RESEARCH ARTICLE

Preschool Teachers' Sensitivity to Early Literacy Milestones in Play

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Play is a primary vehicle for learning in early childhood classrooms. Therefore, teachers must be attuned to the way play supports children's progress towards meeting developmental milestones, such as those described in Early Learning and Developmental Standards (ELDS). Using a semi-structured interview protocol, eight early childhood educators were shown two vignettes of children at play and asked to identify evidences of literacy development and which ELDS those evidences indicated. Teachers were also asked to develop an instructional extension. Teachers were largely able to identify evidence of literacy development using vignettes and envision evidence-based pedagogical extensions to advance children's learning, though this was most evident in the areas of phonological awareness and alphabet knowledge and least evident in areas related to engagement and comprehension. Implications for teacher education and professional development are provided.

Keywords: teacher knowledge, literacy, early childhood, standards

INTRODUCTION

Teacher knowledge is consistently identified as a professional requirement for teachers (National Association for the Education of Young Children [NAEYC], 2020a; National Board for Professional Teaching Standards, 2016; International Literacy Association & National Council of Teachers of English, 2017). While a great deal of work has been done in this area, more is needed. Much of the research on teacher knowledge has addressed how well teachers can demonstrate their content knowledge on domain-specific assessments (Bos et al., 2001; McCutchen et al., 2002; Moats & Foorman, 2003), few studies have addressed preschool teachers and students (Crim et al., 2008; Cunningham et al., 2015; Piasta et al., 2020; Schacter et al., 2016), even fewer have addressed the role teacher knowledge plays during play-based learning (Bubikova-Moan et al., 2019; Hunter & Walsh, 2014), and no studies known to the authors have considered the role of teacher knowledge in identifying student strengths and needs. We hope to contribute to closing these gaps with this research study.

In this study, we were interested in exploring how well preschool teachers were able to identify early literacy developmental milestones in children's play, connect these milestones to Early Learning and Development Standards (ELDS), and plan reasonable learning-rich extensions that built on children's developmental readiness. We explored these questions in a semi-structured interview format using vignettes of children at play. Developing a better understanding of how sensitive teachers are to content-specific milestones evident in children's play and how well they can individualize learning extensions to support students is important in understanding how well teachers *utilize* content knowledge instructionally in their classrooms (Shulman, 1986; Snow et al., 2005). We purposefully use the term "sensitive" to capture the range of teacher ability to notice and respond to students' play. We consider this play to be a stimulus in the environment to which teachers have varying capacity to sense and respond. We believe this sensitivity is a precursor to effective instruction in early childhood environments given the centrality of play and the need for teachers to respond to anecdotal evidence of literacy development demonstrated in play. This renewed understanding has implications for teacher preparation programs and inservice professional development as we seek to support teachers in not only acquiring knowledge but in flexibly *using* knowledge to support students' continuous growth and doing so in such a way that is sensitive to varying needs. Next, we will describe the knowledge of the science of reading early childhood teachers need to deliver effective and appropriate instruction, the role of Early Learning and Development Standards (ELDS) in early education, why play-based learning is necessary, effective, and even crucial for our youngest learners, and explore a theoretical framework of teacher knowledge.

The Science of Reading in Early Childhood Education

The science of reading is the accumulated body of research that demonstrates how individuals learn to read and best practices for reading instruction. Several theories have emerged to capture the many concurrent skills that are necessary to read successfully, such as the Simple View of Reading (Gough & Tunmer, 1986), Scarborough's reading rope (2001) and, most recently, the Active View of Reading (Duke & Cartwright, 2021). What each of these theories has in common is an emphasis on the necessity of both strong oral language and word recognition skills to be a proficient reader. Scarborough's reading rope and the active view also draw attention to the necessity of other skills such as comprehension strategies, concepts of print, alphabet knowledge, phonological awareness, motivation and engagement, and the reciprocal nature of reading and writing. Early childhood teachers must be well versed in how language and literacy relate to one another and the many diverse skills young children must enact simultaneously to read proficiently. One resource to support early childhood professionals in understanding the skills necessary and appropriate for young children are states' Early Learning and Development Standards (ELDS). ELDS are developed to capture developmentally appropriate literacy standards, based on the science of reading, that early childhood teachers should support young children in attaining.

Early Learning and Development Standards

ELDS are fundamental tools that identify developmental milestones for young children across developmental domains and content areas, including early literacy (NAEYC & NAECS/SDE, 2002; Petersen et al., 2008). In the United States, all fifty states have developed state-specific ELDS documents as have many nations across the world. These essential resources were designed in part to support early childhood educators knowledge of important age-specific goals for children's development and learning so this knowledge could be used to identify instructional practices that best support individual student learning (NAEYC & NAECS/SDE, 2002; Scott-Little et al., 2003). Teachers can see ELDS come alive in numerous ways in early childhood classrooms including planned curricular experiences and naturalistic (unplanned) moments during children's spontaneous play (Gronlund, 2006). While ELDS should play a central role in the assessment and curriculum process for planned curricular experiences (Gronlund, 2006; Sumrall & Jordan, 2021), teachers may be less likely to notice or identify ELDS in children's play.

Play-Based Learning and Assessment

Play is essential to young children's development because it has been repeatedly shown to contribute to children's cognitive, physical, social, and emotional development and overall well-being (Ginsburg, K. R. & Committee on Communications and the Committee on Psychosocial Aspects of Child and Family Health, 2007; NAEYC, 2020b; VanHoorn et al., 2015). Play has been highly regarded as a developmentally appropriate approach to early childhood education because it promotes active, meaningful, and joyful learning (NAEYC, 2020b); therefore, it is critical that early childhood teachers maximize opportunities for play to promote important learning goals such as those identified in ELDS. Early childhood teachers must become adept at identifying ELDS, including language and literacy standards, during play in order to appropriately assess children's progress towards reaching ELDS and plan appropriate extensions for learning (Gronlund, 2006; Moyles, 1989; VanHoorn et al., 2015). In order for teachers to be skilled at identifying ELDS in play, they must be knowledgeable about children's development.

Teacher Knowledge of Early Literacy: A Theoretical Framework

Much of the research centered around teacher knowledge is rooted in the groundbreaking work of Shulman (1986). He revolutionized the field by positing that knowledge was not one unified construct but instead composed of content knowledge (knowing what to teach), pedagogical content knowledge (knowing how to teach it), and curricular knowledge (knowing various instructional strategies and supports to teach it). Moreover, he conceptualized this knowledge may take the form of propositional (knowing principles of instruction), case (knowing specific previous similar instructional instances), or strategic (knowing when to apply particular instructional techniques) knowledge. Most studies of teachers' early literacy knowledge have focused on teachers' propositional content knowledge, specifically related to the linguistic aspects of literacy (Cunningham et al., 2009; Jordan & Bratsch-Hines, 2020; McCutchen et al., 2002; Moats, 1994, 1999; Moats & Foorman, 2003; Piasta et al., 2009) and most of that research has occurred in early elementary classrooms. As a whole this research indicates that teachers are not very

knowledgeable of the linguistic basis of language or how reading and writing develop. In fact, teachers tend to overestimate their own knowledge.

