Understanding Epistemic Cognition: Aspects that Emerge When Early Childhood Teachers Consider Materials and Plan Instruction for Literacy Learning

Kit Marie Saiz De La Mora
Montclair State University

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UNDERSTANDING EPISTEMIC COGNITION:
ASPECTS THAT EMERGE WHEN EARLY CHILDHOOD TEACHERS CONSIDER
MATERIALS AND PLAN INSTRUCTION FOR LITERACY LEARNING

A DISSERTATION

Submitted to the Faculty of
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by

KIT MARIE SAIZDELAMORA

Montclair State University

Upper Montclair, NJ

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Dissertation Chair: Dr. Helenrose Fives
MONTCLAIR STATE UNIVERSITY
THE GRADUATE SCHOOL
DISSERTATION APROVAL

We hereby approve the Dissertation

UNDERSTANDING EPISTEMIC COGNITION:
ASPECTS THAT EMERGE WHEN EARLY CHILDHOOD TEACHERS CONSIDER
MATERIALS AND PLAN INSTRUCTION FOR LITERACY LEARNING

of

Kit Marie SaizdeLaMora

Candidate for the Degree:

Doctor of Philosophy

Teacher Education and Teacher Development

Certified by:

Dr. M. Scott Heffness
Vice Provost for Research and Dean of The Graduate School

[Signature]

Dissertation Committee:

Dr. Helenrose Fives
Dissertation Chair

Dr. Nicole Barnes

Dr. Alina Reznitskaya

Date

11-14-19
ABSTRACT

UNDERSTANDING EPISTEMIC COGNITION:
ASPECTS THAT EMERGE WHEN EARLY CHILDHOOD TEACHERS CONSIDER
MATERIALS AND PLAN INSTRUCTION FOR LITERACY LEARNING

By Kit Marie Saiz De La Mora

The purpose of this qualitative study was to gain insight into early childhood teachers’ engagement in epistemic cognition in the context of literacy instruction practices. Early literacy instruction was an important context to examine epistemic cognition because of the complexity of the teaching task. Early literacy instruction involves the simultaneous consideration of knowledge about multiple components of language structure in addition to knowledge of pedagogy, child development, and understandings of immediate socio-cultural context.

Teacher educators need to know how teachers think about knowledge in these multiple areas when they are planning early literacy instruction so they can effectively prepare them for and support them in such a complex task. The problem is that a rich description of the construct as enacted by early childhood teachers in their daily practice, which is needed to provide insight to the field about this phenomenon, does not currently exist, leaving us with little understanding about how early childhood teachers engage in thinking about knowledge and knowing in regards to early literacy instruction. Hence, my goal in conducting this study was to provide a holistic, in-depth description and deep explanatory analysis of this phenomenon.

To do so I explored how aspects of epistemic cognition emerged when early childhood teachers considered materials and planned instruction for literacy learning using a qualitative case study methodology. Participants in my study were two early childhood teachers who each held early childhood teacher certification and taught four-year-olds in a state funded Universal
PreKindergarten classroom. Data sources included observations, interviews (i.e., semi-structured, stimulated recall, and think aloud), classroom artifacts, and documents. I engaged in a rigorous and iterative multi-phase analysis of my data.

Four salient findings are highlighted in my data. First, the teachers in my study were able to shift smoothly between epistemic aims for themselves and epistemic aims for their learners suggesting an ability to engage in epistemic cognition over concurrent planes of knowing. Second, the teachers’ epistemic beliefs and their beliefs about children’s learning functioned as their ideals and influenced all aspects of their engagement in epistemic cognition. Third, the teachers employed multiple types of reliable processes to apply their ideals and meet their aims. Fourth, the teachers in my study came to micro-epistemic ends; smaller epistemic ends, across both tasks before reaching their final epistemic ends, thereby providing insight into the inner workings of the process of early childhood teachers’ epistemic cognition during literacy instruction tasks.

*Keywords:* epistemic cognition, early childhood teachers, literacy instruction
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I offer my heartfelt appreciation to the two early childhood teachers who willingly and eagerly participated in my study. I learned so much from them during my visits to their classrooms about how knowledgeable, respectful, and caring early childhood teachers could be in their interactions with colleagues, the children in their classrooms, and with the families they encounter daily. I am so grateful for the privilege of having been offered a peek into their minds.

Last, but certainly not least, I would like to acknowledge Percy and Juniper for their faithful accompaniment on this journey. I know they approve of this dissertation.
DEDICATION

For my earliest teachers, my loving parents. You set me on the path to a lifetime of appreciation for learning and gently guided me toward my calling to teach.

For my preschool teachers at St. Paul’s Christian Day School and to my kindergarten teacher at Link Elementary School. You created a warm and positive environment for my earliest formal learning experiences.

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CHAPTER 1: OVERVIEW

Literacy is defined as “the ability of children and young adults to learn to speak, listen, read, write, and think” (Cooper, Robinson, Slansky, & Kiger, 2018, p. 6). Early literacy learning is important because the literacy skills and knowledge acquired during the early years of school predict subsequent literacy achievement (Cunningham & Stanovich, 1997; Dickinson & Porche, 2011; Duncan et al., 2007; National Early Literacy Panel (NELP), 2008). Early childhood teachers are in a position to directly influence children’s early literacy learning, and subsequently, their later academic success (Cunningham, Zibulsky, & Callahan 2009). Teaching young children to learn to read is a task that requires complex thinking. According to Greene, Cartiff, and Duke (2018), enactment of such higher order thinking processes requires engagement of epistemic cognition. Epistemic cognition has to do with “how people acquire, understand, justify, change, and use knowledge in formal and informal contexts.” (Greene, Sandoval, & Bråten, 2016a, p. 1). Greene, Sandoval, and Bråten (2016b) argued “effective epistemic cognition is necessary to navigate the complexities of the modern world” (p. 495). I argue that teaching is one of these complexities. In this study I conducted a qualitative investigation into early childhood teachers’ enactment of epistemic cognition while planning and choosing materials for literacy instruction.

Theoretical Influences

I used theoretical perspectives from two fields of study to guide my investigation: epistemic cognition (Model of Epistemic Cognition in Learning and Teaching; Buehl & Fives, 2016; extended framework of personal epistemology; Brownlee et al., 2008) and early literacy instruction (intentionality; Epstein, 2014).
Epistemic Cognition

Epistemic cognition is important in the field of education for both learners and teachers; namely for its predictive role in students’ academic achievement (e.g., Greene, et al., 2018). In addition, theoretical claims and research findings indicate that teachers’ epistemic cognition relates to their teaching practices (Buehl & Fives, 2009; Fives & Buehl, 2010; Fives, Barnes, Buehl, Mascardi, & Ziegler, 2017; Lunn Brownlee, Ferguson, & Ryan, 2017; Schraw & Olafson, 2002). Specifically, Schraw and Olafson (2002) found teachers’ choices of curriculum, assessment use, and instructional strategies to be related to their epistemic cognition. Barnes, Fives, Mabrouk-Hattab, and SaizdeLaMora (In Revision, October, 2019) used epistemic cognition to understand middle school teachers’ cognitive processes while assessing student work. Their work suggests that complex teaching tasks require teachers to consider multiple knowledge domains, that teachers engage in multiple, interactive cycles of epistemic cognition while engaging in complex teaching tasks, and that some instances of epistemic cognition may be more effective than others. Lunn Brownlee and colleagues (e.g., Brownlee, Berthelson, & Boulton-Lewis, 2004; Brownlee, Walker, Lennox, Exley, & Pearce, 2009; Walker, Brownlee, Whiteford, Exley, & Woods, 2012) have contributed substantially to the field of teachers’ personal epistemology in early childhood settings, focusing on these teachers’ epistemic beliefs. Their most recent work was concentrated solely in teaching young children for active citizenship (Lunn Brownlee, Johansson, Walker, & Scholes, 2017). This work established the role of early childhood teachers’ personal epistemologies as a mediating influence on their teaching practices for active citizenship.

Epistemic cognition provides a theoretical framework that can help to explain how teachers engage in complex cognitive tasks such as evaluating student work or providing
instruction. Buehl and Fives (2016) argued that when teachers engage in epistemic cognition for their own learning they do so situated in a task and domain. However, when teachers engage in epistemic cognition for teaching tasks (i.e., planning, assessment, instruction) they are required to draw from multiple domains of knowledge (e.g., literacy, pedagogy, child development, etc.); a point that Cochran-Smith and Lytle (1999) acknowledged.

**Literacy Instruction**

Early literacy instruction is an important context to examine epistemic cognition because of the complexity of the teaching task. Although learning to read may be perceived as a simple, natural occurrence it is anything but (Cunningham, et al., 2009; Moats, 2004; Piasta, 2016). Early childhood teachers must have knowledge about language structure at multiple levels: sub-lexical (i.e., parts of a word, morphemes, phonemes), semantics (word meaning), syntax (word order and sentence structure), and discourse structure (how an entire text is assembled: Cunningham, Perry, Stanovich, & Stanovich, 2004; Snow, Griffin, & Burns, 2005; Vesay & Gischlar, 2013). To further complicate matters, it is essential for early childhood teachers to consider the interdependent nature of these components (Vellutino, Tunmer, Jaccard, & Chen, 2007). Moreover, literacy instruction involves the consideration of knowledge beyond that of language structure, such as, but not limited to, pedagogy, child development, and understandings of the immediate socio-cultural context.

Intentionality is an important construct in early literacy instruction (see Leggett & Ford, 2013; National Association for the Education of Young Children (NAEYC), 2009; Piasta, 2016). Early literacy teachers who engage in intentionality in their practice provide optimal literacy learning experiences for their students (Diamond, Justice, Siegler, & Snyder, 2013; Guo, Justice, Kaderavek, & McGinty, 2012; Hall, 2013; Hamre et al., 2012; Justice, Mashburn, Hamre, &
Intentional teachers are purposeful about their instruction in that they have a specific learning goal in mind and a plan to accomplish this goal (Epstein, 2014). That is, intentional teachers have a clear plan in place for employing instructional strategies that will most likely help them to achieve the learning goals they have set for their students. Intentional teachers also engage in ongoing assessment of students’ progress and make adjustments in their instruction based on information gathered from that assessment.

**Statement of the Problem**

Since epistemic cognition has been shown to be related to teachers’ practices and early literacy teaching is a complex cognitive task requiring consideration and balance of multiple knowledge domains it is important for early literacy teachers to engage in epistemic cognition. Teacher educators need to know how teachers think about knowledge in these multiple areas when they are planning early literacy instruction so they can effectively prepare them for and support them in such a complex task. The problem is that a rich description of the construct as enacted by early childhood teachers in their daily practice is needed to provide insight to the field about this phenomenon. Yet, this description does not currently exist, leaving us with little understanding about how early childhood teachers engage in thinking about knowledge and knowing in regards to early literacy instruction.

Buehl and Fives (2016) argued for the relevance of teachers’ engagement in epistemic cognition because teachers are responsible for designing meaningful learning environments and experiences for their students. Despite the importance of epistemic cognition, we know very little about the role of epistemic cognition when early childhood teachers consider materials and planning for early literacy instruction. Research is needed to understand how teachers justify their pedagogical decisions and practices in early literacy instruction (i.e., determine epistemic
aims, and choose and use reliable processes to achieve those aims) to inform teacher educators for their work in preparing early childhood teachers and supporting teachers in their practice. This research is also needed to provide insight to teachers themselves about the cognitive processes they use during early literacy instruction so that they may be more cognizant of how they use all the knowledge domains they need to consider as they plan instruction for early literacy learning and hence be more intentional about their early literacy teaching practices.

In addition, because epistemic cognition is context sensitive (Hofer & Bendixen, 2012) as well as task and domain specific (Buehl & Fives, 2016; Fives & Buehl, 2010) it is important to look at epistemic cognition in different cultures, contexts, and within different knowledge domains. Among researchers in teachers’ epistemic cognition, only one group, located in Australia, has looked at early childhood teachers’ epistemic beliefs with a recent concentration on early childhood teachers teaching for active citizenship (i.e., moral or values education; Lunn Brownlee, et al., 2017). However, how the phenomenon of epistemic cognition manifests in the context of early literacy instruction has not been investigated. Therefore, the different culture (United States), context (planning), and domains (e.g., early literacy instruction; language structure; child development) of this study will expand on what is already known in the field.

**Purpose of the Study**

The purpose of this instrumental multi-case qualitative study was to gain insight into early childhood teachers’ engagement in epistemic cognition in the context of literacy instruction practices. To do so I explored how aspects of epistemic cognition emerged when early childhood teachers considered materials and planned instruction for literacy learning. My goal in conducting this study was to provide a holistic, in-depth description and deep explanatory analysis of this phenomenon. I chose the context of early childhood education because of the
importance of early literacy learning and because early childhood teachers have the potential to make a valuable contribution to children's literacy learning (Cunningham, et al., 2009). In addition, I drew on my level of expertise in this field as a means of understanding findings as they emerged from my inquiry.

**Research Question**

The question that guided my inquiry was “How do aspects of epistemic cognition emerge when early childhood teachers consider materials and plan instruction for literacy learning?”

**Methods**

I applied case study methodology to examine my research question. Case study allowed me to gain a holistic understanding of the complex phenomenon of epistemic cognition as it emerged within the context of two early childhood teachers’ literacy instruction practice. Each participant held early childhood teacher certification and taught four-year-olds in a state funded Universal PreKindergarten classroom in the same elementary school in the Northeastern United States. I collected data from four sources: questionnaires, observations, interviews, as well as material artifacts and documents. I used Braun and Clarke’s (2006) six-phase process of thematic analysis to iteratively code and categorize data both inductively and deductively until I reached major themes. The Epistemic Cognition in Learning and Teaching Framework (Buehl & Fives, 2016; Fives et al., 2017) guided my analysis.

**Limitations**

Limitations in this study included a lack of generalizability, the inherent difficulty in studying a latent construct, and the potential for researcher bias. Because this was a short term, qualitative study with few participants it may not be possible to transfer findings to the practice of other early childhood teachers or to early childhood teachers’ instruction in other domains,
such as planning instruction for science learning. However, the goal of my research was to provide deeper insight into the phenomenon of early childhood teachers’ engagement of epistemic cognition in a specific context. Another potential weakness of this study was the inherent difficulty in studying an internal mental process that I could not observe directly. To address this I designed my research study to include opportunities for participants to think-aloud during a specific teaching task and I developed interview questions in such a way that elicited participants’ engagement in epistemic cognition. With regards to bias, since I was trying to elicit early childhood teachers’ engagement in epistemic cognition I strived to ensure careful consideration of and adherence to my pre-determined interview questions and prompts so that questions and prompts were not too directive during the interview process and to remain aware of my own epistemic beliefs. I tried to avoid imposing these beliefs on participants in my line of questioning and to imply that one type of epistemic belief had value over another.

Findings

Four salient findings are highlighted in my data. First, the teachers in my study were able to shift smoothly between epistemic aims for themselves and epistemic aims for their learners suggesting an ability to engage in epistemic cognition over concurrent planes of knowing. Second, the teachers’ epistemic beliefs and their beliefs about children’s learning functioned as their ideals and influenced all aspects of their engagement in epistemic cognition. Third, the teachers employed multiple types of reliable processes to apply their ideals and meet their aims. Fourth, the teachers in my study came to micro-epistemic ends; smaller epistemic ends, across both tasks before reaching their final epistemic ends, thereby providing insight into the inner workings of the process of early childhood teachers’ epistemic cognition during literacy instruction tasks.
Significance of the Study

Findings from my study contribute to the field in three salient ways. First, the results of this study inform the field with respect to understanding how early childhood teachers engage in thinking about literacy instruction by providing a rich description of the construct as enacted by early childhood teachers in their daily practice. Second, looking at teachers’ epistemic cognition during early literacy instruction provided a deeper understanding of why and how early childhood teachers make pedagogical decisions for literacy instruction. Such understanding is informative to teacher educators in preparing early childhood teachers and supporting early childhood teachers in their practice. Third, findings could also help early childhood teachers themselves increase their awareness of the cognitive processes they use during early literacy instruction. Findings from my study are compelling for scholarship and practice related to early childhood teachers’ epistemic cognition.

Definition of Terms

**Early Childhood Teachers.** According to Copple and Bredekamp (2009) early childhood teachers can be described as teachers of children from birth through eight years old.

**Epistemic Beliefs.** Epistemic beliefs are beliefs people hold about knowledge and knowing (Hofer & Bendixen, 2012). Education researchers have studied beliefs about knowledge and knowing under an array of terms including epistemological beliefs (Deniz, 2011; Ravindran, Greene, & DeBacker, 2005; Tanase & Wang, 2010), epistemic beliefs (Sosu & Gray, 2012; Ferguson & Brownlee, 2018), personal epistemologies (Bendixen & Feucht, 2010; Chan & Elliott, 2004; Fives, 2011; Kang, 2008), and epistemological worldviews (Olafson & Schraw, 2006; Schraw & Olafson, 2002; 2008).
Epistemic Cognition. Epistemic cognition has to do with “how people acquire, understand, justify, change, and use knowledge in formal and informal contexts.” (Greene, et al., 2016a, p. 1). Buehl and Fives (2016) described epistemic cognition as a domain and topic specific process. Epistemic cognition plays a crucial role in solving ill-structured problems, those with no one solution (Kitchener, 1983). Epistemic cognition research stems from multiple fields of study including psychology (Kitchener, 1983) and philosophy (Goldman, 1986).

Intentionality. Epstein (2014) describes intentionality in terms of early childhood teachers acting with a purposeful plan for accomplishing a specific learning goal while considering potential learning outcomes. To be intentional, a teacher must establish clear learning aims for children, enact instructional strategies that are expected to help children achieve those aims, engage in ongoing assessment of progress, and make continual adjustments to teaching strategies as warranted from that assessment (Epstein, 2014). Intentionality is a prominent construct in the literature on early childhood teachers’ instruction (see Leggett & Ford, 2013; National Association for the Education of Young Children (NAEYC), 2009; Piasta, 2016).

Literacy. Literacy is defined as “the ability of children and young adults to learn to speak, listen, read, write, and think” (Cooper, et al., 2018, p. 6).

Teachers’ Epistemic Cognition. Teachers’ epistemic cognition has to do with teachers’ considerations of knowledge related issues in regards to the tasks of both teaching and learning (Buehl & Fives, 2016). Teachers are in a unique situation because they must attend to and integrate multiple domains of knowledge as they seek to achieve their own learning goals and as they “guide, direct, and assess the learning of others” (Fives, et al., 2017, p. 3).
State-funded Pre-kindergarten (Pre-K). State-funded Pre-K programs are established by states through a variety of revenues and appropriation sources to provide a free preschool experience to children of eligible families (Parker, Diffey, & Atchison, 2018). According to Barnett et al. (2018) state-funded pre-K programs have had substantial growth over the past 15 years with about 1.5 million children, primarily four-year-olds, enrolled each school year. States spent over $7.6 billion on preschool in 2017 (Friedman-Krauss, Barnett, Weisenfeld, Kasmin, DiCrechlo, & Horowitz, 2018). The primary goal of these programs is to boost the learning and development of young children to help prepare them for success in school (Barnett, et al., 2018).
CHAPTER 2: REVIEW OF THE LITERATURE

In this chapter I present an argument for the importance of early childhood teachers’ engagement in epistemic cognition in early literacy teaching where teaching involves planning, instruction, and assessment. A review of the relevant literature is needed to better understand what is known about the phenomenon of early childhood teachers’ engagement in epistemic cognition. This chapter is organized into four sections. In section one I overview the construct of epistemic cognition. Next, I move to a review of empirical work in teachers’ epistemic cognition and early childhood teachers’ epistemic cognition to situate my argument. In section two, I review literature from the field of early literacy teaching. I do so because epistemic cognition is contextual and domain specific making it important to look at early childhood teachers’ practices for literacy instruction. In section three, I discuss my conclusions based on the evidence from my reviews of these two bodies of literature. In section four I offer implications for theory, practice, and research.

Early Childhood Teachers’ Epistemic Cognition

In this section I begin with a brief overview of the general field of epistemic cognition including perspectives on epistemic matters and methodological approaches. I follow with an overview of research in teacher’s epistemic cognition. I then describe the methods I used to identify and analyze the empirical literature on early childhood and elementary teachers’ epistemic cognition followed by a detailed presentation of the findings from my review of this literature. I conclude this section with a discussion of the findings from my analysis.

Epistemic Cognition

Epistemic cognition research stems from multiple fields of study including psychology (Kitchener, 1983) and philosophy (Goldman, 1986). Epistemic cognition has to do with “how
people acquire, understand, justify, change, and use knowledge in formal and informal contexts.” (Greene, et al., 2016a, p. 1). Education researchers have studied the construct under an array of terms including epistemological beliefs (Deniz, 2011; Ravindran, Greene, & DeBacker, 2005; Tanase & Wang, 2010), epistemic beliefs (Sosu & Gray, 2012; Ferguson & Brownlee, 2018), personal epistemologies (Bendixen & Feucht, 2010; Chan & Elliott, 2004; Fives, 2011; Kang, 2008), epistemological worldviews (Olafson & Schraw, 2006; Schraw & Olafson, 2002; 2008), and epistemic cognition (Fives, et al., 2017; Bråten, et al., 2017).

It is important to make a distinction between epistemic beliefs and epistemic cognition because these terms are “woefully conflated in the current educational research literature” (Sinatra, 2016, p. 480). Epistemic beliefs (also called: personal epistemologies, epistemological beliefs, epistemological worldviews) are captured during specific moments in time and represent what individuals believe about knowledge and knowing at that moment (Hofer & Pintrich, 1997; Sinatra, 2016) whereas epistemic cognition is the actual mental process of thinking about knowledge (Kitchener, 1983) which is more fluid and dynamic (Sinatra, 2016). Thus, when I use the term epistemic cognition in this paper I mean it in this way and when I use the term epistemic beliefs I am referring to those stances held in specific moments in time. When I discuss specific studies, I use the terms used by the original researchers and highlight any instances when the researchers conflated beliefs and cognition.

Sinatra (2016) cautioned that researchers should make the distinction between the two constructs obvious in their studies. Kelly (2016) and Buehl and Fives (2016) also made clear statements about not confusing the constructs. Still, the majority of researchers in this field have not made the distinction between epistemic beliefs and epistemic cognition clear. Researchers have provided comprehensive summaries and organized the body of work on
Early childhood teachers’ epistemic cognition elsewhere (Hofer & Bendixen, 2012; Hofer & Pintrich, 1997; Sandoval, Greene, & Bråten, 2016). In the following paragraphs, I draw on a comprehensive review by Hofer (2016) to provide a condensed overview of epistemic beliefs research.

