \checkmark under to yes or no}})
- Modeling
- Feedback
- Probing questions

8. Facilitator allowed time for educators to complete a 5-10 minute quick write regarding the shared practice experience.
9. Educators were given time to share the paired experiences.
10. Educators set goals for implementation of newly learning skills in everyday practice.
11. Facilitator allowed time for educators to complete a reflective closing journal prompt.
12. Facilitator provided a summary of the discussions that took place during Session 1.
13. Educators completed the engagement survey.
### PD Fidelity Adherence Checklist

<table>
<thead>
<tr>
<th>Fidelity Adherence Control Checklist</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SESSION 1</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>PD Design</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Facilitator allowed time for introductions of educators.</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>2. Facilitator gave an overview of the PD sessions.</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>3. Facilitator allowed time for educators completed an opening journal prompt reflecting on the content of current PA practices.</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>4. Educators charted ideas from their journal onto chart paper.</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>5. Facilitator guided a large group discussion pertaining to ideas posted on the chart paper.</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>6. Facilitator used a PPT to introduce PA content.</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>7. Educators participated in a Make and Take session creating X activities related to PA.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Educators were offered various PA skills to make</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B. Educators selected 3-5 PA activities to make</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Educators worked in small groups to make activities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Educators were provided with a packet to store materials</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E. Educator 1 provided feedback</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Facilitator interacted with educators providing:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Materials for making the activities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feedback pertaining to questions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Probing questions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Educators were given time to share after the make and take.</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>10. Facilitator allowed time for educators to complete a closing journal prompt.</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>11. Educators set goals for implementation of Make and Take activities into everyday practice.</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>12. Facilitator provided a summary of the content of Session 1 PD.</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>13. Educators completed the engagement survey.</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Fidelity Adherence Checklist - Both Conditions</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
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<td>----</td>
</tr>
<tr>
<td><strong>SESSION 1</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>PD Content</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Educators completed pretest assessments prior to the start of the PD.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Facilitator defined emergent literacy.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Facilitator presented the key components of emergent literacy. (place a √ under to yes or no)</td>
<td></td>
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</tr>
<tr>
<td>A. Oral language</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B. Phonological awareness</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Concepts of print</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Alphabet knowledge</td>
<td></td>
<td></td>
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<tr>
<td>E. Comprehension</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F. Writing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Facilitator introduced ‘phon’ words.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Facilitator defined the ‘phon’ words.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Facilitator introduced PA continua/trajectories.</td>
<td></td>
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<tr>
<td>7. Facilitator introduced each PA skill and components. (place a √ under to yes or no)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Word awareness</td>
<td></td>
<td></td>
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<tr>
<td>B. Rhyming</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Syllable awareness</td>
<td></td>
<td></td>
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<tr>
<td>D. Alliteration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E. Onset-rime</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F. Phonemic Awareness</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Facilitator discussed the significance of PA skills and components to future reading success.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Facilitator presented the features of English orthography. (place a √ under to yes or no)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. The 4 languages of origin.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B. The features of words.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Examples for each.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Facilitator provided evidence-based research that supports the implementation of PA skills and strategies in preschool.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Facilitator presented PA instructional strategies.</td>
<td></td>
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</tr>
<tr>
<td>11. Facilitator discussion the Ohio Early Learning Development Standards specific to PA.</td>
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</tbody>
</table>
Appendix M

PD Design Questionnaire

Educator Name: _____________________________________

Today’s Date: ____________________

Educator ID: _______________________

These questions are related to your perception of your learning experience in the current PD session. Please mark your response to each question to the best of your ability. Your responses are completely confidential. The information will be used for research purposes only.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree or Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The climate in this PD can be described as collaborative.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>2. The life and work experiences that motivated me for this learning experience were respected.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>3. I felt I had control over my learning in this learning experience.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>4. I was encouraged to set my own individual learning objectives.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>5. My life and work experiences were a regular part of this learning experience.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>6. The facilitator developed strong rapport with the educators in this PD.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

Continued
<table>
<thead>
<tr>
<th>7. I was satisfied with the extent to which I was an active partner in this learning experience.</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>8. Sufficient steps were taken to prepare me for this learning experience.</td>
<td></td>
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<tr>
<td>9. I felt that my life and work experiences were respected in this learning situation</td>
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<tr>
<td>10. The facilitator relied too heavily on lecture during the PD.</td>
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<tr>
<td>11. I felt I had a role to play in my own learning during this learning experience.</td>
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<tr>
<td>12. As the PD experience progressed, I felt less dependent on the facilitator for my learning.</td>
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<tr>
<td>13. I understood how my new learning related to my prior life and work experiences.</td>
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</tr>
<tr>
<td>14. I had important life/work issues that were ignored in this learning experience.</td>
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<tr>
<td>15. I felt my life and work experiences were a resource for this learning.</td>
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<tr>
<td>16. The way I was prepared for this learning experience gave me the confidence I needed.</td>
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<tr>
<td>17. There was an adequate amount of dialogue with the facilitator of the PD regarding my learning needs.</td>
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</tr>
<tr>
<td>18. The facilitator adequately worked with me on identifying my specific learning needs.</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>19. There were adequate opportunities given to learners to identify learning gaps.</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>20. There were mechanisms in place to collaboratively design which learning activities would be used.</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>21. The facilitator/instructor was open to changing the design of the learning experience based on feedback from learners.</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>

Wilson, (2005) and Holton et al. (2009)