While most studies of early literacy knowledge have occurred in early elementary settings, a few have examined preschool teachers' knowledge, though again those studies examined teachers' knowledge of the linguistic basis of literacy (e.g., phonological awareness), through the use of questionnaires. As with teachers of older children, these studies universally identified low levels of teacher knowledge (Crim et al., 2008; Cunningham et al., 2015; Neuman & Cunningham, 2009; Schacter et al., 2016).

We feel confident that the attention to early childhood educators' literacy knowledge is warranted given the low levels of early childhood educator knowledge identified in previous studies (Crim et al., 2008; Schachter et al., 2016) and Piasta et al.'s (2020) findings of significant, positive associations between teachers' knowledge, their classroom practice, and children's learning. That is, teacher knowledge matters and it is a problem. What still remains to be determined, and why this study and others like it are necessary, is how well teachers are able to *utilize* knowledge in practice to determine student needs and provide appropriate instruction, often referred to as strategic pedagogical content knowledge (Shulman, 1986).

Strategic pedagogical content knowledge is the knowledge of *how* to teach and when to use which instructional techniques. To echo Neuman et al. (2000), teachers need not only know what to teach but how to teach it in developmentally appropriate ways. Studies heretofore that have attempted to examine teacher pedagogical content knowledge (e.g., Cunningham et al., 2015) have done so through the use of questionnaires which mitigates the ability to assess strategic knowledge and makes it difficult to determine if the knowledge therein assessed would be utilized in real teaching scenarios. We believe that the use of vignettes as we have done in this study, provides unique insight into teachers' knowledge and how that knowledge affects instruction. The vignette methodology employed in this study allows us to assess strategic pedagogical content knowledge and has previously been demonstrated to be a valid and reliable measurement technique (McCray & Chun, 2012).

The Present Study

Given the critical nature of early literacy development (Snow et al., 1998), the power of play-based learning (NAEYC, 2020b), and the powerful role of teacher knowledge (Darling-Hammond, 2000), it is essential that an investigation into how sensitive teachers are to literacy developmental milestones in children's play occur. Attention to the identification of literacy development during teaching scenarios could provide important insight into how teacher knowledge is used while teaching and have implications for teacher preparation programs and in-service professional development. The purpose of this study was to explore how well preschool teachers were able to identify developmental milestones in children's play, connect those milestones to ELDS, and plan reasonable learning-rich extensions that built on children's developmental readiness. This study addressed the following research questions: (a) how sensitive are teachers to literacy developmental milestones evidenced during children's play?; (b) how accurate are teachers at linking evidence of development with ELDS?; and (c) how well can teachers plan reasonable and

effective learning extensions based on witnessed play and identified development? In the following sections, we describe our context, participants, measures, and procedures.

METHODS

This study analyzed how well preschool teachers were able to detect evidence of literacy development in children's play and plan appropriate evidence-based extensions. Moreover, the teachers' ability to associate those evidences to particular developmental indicators and to broad subdomains of literacy development were investigated.

Context

Data were collected from teachers working within a state located in the southeastern United States. The state has a comprehensive set of ELDS that address five domains of children's learning and development, and includes a continuum of developmental indicators for children ages birth through kindergarten entry. The state has had a set of ELDS for over a decade at the time of data collection and numerous professional development opportunities related to using standards had been implemented across the state. This study focused on one specific domain of development, Language Development and Communication, which includes ELDS related to foundational skills for reading and writing.

We organized The Language Development and Communication domain from the state's ELDS into six **subdomains**, which are subtopics that fall within the domain. These subdomains included: 1) interest and motivation to read, 2) comprehension and use of information in books, 3) book knowledge, 4) phonological awareness, 5) alphabet knowledge, and 6) writing. Each of these subdomains is an important aspect of the science of reading and necessary for proficient reading development (Duke & Cartwright, 2021; Scarborough, 2001). Within each of these subdomains are **developmental indicators**, which are the specific statements of expectations for children's development and learning that are tied to particular age levels. Although the states' ELDS document includes developmental indicators for infants, younger toddlers, older toddlers, and younger preschoolers, we focused solely on development indicators for older preschoolers since our participants taught children in this age group (48 months - 60+ months). There were a total of 32 developmental indicators for older preschoolers that fell within one of the six subdomains previously identified.

Participants

Eight preschool teachers were interviewed for this study. All teachers were female and were working as a preschool teacher in a state-funded Pre-K classroom at the time of the interview. Every participant had obtained a Bachelor's Degree in Birth-Kindergarten and held a Birth-Kindergarten Teaching License. One teacher also had a degree in Elementary Education. On average, teachers had been working with young children for 11 years ($SD = 6.39$; Range = 18 years). The mean age of participants was 40.9 years ($SD = 11.92$; Range = 35 years). Two

participants self-identified as Black or African American and the remaining six participants self-identified as White.

Measure

The Preschool Literacy - Pedagogical Content Knowledge (PL-PCK) Interview Protocol was designed to investigate preschool teachers' ability to identify evidences of early literacy learning depicted in children's play and relate those to broad areas of literacy development, termed "subdomains" (e.g., *interest in and motivation to read*, *phonological awareness*, *writing*), and specific early literacy milestones, also referred to as developmental indicators (e.g., "make some sound-to-letter matches, using letter name knowledge") identified in the state's ELDS. The interview protocol was developed by the authors who share expertise in Early Literacy and ELDS. The protocol consists of a written description of two play scenarios, each containing multiple evidences of children engaging in early literacy in their play. The second scenario also included a child's work sample (i.e., a drawing that included some writing). Content validity of the semi-structured protocol was determined by three experts who all reviewed the protocol independently to examine the clarity of content and wording (e.g., wording and terminology are appropriate for targeted audience). Experts also reviewed the vignettes and independently coded them with relevant subdomains and developmental indicators from the state's ELDS. Discrepancies were discussed and revisions to the protocol were made until experts reached 100% agreement. The use of interviews with preschool teachers consisting of vignettes depicting children at play has previously been demonstrated as a valid and reliable means to measure teacher knowledge that "illuminates the kinds of teacher thinking that really matter for student learning" (McCray & Chen, 2012, p. 304). The authors ensured procedural fidelity by completing the first interview together and discussing any differences. For 25% of the remaining interviews, both authors transferred the interview protocol responses to separate analysis sheets and then calculated interrater reliability. 100% agreement was identified. Analysis sheets were then combined and analysis continued by determining the percentage of times each play example was identified for each subdomain across participants.

Scenario One. Scenario one can be found below, followed by an overview of early literacy examples in play as well as their associated developmental indicators and subdomains.

> While a recording of *The Name Game* as sung by Shirley Ellis (e.g. "Katie, Katie, bo-batie / Banana-fana fo-fatie / Fee-fy-mo-matie / Katie!) is being played, Nina, Emily, and Deshaun are in the music center. Nina beats on the drum in rhythm as Emily and Deshaun march around the center to the beat of the name game song clapping rhythm sticks. Suddenly, Nina says, "Hey, Deshaun! D-D-Deshaun sounds like d-d-dad!" Deshaun laughs and responds, "I'm not a dad! Once upon a time, I might be though!" Emily says, as she holds up the "D" page of an ABC book, "Yeah, Deshaun and Dad start with –d." Meanwhile, Anna and Jacob are in the dramatic play center pretending to be a waiter and a customer at a restaurant. Jacob hands Anna a telephone book and asks her what she would like to eat. She flips through the phonebook page by page, places her hand on a line, and asks for

spaghetti and meatballs. Jacob laughs, and responds that he will bring her pasghetti and peatballs as he draws a picture of spaghetti on a notepad. Anna laughs and says, "panks!"