**Perspectives on Epistemic Matters.** Researchers’ have approached investigations into epistemic beliefs as developmental (Baxter Magdola, 1992; Belenky, Clinchy, Goldberger, & Tarule, 1986; King and Kitchener, 1994; Kuhn, Cheney, & Weinstock, 2000; Perry, 1970), dimensional (Hofer & Pintrich, 1997; Schommer, 1990), epistemological resources (Hammer & Elby, 2002), personal theories (Bendixen & Rule, 2004; Schraw & Olafson, 2008), and as a process perspective (Chinn, Buckland, & Samarapungavan 2011; Chinn, Rinehart & Buckland 2014; Fives et al., 2017; Greene, Azevedo, & Torney-Purta, 2008). The first four of these approaches emphasized learners’ existing epistemic/epistemological beliefs or personal epistemology. In contrast, a process perspective emphasized the active thinking involved in using and making judgments about knowledge thus it is referred to as *epistemic cognition*. While this process perspective was the focus of my research, my study was situated within this connected field of inquiry. Therefore, I describe the extant literature on early childhood teachers’ epistemic beliefs.

Developmental models of epistemic beliefs were similar in a thematic assumption as being a universal, stage like progression of epistemic beliefs from a simple dualistic way of viewing knowledge to a more complex, evaluative view of knowledge (Hofer & Pintrich, 1997). For example, Perry (1970), King and Kitchener (1994), and Baxter Magdola (1992) all proposed that views of knowledge and knowing ranged from absolute, concrete and dichotomous to less certain, indefinite, and more complex. Through work with developmental models, researchers contributed to the field of epistemic cognition by establishing the idea that individuals
experience aspects of knowing in an evolving, successive developmental pattern that reflects a progressive ability to organize both the subjective and objective facets of knowing (King & Kitchener, 1994; Perry, 1970). Prominent in these developmental models is the focus on internal, universal mechanisms within the individual (Hofer & Pintrich, 1997). However, small sample sizes within concentrated populations presented limitations on research efforts during this period (Hofer, 2016). In addition, these early researchers envisioned the construct to be general across all domains of learning and knowledge and conducted research with this assumption (Deniz, 2017; Muis, Bendixen, & Haerle, 2006).

Beginning in the early 1990s, researchers started to challenge the notion of generality of beliefs about knowledge and knowing, as well as the limitations of developmental, stage-like models (Hofer, 2016). Although researchers did not discard initial themes, some researchers began to focus their investigations of epistemic beliefs as a multidimensional system of beliefs that reflected elements of one’s context, such as academic domain (Hofer, 2016; Hofer & Pintrich, 1997; Muis, et al., 2006; Schommer, 1990). For example, Schommer (1990) proposed a view of epistemological beliefs as a complex system of beliefs about knowledge and knowing that had linked yet independent dimensions (Hofer & Bendixen, 2012). Schommer’s (1990) view could be considered multidimensional in the sense that in it she recognized multiple aspects of epistemic beliefs such as learning ability, rate of learning, complexity or simplicity of knowledge (i.e., structure), knowledge source, and certainty of knowledge. In addition, Muis et al. (2006) addressed debates about whether epistemic beliefs are sensitive to the context of academic domains (e.g., history, science, math) in an extensive literature review, which culminated in a proposed theoretical framework that incorporated both a domain specific and domain general position as valid.
Researchers continued to advance the field of study by trying to further illuminate the actual process of engaging in thoughts about knowledge and knowing: epistemic cognition (Hofer, 2016; Sinatra, 2016). To do so, they intentionally acknowledged the significance of social dimensions of knowledge (Goldman & Blanchard, 2012), attempted to foreground attention to the influence of classroom contexts on teachers’ epistemic beliefs (e.g., Feucht, 2010) and established stronger connections to the philosophical underpinnings of the construct of epistemic cognition (Chinn et al., 2011; Greene, et al., 2008). The purpose was to document the active cognitive processes that occur when engaging with knowledge (e.g., Chinn, et al., 2014; Greene, et al., 2008). For example, Chinn et al., (2014) introduced the AIR (Aims, Ideals, Reliable Processes) model of epistemic cognition. Buehl and Fives (2016) and Fives et al., (2017) built on Chinn et al.’s (2014) model to create the Epistemic Cognition in Learning and Teaching Framework which further contextualized the process of epistemic cognition within learning and teaching tasks.

**Exploring Process Models.** The AIR model consists of three main components: epistemic Aims and values (knowledge related goals and attributed importance of achieving those goals), epistemic Ideals (benchmarks or norms used to determine if epistemic aims have been met), and Reliable processes (strategies or procedures used to successfully meet the epistemic aim; Chinn et al., 2014; Chinn & Rinehart, 2016). According to Chinn et al. (2014) once individuals establish an epistemic aim they must employ a reliable process to consider knowledge related issues with regard to new information in conjunction with their ideals.

Consider the following hypothetical, informed by the examples presented by Chinn et al. (2014). Mrs. Robinson finds out her daughter was diagnosed with a rare psychiatric disorder. She decides she should learn everything she can about this condition and how to treat it; this is her
epistemic aim. Mrs. Robinson believes an expert in the field can provide her with understanding of this condition from a medical standpoint and that people who are experiencing the same situation in their families can help her learn how to best care for her daughter; these beliefs serve as benchmarks, or epistemic ideals, that she uses to appraise the quality of information she finds and evaluates. She consults the top-rated psychiatrist for treatment of this condition to gain scientific knowledge and joins a parent support group to gain practical knowledge; these are reliable processes, which given her aim and ideals, will most likely help her achieve the desired epistemic end (her initial aim).

Researchers have used the AIR model (Chinn et al., 2014; Chinn & Rinehart, 2016) to examine students’ and preservice teachers’ epistemic cognition. Barzilai (2017) used the AIR model in a qualitative study of adolescent students’ epistemic thinking in the context of digital game playing. Participants set epistemic aims, employed reliable processes, and referred to epistemic ideals on three planes of knowing within the game context including; “knowing in the game, knowing about playing the game, and knowing about the game as a representational artifact” (p. 51). Torsney, Ponnock, and Lombardi (2017) used the aims and values component of the AIR model to design a 5-item scale to investigate how preservice teachers’ epistemic values influenced their decision to pursue a career in teaching. They found that epistemic value explained 13.11% of the variance in preservice teachers’ motivation to pursue a career in teaching and showed moderate correlations with other values such as social and personal utility.

The AIR model (Chinn et al., 2014; Chinn & Rinehart, 2016) does not address the cognitive interplay happening in one’s mind amidst the interaction of aims and values, ideals, and reliable processes whereas this mental activity is at the heart of the Epistemic Cognition in Learning and
Teaching Framework (Buehl & Fives, 2016; Fives et al., 2017). I describe this model below in the section on Teachers’ Epistemic Cognition.

Greene and colleagues (2018) recently established the importance of students’ epistemic cognition in an extensive meta-analytic review of research on elementary to graduate students’ epistemic cognition related to academic achievement. They found that there is a statistically significant predictive relationship between the two variables with effect sizes notably larger among samples of elementary and middle school students. Results from this study allude to the importance of teachers’ engagement in effective epistemic cognition for students’ academic success. Teachers’ engagement in effective epistemic cognition may be of particular importance for early literacy instruction because of the multiple domains drawn on in the knowledge base. In this chapter I define effective epistemic cognition as instances when aims are met competently through the application of reliable processes.

**Methodological approaches.** The early research in this field relied on qualitative methods. As this field of study moved to multi-dimensional explanations of epistemic beliefs quantitative investigations of epistemic beliefs emerged. Along with these advances, researchers began using primary data sources consisting of participant responses to Likert-type scales (e.g., Schommer’s Epistemological Questionnaire (SEQ), 1990), which allowed researchers to study larger groups of people than when using qualitative methods (Hofer, 2016). However, scholars criticized these measures for consisting of brief statements lacking in context which limited the potential of the measures to capture the intricacies of the construct (Reznitskaya & Gregory, 2013).

In response to the emergence of process models of epistemic cognition as well as the other concerns mentioned, researchers attempted to devise new ways to access the active process
of epistemic cognition by broadening their use of measurement approaches to include mixed methods (Bromme, Pieschl, & Stahl, 2010), use of think-aloud protocols (Mason, Ariasi, & Boldrin, 2011), and use of graphic tasks (Ferguson & Brownlee, 2018). In addition, researchers devised more sophisticated ways to assess the construct by exploring and fine-tuning new procedures such as use of video-taped classroom observations (Elby & Hammer, 2010), conventions for collecting and analyzing think-aloud data (Ferguson, Bråten, & Stromso, 2011), and use of multiple and varied sources of data in conjunction with each other (Kang, 2008; Sosu & Gray, 2012). However, it is important to keep in mind ideas from initial investigations since they are not obsolete and continue to be used in the research (Hofer, 2016).

**Teachers’ Epistemic Cognition**

Buehl and Fives (2016) argued for the significance of teachers’ engagement in epistemic cognition because teachers are responsible for designing meaningful learning environments and experiences for their students, making relevant the examination of this construct. Research evidence supports the idea that teachers’ epistemic beliefs are related to beliefs about how they should teach (Aypay, 2010; Chan & Elliott, 2004; Stoddard, 2010) and influence their practice (Schraw & Olafson, 2002). For example, Chan and Elliott (2004) found that teachers who held absolutist epistemic beliefs were more likely to view teaching as a transmissive process while teachers who held more evaluativistic beliefs were more likely to view teaching as a reciprocal process. Teachers’ epistemological beliefs may also play a role in how teachers use educational materials (Johnston, Woodside-Jiron, & Day, 2001; Olafson & Schraw, 2010). Roth and Weinstock (2013) found that students were more likely to perceive their teachers as using strategies that supported autonomy in their learning (i.e., teacher took perspective of both students during arguments, teacher provided rationale for behavior and learning expectations).
when their teachers reported relativistic epistemological beliefs as opposed to when their teachers reported objectivist epistemological beliefs. Muis and Foy (2010) identified a statistically significant predictive relationship between elementary math teachers’ epistemic beliefs and their students’ levels of self-efficacy to learn math (i.e., self-perception of capability in math learning).

However, evidence of relationships between teachers’ personal epistemologies and their actual teaching practices has been inconsistent (Sosu & Gray, 2012; Tsai & Laing, 2009). For example, Kang (2008), Kang and Wallace (2005), and Olafson and Shraw (2006) found contradictions between teachers’ espoused epistemic beliefs and their practices. Kang and Wallace (2005) suggested that an explanation for this inconsistency could be how teachers negotiate the combination of their teaching context, epistemic beliefs, and teaching goals. Buehl and Fives (2016) supported this notion and suggested that researchers take teaching context (e.g., curriculum mandates, administrative constraints) and teachers’ epistemic aims for their learners (i.e., learning goals set for students) into consideration when analyzing data in order to provide fully balanced interpretations.

Teachers’ epistemic beliefs are related to their beliefs about their own learning (Yadav, Herron, & Samarapungavan, 2011). Preservice teachers’ beliefs about source of knowledge as coming from authority were related to more superficial learning strategies and less meaningful engagement with course materials (Ravindran et al., 2005). When student teachers viewed professors and textbooks as trusted sources of knowledge, they were more motivated to learn from formal education coursework (i.e. theoretical and expert sources of knowledge) than field experiences (i.e. practical sources of knowledge; Bråten & Ferguson, 2015). Furthermore, Buehl and Fives (2009) suggested that teachers’ might seek knowledge about new teaching strategies
from varied sources (other practitioners, educational organizations’ websites) based on their beliefs about source and constancy of knowledge.

The examination of epistemic beliefs is significant because these beliefs appear to be a probable influence on teachers’ use of critical reflectivity (Lunn Brownlee et al., 2017), thinking on how children learn (Brownlee, Schraw, & Berthelsen, 2011), and sometimes their overall teaching practice (Lunn, Walker, & Mascardi, 2015). Given the import of teachers’ epistemic beliefs it is relevant to consider how to foster change in teachers’ epistemic beliefs. Parkinson and Maggioni, (2017) conducted a review of intervention studies structured with the intention of changing preservice teachers’ epistemic beliefs. They reported evidence that explicit and purposeful reflection during field experiences combined with higher-order thinking opportunities (e.g., argumentation, Deniz, 2011; multiple perspective taking, Tanase & Wang, 2010; Sosu & Gray, 2012) was associated with positive change in epistemic beliefs.

The Epistemic Cognition in Learning and Teaching Framework (Buehl & Fives, 2016; Fives et al., 2017) includes epistemic aims and values, epistemic ideals, and reliable processes for achieving epistemic aims as set forth by Chinn et al. (2014) yet goes further to address the “recursive, iterative, and multidirectional” (Fives et al., 2017, p. 3) nature of the entire epistemic cognition process. Buehl and Fives (2016) designed their initial model with the specific, complex work of teachers in mind. As such, in this model epistemic cognition emanates within a specific teaching task (e.g., planning, instruction, assessment) informed by multiple domains of knowledge germane to the task (e.g., pedagogy, child development, subject-matter, self-knowledge). The Buehl and Fives (2016) model also acknowledges epistemic aims that teachers set for themselves as well as for their learners. Buehl and Fives (2016) added context (social, cultural, physical setting) as an informative area of domain knowledge relevant to teaching.
Buehl and Fives (2016) emphasized the complexity of the epistemic cognition process embedded in teaching tasks and accentuated that the teachers’ self-system (prior knowledge and experience, epistemic ideals, epistemic beliefs, epistemic values, epistemic vices [thinking patterns that may inhibit epistemic cognition] or virtues [thinking patterns that may foster epistemic cognition]) plays an influential role in the epistemic cognition process. In addition, Buehl and Fives (2016) used the term “epistemically informed praxis” (p. 259) to describe the teaching-related epistemic outcome of the epistemic cognition process (i.e., an instructional decision, action, or stance).

Recent empirical inquiry with this framework includes approaching teachers’ classroom assessment practices from an epistemic cognition lens (Fives, Barnes, Mabrouk-Hattab, & SaizdeLaMora, 2018). In their study, Fives et al. (2018) provided an example of a fifth-grade teacher evaluating a student’s narrative essay assignment to illustrate engagement in the epistemic cognition process. In this example, Mr. Walker set an epistemic aim for his learners to use the prediction strategy they had worked on in class. As he read the student’s essay, he mentally referenced his rubric criteria, yet part of his reliable process was that he would not assign a grade to the work until it was finished. During the evaluative reading, Mr. Walker referred to his epistemic ideal for ways to establish tone and mood. The outcome of this process, Mr. Walker’s epistemically informed praxis, was when he highlighted a sentence and wrote a note to the student suggesting revision.

In my inquiry I am interested in the early childhood literacy teaching context. Yet epistemic cognition within that context may look different than what we have evidence for with teachers of older children. Consider the following hypothetical example, which places epistemic cognition in the early literacy teaching context. Mrs. Quinn, a pre-K teacher, wants her students to build their story comprehension (epistemic aim for her learners). She reads a story that the
students have not heard before, about a dog that does not like his new bed, to a small group of three to five students. While she is reading, she stops multiple times to ask, “What do you think will happen next?”, “What do you think the dog will say on the next page?”, or “How do you think the dog will get his old bed back?” to see if they can make predictions about the story (epistemic ideal). She will use this activity to assess whether or not the students have achieved the learning goal. Mrs. Quinn records each student’s responses on a large poster paper on an easel chart that she designed for this purpose. Mrs. Quinn verbally prompts her students to discuss their predictions. As she listens to her students explain their responses, she uses large computer labels on a clipboard to make individualized notes for each student. Mrs. Quinn wants to understand how each child comprehends the story (epistemic aim for self). Once the small group activity is completed, she considers the documented recorded responses and her notes about each child’s explanations. With this documentation in hand she completes a checklist she created to keep track of whether or not the students have met the epistemic aim (reliable process for self). Mrs. Quinn’s epistemically informed praxis might be that she decides to restructure the activity into smaller steps because she noticed that the students had difficulty formulating predictions in the stories. For example, she might re-read the story and be more intentional about drawing the students’ attention to certain picture clues.

Continuing with the previous scenario, we can consider how additional aspects of the self-system came into play. Mrs. Quinn’s prior experience as a pre-K teacher (self-system) may have informed her selection of the text as one with strong predictive qualities and construction of the learning activity into a task that was manageable for her students. In addition, her beliefs about knowledge as evolving, uncertain, and personally constructed (epistemic beliefs) may have
informed her decision to use open-ended questions and let the students make their own predictions rather than ask them to choose from a preconceived selection of possible predictions.

It is important to understand teachers’ epistemic cognition in order to better understand how teachers learn and how they teach (Lunn Brownlee et al., 2017). As practicing teachers are in a continual position to learn new information to keep up with increasing expectations in teaching practice and student outcomes (Cochran-Smith & The Boston College Evidence Team, 2009), it would be helpful to know how teachers engage in epistemic cognition when they identify new information on their own, encounter new information during professional development, or are faced with information that conflicts with their espoused epistemic beliefs about teaching and learning. Importance is heightened in particular for early childhood teachers as they are faced with complex challenges inherent in early literacy instruction. Empirical insight into the role teachers’ epistemic cognition plays in how teachers learn about and implement early literacy instruction could hold practical implications for teacher educators.

**Early Childhood Teachers’ Epistemic Cognition**

I reviewed the extent literature on pre-service and inservice early childhood teachers’ epistemic beliefs/cognition. Given the limited research on this topic in the context of early childhood education I included studies that focused on preservice or inservice early childhood, elementary, and middle school teachers’ epistemic beliefs/cognition. I searched for qualitative and quantitative empirical, English-language, peer reviewed studies for this review in accordance with the following procedures. I searched the following academic databases: ERIC, Academic Search Complete, Education Research Complete, PsycArticles, and PsychINFO. My search terms included: “epistemic beliefs” OR “epistemic cognition” OR “personal epistemology” AND “early childhood” OR “early childhood education” OR “elementary teachers.” In addition, I
examined the chapters of four books addressing conceptualization of and empirical research about teachers’ personal epistemologies. This initial process yielded a pool of 52 studies. I examined the abstract and methods section of each study in order to judge their adherence to my selection criteria. The result of this close review yielded a final pool of 35 studies (see Appendix A).

I conducted a multi-phase analysis of the identified studies. In the first phase, I read and annotated paper copies of each article or chapter. In the next phase, I read each article in more depth to identify information relevant to my inquiry into the role of epistemic cognition in early childhood and elementary teachers’ pedagogies and practices. I then generated a table using a Google Sheet to organize the applicable information. As part of my analytic process, I looked in the references to see who was cited, the terms used and how they were defined, the researcher’s choice of conceptual or theoretical frame for their study, the questions asked in the studies, the type of method used to conduct the research, and the measure(s) used to assess epistemic cognition. Finally, I examined key findings of each study.

As holds true for the general epistemic cognition research, none of researchers in the studies identified by my review procedures made the distinction between epistemic beliefs and epistemic cognition clear. In an attempt to maintain conceptual clarity, when I discuss the studies, I use the terminology employed by the researchers as much as possible. About half of the studies sampled practicing teachers (n=19), approximately half used qualitative research methods (n=19), and none explicitly referenced epistemic cognition. The studies took place in Australia (n=17), the United States (n=14), Turkey (n=1), Singapore (n=1), and Finland (n=1). Researchers in one cross-cultural study looked at teachers in Germany and the United States (Feucht, & Bendixen, 2010). In seven studies, researchers designed and incorporated an

Of note, I could not identify any studies that fit my selection criteria prior to 2001. I discuss my findings within three main themes (1) relationships among beliefs, (2) context and epistemic beliefs, and (3) knowledge domains: a focus on literacy instruction.

**Relationships among beliefs.** Most of the studies pertinent to my inquiry focused on relationships between early childhood teachers’ epistemic beliefs and their: (a) beliefs about teaching practices, (b) beliefs about how children learn, (c) enacted teaching practices, and (d) engagement with their own learning. I organized this section accordingly. Findings about the relationships among these beliefs provides insight into how beliefs may act as epistemic ideals in the self-system in terms of the ideal people are holding about what knowledge is. Table 2.1 provides an overview of how the investigated studies map onto these themes.
Table 2.1: Relationships among Beliefs

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<th>Author(s)</th>
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<td>Engagement in Practice</td>
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<td>Adibelli-Şahin et al. (2016)</td>
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<td>Berthelsen et al. (2002)</td>
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<td>Gholami (2017)</td>
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<td>Lunn Brownlee et al. (2016)</td>
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<td>Prestridge &amp; de Aldama (2016)</td>
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<td>Yadav &amp; Koehler (2007)</td>
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<td>Watkins et al. (2017)</td>
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Epistemic beliefs in relation to beliefs about teaching practices. In five studies in my review, researchers looked at epistemic beliefs in relation to beliefs about teaching practices (i.e., Adibelli-Şahin, Deniz, & Topçu, 2016; Berthelsen, Brownlee, & Boulton-Lewis, 2002; Brownlee et al., 2015; Prestridge & de Aldama, 2016; Yadav & Koehler, 2007). I found evidence across these studies that, in general, early childhood and elementary teachers who held more sophisticated epistemic beliefs (i.e., beliefs in knowledge as created, changing, culminating from varied sources, and complex) also tended to describe methods of teaching practice more reflective of constructivist principles as compared to early childhood and elementary teachers who held less sophisticated epistemic beliefs who tended to describe more transmissive and didactic teaching practices. For example, Brownlee et al. (2015) conducted a qualitative study of eleven early childhood teachers in Australia to explore the relationship between epistemic beliefs
and beliefs about how to teach for moral learning (i.e., learning about good or bad behavior and school rules; Thornberg, 2009). Brownlee et al. (2015) found that teachers who expressed the belief that knowledge is tentative and discussed the importance of weighing multiple perspectives (i.e., evaluativistic) tended to believe that they should support children in taking an active role in moral learning rather than simply imparting moral values to children as a teaching strategy. Likewise, Adibelli-Şahin et al., (2016) found that preservice teachers who reported beliefs about knowledge as coming from authority tended to hold teacher-centered beliefs about teaching science. Berthelsen and colleagues (2002) also found that teachers who expressed the importance of integrating different knowledge sources from theory and practice (i.e., relativistic epistemic beliefs) talked about caregiving in early childhood programs as a child-centered process in which they played a responsive role. Other researchers noted findings with regard to epistemic beliefs related to beliefs about literacy instruction (Prestridge & de Aldama, 2016; Yadav & Koehler, 2007), which will be discussed in a subsequent section. Together, these findings accentuate the noteworthy relationship between early childhood and elementary teachers’ epistemic beliefs and their beliefs about how to teach.

**Epistemic beliefs in relation to beliefs about how young children learn.** As mentioned earlier, it is argued that epistemic beliefs play a role in what teachers believe about how children learn and therefore, how they structure learning experiences for children (Brownlee, Schraw, & Berthelsen, 2011). In five studies, researchers looked at early childhood teachers’ epistemic beliefs in relation to beliefs about how young children learn (i.e., Brownlee et al., 2004; Brownlee, Berthelsen, Dunbar, Boulton-Lewis, & McGahey, 2008; Brownlee, Edwards, Berthelsen, & Boulton-Lewis, 2011a; Walker et al., 2011; Walker, 2012b). I found evidence across these five studies that early childhood teachers who held more sophisticated epistemic
beliefs, that is beliefs in knowledge as constructed, evolving, coming from multiple sources, and complex (e.g., evaluativist), tended to hold constructivist beliefs about how children learn.