In scenario one, 11 examples of early literacy can be identified in children's play. These examples can be associated with 18 specific developmental indicators (DIs) across six subdomains related to early literacy. For example, in scenario one, participants may have identified "Anna turning the pages in a phone book when ordering food" as an example of early literacy depicted in play. Participants could have associated this play example with two developmental indicators: (a) hold a book upright while turning pages one by one from front to back and/or (b) demonstrate understanding of some basic print conventions. Both of the play examples and corresponding developmental indicators were associated with the *Book Knowledge* subdomain. In order to provide further context, we have selected one play example from each of the six subdomains and identified a corresponding developmental indicator (see Table 1).

Table 1

Selected Play Examples from Scenario One

Selected Play Examples from Each Subdomain	Associated Developmental Indicator	Subdomain
Jacob and Anna use the telephone book as a menu	Use and share books and print in their play	Interest and Motivation to Read
Emily references ABC book to confirm Deshaun/dad start with the letter "d"	Use informational texts and other media to learn about the world, and infer from illustrations, ask questions and talk about the information	Comprehension and Use of Information in Books
Anna points at a particular line in the phone book when ordering	With prompting and support, run their finger under or over print as they pretend to read text	Book Knowledge
Children say "pasghetti," "peatballs" and "panks"	Enjoy rhymes and wordplay, and sometimes add their own variation	Phonological Awareness
Emily says "Deshaun" and "dad" start with the letter "d"	Show they know letter function to represent sounds in spoken words	Alphabet Knowledge
Jacob draws a picture of spaghetti to record information	Represent thoughts and ideas in drawings and by writing letters or letter-like forms	Writing

Scenario Two. Scenario two, which can be found in Figure 1, included a description of children at play as well as a child's work sample (i.e., a drawing that included some writing). In scenario two, 13 examples of early literacy could be identified in children's play. These examples could be associated with 19 specific developmental indicators (DIs) across five subdomains related to early literacy (scenario two did not include examples of phonological awareness). In Table 2, we have selected one play example from five subdomains and identified a corresponding developmental indicator to provide additional context.
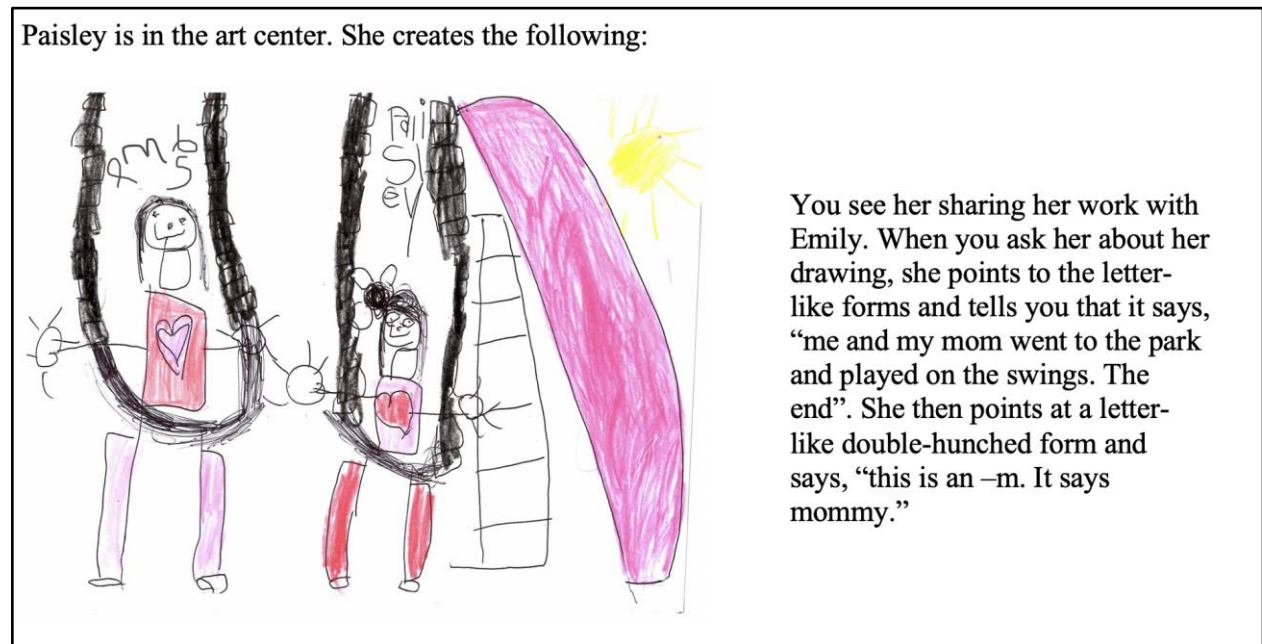
Figure 1.

Scenario Two Description and Work Sample

Paisley is in the art center. She creates the following:

You see her sharing her work with Emily. When you ask her about her drawing, she points to the letter-like forms and tells you that it says, "me and my mom went to the park and played on the swings. The end". She then points at a letter-like double-hunched form and says, "this is an –m. It says mommy."

Table 2

Selected Play Examples from Scenario Two

Selected Play Examples from Each Subdomain	Associated Developmental Indicator	Subdomain
Paisley shares her work with Emily	Use and share books and print in their play	Interest and Motivation to Read
Inclusion of "The End"	Imitate the special language in storybooks and story dialogue with accuracy and detail	Comprehension and Use of Information in Books
Points to letter-like forms to	Recognize print in different forms for a	Book Knowledge

"read" the writing	variety of functions	
Identification of "m" and says "It says mommy."	Try to connect the sounds in a spoken word with letters in a written word (write "M" and say, "This is Mommy.")	Alphabet Knowledge
Child's name is written on her work	Use known letters and approximations of letters to write their own name and some familiar words	Writing

Procedure

Each interview was conducted by one of the co-authors in a quiet place away from distractions and was recorded and transcribed. The first interview was conducted by both PIs to ensure reliability. Before beginning each interview, the teachers were provided with the Preschool Literacy - Pedagogical Content Knowledge (PL-PCK) Interview for Teachers packet.

This packet included (a) a listing of the subdomains of literacy applicable to this study (e.g., *interest in and motivation to read*, *phonological awareness*, *writing*), (b) the Literacy developmental indicators for older preschoolers from the state's ELDS, and (c) two scenarios depicting young children engaging with literacy at play. Teachers were asked to look through the packet and told:

> "In these two scenarios, children are engaging in free play in a preschool classroom. I want you to read through them and see if you can see any evidence of literacy development in their play. When I say literacy development, I'm defining it very broadly. So I mean things like (gesture to list on teacher's packet): Interest in and motivation to read, Comprehension and use of information in books, Book knowledge, Phonological awareness, Alphabet knowledge, Writing. So the definition of "what is literacy" is very broad, OK? Also in your teacher packet you will notice a list of Early Literacy developmental indicators (DIs) for older preschoolers from the [state's ELDS]. Please take a moment to look over these subdomains of Literacy Development and Literacy developmental indicators on the first two pages of your teacher packet."