Brownlee et al. (2008) interviewed 17 Australian students studying to be childcare providers using an extended framework designed to acknowledge the relationship between the participants’ epistemological beliefs, their beliefs about personal learning, and their beliefs about how children learn. The researchers used a deductive approach to analyze the data about epistemological beliefs along the categories of objectivism, subjectivism, and evaluativism (terms the researchers changed for their own clarity from absolutism, multiplism, and evaluativism; Kuhn & Weinstock, 2002). Through inductive analysis, Brownlee et al. (2008) identified a congruency in structure within 14 participants’ belief systems across the three beliefs investigated. Among the 14 participants with coherent profiles, 13 demonstrated some level of evaluativistic beliefs (i.e., have the ability to analyze and reflect rather than simply accepting an authority’s knowledge perspective). Four profiles of beliefs emerged among the participants: complex evaluativism ($n = 4$), practical evaluativism ($n = 4$), practical evaluativism and objectivism ($n = 5$), and subjectivism and objectivism ($n = 1$). Students in the first profile, with the most evaluativistic epistemological beliefs, conceived of their own learning and children’s learning as a constructive, rather than reproductive process. Students in the second profile, practical evaluativism, described epistemological beliefs that were not as complex as those in the first profile because they were based more on practical skill than on theory. This group also conceived of children’s learning as constructive but of their own learning as reproductive. In the third profile, practical evaluativism and objectivism, students described a mix of practical evaluativist beliefs along with solid beliefs of knowledge as absolute and transmitted from experts. This group described their own learning and children’s learning as a reproductive
process. The student in the final profile: subjectivism and objectivism, described knowledge as constructed through personal opinion and from the expertise of others. This student described reproductive beliefs about learning with regard to themselves and for children. Among the participants in this study, only the ones who described evaluativist personal epistemological beliefs described constructivist views for both their learning and children’s learning.

Continuing this line of research, Brownlee et al. (2011a) conducted a qualitative study with 31 child care students during their field placement. The researchers conducted stimulated recall interviews using photos and analyzed the data inductively. Brownlee et al. (2011a) found that teachers who held evaluativist (i.e., sophisticated) epistemological beliefs tended to see their students as active learners, capable of constructing their own meaning and whose ideas were deserving of respect. In another example, Walker et al. (2012b) reported similar findings using quantitative methods. Walker et al. (2012b) investigated the associations between 379 Australian inservice early childhood teachers’ epistemic beliefs and their beliefs about how children learn moral values. Although there was considerable range in participants’ responses, the mean scores reflected that the sample held “relatively sophisticated epistemic beliefs” (p. 271). Through the use of correlational analyses, Walker et al. (2012b) determined that teachers who held evaluativistic (i.e., sophisticated) views of knowledge as tentative, complex, and as taking time also recognized children as having competence to take responsibility for their behavior and actively develop their own moral values (i.e., constructivist) while teachers who viewed knowledge as concrete and unchanging were more likely to see children as learning rules of behavior from teachers (i.e., transmissive).

Taken together, these findings show that early childhood and elementary teachers’ epistemic beliefs play an influential role on beliefs about how young children learn. Scholars
have long argued that constructivist learning experiences have been shown to be important for children’s early literacy learning (Morrow, 2001, Neuman & Roskos, 1993, Wortham, 2002). If teachers’ beliefs about how young children learn are not in alignment with the evidence based understanding of how young children learn they may not be able to engage in effective epistemic cognition because they may not be able to choose appropriate epistemic aims for their students nor select reliable processes to achieve those aims.

**Epistemic beliefs in relation to enacted teaching practices.** Observation of a teacher’s actual performance in real-time allows for documentation of actions which may then be compared to a teacher’s stated beliefs thereby allowing researchers to make connections between beliefs and practice (Schraw & Olafson, 2015). Researchers in nine studies used either direct classroom observation, analysis of video recordings, or examination of digital photos of classroom interactions to document early childhood and elementary teachers’ epistemic beliefs enactment (i.e., Brownlee, Berthelson, & Boulton-Lewis 2004; Brownlee et al., 2011a; Feucht 2011; 2017; Gholami, 2017; Lunn Brownlee, Scholes, Walker, & Johansson, 2016; Prestridge & de Aldama, 2016; Schwartz & Jordan, 2011; Watkins, Coffey, Cordero Maskiewicz, & Hammer, 2017). For example, Brownlee et al. (2011a) conducted stimulated recall interviews of 31 Australian preservice early childhood teachers in conjunction with 90-minute observations of the preservice teachers in their field placement setting to determine links between their epistemic beliefs and their teaching practice. The researchers analyzed their data using deductive analysis to identify general patterns of thinking as opposed to specific personal epistemologies. They found that the preservice teachers who observed teaching in child-centered ways (i.e., teacher-child interactions provided the children opportunities to construct their own learning) tended to be the ones who reported a more evaluativist beliefs pattern.
Lunn Brownlee et al. (2016) also conducted stimulated recall interviews with 29 inservice teachers in Australia using photos of the interviewed teachers’ observed teacher child interactions. They performed a deductive analysis of their data using Buehl and Beck’s (2015) beliefs-practice relationship scenarios to investigate the association between the participants’ espoused personal epistemologies and their teaching practices for active citizenship. Lunn Brownlee et al. (2016) did not find a direct relationship between teachers’ personal epistemologies and their teaching practice. Instead they detected general patterns in the data for the majority of teachers that showed intricate beliefs-practice relationships. They characterized these patterns; “evaluativist, towards evaluativism, practical reflection, and practical implementation” based on the most sophisticated belief described by the participants (p. 267). Participants in each pattern described a scope of practices but the distinctive feature between patterns was how far teachers went beyond supporting children in valuing the opinions of others towards helping them rationalize others’ opinions.

Collectively, these findings highlight the complex relationship between early childhood and elementary teachers’ epistemic beliefs and their enacted teaching practice. These findings are important because they show that early childhood teachers’ epistemic beliefs can influence the decisions they make in the classroom and how they design learning experiences for young children.

**Epistemic beliefs in relation to one’s engagement in learning.** In two studies, researchers found evidence of a relationship between teachers’ epistemic beliefs and how they engaged in their own learning (Bondy et al., 2007; Brownlee, Walker, Lennox, Exley, & Pearce, 2009). In both of these studies, researchers found that teachers who held more sophisticated epistemic beliefs approached learning in more meaningful, constructive ways. For instance, in a
qualitative study Bondy et al. (2007) showed how preservice teachers’ epistemological beliefs about the structure of knowledge functioned as a filter for their own approaches to learning during coursework and field experiences using data from open-ended interviews. Bondy et al. (2007) found that preservice teachers who believed knowledge was tentative and integrated were more likely to engage in constructive approaches to learning by making associations to prior knowledge, relating ideas to each other, and making appraisals of new information. However, the preservice teachers with epistemological beliefs of knowledge as certain and disconnected, tended to be cautious about accepting multiple perspectives and treated ideas as isolated from one another.

Brownlee et al. (2009) found overall patterns in their data, described in terms of profiles, similar to the profiles in the Brownlee et al. (2008) study, suggesting that participants who held complex evaluativistic beliefs (i.e., knowledge derived from evaluation of theory) also held qualitative conceptions of learning (i.e., learning is conceived as meaning making). In addition, they found that participants who held practical evaluativistic (i.e., knowledge based on appraisal of practical experience), subjectivist, or objectivist epistemological beliefs held some transitional but predominantly quantitative conceptions of learning (i.e., leaning is conceived as information gathering).

The findings in these two studies highlight the importance of teachers’ epistemic beliefs in relation to how they learn new information in teacher education programs which is supported in extant literature (e.g., Bråten & Ferguson, 2015; Chan, 2003). Teachers’ epistemic beliefs have consequences for their ability to engage in higher order thinking necessary for learning in teacher education programs and may have bearing on what content they pay attention to (the
practical, the theoretical, or a balance of the two) and how they approach learning tasks (connect new ideas to existing ones or consider new material in isolation).

**Context and epistemic beliefs.** Early childhood teachers’ epistemic beliefs are sensitive to context. Here I am using the term context to include place (i.e., classroom, school, culture) or personal context (i.e., teacher’s own reasoning). Seven studies in my review included findings of context as relevant to epistemic beliefs. Six studies situate context as place (Adibelli-Sahin & Bailey, 2017; Brownlee et al., 2011a; Brownlee et al., 2012; Chai, 2010; Edwards, Brownlee, & Berthelson, 2017; Feucht & Bendixen, 2010). One study accentuates personal context of the teacher’s own voice (Gholami, 2017).

**Classroom context.** Findings across three studies (Adibelli-Sahin & Bailey, 2017; Brownlee et al., 2011a; Edwards et al., 2017) highlighted the influence of modeling of adaptive epistemic beliefs on preservice and inservice early childhood teachers’ epistemic beliefs suggesting that the immediate context of their learning environment influences their epistemic beliefs. For example, researchers using self-authorship theory (of which personal epistemology is a component) found a relationship between field placement or workplace context and development of early childhood teachers’ epistemic beliefs (Brownlee et al., 2011a; Edwards et al., 2017). Brownlee et al. (2011a) used self-authorship theory as an analytic lens to describe students’ epistemic beliefs as a broad pattern of thinking. They found that field placement contexts swayed the pattern of thinking of international students who were studying in a vocational program to become childcare providers. These students seemed to rely on group leaders (master teachers) to direct their practice, as they had not yet formed professional identities. Thus, the students were susceptible to how the host teacher modeled epistemic practice. Likewise, Edwards et al. (2017) found that the teachers who had transitioned from a
vocational child care education program into less collaborative professional child care environments held less developed self-authorship described as “tentative professional identity” (p 131). Adibelli-Sahin and Bailey (2017) also showed how teachers that reported holding a relativist (adaptive) epistemological worldview about teaching science were the ones that had opportunities to observe teachers modeling a relativist worldview in their own classroom while teaching science, further confirming the influence of modeling as an implicit method for epistemic beliefs development. Thus, observed teachers’ enactment of epistemic beliefs may influence the development of epistemic beliefs in developing teachers.

School context. Researchers in three studies found that school context played an influential role in teachers’ epistemic beliefs (Brownlee et al., 2012; Chai, 2010; Lunn Brownlee et al., 2016). Brownlee et al. (2012) used the EMPE (Feucht, 2010) as a lens in their case study of two teachers in two different early childhood school settings to focus on the relationship between inservice early childhood teachers’ personal epistemologies for moral education and school context (e.g., school philosophy, school policy, documented views of learning and knowing via online and print resources). They examined multiple data sources and found that there appeared to be a relationship between the teachers’ personal epistemologies and the school contexts. Specifically, they found that the teacher with evaluativistic (more adaptive) beliefs taught in a school that regarded children as participants in the school community as a democracy while the teacher who described a subjectivist (less adaptive) epistemology taught in a school that prized demonstrating for children the correct ways to behave and how to follow class rules. Lunn Brownlee et al. (2016) found in their study of inservice early childhood teachers that school context may have promoted misalignment of personal epistemological beliefs and teaching practices. For instance, three teachers who taught
in a school context that promoted valuing and challenging others’ opinions espoused personal epistemologies described as “towards evaluativism” yet demonstrated teaching practices reflective of evaluativism (p. 270). Chai (2010) also found that school contexts influenced teachers’ epistemic beliefs.

**Cultural context.** Cultural context and teaching setting also influenced teachers’ epistemic beliefs (Feucht & Bendixen, 2010). Feucht and Bendixen (2010) conducted a cross-cultural study using qualitative data obtained from transcribed semi-structured interviews to comparatively examine the personal epistemologies of 4th grade elementary teachers from the U.S. ($n = 10$) and Germany ($n = 10$). They analyzed the data using content analysis. Themes in the data related to sources of knowledge seemed distinct to each sample population. For example, the U.S. teachers expressed an understanding of sources of knowledge as rooted within the community (i.e., interconnections between people, places, and things in the environment) while the German teachers expressed views of knowledge as emerging from internal sources (i.e., personal experience, instinct, and feelings). The researchers attributed the differences between samples as influenced partly by cultural context and partly by teaching setting (German teachers taught in schools in a small city, U.S. teachers taught in schools in a small rural town in Midwest).

**Personal context.** Gholami (2017) looked at the epistemic nature of six practicing elementary teachers’ reasoning about their teaching practices and practical knowledge. He found that teachers justified their knowledge claims and teaching practices through contextual reasoning. Gholami (2017) concluded that the nature of how teachers justified their pedagogical practice was grounded in three different yet overlapping contexts; professional, classroom situational, and personal experience and that these contexts were nested within each
other in such a way that they overlapped each other and intersected at a common point; the processes of teaching, studying, and learning. Gholami (2017) described the professional act of teaching as a context itself and referenced Kennedy’s (2004) ideas about intention as a contextual influence due to the fluctuation of particular intentions as more or less prominent in a teacher’s reasoning. As stated by Gholami (2017), “[t]eachers’ practical reasoning is a theoretical platform that links theory to practice” (p. 162). That is, how teachers justify their actions in the classroom provides a glimpse into how they make pedagogical decisions, determine epistemic aims, and choose and use reliable processes to achieve those aims.

The studies in this section provide insight into the influential role context plays in early childhood teachers’ epistemic beliefs. Extant literature supports the idea that contexts including the student population, the school, and the broader culture influence teachers’ epistemic beliefs (Buehl & Fives, 2016; Hofer & Bendixen, 2012; Muis & Foy, 2010). Modeling of epistemic practices could be of particular importance during early literacy instruction because young children are learning how to use their literacy skills and knowledge to make meaning across all content areas (e.g., science, social studies, mathematics). If, as evidence suggests, ones’ epistemic beliefs are influenced by the modeled epistemic practices of others, then it is important to explore the kinds of epistemic practices early childhood teachers model for their students during early literacy instruction. In addition, deeper understanding of how context influences early childhood teachers’ epistemic beliefs could inform teacher educators in their design of classroom instruction, selection of field placements, and ongoing professional learning experiences.

**Knowledge domains: A focus on literacy instruction.** Researchers have debated the domain general versus specific nature of epistemic beliefs for decades (Muis et al., 2006). Buehl
and Fives (2016) emphasized the need to consider specific knowledge (e.g., content area knowledge, teaching knowledge) when thinking about knowledge. Across the 35 studies I reviewed, 11 were situated in content area domains. Researchers examined epistemic beliefs related to academic content areas such as science (Adibelli-Şahin et al., 2016; Thomson & Nietfeld, 2016), math (Corkin et al., 2015; Muis & Foy, 2010), and literacy (Feucht, 2011; Prestridge & de Aldama, 2016; Yadav, & Koehler, 2007). Four research teams in Australia focused on early childhood teachers’ personal epistemologies for moral education and moral learning, sometimes referred to as critical values education (Brownlee et al., 2012; Lunn Brownlee et al., 2015; Lunn Brownlee et al., 2016; Walker et al., 2012).

In this section I focus on the studies pertaining to literacy instruction because early literacy learning is the gateway for knowledge acquisition in all academic content areas and a critical foundation for successful participation in contemporary society (Cooper et al., 2018; Moats, 1999; NELP, 2008). As mentioned earlier, literacy is a broad concept involving multiple dimensions: speaking, listening, reading, writing, and thinking (Cooper et al., 2018) making literacy instruction a multidimensional and often complex process. Each of the studies in this section focused on elementary (k-5) literacy instruction and teachers’ epistemic beliefs/epistemological beliefs rather than epistemic cognition (Feucht, 2011; Prestridge & de Aldama, 2016; Yadav & Koehler, 2007). I found that teachers’ epistemic beliefs informed their identification and explanation of good literacy instruction (Yadav & Koehler, 2007), choice and use of materials for literacy instruction (Prestridge & de Aldama, 2016), and instructional approaches used in literacy instruction (Feucht, 2011).

**Identification and explanation of good literacy instruction.** Teachers’ epistemic beliefs informed their identification and explanation of good literacy instruction (Yadav & Koehler,
Yadav and Koehler (2007) explored alignment between eleven preservice early elementary teachers’ epistemological beliefs, their selected examples of good literacy instruction, and their descriptions of these examples. In this mixed-methods study, participants first completed Schommer’s (1990) epistemological survey. Then participants searched for and selected video clips of what they thought exemplified teachers using good literacy instruction within a video case-based program. Finally, participants wrote responses to specific questions in regard to their video clip selection (e.g., “Why do you think that this clip shows a good example of reading instruction for beginning readers?” p. 342). Yadav and Koehler (2007) conducted case studies on two participants who scored at the lower end and two who scored at the higher end of the epistemological survey in order to explore how the participants’ self-reported patterns of beliefs (i.e., learning is innate, fixed ability vs. learning can be improved over time) influenced their video clip selection and how they wrote about their selection. Yadav and Koehler (2007) found that the teachers’ epistemic beliefs functioned as a lens for how they viewed and interpreted the literacy instruction in the video clips. For example, one teacher who described learning ability as innate and static chose video clips depicting direct instruction, modeling, and providing correct answers for students when they made a mistake. In contrast, another teacher who expressed the view that knowledge is integrated and learning can be improved over time chose video clips showing teachers helping students to problem solve, relating content to meaningful examples, and treating mistakes as learning opportunities. Thus, these teachers’ identification and explanation of good literacy instruction seemed related to their epistemological beliefs. This finding is relevant because early childhood teachers are expected to consider students’ individual learning needs and employ multiple teaching strategies when designing and implementing literacy instruction (International Literacy Association, 2018).
**Choice and use of materials.** Teachers’ epistemic beliefs informed their choice and use of materials for literacy instruction (Prestridge & de Aldama, 2016). Prestridge and de Aldama (2016) reported on three cases (an inservice teacher in Year 1, Year 2, and Year 5) from a larger study of teachers’ use of digital games in literacy instruction in Australia. First, the researchers provided brief descriptions of classroom observations during each teacher’s implementation of the chosen digital literacy game with their students. Then the researchers presented a short analysis of each teacher’s epistemic beliefs, pedagogical beliefs about using technology, and their pedagogical practice related to technology use based on a classification framework that they constructed. Additional data from interviews, blog journals, and curriculum documents were collected but not described. Prestridge and de Aldama (2016) analyzed their data using a framework they derived from literature on epistemic beliefs (Perry, 1970), teachers’ pedagogical beliefs about using technology (Tondeur, van Braak, & Valcke, 2007), and teachers’ pedagogical practices when using technology (Ertmer, Ottenbreit-Leftwich, Sadik, Sendurer & Sendurer, 2012). Prestridge and de Aldama (2016) found evidence of alignment among the teachers’ epistemic beliefs, how they chose a digital game, and how they used the game with their students. For example, the Year 1 teacher chose an instructional reading tutor game consisting of rote learning activities, introduced the game to the students in a structured lesson, and emphasized following specific game instructions while they played the game individually. Prestridge and de Aldama (2016) described this teacher as having a teacher-centered approach to instruction and a dualistic (i.e., knowledge is right or wrong, comes from authority) view of knowledge. The Year 5 teacher chose an active learning game that emphasized student participation, allowed the students to set up and play the game together, and encouraged students to explain to her what they were doing in the game. Prestridge and de Aldama (2016) described
this teacher as having a student-centered approach to instruction and a relativistic (i.e., knowledge is contextual and self-constructed) view of knowledge. Thus, these teachers’ choice and use of literacy instruction materials seemed related to their epistemic beliefs. This finding is relevant to my study because early childhood teachers are responsible for selecting literacy materials for the classroom and structuring literacy-focused interactions with their students (Braunger & Lewis, 2006; International Literacy Association’s Standards for the Preparation of Literacy Professionals, 2017; Roskos & Neuman, 2011).

**Instructional approach.** Feucht (2011) identified relationships between one fourth-grade teacher’s personal epistemology of reading, epistemic knowledge representations evident in the curriculum and textbook, and how the teacher delivered instruction by analyzing a combination of different types of qualitative data. In order to identify the teacher’s personal epistemologies about reading, Feucht (2011) conducted a 90-minute semi-structured interview (e.g., “What does knowledge mean in reading?”, p. 234). Based on an analysis of the interview data, Feucht (2011) identified intraindividual variations in the teachers’ espoused epistemic beliefs, which included both absolutist (objective knowledge acquisition, drawing conclusions based on concrete contextual clues in text) beliefs and evaluativist (drawing conclusions based on consideration of prior knowledge and personal experience in addition to contextual clues) beliefs about drawing conclusions in reading.

In order to assess the teacher’s epistemic knowledge representations, Feucht (2011) collected documents such as the teacher’s textbook, the worksheet used during the lesson, and relevant curricular materials. He described the materials as promoting explicit, rule bound strategies for drawing conclusions based on contextual clues and focusing on using the context clues to verify truths. In addition, Feucht (2011) pointed out that the textbook did not
acknowledge using personal experience or prior knowledge as a strategy for drawing conclusions. Feucht (2011) interpreted these features as characteristic of absolutist epistemic knowledge representations. In order to examine the teacher’s enacted epistemic beliefs about reading, Feucht (2011) observed, video recorded, and transcribed the teacher’s reading lesson on drawing conclusions. The detailed transcription documented all classroom communication, how teacher and students interacted, and how educational materials were used.

The teacher’s aim for the reading lesson was for the students to be able to draw conclusions from a story. Although the teacher espoused absolutist and evaluativist beliefs about teaching reading, for the most part, she enacted absolutist epistemic beliefs in her instructional approach. For example, the teacher explained multiple times how to draw conclusions using step-by-step procedures and she promoted her students to use context clues (i.e., objective external knowledge sources) to do so. At one brief point, the teacher encouraged the students to pull from their prior knowledge and experience (i.e., internal knowledge source) as a way to draw conclusions. Then the teacher drew the students’ attention back to their worksheet from the textbook, which reinforced seeking context clues from the text. Feucht (2011) surmised that the teacher might have viewed the curriculum and textbook as authorities, thereby skewing her instruction towards an approach more reflective of her absolutist epistemic beliefs rather than her evaluativist epistemic beliefs about reading. Lack of attention to supporting students’ use of background knowledge is problematic because making connections to literature by activating prior knowledge and experience is an important factor in students’ reading comprehension (Braunger & Lewis, 2006; Duke, Halversen, & Knight, 2012). However, it should be noted that Feucht’s (2011) analysis was based on a 90-minute interview and one observation of instruction.
It could be that this teacher, in this lesson, was emphasizing the target strategies for drawing conclusions and that in other days of the unit she addressed other issues of practice.