While each teacher read, the interviewer also read the pages in the packet to ensure adequate time for reading. The interviewers then reminded each teacher that, "this interview is not about right or wrong answers—it helps us understand how preschool teachers think about literacy development in children's play." For the first scenario, mutual understanding of the reference to the Name Game song was ensured by forewarning teachers and jointly listening to a brief clip. Then, teachers were asked to read through the scenario independently and then a second time with the interviewer. Finally, we asked each teacher, "where do you see any evidence of literacy development in this play?"

As each example of literacy development was identified, the interviewer marked it on the interview guide and followed up with "Do you see a developmental indicator from the list in your packet demonstrated by your example?" and "If you had to describe this literacy development using these terms (point to list of subdomains of Literacy Development in the teacher packet), how would you describe it?" After each example was identified, teachers were told, "Some people see only one example of literacy development, while some people see more. Do you see any other evidence of literacy development in this play?" This questioning process continued until either all evidences of literacy development were identified, the teacher was no longer responding productively, or there was other evidence of frustration. Lastly, teachers were asked, "If you wanted to extend the children's literacy development, what might you ask them or suggest?"

This interview protocol was then repeated for the second scenario. For the second scenario, teachers were reminded that they may see evidence of literacy development in either the description of the scenario and/or in the student's work sample depicted in the scenario.

Data Analysis

The data from the scored interview protocols were transferred to an analysis sheet where each play example and associated developmental indicator (DI) and literacy subdomain were placed on their own line. Play examples associated with multiple DIs were listed with each associated DI to credit teachers for identifying that some play events simultaneously indicate attainment of multiple DIs. For example, there are three examples of *phonological awareness* in scenario one, thus the researchers determined the percentage of participants who accurately identified all, two, one, or none of these play examples. Finally, since participants were only asked to associate a DI and subdomain if a play example was identified, the percentage of times a DI or subdomain, respectively, was identified out of the total possible opportunities across participants for each subdomain was calculated. For example, a participant who identified all three examples of *phonological awareness* in scenario one would have a total opportunity to identify five developmental indicators and to match each of those five to the subdomain *phonological awareness*. This number for each participant was then summed across participants to determine the total opportunity. The percentage of times an accurate DI or subdomain was identified was then calculated across participants.

RESULTS

The results of this study, which are summarized in Table 3, are reported sequentially across each of the literacy subdomains identified from the state's ELDS. Within each subdomain, results from each scenario will be reported in turn. Within each scenario, the identification of play examples will first be reported followed by the percentage of accurately identified DIs and subdomains. It is important to remember in interpreting these results that the opportunity to identify a DI and subdomain was only available in those instances when an example of play for that subdomain was identified. That is, teachers were not penalized for not associating a play example with a DI or subdomain if they were not able to identify the play example. After reporting results across each subdomain, the potential extensions identified by teachers across subdomains will be discussed.

Table 3

Summary of Results by Subdomain

Subdomain	Scenario	Number of Examples in each Scenario	Number of Participants Identifying Examples ($n = 8$)	Percent Accuracy in Connecting Identified Play to Developmental Indicator (DI)	Percent Accuracy in Connecting Identified Play to Subdomain
Interest and Motivation to Read	Scenario 1	2 Examples	0 Examples = 1 1 Example = 5 2 Examples = 2	67%	33%
	Scenario 2	1 Example	0 Examples = 5 1 Example = 3	33%	100%
Comprehension and Use of Information in Books	Scenario 1	2 Examples	0 Examples = 4 1 Example = 2 2 Examples = 2	67%	83%
	Scenario 2	1 Example	0 Examples = 3 1 Example = 5	60%	40%
Book Knowledge	Scenario 1	2 Examples	0 Examples = 2 1 Example = 3 2 Examples = 3	92%	75%
	Scenario 2	1 Example	0 Examples = 1 1 Example = 6 2 Examples = 1	25%	38%
Phonological Awareness	Scenario 1	3 Examples	0 Examples = 0 1 Example = 0 2 Examples = 5 3 Examples = 3	91%	100%
	Scenario 2	0 Examples	N/A	N/A	N/A
Alphabet Knowledge	Scenario 1	1 Example	0 Examples = 2 1 Example = 6	90%	80%
	Scenario 2	3 Examples	0 Examples = 0 1 Example = 1 2 Examples = 5 3 Examples = 2	92%	100%
Writing	Scenario 1	1 Example	0 Examples = 1 1 Example = 7	100%	75%
	Scenario 2	6 Examples	0 Examples = 2 1 Examples = 2 2 Examples = 0 3 Examples = 0 4 Examples = 3 5 Examples = 0 6 Examples = 1	100%	100%

Interest in and Motivation to Read

Scenario One.   There were two examples of children demonstrating the subdomain *interest and motivation to read* in their play in scenario one. One example is when Emily shows another child the "D" page of an alphabet book and the other is when children use a telephone book as a menu in their dramatic play. Over half of participants (*n* = 5) identified at least one example, two participants identified both play examples, and only one participant identified no examples. Both of these play examples were associated with the same developmental indicator (i.e., use and share books in their play). Out of the nine opportunities for the developmental indicator or the subdomain to be identified, the developmental indicator was accurately identified 67% of the time and the subdomain was identified 33% of the time.

Scenario Two.   Only one example of the subdomain *interest and motivation to read* was depicted in children's play in scenario two. This was captured when a child shared her artwork that included words and illustrations with another child. Few participants accurately identified this play example (*n* = 3). Out of the three opportunities for the associated developmental indicator (i.e., use and share books in their play) or subdomain to be identified, the correct developmental indicator was identified 33% of the time and the subdomain was identified 100% of the time.

Comprehension and Use of Information in Books

Scenario One.   There were two literacy examples in scenario one that were indicative of the subdomain *comprehension and use of information in books*. These play examples were the use of the literary language "once upon a time" and the use of an alphabet book to confirm a phoneme-grapheme match. Half of the participants did not identify either play example, two identified both play examples, and the remaining two identified one of the play examples. Each of the two play examples was related to one distinct developmental indicator (i.e., "imitate the special language in storybooks and story dialogue with accuracy and detail" and "use informational texts and other media to learn about the world, and infer from illustrations, ask questions and talk about the information"). Out of six opportunities for a developmental indicator or subdomain to be identified, 67% of the time an accurate developmental indicator was identified and 83% of the time the accurate literacy subdomain was identified.

Scenario Two.   There was one literacy example in scenario two that was indicative of *comprehension and use of information in books*, e.g., the inclusion of "the end". Five out of eight participants were able to identify this example of literacy in play. Out of the five opportunities for a developmental indicator or subdomain to be identified, 60% of the time an accurate developmental indicator was identified and 40% of the time the accurate literacy subdomain was identified.