In sum, evidence from these studies suggested that early childhood teachers’ epistemic beliefs seemed related to how they identified and explained good literacy instruction, the pedagogical decisions they made about materials selection for literacy instruction, and their approaches to literacy instruction in the classroom. Buehl and Fives (2016) hypothesized that teachers’ epistemic beliefs are considered part of the self-system and are probable influences on the process of epistemic cognition. Findings across these three studies suggested that literacy teachers with more sophisticated epistemic beliefs tended to endorse constructivist literacy learning opportunities and enacted more student-centered literacy teaching approaches. Similar findings are evident in other teachers’ epistemic beliefs research (Roth & Weinstock, 2013; Sinatra & Kardash, 2004). Thus, early childhood teachers’ epistemic beliefs may have bearing on the types of approaches they use during early literacy instruction.

**Summary: Early Childhood Teachers Epistemic Cognition**

In section one I first overviewed the construct of epistemic cognition in regard to development of the theory. Second, I reviewed empirical work in teachers’ epistemic cognition. Finally I reviewed empirical work in early childhood teachers’ epistemic cognition.

What is missing in this field are rich, descriptive studies of early childhood teachers engaged in the actual process of epistemic cognition within domain specific contexts. In three studies, researchers seemed to allude to epistemic cognition in their description of their findings or of how they designed their studies (Feucht, 2011; Gholami, 2017; Yadav & Koehler, 2007). For example, Yadav and Koehler (2007) asked their participants to justify and explain their choice of good literacy instruction and Gholami (2017) asked his participants to justify their pedagogical
practices. Yet detailed portrayals of this construct enacted in the teaching context using conceptualization and terminology from process models of epistemic cognition are absent from the research.

**Early Childhood Teachers’ Literacy Instruction**

My purpose in this part of the chapter is to establish the context of early childhood teachers’ literacy teaching. Buehl and Fives (2016) suggested that context, including who is being taught, the content being taught, where the teaching happens, and how the teaching happens be considered an area of domain knowledge that plays an influential role in how teachers engage in epistemic cognition. Early childhood teachers can be described as teachers of children from birth through eight years old (Copple & Bredekamp, 2009) and may work in a variety of possible settings. Therefore, early childhood teachers may be defined in various ways. In this chapter I concentrate on teachers of preschool children (ages three through five). Hence, in this section I describe the context of teaching literacy to preschoolers. I define quality early literacy instruction as all facets of instruction that support desired literacy outcomes for young children.

I begin this section with the assertion that intentionality is epistemic cognition and is important in early literacy teaching. Next, I describe the knowledge base for early literacy instruction. I then discuss the importance of a balanced approach to early literacy instruction.

**Intentionality is Epistemic Cognition and is Important in Early Literacy Teaching**

In my review of the literature on early literacy instruction intentionality emerged as related to quality. In the following paragraphs, I discuss the importance of intentionality in early literacy teaching including how intentionality may be characterized as teachers’ engagement in epistemic cognition.
Fives et al. (2017) urged researchers in learning science and educational psychology to mine the work of teachers and research on them for hidden instances of epistemic cognition. In the realm of early literacy teaching the construct of intentionality seems to be the alias used for epistemic cognition. Intentionality is a prominent construct in the literature on early childhood teachers’ instruction (see Leggett & Ford, 2013; National Association for the Education of Young Children (NAEYC), 2009; Piasta, 2016). Epstein’s (2014) definition of intentionality (below) aligns with Fives et al.’s (2017) model of teachers’ epistemic cognition, which draws heavily from the AIR model (Chinn et al., 2014; Chinn & Rinehart, 2016). In Epstein’s definition below, I have inserted using brackets the components of epistemic cognition evident:

To be intentional means to act purposefully, with a goal in mind and a plan for accomplishing it. Intentional acts originate from careful thought and are accompanied by consideration of their potential effects. Thus, an intentional teacher aims at clearly defined learning objectives for children [epistemic aims], employs instructional strategies likely to help children achieve the objectives [reliable processes], and continually assesses progress and adjusts the strategies based on that assessment [evaluation of epistemic matters based on ideals]. The teacher who can explain why she is doing what she is doing is acting intentionally. (p. 5).

Berliner (1983; 1987; 1992) emphasized that effective teaching requires intentionality during interactions with children, while simultaneously considering the anticipated outcomes of instruction. This overlap between intentionality in early literacy instruction and the process model of epistemic cognition is important because it brings together two previously disparate fields of research and provides a window for looking at early childhood teachers’ literacy instruction in a new way.
Early literacy teachers who engage in intentionality in their practice provide optimal literacy learning experiences for their students (Diamond, Justice, Siegler & Snyder, 2013; Guo, Justice, Kaderavek, & McGinty, 2012; Hall, 2013; Hamre et al., 2012; Justice, Mashburn, Hamre, & Pianta, 2008; Piasta, 2014, 2016; Wasik, 2010). To illustrate that there are some learning activities during which early childhood teachers should engage in epistemic cognition I turn to the literature on read-alouds. For example, Piasta, Justice, McGinty, and Kaderavek (2012) conducted a randomized-controlled trial study of 550 four-year-old children in two groups. Teachers of children in the experimental group intentionally employed explicit verbal and nonverbal print reference strategies (e.g., ask specific questions, make comments, point to text) during read-alouds as directed during professional development. Teachers of children in the comparison group conducted read-alouds in their normal way, without receiving professional development on intentional print referencing strategies. Piasta et al. (2012) analyzed data from multiple literacy measures using hierarchical linear modeling to determine that children in the experimental group with teachers using intentional print referencing strategies had statistically significant higher literacy outcomes than the students in the comparison group two years after the intervention. Zucker, Cabell, Justice, Pentimonti, and Kaderavek (2013) conducted a randomized-controlled study of 28 preschool teachers and 178 preschoolers. They found that teachers’ intentional meaning (focused on storyline, language or illustration comprehension) and code (focused on print features, letters, or word sounds) related talk about the text before during and after reading was significantly associated with gains in preschoolers’ letter knowledge and gains in both expressive and receptive vocabulary.

Choosing and using materials for early literacy instruction with young children is an important task for early childhood teachers (Christ & Wang, 2011; Roskos, Christie, Widman, &
Holding, 2010; Teale, 2003). Intentionality appears to be an effective approach to this teaching task. For example, Lane and Wright (2007) suggested that teachers select books for read-alouds with instructional goals in mind. Remember, that clearly defined learning objectives (i.e., epistemic aims) are a key part of the intentional approach to instruction. For instance, non-fiction books can be used to help children build background knowledge (e.g., What is it like to live on a farm?) and practice problem solving (e.g., Why do we need to recycle?). Books focused on word play can be used to help children develop phonemic awareness and narrative stories can be used to teach children about character and plot. Selecting books for read-alouds with an instructional goal in mind would mean that teachers would need to set an epistemic aim for the students, consider the standards they would use to determine if the epistemic aim was met (epistemic ideals) and have a reliable process for selecting a book that would support the achievement of the epistemic aim. Holding all of these knowledge considerations in mind and using them in concert requires the teacher to engage in epistemic cognition.

Yopp and Yopp (2006) studied early childhood teachers’ selection and use of texts for read-alouds. They found that early childhood teachers provided limited exposure to informational texts with the majority of read-aloud texts selected being narrative stories. In a further analysis of the data, Yopp and Yopp (2012) identified the vast majority of informational texts that were chosen for read-alouds (85%) were related to science topics, with 75% of these related to life science (study of animals, plant cycle). Yopp and Yopp (2012) suggested that early childhood teachers should be more intentional about the amount and range of selection of informational text topics because informational texts expose children to the concepts and vocabulary of academic content areas such as math, science and social studies.
In addition, Yopp and Yopp (2012) proposed that early childhood teachers consider experiential connections that could be made between the text and the students so that they can stimulate and capitalize on related background knowledge, preview the text for vocabulary and language structures so that they can highlight these features during reading, and consider features of the text to decide if it is better suited for reading to a small or large group (e.g., level of details in graphic images). Such an intentional approach to selection and use of informational texts would mean that early childhood teachers’ must engage in epistemic cognition. Yopp and Yopp (2012) also proposed that early childhood teachers “should guide children in setting purposes for the read-aloud” (i.e., setting an epistemic aim), pose challenging questions about the text, and “model the use of a variety of resources, such as additional print materials, colleagues and expert others, and the Internet for answers to these questions” (i.e., reliable process, p. 488). These suggestions for practice are reliable processes that can be actual ways for teachers to model engagement in epistemic cognition for young children.

If intentionality is indeed epistemic cognition, thereby making epistemic cognition a required process for early literacy teachers, then it is important to consider the kinds of knowledge early childhood teachers are expected to know in terms of content (the what) and process (the how). I refer here again to Muis et al.’s (2006) definition of domain knowledge as “a body of knowledge that individuals possess about a specific field of study” (p. 10). Buehl and Fives (2009) specifically defined teaching knowledge as “all knowledge relevant to the practice of teaching” (p. 370). Thus, in the next section I discuss the knowledge base for early literacy teaching; what early literacy teachers should know and be able to do to provide quality early literacy instruction (i.e., instruction that supports desired literacy outcomes for young children).
In the following paragraphs, I discuss what early childhood teachers need to know and be able to do to teach literacy to preschoolers. My goal in this section is to establish that in early literacy teaching, teachers need to engage in epistemic cognition. To emphasize my point, I refer to Hall’s (2013) review of research on early literacy instruction. Hall (2013) concluded in her review that effective early literacy instruction is best viewed as a combination of intentionally chosen teaching materials and approaches whereby seeking a single best approach to early literacy instruction is not a fruitful endeavor. Rather, as she pointed out, children seem to benefit from a variety of teaching approaches and that teachers must make individual decisions about which approach best fits each child or group of children as opposed to implementing scripted curriculum packages or generic approaches without question. The International Literacy Association (2018) supports this perspective.

**The what of early literacy instruction.** In 2008, The National Early Literacy Panel (NELP) conducted a meta-analysis, which proposed a body of knowledge for early childhood teachers for teaching reading, often referred to as early literacy. In their report, *Developing Early Literacy* the NELP (2008) identified alphabet knowledge, phonological (sounds of words and syllables) and phonemic (units of sounds in words) awareness, the ability to remember spoken language content (e.g., simple multi-step instructions, parts of a story read-aloud), rapid letter, object, and color naming, writing ability (e.g., individual letters or one’s own name), print knowledge (i.e., how to handle a book, print has meaning, recognize environmental print) and vocabulary and oral language development as essential skills and knowledge for young children learning to read. Hence, early childhood teachers need to know how children develop in these areas and how to implement instruction in these areas.
In addition, early childhood teachers need to have content knowledge in phonology (i.e., the sound system of language), orthography (i.e., writing conventions), all levels of language structure (i.e., parts of words, words, sentences, discourse), and grammar (International Literacy Association’s Standards for the Preparation of Literacy Professionals, 2017; Moats, 2009; Snow, Griffin, & Burns, 2005; Vesay & Gischlar, 2013). The International Literacy Association’s Standards for the Preparation of Literacy Professionals (2017) suggest that the role of classroom Pre-K teachers is to use research evidence as a basis for their selection and implementation of instructional materials and methods and to do so in keeping with students’ learning needs and instructional objectives in mind. Keeping all of these knowledge related considerations in mind and using them in conjunction with each other requires early childhood teachers to engage in epistemic cognition during literacy instruction.

The how of early literacy instruction. The efforts of researchers to understand how children learn to read have culminated in a professional knowledge base for teaching reading supported by empirical research (Braunger, & Lewis, 2006; Moats, 2009). Nearly two decades ago, in the American Federation of Teachers’ 1999 publication, Teaching Reading is Rocket Science: What Expert Teachers of Reading Should Know and Be Able to Do, Louisa Moats synthesized the empirical research on effective strategies for reading instruction to provide teachers with a foundation for their work in literacy instruction. Moats (1999) identified specific teaching practices supported throughout the literature such as direct instruction in phonemic awareness (the ability to hear, attend to, and manipulate individual sounds in words), vocabulary development, comprehension strategies, as well as providing children daily experiences with writing and varied types of texts (books, magazines, written display on classroom walls, etc.).
Scholars agree that early literacy instruction must be systematic and intentional while entailing sustained, simultaneous attention to comprehension, oral language, and development of meaningful content knowledge as well as emphasize letter identification, phonological awareness, print knowledge, and letter-sound correspondences, (Lonigan, Purpura, Wilson, Walker, & Clancy-Menchetti, 2013; Morrow, 2001; Teale, Paciga, & Hoffman, 2007). Doing so requires early literacy teachers’ engagement in epistemic cognition. I argue that there are specific teaching strategies during which early childhood teachers should engage in epistemic cognition. These strategies are often referred to as best practices. Piasta (2016) conducted a review of the literature on best practices for early literacy instruction. Best practices were defined as “empirically backed instructional strategies independent of curricula” (Piasta, 2016, p. 236). Broad and specific best practices that emerged from his review included: a) deliberate, systematic instruction (e.g., purposeful teaching of new vocabulary and provision of multiple opportunities to hear, see, and say new words; Gonzalez et al., 2010); b) teachers’ active scaffolding of learning for children embedded within the context of literacy related activities such as shared book reading or print referencing (i.e., systematic drawing of attention to print in books and environment; Justice & Piasta, 2011; Lovelace & Stewart, 2007); and c) differentiation and individualization of instruction based on learners’ needs and interests (teaching letters based on difficulty and with consideration of children’s familiarity; Justice, Pence, Bowles, & Wiggins, 2006; Piasta, 2014). Cooper et al. (2018) defined an effective literacy teacher as one whom “differentiates instruction for students in accordance with their strengths, their needs, and the tasks they are performing” (p. 18). Within each best practice there is a spectrum of intervention and the early childhood teacher should use epistemic cognition to decide when and how much to intervene, direct, support or guide the child.
Together these early literacy teaching strategies, the content knowledge of literacy itself as well as knowledge about how children develop essential literacy skills and knowledge constitute the body of knowledge teachers need to consider in early literacy instruction and must be integrated according to what the most recent reviews say about balanced literacy instruction (see Chambers, Sleung, & Slavin, 2016; Hall, 2013). That mental integration will require early childhood teachers to engage in epistemic cognition.

**A Balanced Approach to Early Literacy Instruction Requires Epistemic Cognition**

A long-standing debate exists in the field of early childhood education between those who advocate for overall developmental approaches (i.e., whole-child, play-based) versus those who advocate for direct academic instruction (see Bishop-Josef & Zigler, 2011; Roskos et al., 2010). As mentioned earlier, some scholars have argued that constructivist learning experiences are critical to children’s early literacy learning (Morrow, 2001, Roskos & Neuman, 2011, Wortham, 2002). Indeed, research supports positive benefits for literacy learning in young children during free choice when adults purposefully mediate children’s self-selected, play-based literacy experiences (Roskos & Neuman, 2011). However, Justice et al. (2008) defined high quality early literacy instruction as “explicit and direct instruction that systematically teaches children about the code-based characteristics of written language, to include both phonological and print structures” (p. 13). Together these perspectives on early childhood literacy instruction would seem to present a contradiction for early childhood teachers who may adhere to a constructivist learning philosophy because they create a conflict between child-centered pedagogy and the apparent benefits of didactic teaching practices. The either/or debates over code-based versus literature-based instruction as well as the all-or-none misnomers of developmentally appropriate practice create a false dichotomy in early literacy instruction.
because they do not capture the complex nature of early literacy learning (Hall, 2013; Lonigan, Farver, Phillips & Clancy-Menchetti, 2011).

Current advice from the field supports a balanced approach to early literacy instruction (Chambers et al., 2016; Epstein, 2014; Hall, 2013, ILA, 2018; Lonigan et al., 2011; NAEYC, 2009; Vesay & Gischlar, 2013). Sometimes this is referred to as a comprehensive approach because it attends to both teacher-directed instruction (e.g., systematic and explicit modeling) and child-initiated activities (Cooper et al., 2018). Chambers et al. (2016) explained a comprehensive approach as one where the teacher provides some direct instruction in large or small groups on code-based skills, such as phonemic awareness or letter recognition, as well as time for child-initiated activities such as story re-enactment in the dramatic-play center, that support constructivist learning.

A balanced approach would require teachers to engage in epistemic cognition in order to think about the multiple domains of knowledge (child development, knowledge base for early literacy instruction) that they need to consider to respond to students’ literacy learning needs. Hall (2013) emphasized that teachers who employ eclecticism and balance in their choice of teaching approach seem to be most effective in early literacy instruction. According to Hall (2013), “[c]hildren benefit from a combination of approaches to become successful readers and writers and effective teachers know and act on this” (p.12). This eclecticism and balance requires teachers to engage in epistemic cognition as Kitchener (1983) defined it. Therefore, epistemic cognition is important in early literacy instruction.

**Summary of Early Childhood Teachers and Early Literacy Instruction**

Epistemic cognition seems to be a required process for teachers to provide quality early literacy instruction. The ability to choose materials and strategies (when to model, when to
guide, when to provide direct instruction) requires teachers to consider the knowledge to be learned, the child’s developmental level and/or current ability level, and the overall goals of instruction in tandem. This complex process requires early childhood teachers to engage in epistemic cognition (i.e., establishing an epistemic aim, considering epistemic ideals, choosing a reliable (aligned) process to achieve the aim).

What is missing from these studies on early literacy instruction is information about the teachers’ thinking process in relation to their selection and use of materials and why they interacted with children the way they did (or did not). In the instances where quality literacy instruction was implemented, teachers likely engaged in effective epistemic cognition (i.e., occasions when aims were met competently through the application of reliable processes). However, in these studies on early literacy instruction, researchers simply report the observable interactions (or lack thereof) of the teachers or report the observed literacy environment. There is no way to determine if the teachers in these studies had an epistemic aim for their students or if they had an epistemic ideal. All we can see is the final product and we are not able to judge if the teacher’s process for achieving the aim (if there was one) was reliable or not.

Discussion

In this chapter I looked across multiple bodies of literature: epistemic cognition/beliefs, early childhood teachers’ epistemic cognition, and early literacy instruction. In this section I describe the significance of my findings in relation to my argument for the importance of early childhood teachers’ engagement in epistemic cognition in early literacy teaching.

Links across Fields

The most important insight gained from looking across the bodies of literature is the overlap between intentionality and epistemic cognition. Intentionality, as described by Epstein
(2014) sounds a lot like the process model of epistemic cognition, making teachers’ epistemic cognition important for early literacy instruction. The purposeful nature of intentionality in early childhood teaching is comparable to process models of epistemic cognition (Buehl & Fives, 2016; Chinn et al., 2014; Fives et al., 2017) in which individuals set knowledge focused goals for themselves or others, assess whether or not these goals are met in relation to epistemic ideals (benchmarks or criteria), and use reliable processes (strategies or practices) to achieve these goals. Therefore, the construct of epistemic cognition can be equated to the construct of intentionality in the field of early literacy instruction when teachers are considering knowledge related aims. Moreover, drawing the connection between these two constructs allows researchers to use the process-focused constructs and vocabulary of epistemic cognition to understand and explain the empirical evidence around intentionality.

A second insight gained from looking across the bodies of literature is the connection between calls for a balanced approach to early literacy instruction and the need for early childhood teachers to engage in epistemic cognition to employ such an approach. Teaching literacy to young children is a complex cognitive task that requires consideration of both broad (e.g., child development) and specialized (e.g., literacy learning, language structure) knowledge (Cunningham et al. 2009; Pianta; 2011). Contemplating the entailed multiple knowledge domains while deciding how to implement teaching strategies in the called for balanced approach may be conceived of as an ill-defined problem for early childhood teachers to solve in their practice. Ill-defined problems, those with no one solution, require engagement of epistemic cognition (Kitchener, 1983).

**Relationships among Beliefs and Between Beliefs and Practices**
The finding that early childhood teachers’ epistemic beliefs seem related to (a) beliefs about teaching practices, (b) beliefs about how children learn, and (c) enacted teaching practices, is important because of the bearing teachers’ epistemic beliefs have on the kinds of learning opportunities teachers afford young children and raises questions about how early childhood teachers’ epistemic beliefs influence their engagement in epistemic cognition during literacy instruction. Early childhood teachers’ epistemic beliefs informed their identification and explanation of good literacy instruction (Yadav & Koehler, 2007), choice and use of materials for literacy instruction (Prestridge & de Aldama, 2016) and instructional approaches used in literacy instruction (Feucht, 2011) yet we do not know from these studies how early childhood teachers’ epistemic beliefs inhibited or facilitated their engagement in epistemic cognition during early literacy instruction. When early childhood classroom teachers’ epistemic aims for their students are simplistic and reflective of a less adaptive epistemology, children’s opportunities to construct their own literacy knowledge could be limited. Early childhood teachers with evaluativist epistemic beliefs may be reluctant to provide direct instruction as part of the balanced instruction needed to support the best literacy outcomes for their students while teachers with absolutist epistemic beliefs may provide too much direct early literacy instruction.

In Chinn and colleagues’ (2014; 2016) AIR model of epistemic cognition and Buehl and Fives’ (2016) Model of Epistemic Cognition in Teaching and Learning, epistemic beliefs are considered epistemic ideals and are used to guide judgments about knowledge. This was underspecified in the studies of epistemic beliefs only.

These findings deserve further attention based on what we know about the importance of early literacy, its relationship to later academic achievement, and how early literacy instruction should happen; with intentional and balanced approaches. Given the multiple domains of
knowledge to consider in early literacy teaching, and the evident influence of early childhood teachers’ epistemic beliefs on their literacy teaching practice, it is important to examine how early literacy teachers engage in the epistemic cognition process. For example, an examination of how early childhood teachers engage in epistemic cognition during specific literacy teaching tasks (i.e., planning) may shed light on how early childhood teachers make key pedagogical decisions for literacy instruction. Researchers demonstrated that teachers with more sophisticated epistemic beliefs tend to be more flexible in their teaching strategies (Sinatra & Kardash, 2004). Johnston et al. (2001) found that teachers who view learners as active constructors of knowledge tended to interact more with their students. These findings relate to epistemic cognition as a process because teachers’ epistemic beliefs become part of their self-system and may act as their ideals (Buehl & Fives, 2016).

Gaps in the Research

I identified two key gaps within the body of literature on early childhood and elementary teachers’ epistemic beliefs. First, only three studies addressed the literacy domain and of these three, all were focused on elementary teachers; none were focused on early childhood teachers. This is problematic because of what we know about the importance of quality early literacy instruction and its relationship to later academic achievement (Dickinson & Porche, 2011; Duncan et al., 2007). Second, I found an emphasis in the research on the status of beliefs and relationships between beliefs and outcomes rather than on the mental activities teachers’ employ while thinking about knowledge and knowing. None of the researchers in the review of early childhood teachers’ epistemic cognition used the term epistemic cognition nor did they use recent, more complex models of epistemic cognition such as Chinn et al. (2011), Greene et al., (2008) or the recently developed framework of Epistemic Cognition for Teaching and Learning.
(Buehl & Fives, 2016) to frame their investigation or analyses. This is problematic because identifying associations among beliefs does not provide a full picture of teachers’ knowledge construction and justification processes and therefore no way to determine if the teachers’ epistemic cognition was effective or not. Instances of misalignment of beliefs and practice may be explained by issues related to the reliable processes selected or the aims identified in a particular instance of practice.