Book Knowledge

Scenario One.   There were two examples of children demonstrating the subdomain *book knowledge* in their play in scenario one. Out of the eight participants, three identified one example, three identified both examples, and two were unable to identify any examples. Both of the examples associated with the *book knowledge* subdomain were each linked to two developmental indicators. For example, a child that pointed at a particular line in a phone book when ordering food during dramatic play demonstrated evidence of two developmental indicators: (a) "demonstrate understanding of some basic print conventions (the concept of what a letter is, the concept of words, directionality of print)" and (b) "with prompting and support, run their finger under or over print as they pretend to read text." Out of the twelve opportunities for a developmental indicator or subdomain to be identified, a developmental indicator was associated with the examples 92% of the time and the accurate subdomain was identified 75% of the time.

Scenario Two.   There were also two examples of children demonstrating the subdomain *book knowledge* in their play in scenario two. Six out of eight participants accurately identified one of the two play examples, one participant identified both examples, and one participant identified no examples. Each play example was associated with a distinct developmental indicator. For example, in scenario two when the child points to the letter-like forms and "reads" the writing, this evidence was associated with the developmental indicator that states, "recognize print in different forms for a variety of functions." Out of the eight opportunities for a developmental indicator or subdomain to be identified, a developmental indicator was only identified a quarter of the time and the literacy subdomain was identified 38% of the time.

Phonological Awareness

Scenario One.   There were three examples in scenario one that were indicative of *phonological awareness*. All eight participants identified at least two play examples. Five participants identified two play examples while the remaining three participants identified all three examples. Because one play example was linked to two DIs (that is, comparing the names Deshaun and dad and asking for pasghetti and peatballs were both associated with the DI "play with the sounds of language, identify a variety of rhymes, and recognize the first sounds in some words"), there were twenty-three opportunities for a DI or subdomain to be listed. Out of those twenty-three opportunities, the accurate DI was identified 91% of the time and the accurate subdomain was identified 100% of the time.

Scenario Two. There was no evidence of *phonological awareness* in scenario two.

Alphabet Knowledge

Scenario One.   There was one example in scenario one that represented *alphabet knowledge* (i.e., noticing that Deshaun and dad both begin with the letter -d). Six out of eight participants were able to identify this play example. Because this one play example was linked to three DIs (i.e., "show they know that letters function to represent sounds in spoken words", "make some sound-

to-letter matches, using letter name knowledge", and "associate sounds with the letters at the beginning of some words, such as awareness that two words begin with the same letter and the same sound"), out of ten opportunities for a DI or subdomain to be listed, an accurate DI was identified 90% of the time and the accurate subdomain was identified 80% of the time. In the instances when the incorrect subdomain was named, *phonological awareness* was universally the inaccurate subdomain selected.

Scenario Two.   There were three examples in scenario two that related to *alphabet knowledge* (i.e., writing their name, identifying the letter -m, and stating that the -m says "mom"). All eight participants were able to name at least one of these play examples. One participant was only able to name one example, two were able to identify all three examples, and five were able to identify two play examples. Because two play examples were linked to more than one DI, out of twenty-six opportunities for a DI or subdomain to be listed, a DI was identified 92% of the time and the accurate subdomain was identified 100% of the time.

Writing

Scenario One.   There was one example of children demonstrating the subdomain *writing* in their play in scenario one and nearly all participants ($n = 7$) correctly identified this example. The play example (i.e., Jacob drawing a picture of spaghetti to record information) was associated with two developmental indicators (i.e., "represent thoughts and ideas in drawings and by writing letters or letter-like forms" and "independently engage in writing behaviors for various purposes"). Out of the eight opportunities for a developmental indicator or subdomain to be identified, a developmental indicator was associated with the examples 100% of the time and the accurate literacy subdomain was identified 75% of the time.

Scenario Two.   Six distinct evidences of *writing* could be identified by participants in scenario two (e.g., use of letter-like forms, name is written on artwork, use of multiple writing tools, etc.). Out of the eight participants, three identified half of the examples, two identified one example, two identified no examples, and only one participant identified all six examples. Out of the sixteen opportunities for the identification of a developmental indicator or subdomain, an accurate developmental indicator was identified 67% of the time and the accurate subdomain was identified 75% of the time.

Extensions

Given our small sample size, we have opted to share with you the transcribed responses of each participant in Tables 4 and 5. From these responses, the breadth of possible extensions is visible as well as the variety across teachers.

Scenario One.   Teachers were consistently accurate when identifying subdomains, when a response was provided, and were largely cognizant that their extensions targeted multiple subdomains simultaneously. Moreover, these extensions never relied on a textbook or program, but consistently evolved from the play described in the scenario itself. Four participants relied on

oral interactions, largely revolving around questioning the students to extend their literacy development, while two participants described changes they could make to centers/interest areas to support students' continued growth. The final two participants described integrating physical activities (i.e., looking at a menu and taking dictation of what students are ordering) with oral discussion (i.e., identifying initial sounds to advance learning). It is important to note that while most of the responses are detailed, one participant does reference, "just ask[ing] them open-ended questions" without specifying any specific examples of what she might ask.

Table 4

Participant Extensions in Response to Scenario One

Participant	Transcribed Response	Subdomain Identification
P1	Uh, what's your name? What letters it starts with. What sound is that? Is that, uh—are there any other words that start with that sound that you can think of?	Alphabet Knowledge
P2	I guess I'd probably get me a notepad in that center 'cause kids will write in their notepads, and probably do a mini search around the classroom, what can we find that has a D like in Deshone's name.	Interest; Alphabet; Phonological Awareness; Writing
P3	I would just ask them open-ended questions and just depending on what their answers are, or what my next questions might be. Whatever they're bringing me. 'Cause sometimes they'll surprise you and know things.	Writing; Phonological Awareness
P4	Well, maybe you can extend and make a restaurant. We could make signs. We'd use that. We'll find pictures of spaghetti and write it down. Have things labeled so that they could see the words and stress the correct words, the correct sound of the words. Do it in a fun way. Maybe create a menu based on that that has pictures and words. I have somethin' similar like that in my dramatic play area over there.	Writing; Phonological Awareness
P5	I think I would go with the rhyming words, and then encourage them to—I think it's always funny to do rhyming words with kids and let them know that it's okay to do nonsensical words because they are astounded by that because they want to follow our rules. They think that's not quite okay. I think I would do some—because I think kids just love rhyming.	Phonological Awareness
P6	I mean, just to mix it up with the D, I might give an example	Phonological

	of my name or any of their other friends in the classroom. Maybe the friends in that center they're with, give an example there. If there are menus in the center, then we could look at a menu and we could look at words about certain types of food, how those words are started with what letter, what sounds they make, beginning sounds. Jacob was talkin' about drawin' a picture of spaghetti. I could try to get them to elaborate a little bit more just asking questions. Again, I could use the notepad to write down what they say about—I mean, if they had a story or just any way they elaborated, I could document it.	Awareness; Alphabet Knowledge; Comprehension and Use of Information in Books; Book Knowledge
P7	I guess where they said, Nina said, "Deshawn, d-, d-, Deshawn sounds like d-, d-, dad." You can ask what other words have a d-, d- sound. Or with Emily, when she holds up the D page of a book, "Yeah, Deshawn and dad start with D," you could ask her what other words start with D."	No response
P8	I like to do this a lot, but I'll play with the sounds to be silly, but it helps them understand the connection. Like what about j-j-jump rope. They'll be like, "yeah, that sounds the same." Then I'll be like, "Okay, what about j-j-joffee," like a coffee. They'll be like, "No, that's not right. Just to help them understand that sound, to help them start thinking about things that are family, that matches that sound. Does that make sense? I can go talk about the spaghetti and meatball and a notepad. Another extension of that I might do is once he draws the picture, then I write the word. Write the words of what he's ordering. That way he can associate the picture with the words, the text and that will help him develop the meaning of print.	Phonological Awareness; Alphabet Knowledge; Writing

Scenario Two. As seen in Table 5, the extensions provided by teachers for scenario two were by and large appropriate, relevant, and would support play-based literacy learning. A variety of extension activities targeted multiple subdomains, and all eight teachers correctly associated their extension with the *writing* subdomain. The majority of these extensions supported children in expanding their writing, often by using evidence-based strategies such as dictation, illustrating, and providing more detail. One teacher envisioned asking the child to sound out words relevant to the child's work.

Table 5

Participant Extensions in Response to Scenario Two

Participant	Transcribed Response	Subdomain Identification
P1	"...and maybe we would write out her thoughts, and then she could put her, um, letters or letter-like forms above each word since she said, "This is—this says me and my mom went to the park and played on the swing." So, I'm kind of scribing for her in her picture."	Writing
P2	"I'd probably see if she wanted to make this into a little book, make it into, yeah, a little book, add my parts to it. Well since this is the end of this story, what did you guys do before you went to the park and played at the swings, and probably develop her book that way, and have her write her sentences, and then again write them over in a note card. Yeah."	Interest In and Motivation to Read; Book Knowledge; Writing
P3	"Since she has done something like this I may ask her something else that she and mommy went to do, maybe ask her to sound out parts, that she knows that M starts with mommy. That she loves to draw pictures of her and her mommy, so I may ask for other things that they like to do. Maybe create another illustration of them going to the grocery, whatever she said, whatever her answer was."	Writing; Alphabet Knowledge; Interest In and Motivation to Read
P4	"That we maybe take that further and maybe write a story about what they did at the park. Maybe talk about what she likes to do other places. What's your favorite place—sorta just kinda give her scenarios and maybe have her dictate some things and draw about it while I write of course. Maybe even motivate her to share it with other classmates. We can write a book. We can write a story and illustrate it."	Phonological Awareness; Alphabet Knowledge; Writing
P5	"I would ask if there's anything else that Paisley would like to describe about what she and mom did. Does she want to write about that? Does she want to dictate that to me? Does she want me to write the word mommy and see if she would like to write it if she wants to form those letters? Then ask Emily, what are you interested in doing here? Do you want to—and even do you want to learn—do you know mom's name? If	Writing; Alphabet Knowledge; Phonological Awareness; Book Knowledge; Interest In and Motivation to

	you know momma's name is Debbie, have you ever written Debbie? Do you want to write Debbie? Do you want to make put this in a card for your momma and tell her how much you enjoy going to the park?"	Read
P6	I mean, we talked about elboratin' on her story but I mean, just encouragin' more details, I guess, in her story, furthering that. If she's able to write her name, she could potentially write her family's names or anything else about the story.	Interest In and Motivation to Read; Writing
P7	I guess, since she is older, try to get her to maybe move her name somewhere different where she could space out the writing of her name maybe.	Writing
P8	"I might encourage us to write other parts of the—you know, did the park have a name? Maybe we should make—maybe we should add that to your drawing so we know where you were, a lot of different things, but I'm gonna stick with that one."	Alphabet Knowledge; Phonological Awareness; Writing

DISCUSSION

A major conclusion of this study is that teachers are able to identify evidence of literacy development using vignettes and envision pedagogical extensions to advance their learning. This methodological tool may be valuable in future studies that assess teachers' pedagogical content knowledge. The current imbalance between early literacy studies that assess linguistic content knowledge (Moats, 1994; Piasta et al., 2009) and pedagogical content knowledge may be diminished by using similar methodology.

The subdomains in which teachers were relatively more or less successful in identifying literacy milestones in play and subsequently connecting those to developmental indicators in the state's ELDS were of primary interest to us. We will first discuss this rate of success subdomain by subdomain, then describe how generally successful teachers were in connecting those milestones to developmental indicators, and, finally, describe the extensions teachers envisioned to further student learning. We will then describe the implications of those findings for teacher education and end with the limitations and future directions for research.

Relative Accuracy Across Subdomains

The subdomains with which the teachers had the greatest rate of success were *phonological awareness* and *alphabet knowledge*, evidenced by all participants identifying at least one play example evidencing development in these subdomains. These findings were somewhat surprising

given the widely noted lack of phonological and orthographic knowledge among teachers of early literacy (Cunningham et al., 2015; Moats, 1994; Piasta et al., 2009; Piasta et al., 2020). It is possible that teachers may be more easily able to note evidence of phonological awareness development in play than they can manipulate phonemes themselves. This area is one for future research in which teachers' ability to identify phonological awareness development in play is measured at the same time as, and can be compared directly to, teachers' own phonological awareness.

The subdomains in which participants were least able to identify evidence of development in play were *interest in and motivation to read* and *comprehension and use of information in books*, evidenced by the majority of participants not identifying any milestones from these subdomains in at least one of the scenarios. We believe that these findings indicate a need for greater emphasis in teacher education on the ways in which young children engage with text, with literary language, and with various genres of text young children may explore. This reflects similar calls made by Ripp (2016) and the National Council of Teachers of English (2018), among others, for enhanced teacher education focused on children's literature. Moreover, the difficulty in accurately identifying which subdomain of literacy various milestones evidenced, even with a list of subdomains provided, attests to the need for more explicit teacher education on the components of literacy, particularly using terms commonly found in research reports (NELP, 2008; NRP, 2000) and ELDS documents.

Connecting to Developmental Indicators and Subdomains

We did not expect teachers to have memorized the developmental indicators and subdomains and, therefore, gave them a condensed copy. Nonetheless, we were surprised with how unfamiliar most teachers were with the developmental indicators and subdomains. On average, a matching developmental indicator and a matching subdomain were each identified less than three-quarters of the time, though there was significant variability on both features with a range of 33% - 100% across subdomains. When teachers were asked qualitatively about their familiarity with the ELDS document from which the developmental indicators and subdomains were taken, most indicated that they had heard of it, received some level of training on it, and had access to it somewhere within their classroom. Teachers also unanimously self-reported that the ELDS document was not something they had been provided much time or insight into how to use in relation to the children in their classrooms. They also all indicated that they would benefit from more professional development on what it means for them, their students and their teaching.