Buehl and Fives (2016) called for studies that are designed to develop an explanation for how teachers engage in this process. Since researchers in these studies focused on epistemic beliefs rather than the mental activity of the teachers, there was no insight provided into the teachers’ thinking process in regards to considerations of knowledge. This is problematic because in the research on early literacy instruction, researchers agree that intentionality (i.e., epistemic cognition) is required for quality literacy instruction.

Implications

In this section I present a series of implications for theory, practice, and research based on my findings from a review of the literature on early childhood teachers’ epistemic cognition and early childhood teachers’ literacy instruction.

Implications for Theory

Since epistemic cognition is conceived of as a process specific to a domain of knowledge (Buehl & Fives, 2016), an investigation into epistemic cognition in early literacy teaching would benefit scholars with regards to developing theory explaining how this process might work in the context of early literacy instruction. Fives et al. (2017) set their theoretical model of epistemic cognition in teaching within the context of classroom assessment because, as they proposed, classroom assessment is a complex task requiring epistemic cognition and therefore an
appropriate forum in which to examine the process. I propose to set the context of my investigation within the context of early literacy instruction because researchers agree that this is a complex task requiring intentionality (i.e., epistemic cognition), simultaneous attention to a broad range of knowledge matters, and a balanced approach. The context of early literacy instruction provides a rich opportunity to explore and build on the construct of epistemic cognition. The findings of my investigation could inform and refine existing process models.

**Implications for Practice**

The finding that early childhood teachers’ epistemic beliefs are related to context highlights the need for teacher educators to model adaptive epistemic cognition for preservice and inservice early childhood teachers as well as the importance of teachers being supported in resolving the tension that may exist between their epistemic beliefs and their teaching context. When designing preparatory and professional learning experiences in higher education and professional development settings, teacher educators should be purposeful with efforts to be cognizant of how they may be modeling epistemic cognition in their own practice, pay attention to the design of learning activities implemented to promote effective epistemic cognition, and sensitize themselves to how their students (i.e., preparing and practicing teachers) engage in epistemic cognition. Holistic consideration of teachers is necessary when designing ways to help them learn and develop in ways that effective teaching demands (Brownlee et al., 2012; Mills & Fives, 2018). In addition, it is important to be aware of and consider early childhood teachers’ epistemic cognition when expecting early childhood teachers to incorporate educational reforms and implement new practices, rather than focusing solely on the status of teachers’ epistemic beliefs and relationships between beliefs and outcomes.
Since early childhood classrooms are complex environments and teaching young children literacy is a complex endeavor, it is necessary for teachers to engage in effective epistemic cognition to bring about worthwhile knowledge-related outcomes for themselves as teachers and their students as learners (Buehl & Fives, 2016). The research in early literacy instruction supports teachers’ implementation of intentional and balanced approaches, which would require teachers’ engagement in epistemic cognition. Therefore, it is important to support early childhood teachers’ development of effective epistemic cognition.

**Implications for Research**

The literature in early literacy instruction emphasizes the importance of intentionality (i.e., epistemic cognition) and a balanced approach in teachers’ practices. All the research I reviewed on early childhood teachers’ epistemic cognition, including research in the literacy domain, was in actuality about epistemic beliefs, not epistemic cognition. Yet intentionality is epistemic cognition and a balanced approach would require teacher’s engagement in epistemic cognition. Sole focus on the nature of early childhood teachers’ epistemic beliefs without regard to the actual mental activity early childhood teachers use while engaged in teaching tasks limits the potential for research in this field to be applicable to the professional work of teacher educators. Research is needed on early childhood teachers’ epistemic cognition during early literacy instruction that would help explicate the mental process they use while engaging in teaching tasks such as considering materials and planning instruction for early literacy learning. Specifically, how do the components of epistemic cognition reveal themselves during early childhood teachers’ early literacy instruction?

Implications for research arise based on my finding that early childhood teachers’ epistemic beliefs are sensitive to context. First, this finding highlights the need for researchers
to be sensitive to the pressures on teachers for accountability and non-epistemic, pragmatic goals (e.g., meeting standards, advancement to next grade, achievement scores on standardized tests, pleasing parents). Second, the existence of differences among teachers’ groups in relation to cultural context found in Feucht and Bendixen’s (2010) study provides an opening for researchers to explore this cultural contextual aspect of epistemic cognition in greater detail. Third, exploring early childhood teachers’ epistemic cognition across and within systemic contexts is important because early childhood teachers may be employed in a wide range of settings with varied amounts of preparation, experience, and professional support. Therefore, researchers should consider multiple contexts when designing studies to help them understand teachers’ epistemic cognition.

Furthermore, Buehl and Fives (2016) emphasized that researchers studying teachers’ epistemic cognition should be clear about whether the principal task under investigation involves the teacher in the context of teaching or learning because of the inherent difference in focal point between the two tasks. The task of teaching requires teachers to focus on others’ learning while the task of learning requires the teachers to focus on themselves and their own learning. Clarifying these distinct teacher tasks in research design distinguishes the focus of the teacher as on themselves as a teacher, as a learner, or on others as learners.

I concur with Hofer (2016) and Buehl and Fives (2016) by arguing that it is time to move the field forward with empirical explorations using newer frameworks and models of epistemic cognition that seek to provide evidence for explicit claims about the actual process of engaging in thoughts about knowledge and knowing. If the process of epistemic cognition is, as I assert, important for early childhood teachers to be able to provide the intentional, balanced literacy instruction necessary for positive early childhood literacy outcomes, then empirical inquiry into
how early childhood teachers engage in epistemic cognition during literacy instruction is warranted. Thus, an important avenue to explore related to my findings is how early childhood teachers engage in epistemic cognition within the context of particular early literacy teaching tasks (e.g., during planning of instruction, during assessment practices, and while providing instruction) and how these components of teaching can be brought together (i.e., alignment of epistemic aims and reliable processes used to accomplish aims). Looking at teachers’ epistemic cognition during early literacy instruction may provide a deeper understanding of why and how teachers’ make pedagogical decisions for early literacy instruction. Such understanding could be used as a starting point in helping teacher educators support teachers in their practice and could help make teachers themselves aware of the cognitive process they use when choosing early literacy teaching materials, deciding how those materials are used in the classroom, and in how they structure literacy learning experiences for their students.
CHAPTER 3: RESEARCH METHODOLOGY

The purpose of my investigation was to uncover and understand aspects of epistemic cognition that emerged when early childhood teachers considered materials and planned instruction for literacy learning. My goal was to provide a holistic, in-depth description and deep explanatory analysis of this phenomenon. The case study approach is a flexible way to explore a complex phenomenon that is sensitive to the context within which it takes place (Stake, 1995; Yin, 2016). Specifically, I conducted an instrumental multi-case study. I defined this case as instrumental because I selected my participants with the specific intention of gaining a detailed understanding into the phenomenon of early childhood teachers’ epistemic cognition during consideration of materials and planning for literacy instruction (Stake, 1995). I also defined my study as a multi-case study because I explored how epistemic cognition emerges in the practice of two early childhood teachers and I conducted a cross-case analysis to identify themes that emerged across the teachers’ practice by exploring patterns of similarities and differences across the cases (Stake, 2006). In this study, my case was the early childhood teacher in the context of considering material and planning for early literacy instruction in a state funded pre-kindergarten program. The phenomenon of interest was how aspects of epistemic cognition emerged during consideration of material and planning for early literacy instruction. The case, context and phenomenon of study constitute the bounded system that was the subject of my research (Stake, 2006). In my study I drew on the bodies of literature on epistemic cognition and early literacy instruction.

The question that guided my research was: How do aspects of epistemic cognition emerge when early childhood teachers consider materials and plan instruction for literacy learning?
Context of Study

I conducted this study in two Universal pre-kindergarten (UPK) classrooms at the pseudonymous Chapman Elementary School in a metropolitan suburban area of the northeastern United States. UPK is a state funded early childhood education program that was established for children who are four years of age. The purpose of this program is to provide four year olds with the chance to attend a quality early childhood program the year before they enter kindergarten. Children are eligible for the program if they will be four years of age on or before December 1, of the school year and reside within a school district that offers UPK.

I focused on early childhood teachers in a state funded pre-kindergarten program in a school-based setting because the expectations for and accountability of these teachers to ensure positive child outcomes has increased and become more consistent over the past several years (Barnett et al., 2018; Bassok, Dee, & Latham, 2017). For instance, the National Institute for Early Education Research (NIEER) has established quality benchmarks for state funded pre-kindergarten programs such as requiring teachers in state funded pre-kindergarten programs to hold a Bachelor’s degree and specialized certification in early childhood education. This was important to my investigation because it ensured the presence of typical features across classrooms, which was important for transferability (Guba, 1981).

Participants

Early childhood teachers are teachers of children birth through eight years old (Copple & Bredekamp, 2009). Participants for this study included two early childhood teachers in a state funded pre-kindergarten program from one school district in the Northeastern United States. I chose to study early childhood teachers because, aside from parents and families, they have the earliest influence on children’s literacy learning. I used the following three criteria to determine
participant eligibility. First, I selected teachers who held state certification in early childhood (either B-2nd, N-6, or preschool certification) because early childhood teachers with special preparation may have stronger knowledge of learning, development, and pedagogy specific to young children than those who hold certification for upper grade levels. Second, I selected teachers in a universal/state funded pre-kindergarten classroom for four-year-old students because teachers in these programs are typically required to adhere to early learning standards across multiple domains and receive annual professional development to do so. Also these programs are paid for with state tax dollars serving about one third of all four-year-olds in the United States, making the findings potentially relevant to taxpayers and state policy makers. Third, I selected teachers who had at least five years of experience with the early childhood population so that they could talk in depth with reference to experience about their practice.

I used convenience sampling to identify the two participants who met my above criteria (Merriam & Tisdell, 2016). I asked a former colleague who provides professional development to early childhood teachers in the area to suggest a school district early childhood administrator who may be receptive to helping me identify potential participants. I then contacted one of the administrators she suggested from a district with which I had no prior professional relationship to avoid potential bias. I explained the study and selection criteria to the administrator, emphasizing that it would be ideal to identify participants who were articulate and comfortable talking about their practice. She identified two participants who ultimately agreed to participate in my study. Participants’ professional demographic data are presented in Table 3. 1.
Table 3.1 Participants Professional Demographics

<table>
<thead>
<tr>
<th>Teacher</th>
<th>Qualifications</th>
<th>Classroom Teacher Experience</th>
<th>Experience as UPK Classroom Teacher</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mrs. Sanchez</td>
<td>Bachelor’s, Elementary Ed</td>
<td>22 years-UPK</td>
<td>22 years</td>
</tr>
<tr>
<td></td>
<td>Master’s Early Childhood Ed</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>N-6th grade Teaching Certification</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Master’s in Science in Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>N-6th grade Teaching Certification</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mrs. Logan</td>
<td>Master’s of Science in Education</td>
<td>4 years-UPK</td>
<td>4 years</td>
</tr>
<tr>
<td></td>
<td>N-6th grade Teaching Certification</td>
<td>3 years-Kindergarten</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>9 years-third grade</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4 years-fifth grade</td>
<td></td>
</tr>
</tbody>
</table>

Mrs. Sanchez

Mrs. Sanchez has 22 years of experience teaching four-year-olds in a UPK classroom within the Chapman School District. She has taught at Chapman Elementary School for the past 10 years. She earned her Bachelor’s in Science in Elementary Education from a local state university, taught for two years, then earned her Master’s of Early Childhood Education at a local college. Mrs. Sanchez routinely attends the annual state Association for the Education of Young Children Conference and the Los Niños Young Child and Expo Conference. She participated in district provided professional development for *The Creative Curriculum® for Preschool* (Dodge, Heroman, Berke, Colker, & Bickart, 2016b), the curriculum the district requires for use in UPK classrooms. Mrs. Sanchez identified herself as White and in her mid-40s.

Mrs. Logan
Mrs. Logan has been an educator for 20 years and has taught at Chapman Elementary for the past 17 years. She is in her fourth year of teaching four-year-olds in a UPK classroom. Prior to teaching UPK she taught in kindergarten, third grade, and fifth grade. She earned her Master’s of Science in teaching from a university in a nearby state. Mrs. Logan holds approximately 84 hours of inservice professional development credits, which included a course called Literacy Beginnings. At the time of the study, Mrs. Logan was enrolled in a 15-hour inservice course on Guided Reading. She participated in district provided professional development for *The Creative Curriculum®* for Preschool, Mrs. Logan identified herself as White and in her mid-50s (Logan_DQ_2-15-19).

**Recruitment**

In order to recruit teachers for this study, I worked with a school district administrator who oversaw a state funded pre-kindergarten program to identify and obtain permission to contact the teachers who fit my criteria for potential study participants (see Appendix B). I then contacted teachers via email using a recruitment script (see Appendix C). Teachers received a twenty-five dollar gift certificate to Barnes and Noble as a thank you for participating in the study.

**Data Collection Procedures**

I followed the timeline presented in Appendix D to complete my study. Data collection for each early childhood teacher took place across six rounds. By round I mean a one to two-week period of concentrated data collection during which I focused on collecting a specific data source from each teacher. Data collection took place over a ten-week period from mid-February to mid-April. This schedule allowed me to stay in regular contact with each participant and required each participant to dedicate only one day per week to an interview.
Prior to the first round of data collection, I obtained site consent from the district UPK administrator. During the first round, in mid-February, I met with both participants and the UPK administrator. First, I explained the study and obtained informed consent (see Appendix E). Next, I asked the teachers to complete a demographic questionnaire on paper (see Appendix F). I then scheduled the observation and interview for the second round of data collection with each teacher and explained that I would be emailing them a link for the Epistemic Beliefs Questionnaire for them to complete online. Subsequent observations and interviews were scheduled following the end of each interview at a time convenient for the teachers.

Rounds 2-5 took place from mid-February through late March. These rounds consisted of one observation (prior to the interview) and one interview with each teacher (i.e., two observations and two interviews per round). I observed participants five times. The first observation took place over the entire 5-hour instructional session. This first observation helped me to acclimate to the classroom setting, understand how the entire session was conducted, and see how literacy instruction occurred throughout the session. Subsequent observations were more targeted and occurred during literacy instruction prior to each interview. I attempted to ensure that I observed the teachers conducting a range of instructional interactions. For example, I observed each teacher conducting a read aloud to the entire class and implementing small group instruction. I used data gathered from classroom observations for three purposes. First, observation data provided a focal point for the stimulated-recall interviews. Second, observation data allowed me to make qualitative comparisons of the teachers’ espoused epistemic beliefs to their enacted epistemic practices. Third, the observation data helped me create a thick, rich description of the context of the phenomenon. During round six, which occurred in mid-April, I
conducted the closing interviews. I asked final follow-up questions and clarified any points that came up during my ongoing data analysis. I did not observe during round six.

After each data collection point I documented my visit in my researcher memo book, often stopping at a local coffee shop or diner to do so before I drove home so my notes would be as fresh as possible. My researcher memo book is stored in a locked file cabinet in my home office when not in use. I audio recorded all interviews using my personal computer and documented observations using handwritten field notes. I transcribed each interview and typed my handwritten field notes into a Google Doc within 24-48 hours after each data collection point. I sorted data as collected into digital folders, one for each participant, labeled with each participant’s alias. Digital data is stored on my password-protected personal computer or in my personal password-protected Google Drive. See Appendix D for data collection details.

Data Sources

In qualitative research, it is important to corroborate findings across multiple sources of evidence to address trustworthiness of the data (Merriam & Tisdell, 2016). I used the following data sources; observations, interviews (i.e., semi-structured, stimulated recall, and think aloud), classroom artifacts, and documents. In addition, I collected data multiple times in multiple ways as an important way to reach saturation in my data, meaning getting to the point where no new codes in the data are being found (Merriam & Tisdell, 2016). I followed specific protocols for each data collection method across all participants, which allowed me to interpret data at the individual case level, and across the cases. See Appendix G for a summary of the purpose and description of the data sources I used in my study.

Questionnaires
I used a teacher Demographic Questionnaire (Appendix F) to collect demographic information from the participants in my study during the initial meeting. Demographic information included race/ethnicity, age, gender, level of education, degree held, years and type of teaching experience, as well as professional learning experiences related to early literacy instruction.

I used an online Epistemic Beliefs Questionnaire to collect information from the participants about their epistemic beliefs. At the end of the first meeting, I explained the questionnaire and emailed each participant a link to the questionnaire. Each participant completed the questionnaire prior to round two of data collection. I designed the questionnaire to purposely elicit responses that would shed light on the participants’ epistemic beliefs. I used prompts and questions based on an interview protocol designed by Brownlee et al. (2008).

Brownlee et al. (2008) developed an interview protocol and coding system based on an extended framework for epistemological beliefs (EFEB) that included beliefs about children’s learning (e.g., “How do you think children develop knowledge/learn?” p. 141), preservice teachers’ personal learning (“How would you o about learning something that you needed to know that would help you to be a group leader?” p. 141), and beliefs about the nature of knowledge (“What are the most important sources of knowledge that influence your practice as a teacher in early childhood?” p. 141). Brownlee et al. (2008) kept their questions domain general or focused on leadership. I rephrased the questions Brownlee et al. (2008) used in their study to design a questionnaire that reflected a domain-specific focus on reading/literacy. For example, to ascertain what the teachers believed about how young children learn literacy I prompted and asked “Describe an experience you have had with a child where you really noticed that he or she had learned something literacy related. How did you know that the child had learned?”


Brownlee et al.’s questions regarding epistemic beliefs focused on the source and certainty of knowledge. Thus, I prompted/asked additional questions regarding the structure (e.g., “Some people say that there are no right answers in early literacy instruction. What are your views?”) and justification of knowledge (e.g., “What criteria do you use to evaluate new approaches to early literacy instruction?”). The full Epistemic Beliefs Questionnaire is provided in Appendix H.

**Observations**

Researchers use observation as a tool to gather data in situ (Merriam & Tisdell, 2016). Observation of a teacher’s actual performance in real-time allows for documentation of actions which may then be compared to a teacher’s stated beliefs, thereby allowing researchers to make connections between beliefs and practice (Schraw & Olafson, 2015). The observation protocol I used is provided in Appendix I.

**Interviews**

I conducted six interviews with each participant in my study: two semi-structured interviews, two stimulated-recall interviews, and two think aloud interviews. An interview is a process of gathering data through a focused discussion between the researcher and the participant centered on questions related to the research study (deMarrais, 2004). Use of interviews as a data collection method allows researchers to probe participants to elaborate on their responses, thereby providing depth of insight into how teachers justify their beliefs or explain their teaching behaviors in relation to their beliefs (Schraw & Olafson, 2015). By using three different kinds of interviews with different foci, I gained access to teachers’ epistemic cognition in a variety of ways. In the following paragraphs I explain the rationale for each type of interview I conducted and describe the process I used.
Semi-structured interviews (SSI). I used a semi-structured interview format to access participants’ epistemic cognition and epistemic beliefs related to early literacy instruction, as well as their beliefs about how young children learn literacy, and beliefs about their own personal learning related to early literacy instruction. The semi-structured interviews consisted of using a base set of flexibly worded, open-ended questions targeting specific topics, which allowed me to respond to the participants emerging ideas during the interview (Merriam & Tisdell, 2016). I conducted two semi-structured interviews with the participants: a follow-up interview to explore the teachers’ epistemic beliefs, and a closing interview.

Epistemic beliefs follow-up interview (SSI-1). As mentioned earlier, I used an online Epistemic Beliefs Questionnaire to collect information from the participants about their epistemic beliefs. I conducted a follow-up interview after reviewing the participants’ responses to the questionnaire. I did so in order to clarify participants’ responses and allow them to expand their responses. I used questions designed to clarify and expand their responses such as “Can you tell me more about that?” and “Why do you say that? The full epistemic beliefs semi-structured follow-up interview protocol is provided in Appendix J.

Closing interview (SSI-2). During the closing semi-structured interview, I conducted a member check. I personalized the closing interviews to contain data samples from each teacher’s interviews and observations along with relevant digital images. First, I played back portions of audio-recorded interviews or restated portions of interview transcripts and asked participants “Is there anything you would like to add to or clarify about your response?” Next, I showed photos I had taken during prior observations in conjunction with questions such as “What was your intention for literacy learning here?” Then, I asked follow-up questions based on previous interview responses. Finally, I thanked the teachers for their participation, gave them their gift
certificate, and asked if they had any final questions. See Appendix K for the closing interview protocol.

**Stimulated recall interviews (SRI).** I conducted two stimulated recall interviews with each participant; one situated in a classroom tour and one observation based stimulated recall interview following my observation of their planned literacy lesson. Researchers in my review used stimulated-recall interviews using videos or photos of interactions between children and participating teachers to assess early childhood and elementary teachers’ epistemic beliefs (Berthelson et al., 2002; Brownlee et al., 2004; Brownlee et al., 2011a; Brownlee et al., 2012; Brownlee et al., 2015; Lunn et al., 2016). Calderhead (1981) suggested stimulated recall as a procedure “for collecting data concerning teachers’ thoughts and decision making” (p. 216). Stimulated recall interviews can be an effective way to help teachers articulate the beliefs that inform their practice (Meade & McMeniman, 1992).

**Classroom tour interview (SRI-1).** The classroom tour stimulated recall interview consisted of the teacher giving me a guided walking tour of her classroom with a particular focus on aspects related to early literacy instruction. Throughout the tour I asked open-ended questions to prompt elaboration such as “What do you mean by…..?” I also asked open-ended questions designed to prompt the teachers to talk about their epistemic beliefs. Sample questions included: “How has your thinking around that changed?” (i.e., certainty) and “How do you know?” (i.e., justification). In addition, I used questions designed to expose epistemic cognition such as “What is your intention here?” Following the walking tour I sat with the teacher in her classroom and asked specific questions using observations I made in the environment or statements the teacher had made during the tour as points of reference. During the classroom tour interview with each teacher, I developed an understanding of the classroom routine as well as the teachers’
perspectives on literacy instruction. I also used the classroom tour interview as a way to get the
teachers comfortable talking with me about their literacy teaching practice and to assess each
teacher’s overall ability to do so in order to make adjustments to subsequent interview protocols.
During this semi-structured interview, I followed the Class Tour Stimulated Recall Interview
protocol provided in Appendix L.

Observation based interview (SRI-1). I used observation based stimulated recall
interview as one way to access early childhood teachers’ epistemic cognition in hindsight and to
access a larger cycle of epistemic cognition, meaning it prompted the teachers to reference a
larger unit of instruction, learning, or teaching than what emerged during the think aloud
interviews. I selected five observed situations based on my field notes as focal topics for
interview questions. I used these situations as prompts for the teachers to talk about their
decision-making regarding literacy planning and instruction. For example, I referred to the
teacher’s small group instruction and asked, “What was your intention here?” The protocol that I
used for the observation based stimulated recall interview is provided in Appendix M.