Planning Extensions Based on Play

Identifying evidence of early literacy development in children's play and connecting those to specific milestones, such as those described in ELDS, is an essential skill for teachers. More importantly, is what teachers do with this knowledge to further support children's continued growth and learning. In other words, we were interested in teachers' pedagogical content knowledge of *how* to teach. By and large, we found that teachers were able to plan reasonable literacy-rich extensions that were not not only appropriate, relevant, and based on evidence-based

teaching strategies, but extensions also directly expanded upon the play described in each of the scenarios. Furthermore, teachers were fairly accurate when identifying subdomains that their extension supported, and oftentimes recognized that their extension would support development across multiple early literacy subdomains. This finding is particularly interesting given teachers' difficulty in relating evidence of literacy play to developmental indicators and subdomains in each of the play scenarios. It is important to note that a few teachers made more general comments, such as non-specific praise and asking open-ended questions without identifying evidence-based practices.

Implications

Findings from this study have important implications for Early Childhood Teacher Education programs in Institutions of Higher Education (IHEs) as well as professional development (PD) for in-service teachers. IHEs and PD should not only aim to increase teachers' early literacy content knowledge, but also their pedagogical content knowledge. The authors suggest IHEs and PD for in-service teachers incorporate opportunities for teachers not only to learn about their states' ELDS but also to use it for a variety of authentic purposes (e.g., observation, documentation, identification of milestones in children's play, curriculum development, etc.). Such practice would deepen teachers' understanding of the ELDS as having specific meaning for their own teaching with their particular students. Furthermore, courses and PD that are geared toward early literacy development should break down the subdomains of language and literacy explicitly to enhance content knowledge. This content knowledge will build a solid foundation for early literacy instruction.

An increased focus on early childhood education has led to the impetus of ELDS development around the world. Although ELDS vary greatly in their organization and content, countries use them for many of the same purposes as here in the United States, including professional development for in-service and pre-service teachers and curriculum development (Kagan et al., 2013). International audiences, and domestic alike, would benefit from a careful examination of their ELDS documents to ensure that all domains and content areas are represented and include not only important goals for development, but also a progression of milestones or developmental indicators that teachers can use to guide their instructional practices. Additionally, programs that utilize other standards documents, such as the Head Start Early Learning Outcomes Framework (HSELOF), would benefit from aligning their ELDS to their states' standards document. The alignment process can help those working in early care and education across systems to develop common expectations for children's development and identify areas where additional alignment is needed.

Limitations and Future Directions

This study has several limitations, not the least of which is our sample size. With only eight participants who were quite homogenous in terms of race, gender, education, and teaching placement, the generalizability of these findings must be limited to the population from which this sample was drawn. Nevertheless, we believe this study is an important first step to understanding

how well preschool teachers identify literacy milestones at play and can relate those to developmental standards.

This study used an interview format using vignettes of children at play, which allowed researchers to develop a better understanding of teachers' awareness of early literacy milestones in children's play and learn about ways teachers would extend learning. While this methodological approach is innovative, future studies could consider using videos of children at play to better understand teachers' content knowledge and pedagogical content knowledge. Additionally, the current study could be replicated with a larger and more heterogeneous sample to improve the generalizability of findings.

Conclusion

As one of the first studies to use vignettes of children at play to examine pedagogical content knowledge, we believe this study sets an important methodological precedent for future studies examining teacher pedagogical knowledge. Teachers' ability to identify evidence of literacy development in these scenarios and relate those to developmental indicators found in one state's ELDS provides important insight into how teachers can use anecdotal evidence to note progress and plan future instruction. These findings call for more research to investigate the connection between ELDS and classroom assessment and instruction. We believe investigation into teacher sensitivity to educational milestones evidenced in play may create new and fruitful professional development that spurs educational attainment.

REFERENCES

Annie E. Casey Foundation (2010), "EARLY WARNING! Why Reading by the End of Third-grade Matters" A KIDS COUNT Special Report from the Annie E. Casey Foundation. Baltimore, MD. Annie E. Casey Foundation.

Bos, C. S., Mather, N., Dickson, S., Podhajski, B., & Chard, D. (2001). Perceptions and knowledge of preservice and inservice educators about early reading instruction. *Annals of Dyslexia, 51*, 97-120. http://doi.org/10.1007/s11881-001-0007-0

Bubikova-Moan, J., Hjetland, H.N., & Wollscheid, S. (2019). ECE teachers' views on play-based learning: A systematic review, *European Early Childhood Education Research Journal, 27*(6), 776-800, http://doi.org/10.1080/1350293X.2019.1678717

Crim, C., Hawkins, J., Thornton, J., Rosof, H. B., Copley, J., & Thomas, E. (2008). Early childhood educators' knowledge of early literacy development. *Issues in Teacher Education, 17*, 17– 30.

Cunningham, A. E., Zibulsky, J., & Callahan, M. D. (2009). Starting small: Building preschool teacher knowledge that supports early literacy development. *Reading & Writing, 22*(4), 487–510. https://doi.org/10.1007/s11145-009-9164-z

Cunningham, A. E., Etter, K., Platas, L., Wheeler, S., & Campbell, K. (2015). Professional development in emergent literacy: A design experiment of teacher study groups. *Early Childhood Research Quarterly, 31*, 62–77. https://doi.org/10.1016/j.ecresq.2014.12.002

Darling-Hammond, L. (2000). Teacher quality and student achievement: A review of state policy evidence. *Education Policy Analysis, 8*(1), 1-44. http://doi.org/10.14507/epaa.v8n1.2000

Duke, N.K., & Cartwright, K.B. (2021). The science of reading progresses: Communicating advances beyond the simple view of reading. *Reading Research Quarterly*, 56*(S1), S25– S44*. https://doi.org/10.1002/rrq.411

Ginsburg, K. R. & Committee on Communications and the Committee on Psychosocial Aspects of Child and Family Health. (2007). The importance of play in promoting healthy child development and maintaining strong parent-child bonds. *Pediatrics*, *119*(1), 182–191.

Geary, D. C. (2005). Evolution and development of brain and cognition. In D. C. Geary (Ed.), *The origin of mind: Evolution of brain, cognition, and general intelligence* (pp. 83–124). American Psychological Association. https://doi.org/10.1037/10871-004

Gough, P.B., & Tunmer, W.E. (1986). Decoding, reading, and reading disability. *Remedial and Special Education, 7*(1), 6– 10. https://doi.org/10.1177/07419 32586 00700104

Gronlund, G. (2006). Make early learning standards come alive: Connecting your practice and curriculum to state guidelines. St. Paul, MN: Redleaf Press.

Hunter, T. & Walsh, G. (2014). From policy to practice?: The reality of play in primary school classes in northern Ireland. *International Journal of Early Years Education, 22*(1):19 - 36. https://doi.org/10.1080/09669760.2013.830561.

International Literacy Association and National Council of Teachers of English (2017). *Literacy teacher preparation* [Research advisory]. Newark, DE; Urbana, IL: Authors.

Jordan, R.L.P. & Bratsch-Hines, M. (2020). Associations of reading knowledge with kindergarten and first grade teachers' reported instructional strategies. *Literacy Research and Instruction, 59*(4), 277-297. https://doi.org/10.1080/19388071.2020.1774689

Kagan, S. L., Castillo, E., Gomez, R. E., & Gowani, S. (2013) Understanding and using early learning standards for young children globally. *International Journal of Child Care and Education Policy, 7*(2): 53-66. https://doi.org/10.1007/2288-6729-7-2-53

Karoly, L. A. (2016). The economic returns to early childhood education. *The Future of Children, 26*(2), 37-55.

McCray, J. S., & Chen, J. (2012). Pedagogical content knowledge for preschool mathematics: Construct validity of a new teacher interview. *Journal of Research in Childhood Education, 26*(1), 291-307.

McCutchen, D., Abbott, R. D., Green, L. B., Beretvas, S. N., Cox, S., Potter, N. S., Quiroga, T., & Gray, A. L. (2002). Beginning literacy: Links among teacher knowledge, teacher practice, and student learning. *Journal of Learning Disabilities, 35*(1), 69-86. http://doi.org/10.1177/002221940203500106

Moats, L. C. (1994). The missing foundation in teacher education: Knowledge of the structure of spoken and written language. *Annals of Dyslexia, 44*, 81-102. doi:10.1007/bf02648156

Moats, L. C. (1999). *Teaching reading is rocket science: What expert teachers of reading should know and be able to do*. Washington, DC: American Federation of Teachers.

Moats, L. C. (2009). Knowledge foundations for teaching reading and spelling. *Reading and Writing, 22*(4), 379-399. doi:10.1007/s11145-009-9162-1

Moats, L. C., & Foorman, B. R. (2003). Measuring teachers' content knowledge of language and reading. *Annals of Dyslexia, 53*(1), 23-45. http://doi.org/10.1007/s11881-003-0003-7

Moyles, J.R. (1989). Just playing? The role and status of play in early childhood education. Philadelphia, PA: Open University Press.

National Association for the Education of Young Children & National Association of Early Childhood Specialists in State Departments of Education. (2002). Early learning standards: Creating conditions for success. Retrieved from www.naeyc.org/about/positions/pdf/Position_statement.pdf.

National Association for the Education of Young Children (2020a). Unifying framework for the early childhood profession. Retrieved from http://powertotheprofession.org/wp-content/uploads/2020/03/Power-to-Profession-Framework-03312020-web.pdf

National Association for the Education of Young Children (2020b). Developmentally Appropriate Practice Position Statement. Retrieved from https://www.naeyc.org/sites/default/files/globally-shared/downloads/PDFs/resources/position-statements/dap-statement_0.pdf

National Board for Professional Teaching Standards. (2016). *What teachers should know and be able to do*. Arlington, VA: Author.

National Early Literacy Panel. (2008). Developing early literacy: Report of the National Early Literacy Panel. Washington, DC: National Institute for Literacy.

National Reading Panel. (2000). Report of the National Reading Panel. Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction (NIH Publication No. 00-4769). Washington, D.C.: U.S. Government Printing Office.

NCTE Children's Literature Assembly. (2018). *Preparing teachers with knowledge of children's and young adult literature.* Urbana, IL: NCTE.

Neuman, S. B., Copple, C., & Bredekamp, S. (2000). *Learning to read and write: Developmentally appropriate practice.* Washington, DC: National Association for the Education of Young Children.

Neuman, S. B., & Cunningham, L. (2009). The impact of professional development and coaching on early language and literacy instructional practices. *American Educational Research Journal, 46*, 532–566. https://doi.org/10.3102/0002831208328088

North Carolina Foundations Task Force. (2013). North Carolina foundations for early learning and development. Raleigh: Author.

Petersen, S., Jones, L., McGinley, K. A. (2008). Early learning guidelines for infants and toddlers: Recommendations for states. Washington, DC: Zero to Three.

Piasta, S. B., Connor, C. M., Fishman, B. J., & Morrison, F. J. (2009). Teachers' knowledge of literacy concepts, classroom practices, and student reading growth. *Scientific Studies of Reading, 13*(3), 224–248. http://doi.org/10.1080/10888430902851364

Piasta, S. B., Park, S., Farley, K. S., Justice, L. M., & O'Connell, A. A. (2020). Early childhood educators' knowledge about language and literacy: Associations with practice and children's learning. *Dyslexia: An International Journal of Research and Practice, 26*(2), 137–152. https://doi.org/10.1002/dys.1612

Reynolds, J.J., Temple, J.A., Robertson, D.L. & Mann, E.A., (2001). Long-term effects of an early childhood intervention on educational achievement and juvenile arrest: A 15-year follow up of low-income children in public schools. *Journal of the American Medical Association, 285*(18), 2339-2346;

Reynolds, A. J., Ou, S.-R., Mondi, C. F., & Giovanelli, A. (2019). Reducing poverty and inequality through preschool-to-third-grade prevention services. *American Psychologist, 74*(6), 653–672. https://doi.org/10.1037/amp0000537

Ripp, P. (2016). The spirit of children's literature: How a teacher's love of children's books affects the whole classroom. *Literacy Today, 33*(6), 28–29.

Scarborough, H.S. (2001). Connecting early language and literacy to later reading (dis)abilities: Evidence, theory, and practice. In S.B. Neuman & D.K. Dickinson (Eds.), *Handbook of early literacy research* (Vol. 1, pp. 97– 110). New York, NY: Guilford.

Schachter, R. E., Spear, C. F., Piasta, S. B., Justice, L. M., & Logan, J. A. R. (2016). Early childhood educators' knowledge, beliefs, education, experiences, and children's language- and literacy-learning opportunities: What is the connection? *Early Childhood Research Quarterly, 36*, 281–294. https://doi.org/10.1016/j.ecresq.2016.01.008

Scott-Little, C., Kagan, S. L., & Frelow, V. (2003). Standards for preschool children's learning and development: Who has standards, how were they developed and how are they used. Tallahassee, FL: SERVE

Seidenberg, M. S. (2005). Connectionist models of word reading. *Current Directions in Psychological Science, 14*(5), 238–242. https://doi.org/10.1111/j.0963-7214.2005.00372.x

Shulman, L. (1986). Those who understand: Knowledge growth in teaching. *Educational Researcher, 15*(2), 4-14. doi:10.3102/0013189X015002004

Snow, C. E., Burns, M. S., & Griffin, P. (Eds.). (1998). Preventing reading difficulties in young children. Washington, DC: National Academy Press.

Snow, C., Griffin, P., & Burns, M.S. (Eds.). (2005). *Knowledge to support the teaching of reading: Preparing teachers for a changing world.* Jossey-Bass.

Sumrall, T. C. & Jordan, R. P. (2021). Using Early Learning and Development Standards for Intentional Literacy Instruction in Early Childhood Classrooms. *Literacy Matters, 21, 46-50.*

VanHoorn, J., Nourot, P.M., Scales, B., & Alward, K.R. (2015). Play at the Center of the Curriculum. (6th ed.). London, England: Pearson.

Vouloumanos, A., & Werker, J. F. (2007). Listening to language at birth: Evidence for a bias for speech in neonates. *Developmental Science, 10*(2), 159–164. https://doi.org/10.1111/j.1467-7687.2007.00549.x

Yoshikawa, H., Weiland, C., & Brooks-Gunn, J. (2016). When Does Preschool Matter? *Future of Children, 26(2)*, 21–35.