Think aloud interviews (TAI). The goal of these think aloud interviews was to help me
access early childhood teachers’ epistemic cognition in real time. A think aloud interview can
“provide rich verbal data about reasoning during a problem-solving task” (Fonteyn, Kuipers, &
Grobe, 1993, p. 430). It may not only be useful, but necessary to observe early childhood
teachers in a task-based activity to gain a true understanding of how they engage in epistemic
cognition (Sandoval, 2005, 2012). While Fives et al. (2018) used a think aloud protocol to access
teachers’ thinking in real time and found that epistemic cognition emerged when teachers
engaged in assessment related tasks, they did not use specific prompts geared towards eliciting
teachers’ epistemic cognition. My intention was to use purposeful questions and prompting
designed to promote and make external early childhood teachers’ engagement in epistemic cognition during typical literacy teaching tasks. Specifically, guided by the Barnes et al. (in revision, October, 2019) descriptions of teachers’ epistemic aims, ideals, and reliable processes, I sought opportunities to have teachers make these conceptions explicit and, when possible, elaborate on them. I conducted two think aloud interviews with each teacher. During each think aloud interview I prompted the teacher to engage in a different literacy instruction task: book selection (an imposed task) and lesson planning for intended instruction (an authentic task).

Participants had an opportunity to practice the think aloud method prior to actual data collection. I did not collect data from the practice think aloud.

**Book selection think aloud (BS-TAI).** I piloted a think aloud interview protocol using a book selection task in February 2018 with three early childhood teachers in state funded pre-kindergarten programs. I did so because I wanted to assess the practicality of this data collection protocol and to find out if the data garnered through this method were suitable for my inquiry into early childhood teachers’ epistemic beliefs and epistemic cognition. I asked the teachers to think aloud while they examined two children’s picture books (i.e., *Walt Disney’s Peter Pan*, Author, 2014 and *Click, Clack, Moo: Cows That Type* by Doreen Cronin, 2011). I then asked them to elaborate aloud as to which book they would use for literacy instruction, why they chose it, and why they chose not to use the other one. I audio recorded and transcribed all interviews. I coded and analyzed data from portions of each interview using both established codes (Fives et al., 2018) and new codes that emerged from these data. I did not obtain Internal Review Board approval because the purpose was for my own learning about the research process, not to publish or present findings.
In my current study, I asked the teachers to think aloud while engaged in the process of selecting children’s literature for use during a hypothetical class read aloud following a refined procedure based on the one I used in my pilot activities. I asked the teacher to choose one of two pre-selected children’s books (i.e., *Walt Disney’s Peter Pan*, Author, 2014 and *Move Over, Rover!* by Karen Beaumont, 2006) and explain their decision-making process aloud. I purposely selected two books with clear differences in thematic content, illustrations, and literary structure so that the teachers would have clear opportunities to make comparisons during their selection. I selected *Walt Disney’s Peter Pan* because it was a Little Golden Book and I wanted one selection to be a culturally iconic representation of commercial children’s literature. I selected *Move Over, Rover!* because it was a 2007 Theodor Seuss Geisel Honor winner for recognition of creative literary and artistic contributions to engage young readers and, therefore, held literary merit. The reason for using this imposed task was to increase commonality of data across participants by having them complete the same task using the same materials. The protocol, questions, and prompts that I used for the BS-TAI is provided in Appendix M.

**Lesson planning think aloud (LP-TAI).** I arranged to be with each teacher when she was planning instruction for a literacy lesson. During this time, I asked each teacher to think aloud and explain her processes, decisions, and reasoning while designing instruction. I collected relevant artifacts and documents used or referenced by the teacher during these think aloud interviews to aid me in my subsequent analysis of the interview transcripts. The protocol that I used for the LP-TAI is provided in Appendix N.

**Material Artifacts and Documents**

Researchers sometimes use documents or artifacts to provide supplementary information in conjunction with primary data (Bowen, 2009; Schraw & Olafson, 2015). I collected material
artifacts and documents to support my understanding of early childhood teachers’ literacy teaching practices in context and help me develop rich descriptions of each case context. The terms artifacts and documents are used to describe concrete data sources other than transcripts from observations and interviews (Merriam & Tisdell, 2016). My intention in collecting these was to use them in triangulating observation and interview data with material artifacts and documents. I noted specific artifacts and documents when referred to during an interview so that the document would be aligned with the teachers’ interview data during transcription. Below I describe in detail the types of artifacts and documents I collected for my study.

**Material artifacts.** Material artifacts (i.e., items generated by the teacher for classroom use) included digital or hard copies of literacy related planning and instructional materials (e.g., teacher generated lesson plans, checklists, assessments, copies of student work) and photos. Artifacts were photographed or scanned with student or program identification hidden. Photo subjects included classroom wall display, the class family communication center, photos depicting the classroom literacy environment (i.e., labeling, signs/posters telling children what to do in words and pix, children’s literature on display), and the daily class schedule. For example, I looked to see how the daily schedule was depicted to the children, if read aloud was a stand-alone activity or an incidental part of snack or circle, if read aloud occurred one time or multiple times with a large group, small group, or individual children, and if there was an “independent reading” time built in to each day. I avoided taking photos of children in the classroom.

**Documents.** School level documents included: school philosophy statement, school mission statement, school parent handbook, school marketing materials, and school assigned literacy related curriculum. State level documents included program protocols, checklists, and
literacy related assessments. The district UPK administrator provided me digital copies of the majority of these documents via email.

**Data Analysis**

I analyzed my data in concurrence with data collection and alternated back and forth between phases as part of a continuous process (Braun & Clarke, 2006). For example, I transcribed and wrote journal notes about each interview as I went. In doing so, I identified additional questions for the next interview, made any necessary refinements in the interview protocols, and documented my ideas about themes that emerged. Data analysis was ongoing and iterative which allowed me to consider possibilities for new data collection to fill in any gaps that emerged along the way (Miles & Huberman, 1994). After reviewing the participants’ responses in the Epistemic Beliefs Questionnaires I realized some of the questions might have been misinterpreted so I decided to rephrase some of the questions for the follow-up interview. I provide a summary of my data analyses procedures within my study timeline (see Appendix D).

Following data collection and transcription, I used Braun and Clarke’s (2006) six-phase process of thematic analysis to identify, analyze, and tell the story of patterns that emerged within and across my data set. Braun and Clarke (2006) argued that thematic analysis is a “foundational method for data analysis” (p. 78). Thematic analysis is independent of any one particular theoretical framework and is therefore a flexible analytic tool to use across different data analysis methods (Boyatzis, 1998). My understanding of the literature on epistemic cognition, teachers’ epistemic cognition, early childhood teachers’ epistemic cognition, and early literacy instruction drove my specific data analysis in relation to my research question: How do aspects of epistemic cognition emerge when early childhood teachers consider material and plan for literacy instruction?
Although I set out to use a priori categories derived from the literature to focus my analysis, I also accounted for occurrences that did not fit in with these predetermined categories and eventually developed my own coding schema. Thus, I employed both a deductive and inductive approach to the analysis (Merriam & Tisdell, 2016). In the following paragraphs I provide a description of how I enacted Braun and Clarke’s (2006) six-phase process of thematic analysis with the data I collected.

**Phase 1: Familiarize Myself with the Data**

Familiarization is the foundation stage for the entire analytic process and requires full immersion in the data set (Braun & Clarke, 2006). During this phase, I audio-recorded and transcribed each interview session. I audio recorded all interviews using a recording application (QuickTime Player) on my laptop and transcribed each recording within 24-48 hours of the interview when possible. In order to develop a deep understanding of the data, I transcribed the interviews myself. I focused on the written features of language by using a naturalized transcription method (Bucholtz, 2000). Bucholtz (2000) explained that a naturalized transcription method is a means to enhance transparency of the content and minimize distractions such as hesitancies like “uh” and “er” that occur in spoken language. In addition, I added needed punctuation when applicable.

Once data collection was complete, I engaged in iterative readings of the interview transcripts and observation field notes to generate early ideas about what was contained in the data. I did so in conjunction with material artifacts to help me understand the data. Each time I read through my data, I documented my thoughts by writing in my researcher journal and entering comments in Google Doc interview transcripts. I implemented a data management/organization system with all data, memos, and journal entries clearly labeled. I also
developed initial case sketches on each participant using data gathered during my initial interview, teachers’ completed demographic questionnaires, and observations.

**Phase 2: Generating Initial Codes**

Coding is the process of detecting a feature of the data that seems interesting in relation to the researcher’s theoretical frame and research question (Braun & Clarke, 2006). Saldaña (2016) defined a code as “a word or short phrase that symbolically assigns a summative, salient, essence-capturing, and/or evocative attribute for a portion of language-based or visual data” (p. 4). For my unit of analysis, I focused on segments of text that stood by themselves as independent concepts and that conveyed meaning within the context of the data as relevant to my theoretical frame and research question (DeCuir-Gunby, Marshall, & McCulloch, 2011). Hence, in my data, I may have coded a single word, phrase, sentence or entire paragraph of text. Throughout the coding process I made multiple passes through each transcript.

I maintained a developing codebook throughout this process. A codebook is a “set of codes, definitions and examples used as a guide to help analyze interview data” (Saldaña, 2016, p. 4). I used a different manual coding process based on my coding purpose. I coded using Post-its and chart paper as well as Google Docs, which involved using program functions such as highlighting, colored text, and adding comments to code my data. Using Google Docs allowed me to collate similarly coded extracts of text together, which was an important part of the coding process (Braun & Clarke, 2006). During this initial code generation phase, I attempted to apply existing coding schemes generated during prior research to different data sources. As the coding process unfolded, I added new codes when needed to describe emergent units of analysis not identified in the existing schemes. Eventually I realized that the a priori codes were not a good fit
for my data and I turned my focus to development of an inductive coding scheme. Further, I kept track of unused codes from the existing schemes.

**Coding for teachers’ beliefs.** Initially I attempted to use an adapted version of Brownlee et al.’s (2008) “extended framework for epistemological beliefs” (p.141) to analyze data from the Classroom Tour Interview and the Epistemic Beliefs Follow-up Interview to help me gain a holistic understanding of each teacher’s beliefs in three categories: their beliefs about how young children learn to read, their beliefs about their own personal learning related to early literacy instruction, and their epistemological beliefs related to early literacy instruction. Their framework pulls from “research about general epistemological beliefs and considers the relationship between beliefs about knowing and personal learning, as well as the relationship that connects epistemological beliefs to children’s learning” (p. 139). My rationale for using this framework stemmed from the finding from my literature review that early childhood teachers’ epistemic beliefs are related to their beliefs about children’s learning and to their beliefs about their own personal learning. Ultimately, Brownlee et al.’s (2008) framework was not a good fit for my data so I developed an inductive coding scheme that helped me to develop profiles of the teachers’ across their epistemic beliefs and beliefs about children’s learning related to early literacy instruction, thereby building on the findings in their study. In my first few rounds of coding for the teachers’ beliefs, I used color coded Post-it strips on a large piece of easel paper so I could quickly and easily manipulate codes to represent my thinking as it evolved. First I separately coded each teacher’s Classroom Tour Interviews, Epistemic Beliefs Questionnaire responses, and Epistemic Beliefs Follow-up Interviews (see Figures 3.1 and 3.2).
I then combined codes from both teachers into related chunks or categories to begin generating a rough conceptual map of the codes, which helped me organize my thinking. I captured two phases of this process as seen in Figures 3.3 and 3.4. Sample teachers’ beliefs codes with examples from the data are provided in Table 3.1.
Table 3.1 Teacher’s Beliefs Codes

<table>
<thead>
<tr>
<th>Teachers’ Belief</th>
<th>Code</th>
<th>Definition</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structure</td>
<td>EP-B-ST</td>
<td>Knowledge is integrated and complex or simple and concrete</td>
<td>“Like when I’m at the water table just asking them all these questions and we’re creating things and just these conversations that we’re having. It’s all enrichment” (Sanchez_CT-SSI_2-20-19). “If they’re [students] making a structure and then they’re writing about their structure. And they make a ‘B’ for bridge or something. Now they own it. It’s part of their schema” (Logan_CT-SSI_2-19-19).</td>
</tr>
<tr>
<td>Source of Knowledge</td>
<td>EP-B-SK</td>
<td>Origin of knowledge, where it comes from</td>
<td>But you really, really don't learn WHAT to do, how to do it properly or well, until you are actually thrown into a situation (Sanchez_CT-SSI_2-20-19). “Well a lot of it came from my Masters work at the University of Bridgeville” (Logan_CT_2-19-19).</td>
</tr>
<tr>
<td>BCL-SEL</td>
<td>Social</td>
<td>Student Centered</td>
<td>“Say I have something else on the table and I have a set activity. If they say: “Can I do this instead?” I am pretty lenient with that” (Sanchez_CT-SSI_2-20-19).</td>
</tr>
<tr>
<td></td>
<td>Emotional</td>
<td></td>
<td>Autonomy Supportive</td>
</tr>
<tr>
<td></td>
<td>Learning</td>
<td></td>
<td>“It’s important to provide student choice. And again, it goes along with their interests. They're going to learn at all of these centers” (Logan_CT-SSI_2-19-19).</td>
</tr>
<tr>
<td>BCL-AE</td>
<td>Literacy</td>
<td>Physical movement</td>
<td>“I want them to be constantly moving and I want them to enjoy and I don't want them to sit here” (Sanchez_CT-SSI_2-20-19).</td>
</tr>
<tr>
<td></td>
<td>Involves</td>
<td></td>
<td>Concrete and practical</td>
</tr>
<tr>
<td></td>
<td>Active</td>
<td></td>
<td>“Simply because I want the kids to touch things that are more concrete” (Logan_CT-SSI_2-19-29).</td>
</tr>
</tbody>
</table>
Coding for aspects of epistemic cognition. In my data analysis of the stimulated recall interview after lesson planning, and the think aloud interviews, I examined the data in relation to the Model of Epistemic Cognition in Learning and Teaching (Buehl & Fives, 2016), as described in Chapter Two, in an attempt to identify empirical case evidence to support or expand the model. Initially, I used the epistemic cognition codebook developed by Barnes et al. (in revision, October 2019) to deductively code the data, keeping in mind the possibility of any variations in codes that may emerge from the data. Ultimately, Barnes et al.’s (in revision, October 2019) a priori codes proved to be a limited fit for my data so I developed a coding scheme based on the Epistemic Cognition in Learning and Teaching Framework (Buehl & Fives, 2016; Fives et al., 2017), specifically seeking evidence for aspects of epistemic cognition that emerged in light of the AIR process model (Chinn et al., 2014) of epistemic cognition that helped me to identify specific aspects of the teachers’ epistemic cognition during early literacy instruction. In addition, I examined my data through the field of study in early literacy instruction (intentionality; Epstein, 2014). See Table 3.2 for sample epistemic cognition codes.
<table>
<thead>
<tr>
<th>Aspect of Epistemic Cognition</th>
<th>Code</th>
<th>Definition</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epistemic aims</td>
<td>EP-A</td>
<td>Knowledge-related goals</td>
<td>[For Learners] “So my objective is to get them to understand what rhyming words are” (Sanchez_LP-TA_3-21-19).&lt;br&gt;[For Self] “How am I going to get these children to understand the concept of rhyming?” (Sanchez_LP-TA_3-21-19).&lt;br&gt;[For Learners] “My initial objective would be to be able to locate and identify the letter V” (Logan_LP-TA_3-15-19).&lt;br&gt;[For Self] “I want to plan something where I have, you know, where my objective is going to be met. Not just something that’s random” (Logan_LP-TA_3-15-19).</td>
</tr>
<tr>
<td>Epistemic ideals</td>
<td>EP-I</td>
<td>Criteria individuals use to assess the product of epistemic cognition</td>
<td>“I like books with repeating because then they’re able to repeat” (Sanchez_BS-TA_3-11-19).&lt;br&gt;“Oh! Now I like this too cause I’m assuming that Move over, Rover! is going to be repetitive” (Logan_BS-TA_3-7-19).</td>
</tr>
<tr>
<td>Reliable processes</td>
<td>REL-PR</td>
<td>Strategies that individuals use to achieve knowledge or any other epistemic aims.</td>
<td>“I was planning for literacy. I wanted her to really help me with it. And to really get me on the right track. Because even though I think I know, I still want to use those resources [meaning the AIS as a resource] to make sure that I am doing things right. And I feel that she really is the expert cause this is what she does every day for students that may be struggling with such a specific concept” (Sanchez_LP-TA_3-21-19).</td>
</tr>
</tbody>
</table>
Phase 3: Searching for Themes

Once I identified and collated initial codes across my entire data set, I turned my focus to a broader thematic level (Braun & Clarke, 2006). During this phase I looked for initial themes that would describe the more subtle and implicit patterns that emerged from my data (Merriam & Tisdell, 2016). The initial themes I developed helped me to begin to understand the participating teachers’ epistemic beliefs and identify aspects of epistemic cognition that emerged. In order to help me sort codes into initial themes, identify similarities and differences between codes, and see overall relationships or patterns in my data set, I used Google Slides to develop a thematic map (Braun & Clarke, 2006). Some codes did not seem to fit in with initial emerging themes. Therefore, I maintained a set of codes labeled as ‘other’ so I could reconsider at a later point in the analysis process. During this phase, I remained open to all initial themes that emerged no matter how insignificant they seemed at the time because I planned to revisit all themes in the next phase. However, this is not to say that I carried all initial themes through to my final analysis because my ultimate goal was to develop a coherent and concise analysis (Saldaña, 2016).

Phase 4: Reviewing the Themes

Reviewing themes is a two-level process consisting of first reviewing codes within each theme for formation of a coherent pattern and then reviewing themes for relevance and prevalence across the entire data set (Braun & Clarke, 2006). In the first level, I examined codes within each theme for meaningful connections. In level two, I re-read my entire data set to determine whether or not the themes were represented across my data set as a whole. This re-read provided an opportunity for me to code any missed data that fit into my themes. I continued
to make refinements until I was not adding anything substantial to the themes. At the end of this phase I revised my thematic maps to reflect the refined themes.

**Phase 5: Defining and Naming Themes**

Once I was satisfied with my thematic map, I began to define and further refine my themes. During this phase I considered each theme as an independent idea and considered each theme in relation to other themes (Braun & Clarke, 2006) meaning, I completed a detailed analysis within each theme and across the themes. Throughout this phase I kept my theoretical framework and research question in mind. I also looked for sub themes within a theme. My goal in this phase was to be able to explain the substance and breadth of my themes in a clear and concise way. When my themes were firm, I decided on a name for each theme that would alert the reader of my report to the essence of the theme. In Table 3.3 I provide a thematic summary of how epistemic cognition emerged in my data.

**Phase 6: Producing the Report**

After I made a thorough preliminary analysis within and across my themes, I completed my final analysis and wrote my report. My goal in this phase was to convey to the reader the merit and legitimacy of my analysis through the telling of a convincing and coherent story of my data both within and across my themes (Braun & Clarke, 2006). In my report I related my thematic analysis back to my research question and to the literature. In order to provide evidence of the prevalence of my themes I selected rich concrete examples of data extracts to embed within my analytic narrative. To make my argument relevant to my research question and the literature, my analytic narrative extends beyond a description of my data through the telling of an interpretive story.
Table 3.3 Illustration of Epistemic Cognition in Two Early Childhood Teachers

<table>
<thead>
<tr>
<th>Aspect of Epistemic Cognition</th>
<th>Mrs. Sanchez</th>
<th>Mrs. Logan</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Aims</strong></td>
<td>For learners</td>
<td>For learners</td>
</tr>
<tr>
<td></td>
<td>• one overarching aim for her learners and two smaller epistemic aims</td>
<td>• multiple mini-epistemic aims for her learners which could be construed to equate a broader epistemic aim</td>
</tr>
<tr>
<td></td>
<td>For self</td>
<td>For self</td>
</tr>
<tr>
<td></td>
<td>• understanding how to accomplish the literacy teaching task</td>
<td>• understanding how to accomplish the literacy teaching task</td>
</tr>
<tr>
<td></td>
<td>• understanding students’ literacy knowledge</td>
<td>• understanding students’ literacy knowledge</td>
</tr>
<tr>
<td><strong>Ideals</strong></td>
<td>Internalized expectations</td>
<td>Internalized expectations</td>
</tr>
<tr>
<td></td>
<td>• Common mental checklist</td>
<td>• Common mental checklist</td>
</tr>
<tr>
<td></td>
<td>• Literacy learning is a multi-tiered event</td>
<td>• Literacy learning is a multi-tiered event</td>
</tr>
<tr>
<td></td>
<td>• Self system looms large</td>
<td>• Self system looms large</td>
</tr>
<tr>
<td><strong>Reliable Processes</strong></td>
<td>Reviewing a mental checklist</td>
<td>Reviewing a mental checklist</td>
</tr>
<tr>
<td></td>
<td>• Activate prior knowledge and experience</td>
<td>• Activate prior knowledge and experience</td>
</tr>
<tr>
<td></td>
<td>• Analysis based on text</td>
<td>• Analysis based on text</td>
</tr>
<tr>
<td></td>
<td>• Analysis based on illustrations</td>
<td>• Analysis based on illustrations</td>
</tr>
<tr>
<td></td>
<td>• Analysis based on read aloud to self</td>
<td>• Analysis based on read aloud to self</td>
</tr>
<tr>
<td></td>
<td>Considering students in the class</td>
<td>Considering students in the class</td>
</tr>
<tr>
<td></td>
<td>Varied reliable process</td>
<td>Varied reliable process</td>
</tr>
<tr>
<td></td>
<td>• Online search</td>
<td>• Hold objective in mind</td>
</tr>
<tr>
<td></td>
<td>• Appeal to colleague as authority</td>
<td>• Use multiple sources of knowledge</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Search the classroom</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Epistemic Ends</strong></td>
<td>Final Ends</td>
<td>Final Ends</td>
</tr>
<tr>
<td></td>
<td>• Select Move Over, Rover!</td>
<td>• Select Move Over, Rover!</td>
</tr>
<tr>
<td></td>
<td>• Design multi-tiered lesson</td>
<td>• Design multi-tiered lesson</td>
</tr>
<tr>
<td></td>
<td>Micro-epistemic ends</td>
<td>Micro-epistemic ends</td>
</tr>
<tr>
<td></td>
<td>• Include read aloud</td>
<td>• Include read aloud</td>
</tr>
<tr>
<td></td>
<td>• Include small group instruction</td>
<td>• Include small group instruction</td>
</tr>
<tr>
<td></td>
<td>• Include assessment</td>
<td>• Include assessment</td>
</tr>
</tbody>
</table>
During this final phase I first considered each participant as an individual case. Hence, I examined how the aspects of epistemic cognition emerged in these early childhood teachers’ literacy instruction. Once I concluded my analysis of each individual case, I conducted a cross case analysis (Stake, 2006). To do so, I examined similarities and differences across the participants regarding how the aspects of epistemic cognition emerged. My goal here was to understand how the similarities and differences were revealed in early childhood teachers’ practice when they considered material and planned for literacy instruction. This cross case analysis served to elucidate the broader themes that emerged across the participants, provided a way for me to describe factors that shaped the outcomes of each case, and allowed me to examine contextual complexity of the phenomenon (Stake, 2006).

**Trustworthiness**

Researchers are responsible for adhering to certain criteria to ensure rigor and confidence in their research: credibility, transferability, dependability, confirmability, and positionality (Shenton, 2004). Guba (1981) described these criteria as standards of trustworthiness. In the following paragraphs I explain how I established trustworthiness in my data and research design. Throughout the research process I strived to make clear my adherence to each of Guba’s (1981) standards. In Table 3.4 I provide a summary of the strategies I used to do so.

**Credibility**

Credibility concerns confidence in transparency of the research process and subsequent genuineness of the findings (Guba, 1981; Lincoln & Guba, 1985). I established the credibility of my study in multiple ways. Prolonged engagement and multiple points of contact are important features, which added breadth and depth to my data (Lincoln & Guba, 1985). I addressed breadth
in my data by using four different data sources (i.e., observations, semi-structured interviews, stimulated recall interviews, and think aloud interviews) collected.

Table 3.4 Meeting Standards of Trustworthiness (Guba, 1981): Strategies and Examples

<table>
<thead>
<tr>
<th>Standard</th>
<th>Strategy Addressed in Study</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credibility</td>
<td>1. Prolonged engagement</td>
<td>1. Data collection took place over 2 months</td>
</tr>
<tr>
<td></td>
<td>2. Multiple points of contact</td>
<td>2. Observed teachers 5 times and interviewed teachers 6 times (6 points of contact per teacher)</td>
</tr>
<tr>
<td></td>
<td>3. Iterative questioning</td>
<td>3. Asked similar questions in different ways across interviews</td>
</tr>
<tr>
<td></td>
<td>4. Member checking</td>
<td>4. Played back or quoted portions of recorded interview to clarify responses</td>
</tr>
<tr>
<td></td>
<td>5. Peer debriefing</td>
<td>5. Discussed my ongoing analysis with a critical friend</td>
</tr>
<tr>
<td></td>
<td>6. Audit trail</td>
<td>6. Used post-its and side notes to document decision making process</td>
</tr>
<tr>
<td></td>
<td>7. Peer coding</td>
<td>7. A critical friend coded data excerpts</td>
</tr>
<tr>
<td></td>
<td>8. Triangulation</td>
<td>8. Gathered information from observations, interviews, artifacts, and documents</td>
</tr>
<tr>
<td>Transferability</td>
<td>1. Participant background data</td>
<td>1. Provided a rich description of participants, settings, and study design</td>
</tr>
<tr>
<td></td>
<td>2. Establish context</td>
<td>2. Provided a detailed description of phenomenon under investigation</td>
</tr>
<tr>
<td>Dependability</td>
<td>1. Clear description of research methods</td>
<td>1. Made clear the design of my study; provided detailed protocols for interviews and observations</td>
</tr>
<tr>
<td></td>
<td>2. Audit trail</td>
<td>2. Kept a researcher journal describing data collection process and documented decision making in analytic memos</td>
</tr>
<tr>
<td>Confirmability</td>
<td>1. Reduce bias</td>
<td>1. Acknowledged my beliefs in researcher journal; sought critical feedback from doctoral peer and research advisor; considered and memoed about alternative explanations</td>
</tr>
<tr>
<td></td>
<td>2. Reinforce theoretical verification</td>
<td>2. Used two theoretical perspectives to describe and analyze data</td>
</tr>
</tbody>
</table>
at seven points over an extended period of time (i.e. ten weeks). This helped my participants to build trust in me, helped me to become oriented to, appreciate, and understand the context of each teacher’s setting, and allowed me to engage in iterative questioning of the participants. I addressed depth and richness in my data by observing prior to conducting teacher interviews. In addition, I collected data from multiple sources as a means of triangulation. Triangulation of data is a way to maintain research credibility and minimize bias (Yin, 2016).

Another way I established credibility in my study was to conduct member checking. I played back or quoted back portions of interviews to the participants for further probing questions. Member checking also allowed an opportunity for participants to clarify, confirm, or provide more information about their responses. In addition, I attempted to increase credibility in my study through a routine process of “peer debriefing” in which I discussed my ongoing analysis with a critical friend (doctoral colleague) and more capable other (doctoral advisor) with the intention of making aspects of my inquiry explicit and open to interpretation (Lincoln & Guba, 1985, p. 308). I did so on a weekly basis. Further, I maintained an audit trail in order to document and make explicit how I collected and coded data, derived categories and themes using the data, and how I made decisions along the way (Lincoln & Guba, 1985). To do so, I kept track of my process and progress in a researcher journal. Researcher journals can help the researcher maintain transparency during the research process and alleviate bias (Guba, 1981; Ortlipp, 2008). In conjunction with my researcher journal, I kept analytic memos to document how I came to particular decisions and conclusions (Corbin & Strauss, 2015). Specific to my coding, I established credibility by having a critical friend, who was familiar with the theoretical framework I used, code anonymous data excerpts. She used a similar codebook in the coding of
her own data. Miles and Huberman (1994) suggested a 90% or better agreement between coders for coding reliability, hence I sought that level of agreement.

**Transferability**

Transferability has to do with the potential for application of study findings to other similar contexts (Guba, 1981; Lincoln & Guba, 1985). I included a rich description of individual participants and settings, a thorough description of the phenomenon of inquiry as well as a detailed account of study design to help readers determine whether or not they could relate the findings of my study to one of similar contexts. For example, I included a demographic profile of the participants in my study narrative. I also incorporated a detailed description of each specific teaching setting and the overall context of state funded pre-kindergarten into my narrative.

**Dependability**

A dependable study is one that can be replicated through the close following of steps in data collection and analysis in comparable research conditions (Guba, 1981; Lincoln & Guba, 1985). To boost dependability in my study, I provided a detailed description of my research design and methods. I also kept a clear audit trail through memos, and a researcher journal. In addition, I adhered to and provided protocols for each data collection procedure as well as intended questions and prompts for each interview. Finally, I sought guidance from my research advisor and dissertation committee in assessment of the adequacy of my research design and methods as well as how I articulated my findings.

**Confirmability**

A confirmable study is one in which the data analysis and findings are substantiated in actual research events rather than the researcher’s personal construction of events and shaped by the participants’ responses rather than the researcher’s personal bias, motivations, or interests.
To create confirmability in my study I attempted to reduce bias as previously mentioned (i.e., researcher journal, triangulation of methods). Also, I sought critical feedback from my research advisor, my dissertation committee, and a fellow doctoral student who became my critical research friend to help me avert influences from my potential bias, and to challenge me to examine my own beliefs. I implemented member checking as described above to catch instances where I may have imposed my biases or beliefs on the data analysis. To reinforce theoretical verification, I examined the phenomenon of inquiry and characteristics of the data through theoretical perspectives from two fields of study: epistemic cognition (Model of Epistemic Cognition in Learning and Teaching; Buehl & Fives, 2016; extended framework of personal epistemology; Brownlee et al., 2008) and early literacy instruction (intentionality; Epstein, 2014) at repeated points during the research process. To determine whether or not my analysis of the data was logical, I sought and considered alternative explanations for patterns in the data.

**Positionality**

My role as a doctoral student completing dissertation research placed me in the unique position of sole designer of research methods, data collector, and data analyzer: a position that commanded authority and therefore, responsibility (Merriam & Tisdell, 2016). Although I had the guidance of my research advisor and dissertation committee, as well as the support of doctoral colleagues throughout this process, the decisions made in the design and execution of this study were ultimately mine. My role as a research assistant at Montclair State University included an opportunity to participate in research on teachers’ epistemic cognition. Participating in this work prompted me to reflect on my own experiences as an early childhood classroom teacher, teacher educator, and administrator of state funded pre-kindergarten programs across
seven school districts. In turn, this reflection informed my inquiry into early childhood teachers’ epistemic cognition.

I recognize that my professional and research experiences have influenced my approach to this study and acknowledge that I am motivated to gain understanding of early childhood teachers’ epistemic cognition so that I can make contributions to the field in terms of theory, research, and practice in my desired future role/position as an early childhood teacher educator at a major university. However, throughout my study, I remained aware that my experiences may have contributed to bias and assumptions regarding early childhood teachers and early literacy instruction. I strived to remain cognizant of trying to maintain a level of neutrality as I moved through this process. I was not concerned about imbalanced power relationships with my participants because I did not ever have a supervisory position over them and I have not held an administrative position for two years.

**Ethical Considerations**

I obtained permission to conduct human subject research from the Montclair State University’s Institutional Review Board (IRB) before beginning the study. The ethical matters or concerns in this study were in line with those that pertain to any research with human participants. I collected signed consent forms, approved by the IRB, from all participants. All of the participants were informed verbally and in writing that their participation was voluntary and that consent could have been rescinded at any time throughout the study. During my first meeting with participants I clarified my status as a doctoral candidate as well my research purpose and process. I explained how I would strive to maintain confidentiality to the best of my ability throughout the study by ensuring that participant identification was only available to me and by assuring participants that I would not divulge their identity in conference presentations or
in publications. Further, no identifying information was collected on any students in any of the teachers’ classrooms.

I scheduled classroom visits for data collection and teacher interviews at a time convenient for the participants. I filed all audio-recordings, transcripts, and scanned documents on my own password protected personal electronic devices. Only I had access to the files. In addition, I assigned pseudonyms to each participant that only I know.

Summary

In this chapter, I described my study’s context and participants. Each participant taught four-year-olds in a UPK classroom in the same elementary school. I explained data collection and analysis procedures. I gathered data from four sources: questionnaires, observations, interviews, and material artifacts or documents. I explained how I coded and categorized data both inductively and deductively following Braun and Clarke’s (2006) six-phase process of thematic analysis using the Epistemic Cognition in Learning and Teaching Framework (Buehl & Fives, 2016; Fives et al., 2017) as an analytic framework. I also documented how I met Guba’s (1981) standards of trustworthiness, discussed my researcher positionality, and discussed ethical considerations.
CHAPTER 4: ONE SCHOOL, TWO CLASSROOMS, TWO TEACHERS: SITUATING EPISTEMIC COGNITION

The purpose of this chapter is to provide a rich description of the teachers in my study in order to provide a context for their engagement of epistemic cognition. As I discussed in Chapter Two, epistemic cognition is context sensitive, making it important to consider my findings as situated in these teachers’ environments for a balanced interpretation. Therefore, in this chapter I provide a thick, rich description of the school context followed by a narrative description of each teacher’s classroom environment (where they are), epistemic beliefs, and their beliefs about children's literacy learning. I do so as a background to my findings, which will be presented in Chapter Five.

In Table 4.1. I provide an advanced organizer for the reader to accentuate the similarities and differences between the teachers’ environments and beliefs. The table highlights that, while both teachers saw knowledge as complex and integrated it emanated differently within each teacher. For example, Mrs. Sanchez allowed her students to lead discussions during Morning Meeting while Mrs. Logan carefully planned and guided class discussions. They both believed literacy learning could occur through class discussions but they had a different approach to how the discussions happened.
Table: 4.1 Descriptive Summary

<table>
<thead>
<tr>
<th>Environment</th>
<th>Mrs. Sanchez</th>
<th>Mrs. Logan</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Structured chaos</td>
<td>Structured play</td>
</tr>
<tr>
<td></td>
<td>● Surplus of materials available</td>
<td>● Just enough materials available</td>
</tr>
<tr>
<td></td>
<td>● Casual, spontaneous conversations with children</td>
<td>● Precise, deliberate conversations with children</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Epistemic Beliefs</th>
<th>Sources of Knowledge:</th>
<th>Sources of Knowledge:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>● Enactive experience</td>
<td>● Enactive experience</td>
</tr>
<tr>
<td></td>
<td>● Formal preparation</td>
<td>● Formal preparation</td>
</tr>
<tr>
<td></td>
<td>● Formalized bodies of knowledge</td>
<td>● Formalized bodies of knowledge</td>
</tr>
<tr>
<td></td>
<td>● Colleagues</td>
<td>● Colleagues</td>
</tr>
<tr>
<td></td>
<td>● Students</td>
<td></td>
</tr>
<tr>
<td></td>
<td>● Innate</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Structure of knowledge: Complex and integrated</th>
<th>Structure of knowledge: Complex and integrated</th>
</tr>
</thead>
<tbody>
<tr>
<td>● Literacy is happening everywhere in the classroom</td>
<td>● Holistic teaching approach</td>
</tr>
<tr>
<td>● Literacy learning has multiple parts</td>
<td>● Literacy learning spreads across activities</td>
</tr>
<tr>
<td>● Literacy learning goes beyond letters and words</td>
<td>● Literacy can be developed indirectly</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Beliefs About Children’s Learning</th>
<th>Social emotional learning is important</th>
<th>Social emotional learning is important</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>● Child centered</td>
<td>● Autonomy supportive</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Beliefs About Children’s Learning</th>
<th>Active engagement</th>
<th>Active engagement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>● Physical</td>
<td>● Concrete</td>
</tr>
<tr>
<td></td>
<td>● Verbal</td>
<td>● Practical</td>
</tr>
</tbody>
</table>
Where Are They? The Environment

In this section I first provide a description of the school context shared by these teachers, followed by a narrative description of each teacher’s classroom environment.

School Context

Jacklyn Sanchez and Cassie Logan are two Universal PreK teachers in the same school district in Chapman Elementary School\(^1\), a brick building near a bustling intersection of a two-lane highway. The front of the school contains a quaint courtyard with trees and raised garden beds. Just outside the main entrance is a glass enclosed bulletin board with posted notices for families about current school fundraising events and upcoming kindergarten registration. The main entrance leads to an enclosed vestibule with a colorful, hand painted picture on the interior window. The painting is of an owl perched on a scrolled quote in a tree. It reads, “A leader is one who knows the way, goes the way, and shows the way. John Maxwell.” Each time I arrived at the school Mrs. Johnson, the school security officer, greeted me warmly. During my daily waiting period before she gives me the cue to walk down to the classrooms, I noticed that she greets arriving parents and children by name. Chapman Elementary seems to be a welcoming, family friendly place; an oasis from the busy road it faces.

The main school parking lots are located directly in front of the school (primarily for office staff, administrators, and visitors), and behind the school (for faculty). A sports field is located to the right side of the school near additional faculty parking. A large playground is situated in the center of a courtyard to the rear of the building. A residential area to the rear borders the school property.

\(^1\) All names, teachers and school, are pseudonyms
Both teachers’ Universal PreK classrooms are located side by side in the lower level of the two floored building. Entering their hallway, you see clusters of children's artwork posted at all heights. The first door on the right leads to Mrs. Sanchez’s classroom. Mrs. Logan’s classroom is next door. The district required UPK Teachers to use the Creative Curriculum® for Preschool (Dodge et al., 2016b), which is a research-based curriculum that approaches children’s learning through exploration and discovery.

**Mrs. Sanchez**

Mrs. Sanchez had a total of seventeen students; nine boys and eight girls. Four of her students had an Individual Education Plan (IEP) and four students were economically disadvantaged. Mrs. Sanchez had a full-time teaching assistant or teacher’s aide present in the room at all times. She also hosted a student intern from the high school on occasion.

**The classroom space.** In Mrs. Sanchez’s classroom there was a large open white-tiled floor space with four small table and chair sets each with seating for 4-6 students. These tables were located in various areas of the classroom and used for meals, small group-teacher directed activities, and child-initiated activities. There was a carpeted area intended for floor play (i.e., block construction, use of toy vehicles, dollhouse, farmhouse etc.) and large group instruction (i.e., Morning Meeting, read aloud). Shelves filled to the brim with children’s materials surrounded the carpeted area. A Promethean board (an interactive white board) rests on the wall over the carpeted area. Toys, papers, or book bins cover nearly every surface. Posted student artwork is scattered throughout the room, even on the windows. Displayed pictures tilt to the right or left. The overall atmosphere of this room suggests “structured chaos.”

Mrs. Sanchez arranged her classroom space into learning centers for the children (e.g., dramatic play, art, blocks, class library). In Mrs. Sanchez’s classroom the art center featured
open shelves near the easel jammed with stacked construction paper, bins of glue sticks, and baskets of paintbrushes. The easel had two cups of red paint with brushes. Paper is posted on the easel ready for a child to paint. In the dramatic play area a five-section storage cubby is accessible to the students bursting with a variety of dress up clothes, hats, and props (see Figure 4.1; Sanchez_Image-Dramatic Play Center-Dress Up Clothes_2-28-19).

Figure 4.1 Sanchez Dramatic Play Center Dress-up Clothes

**Student teacher interactions.** The student teacher interactions I observed in Mrs. Sanchez’s classroom were frequent, sustained and often spontaneous. For example, during my observation of Mrs. Sanchez’s Morning Meeting I documented a lively conversation between her and the students about words that begin with the letter ‘V’ lasting about four and a half minutes (Sanchez_ON-TRA_3-11-19). Mrs. Sanchez tends to refer to her students as “you guys” or “everybody” (Sanchez_ON-TRA_3-11-19). After observing in Mrs. Sanchez’s class I wrote,
“High energy and attending to multiple tasks at once. I see this in her interactions with children simultaneous to interactions with her teaching assistant and intern” (Researcher Memo_2-20-19).

**Overall impression.** The overall atmosphere of Mrs. Sanchez’s room suggests, as she self-described, “structured chaos.” (Sanchez_EB-SSI_2-28-19). After my initial conversation with Mrs. Sanchez I wrote, “Jacklyn is sometimes scattered in her speech, jumping from one subject to the next, making tangential comments and very animated faces” (Researcher Memo_2-15-19). After the classroom tour interview with Mrs. Sanchez I wrote, “Needs redirection to what I have actually asked” (Researcher Memo_2-20-19).

**Mrs. Logan**

Mrs. Logan had a total of eighteen students; nine boys and nine girls. She had two students with IEPs, three students identified as English language learners, and no economically disadvantaged students. Mrs. Logan also had a full-time teaching assistant or teacher's aide present in the room at all times.

**The classroom space.** In Mrs. Logan’s classroom you see a similar arrangement of furniture to that of Mrs. Sanchez. There is a carpeted area, yet the shelves around the room are sparsely filled and many surfaces are clear. Student artwork is contained to specific areas and displayed in a straight and level manner. Mrs. Logan arranged her classroom space into learning centers for the children (e.g., dramatic play, art, blocks, class library). In Mrs. Logan’s art center only a few sheets of construction paper are available at a time stored on a tray under the easel. Five colors of paint rest in cups on the easel, wrapped in plastic baggies with lids closed tight. Brushes are available when children ask for them. Multi-colored-fabric drapes storage shelves to cover spare materials. Mrs. Logan created an inviting space for the children in the literacy center. She explained, “Here’s a beanbag so they can cozy up with a book. They have their cushions that
they love to take out” (Logan_CT-SSI_2-19-19). A small selection of dress up items are located on a singular clothes rack with props and hats organized on two separate shelves (see Figure 4.2; Logan_Image-Dramatic Play Shelves_2-27-19).

Figure 4.2 Logan Dramatic Play Shelves

**Student teacher interactions.** The student teacher interactions I observed in Mrs. Logan’s classroom were frequent, sustained and often seemed to be planned deliberately. For example, while observing Mrs. Logan’s read aloud, I documented a full three minutes of dialogue between her and the students discussing the book’s cover illustrations and text (Logan_ON-TRA_3-7-19). Mrs. Logan’s interactions with her students had a formal quality as I noted in my research memo after an observation in Mrs. Logan’s classroom, “Cassie (Mrs. Logan) is very structured and proper in her discourse with the children. There is a formality to her interactions. There seems to be a clear structure of the flow of the day and each activity” (Researcher Memo_2-27-19). In addition, I wrote in my observation notes, “As Mrs. Logan introduces the book she speaks slowly and distinctly. She seems conscientious of her articulation
and clarity” (Logan_ON-TRA_3-7-19). Mrs. Logan typically addresses her students as “boys and girls” (Logan_ON-TRA_3-7-19).

**Overall impression.** The overall atmosphere in Mrs. Logan’s room suggests “structured play.” In my written notes after meeting with Mrs. Logan for the first time I wrote, “Cassie (Mrs. Logan) seems confident and ordered in her responses. She speaks clearly and succinctly with a level of organization in her thoughts that comes through in how she forms her sentences as far as structure” (Researcher Memo_2-15-19). I documented these impressions further in subsequent research memos. After the classroom tour with Mrs. Logan I wrote, “Although she speaks quickly she is mostly coherent and organized in what she tells me. She speaks in short sentences and does not ramble too much” (Researcher Memo_2-19-19).

**Where They Are: Summary Comparison**

Both teachers arranged their spaces into learning centers for the children (e.g., dramatic play, art, blocks, class library) yet differences in how they placed materials in these centers are evident. The differences in these two environments provide insight into how each teacher enacted her beliefs in her selection, placement, and use of materials. During the classroom tour interviews each teacher provided a rationale for how she designed her classroom, leaving me with the impression that nothing was random; each move was intentional. The physical classroom settings, selection of materials, and instructional design seemed to reflect each teacher’s epistemic beliefs and beliefs about children’s learning as evidence suggests in the following sections. Student-teacher interactions in both classrooms were frequent and sustained. My observation notes are full of dialogue between teacher and students. Although student teacher interactions were almost constant in both classrooms, they had different qualities. These observed behaviors indicated to me that both teachers see the value of high-quality teacher
student interactions yet there are differences in how they enacted this belief. Despite differences in how each teacher responded during the interview process, based on the content of their responses, and my own thirty-year career as an early childhood teacher, teacher educator, and administrator, my overall impression of these two teachers is one of skilled professionals who are dedicated to and respectful of the children in their classrooms.

Who Are They? Their Beliefs

In this section I describe the teachers’ epistemic beliefs. I begin with Mrs. Sanchez and then address Mrs. Logan.

Mrs. Sanchez

Mrs. Sanchez held distinct epistemic beliefs as well as beliefs about how children learn literacy. Below I describe these beliefs as revealed to me in our interviews and through my analysis of the data.

**Epistemic beliefs.** Based on my analyses I can describe Mrs. Sanchez’s epistemic beliefs with respect to the dimensions of source and structure.

**Sources of knowledge.** Mrs. Sanchez drew from multiple sources of knowledge for literacy instruction, often at the same time. However, I highlight the sources as separate for clarity in the following description. In actuality, as seen in the quoted excerpts, she talked about the sources in relation to/conjunction with one another; hinting that the sources are interconnected in her mind. Mrs. Sanchez expressed epistemic beliefs about the sources of her knowledge for literacy instruction as derived from varied origins including: enactive experience, formal preparation, formalized bodies of knowledge (see Fives & Buehl, 2010), as well as knowledge from colleagues and her own students. In addition, Mrs. Sanchez talked about how
literacy instruction came naturally to her and how she found it difficult to explain how she knew what to do.

Mrs. Sanchez gave an overall deference to experience as a source of knowledge. For instance, Mrs. Sanchez described her knowledge as coming from an enactive experience in the field during her teacher preparation program. She said, “When I went to college, I went to Merham. And in Merham, they threw you into a classroom very quickly. And that was where I really learned A LOT. (Sanchez_CT-SSI_2-20-19). Here Mrs. Sanchez emphasized the words ‘A LOT’ to indicate that the majority of what she learned came from being in the field as opposed to in the classroom, suggesting that she believed her practical experience trumped her learning in the college classroom.

Although Mrs. Sanchez acknowledged formal preparation as a source of her literacy instruction knowledge, at times she talked about enactive experience as a more prominent source within the same statement. For example, Mrs. Sanchez explained,

So, you go to school and you learn. Right? You go to college. They teach you what to do. But you really, really don't learn WHAT to do, how to do it properly or well, until you are actually thrown into a situation (Sanchez_CT-SSI_2-20-19).

This statement illustrates how Mrs. Sanchez credited a certain level of her literacy instruction knowledge to formal college courses but qualified actual classroom experiences as more formative. Meaning, her enactive experience served to temper her formalized knowledge.

Mrs. Sanchez also referenced formal bodies of knowledge (i.e., research, formal curriculum) and enactive experience together when writing about sources of knowledge for literacy instruction. When asked in the Epistemic Beliefs Questionnaire what sources of knowledge she had used for literacy instruction she listed, “DAP (developmentally appropriate
practice), *Creative Curriculum*, my 22 years of experience (I have seen what works and what doesn’t)” (Sanchez_EBQ_2-20-19). This is an instance similar to that of formal preparation whereas here Mrs. Sanchez credited a certain level of her literacy instruction knowledge to formal bodies (i.e., curriculum) but seemed to give her professional experience as much credit. These examples indicate that Mrs. Sanchez seemed to lean towards her enactive experiences as a source of knowledge for her literacy instruction.

Mrs. Sanchez also credited colleagues and experts as sources of knowledge. When asked in the Epistemic Beliefs Questionnaire about her most important sources of knowledge for literacy instruction, Mrs. Sanchez responded, “I use what I know and get advice from reading teachers and other colleagues” (Sanchez_EBQ_2-20-19). In this example, she seemed to be referring to her prior knowledge as well as experts (reading teachers) and her professional peers. Further, during the lesson planning think aloud, Mrs. Sanchez explained how she purposely sought the input of the building reading specialist to assist her in planning a literacy lesson on rhyming. Mrs. Sanchez further explained why she referred to her colleague as an expert:

> I think that I call her an expert because ALL she does all day is helps children learn to read. That is her main goal. Everyday. I feel like she has the strategies and the ‘know how.’ And I know she does professional development. And I KNOW she goes on conferences, and these kinds of things, and she’s always bringing back the latest (Sanchez_SRI_3-21-19).

In the preceding excerpt Mrs. Sanchez explained her rationale for why she considered her building reading specialist an expert. Mrs. Sanchez believed her colleagues had valuable knowledge to share. Together these examples are strong indicators of Mrs. Sanchez’s belief that her professional peers are sources of literacy instruction knowledge.
Mrs. Sanchez also considered her students as sources of knowledge for literacy instruction. In the Epistemic Beliefs Questionnaire, Mrs. Sanchez wrote, “I also use the students as a source for learning. I use their interests to help mold what I am teaching” (Sanchez_EBQ_2-20-19). Mrs. Sanchez’s response suggests that she considers what she knows about her students as individuals to be a valuable source of knowledge for her teaching. She exemplified how this belief shaped her teaching when talking about an activity she developed for her students using the Promethean board. She said, “this [Promethean board activity] is not something that I planned. This was just something that came naturally through the children asking me questions and wanting to do things relating to their names, letters, and all of that” (Sanchez_CT-SSI_2-20-19).

Mrs. Sanchez indicated on multiple occasions that her knowledge for literacy instruction was innate. For example, when Mrs. Sanchez talked about how she learned the literacy instruction strategies that she was describing to me, she stated, “I don't really know how to explain that because it's just innate like” (Sanchez_CT-SSI_2-20-19). In this statement Mrs. Sanchez acknowledged how difficult it was for her to explain her thinking because it is something that is just inside her. In another interview I asked Mrs. Sanchez to describe what she was thinking as she responded to questions on the Epistemic Beliefs Questionnaire. She explained, “I really had to THINK and really break it down in my own head. Because, you know, when I have talked to you in the past, I told you that things come naturally. As a teacher I feel things come naturally” (Sanchez_EB-SSI_2-28-19). Again, she described her knowledge as something she was born with. In these instances, it was evident that Mrs. Sanchez sometimes had difficulty articulating how she acquired her literacy instruction knowledge. Yet, when I asked her
to tell me what criteria she used to evaluate the *Creative Curriculum® for Preschool* (Dodge et al., 2016b) when she was first introduced to it, she replied:

I feel that I have a really good sense of what is appropriate for four-year-olds, five-year-olds, and what isn't appropriate. When *Creative Curriculum* came about and we were learning all about it and we had all that (professional development), I read through it. And I just kind of took my prior knowledge, my, what I know children need to grow. (Sanchez_EB-SSI_2-28-19).

In earlier examples, Mrs. Sanchez was attributing her knowledge of literacy instruction as internal to her, a knowledge she was born with, when she used the word ‘innate.’ Yet here, what she described seems more intuitive, meaning she referenced having a ‘good sense’ of the knowledge and accessing prior knowledge, knowledge that was internally accessible to her.

In the paragraphs above I provided evidence that Mrs. Sanchez’s sources of knowledge for literacy instruction come from multiple places; enactive experience, formal preparation, formalized bodies of knowledge, colleagues, her own students, and her intuitive prior knowledge.

**Structure of knowledge.** In the section above, evidence for Mrs. Sanchez’s beliefs about where her literacy instruction knowledge comes from also shows the interrelatedness of her thinking when she referenced multiple sources in single responses. Hence, the quotes in the prior section also revealed beliefs Mrs. Sanchez held about the structure of knowledge as interconnected. In addition, Mrs. Sanchez referenced multiple kinds of learning experiences as part of literacy learning, thereby showing an implicit belief about the structure of knowledge as complex and integrated. For example, when talking about children negotiating turn taking during activities Mrs. Sanchez said, “that’s all part of literacy. All part of the social aspect”
In the preceding quote Mrs. Sanchez clarified that literacy learning has multiple parts, in this case a social aspect.

Mrs. Sanchez also explained her belief that, for her students, literacy knowledge is constructed throughout the day, including during water play. She stated:

So much literacy. So much that sometimes you don't realize that you’re doing it.

But even at the water table. Like when I’m at the water table just asking them all these questions and we’re creating things and just these conversations that we’re having. It’s all enrichment (Sanchez_CT-SSI_2-20-19).

In the quote above Mrs. Sanchez expanded her understanding of the structure of knowledge for literacy instruction to encompass a sensory activity. These examples serve as evidence for Mrs. Sanchez’s beliefs about knowledge as ill-structured and fluid in that she viewed literacy learning as not confined to a finite lesson but occurring throughout and across daily activities. Overall, between Mrs. Sanchez’s responses to direct questions and implicit commentary it seems clear that her notion of knowledge is complex and integrated.

Beliefs about children’s learning. Throughout my data I was able to infer Mrs. Sanchez’s beliefs about children’s learning. Here I continue to build a description of her beliefs. Specifically, my analysis of the evidence suggests that she believed social emotional development is foundational to children's literacy learning and that children must be actively engaged in their literacy learning either through talking or doing. Beliefs, that as discussed in the next chapter, served as ideals she employed when engaging in epistemic cognition with respect to her professional practice.

Mrs. Sanchez’s beliefs about knowledge as integrated emerged in tandem with her beliefs about how children learn literacy. When asked if she saw any connections between her literacy
instruction and her classroom management strategies, which seemed to focus on supporting the
students’ independence, she replied,

I do. Because they take responsibility. THEY’RE the ones that are in charge. I
feel that by them being able to do that. By following through. Now they ARE able
to sit, write, because it’s THEIR classroom. They’re responsible” (Sanchez_EB-
SSI_2-28-19).

In the quote above Mrs. Sanchez was referring to the students’ being accountable to care for
class materials. She then reiterated, “I believe it’s all connected. I believe every aspect of
everything that we do is all, all connected” (Sanchez_EB-SSI_2-28-19).

Social emotional development is foundational to children’s literacy learning. Mrs.
Sanchez reported beliefs about social emotional development being foundational for children's
learning. For example, Mrs. Sanchez talked about her typical response to teachers of older
children when they asked about what she taught her students in PreK. She said:

My answer has always been, ‘Can they walk in a line? Can they look at you when
they're talking to you? Can they go to the bathroom by themselves?’ Those social
emotional things, for me, which I think I have told you. Literacy is.

ABSOLUTELY! Math, all that is so important. For me the social emotional part
is the biggest piece I feel for them to become lifelong learners (Sanchez_EB-
SSI_2-28-19).

Here, Mrs. Sanchez acknowledged that academic learning was important but ended with a broad
statement prioritizing social emotional learning. In this way, Mrs. Sanchez seemed to be
expressing her belief that children’s social emotional learning is integral for academic learning to
take place. This statement may also be reflective of an epistemic value Mrs. Sanchez held about
children’s learning in that she seemed to value social emotional learning over academic learning in the early childhood setting.

Mrs. Sanchez emphasized multiple components of social emotional learning in our meetings. She seemed concerned about autonomy, self-regulation, feeling capable, and self-esteem. For example, autonomy emanated as providing opportunities for the children to make choices in their learning based on their interests. She said, “I am that teacher, that I will be like, okay, as long as I’m fulfilling the objective, then absolutely” (Sanchez_EB-SSI_2-28-19). In this statement Mrs. Sanchez was talking about making changes to her plans based on suggestions from the children about how to approach a particular activity or what materials to use. In other words, she was not locked into her own ideas of how to approach a lesson because she believed the children had important contributions to make and if she deemed that their suggestions would still achieve her objective they would be more engaged in their learning when activities were self-initiated than if she insisted on following through with her own plans. Later Mrs. Sanchez explained,

Everything that’s out, they can take out. So, if it’s on the shelf and they want to use it they just say: “Can I take this out?” and I’m like: “Absolutely.” Even if it’s something that I haven’t planned. Say I have something else on the table and I have a set activity. If they say: “Can I do this instead?” I am pretty lenient with that (Sanchez_CT-SSI_2-20-19).

By encouraging the children’s decision making in such a way she was facilitating their autonomy and thereby creating an environment supportive of the students’ social emotional learning. In this way she also seemed to be encouraging the children’s active engagement in their learning. To do so required flexibility in her thinking, hence this data corroborates my earlier analysis that her
belief about the structure of knowledge as integrated and complex. In the preceding statements Mrs. Sanchez seemed to be targeting social emotional development as important to children’s learning. In other statements she seemed to be prioritizing her belief that active learning was even more so.

*Children should be actively engaged in their literacy learning.* Mrs. Sanchez prioritized the belief that children should be doing and talking to learn literacy as an ideal that influenced her engagement in epistemic cognition.

*Doing.* Early in the interview process Mrs. Sanchez made it a point to let me know that she believed children should be actively engaged in their learning. She described herself as follows,

I am totally hands-on. One thing you’re gonna learn about me is that I am process over product. Again, going back to my days in the nineties (laughs) where everything for me is, and I am a very hands-on teacher. I want the kids [to] get the kinesthetics. I want them to be constantly moving and I want them to enjoy and I don’t want them to sit here (Sanchez_CT-SSI_2-20-19).

Mrs. Sanchez used the phrase, ‘process over product’ numerous times over the course of our meetings. She meant that she was more concerned with how the students were engaging with materials and experiencing activities than in a specific outcome (i.e., art versus craft), and to her this engagement should involve a physical activity on the part of the students. To illustrate, Mrs. Sanchez provided the following example:

We do a lot of acting out of stories also. I read this story, *Clap Your Hands*\(^2\), and you do all different things with your body parts. So, while I’m reading, they’re

\(^2\) Cauley, 1997
stamping. They’re clapping their hands. They are stomping their feet. So, they’re connecting the word with what we’re doing” (Sanchez_CT-SSI_2-20-29).

This statement provides further evidence of Mrs. Sanchez’s beliefs about the structure of knowledge as interconnected. In this case, she connected literacy learning with physical activity showing how her beliefs about learning literacy extended beyond the domain of literacy. Mrs. Sanchez further reiterated her belief about children being actively engaged in literacy learning when she said, “I also like books where the children can get up and act them out because that way they’re engaged and are learning. And hopefully they’re going to remember specific details and comprehend” (Sanchez_CI_4-30-19). These examples point to Mrs. Sanchez’s belief that incorporating active movement experiences is beneficial to her students’ literacy learning.

Talking. Data gathered from Mrs. Sanchez highlighted her belief that children’s literacy learning required their use of language, meaning children need opportunities to talk. On multiple occasions Mrs. Sanchez expressed that it was important to her for children to use their language as a means to literacy learning. For example, she said, “My biggest thing is that I want the children to talk. I have said that to you today. I want them to talk in complete sentences. I want them to make sense of what they’re trying to express” (Sanchez_EB-TA_2-28-19). Here Mrs. Sanchez explained why she would not accept pointing from the children as a way of communication. In fact, I witnessed Mrs. Sanchez following through on this belief in her interactions with her students in the classroom (Researcher memo_2-28-19). She further accentuated her belief about the importance of children talking when she said:

Literacy is not just letters and writing. It is about the letters and the sounds. And it is putting the letters together to make words. I feel like we do a lot of that. But for
me, it’s the talking. It’s the expression. It’s drawing a picture (Sanchez_EB-TA_2-28-19).

In the preceding example, Mrs. Sanchez argued that literacy learning is not limited to letters and sounds. She seemed to place equal importance on children’s opportunities for verbal and graphic expression thereby expanding her idea of what literacy learning is to include multiple components.

Mrs. Logan

Here I describe Mrs. Logan’s epistemic beliefs and her beliefs about children’s learning. Her beliefs serve as the context for epistemic cognition discussed in the next chapter.

Epistemic beliefs. I describe Mrs. Logan’s epistemic beliefs along the knowledge dimensions of source and knowledge.

Sources of knowledge. Mrs. Logan expressed epistemic beliefs about the sources of knowledge for literacy instruction as derived from four sources: formal preparation, enactive experience, formalized bodies of knowledge, (see Fives & Buehl, 2010), and knowledge from colleagues. When I asked Mrs. Logan where she acquired her understanding of literacy instruction she replied, “Well a lot of it came from my Masters work at the University of Bridgeville” (Logan_CT_2-19-19). In this response, Mrs. Logan credited some of her literacy instruction knowledge to her formal preparation. Mrs. Logan also attributed some of her literacy instruction knowledge to enactive experience, particularly her observations made in the classroom. She said, “I see it first-hand. It’s like Christmas in here every day” (Logan_CT-SSL_2-19-19). Here Mrs. Logan explained how she actually learns how to instruct the students by observing what strategies work best with them on a daily basis.
In addition to formal preparation and enactive experiences, Mrs. Logan referenced formal bodies of knowledge (i.e., research, formal curriculum) when talking about sources of knowledge for literacy instruction. For example, when I asked how she knew specific knowledge about supporting children’s literacy learning, Mrs. Logan responded, “How do I know? Well research says that” (Logan_CT-SSI_2-19-19). Mrs. Logan’s reference to research was brief and general. She did not mention specific research in our discussions. The formal bodies of knowledge Mrs. Logan referenced in her responses clustered around one specific approach, *The Responsive Classroom*. When asked in the Epistemic Beliefs Questionnaire what sources of knowledge she had used for literacy instruction she wrote one response, “*The Responsive Classroom*” (Logan_EBQ_2-20-19). Here Mrs. Logan was referring to *The Responsive Classroom* as an approach or curriculum. Mrs. Logan also made extensive references to knowledge she gained from books and videos aligned with the specific evidenced based approach called *The Responsive Classroom*. For example, during the follow up interview she listed specific related texts:

There’s the book, *The First Six Weeks*\(^3\). There’s a book by Chip Wood, called *Yardsticks*\(^4\), that talks about developmentally appropriate practices for threes, for fours. We [the teachers] all had to have that book. Again, I’ve carried it with me.

To me that was the foundation of what I do (Logan_EB-SSI_2-27-19).

Mrs. Logan seemed to place a great deal of faith in *The Responsive Classroom* approach and these texts that she had been using since her first year of teaching. So much so that she insisted on taking me down the hall after the interview to locate the texts in the resource room so I could see them for myself (Researcher memo_2-27-19). Mrs. Logan’s implementation of the

\(^3\) Anderson, 2015
\(^4\) Wood, 2015
instructional approach advocated in *The Responsive Classroom* was evident in her environment and in her interactions with the children (e.g., use of Classroom News, responding to misbehavior with empathy), suggesting that she followed through on enactment of her beliefs.

Colleagues also emerged as a source of knowledge. Mrs. Logan described a scenario where she had identified two advanced readers in her class but lacked the instructional materials to help them. She explained how she sought help from a colleague in order to find out what materials she could use to support these students. She said, “So I went to a kindergarten teacher and I had the [my] students read (for the teacher)” (Logan_CT-SSI_2-19-19). Here, Mrs. Logan meant that she wanted her colleague to hear her (i.e. Mrs. Logan’s) students reading for herself so she could suggest appropriate literacy materials to use with those students. Mrs. Logan further explained, “So, then I borrowed (a kindergarten workbook)” (Logan_CT-SSI_2-19-19). This example hints at Mrs. Logan’s belief that her professional peers can be sources of literacy instruction knowledge.

Finally, in some instances, when asked directly about her specific knowledge of literacy instruction, her response included references to multiple sources at once. For example, Mrs. Logan stated,

The literacy knowledge that I have comes from my graduate school program and also from *The Responsive Classroom* training that we had discussed at length. So, I take those things that I know. Plus, just my years of teaching and what I’ve had experience with. And I carry all of that with me (Logan_BS-TA_3-7-19).

Here, Mrs. Logan talked about two knowledge sources: (1) formal preparation (i.e., formal schooling and training/professional development) and (2) enactive experience. This suggests that Mrs. Logan believed that these sources of knowledge were interconnected. This example
also points to her implicit beliefs about the structure of knowledge as complex in that her knowledge was derived from multiple places.

Structure of knowledge. Mrs. Logan seemed to have a notion of knowledge about literacy instruction as complex and integrated. This is demonstrated in the following statement Mrs. Logan made with respect to her holistic approach to teaching: “If they’re [students] making a structure and then they’re writing about their structure. And they make a ‘B’ for bridge or something. Now they own it. It’s part of their schema” (Logan_CT-SSI_2-19-19). In this example, Mrs. Logan explained how students make connections to their literacy knowledge during an authentic play experience. She expanded on this belief when she described how the children build literacy knowledge outside of centers dedicated to literacy, and in situations where the focus may be talking with the child. She explained:

Well, in the literacy center there are books, and they’re reading to each other. The magnetic letters. There are other alphabet type manipulatives. That’s more of a literacy rich center. Where in, let’s say, the Blocks Center, right now our theme, our unit, is building. So, they’re building and they’re talking about a skyscraper, or a home, or different type of buildings. And if they need an elevator in their building or where the roof is. So, I may take it from there and ask them if they want to draw a picture about it or write a story about it. They may or may not. So, we’re doing that sharing of information. Their comprehension of what they know. Their structure that they’re building. But they’re not actually working with letters or manipulating a book” (Logan_CT-SSI_2-19-19).

Here Mrs. Logan expressed the belief that the structure of literacy knowledge is complex and can therefore be developed indirectly, through block play and/or picture drawing. In other words, she
indicated that literacy knowledge is not bound to traditional literacy activities (i.e., using letters, book handling).

**Beliefs about children’s learning.** Throughout my data I identified beliefs that Mrs. Logan held about children’s learning. In this section I provide evidence that she held the beliefs that: a) social emotional development is foundational to children's literacy learning, and b) children must be actively engaged in their literacy learning in concrete, practical ways.

**Social emotional development is foundational to children's literacy learning.** Mrs. Logan prioritized the belief about social emotional development being foundational for children's learning as an ideal that influenced her engagement in epistemic cognition. Specifically, she showed an overwhelming emphasis on supporting the children’s autonomy in their learning. For example, she explained why it is important for the children to choose their activities during center time; so that they had some autonomy over their learning. She went on to say,

> It’s important to provide student choice. And again, it goes along with their interests. They're going to learn at all of these centers. It’s about where they feel they want to play. That’s where they’re going to learn. And that’s where they’re going to build their foundation. And it’s all going to come together through their speaking, listening, reading, and writing. And it’s not about me. It’s about them. Let them go play. As long as you put what they need everywhere (Logan_CT-SSI_2-19-19).

In the preceding example Mrs. Logan explained to me how she rationalized providing students’ opportunities to choose their own activities during certain periods of the day. She seemed to believe it was important for the students to have this level of choice because it would support their level of engagement. It also provides another hint at her implicit beliefs about the structure
of knowledge as integrated in that she talked about the four components of literacy and she
intimated that children could learn literacy in multiple areas of the room. When she explained
how the children decide which center they want to go to after Morning Meeting she said, “…this
way they can pick and choose along the way. And then they’re in control of their learning and
where they’re going during the day and in the afternoon” (Logan_CT-SSI_2-19-19). The
preceding example provides further evidence that Mrs. Logan believed children should have
choice in their learning and an additional glimpse into how she structures her environment as
autonomy supportive.

I also found Mrs. Logan’s adherence to The Responsive Classroom approach to teaching,
one that is based on a social emotional approach to instruction, to be evidence that she believed
social emotional development was concurrent with literacy learning. For example, she described
the beginning of the school year as follows, “the first six weeks of school are all based on more
social emotional needs and classroom rules” (Logan_EB-SSI_2-27-19). Mrs. Logan explained in
detail how she spent time at the beginning of the school year dedicated to addressing the
children’s social emotional needs. She talked about structuring her environment in such a way
that supported students’ self-regulation and independence, such as ensuring that the children had
independent access to needed materials. She explained how she intentionally labeled the
materials in the classroom with the purpose of supporting students’ sense of autonomy. For
example, she neatly organized bins of small manipulative toys which were labeled with pictures
and words. She said, “And we like the picture side facing out. This way the children are
responsible for their environment. Responsible for the clean-up and everything has its place.
(Logan_CT-SSI_2-19-19). Here Mrs. Logan hinted at her belief that the children’s feelings of
ownership over their environment are concurrent with their learning in that environment.
Children learn in concrete, practical ways. In her responses, Mrs. Logan indicated that she believed children must be actively engaged in their literacy learning in concrete practical ways. Mrs. Logan described her beliefs about concrete, practical learning with respect to the Promethean board and when she used it. She said, “Usually in the morning if I use it at all. There’s an awesome interactive calendar that I’ll use. Then I usually don’t like to use it. Simply because I want the kids to touch things that are more concrete” (Logan_CT-SSI_2-19-29). In this example she described why she limited the use of the Promethean board in her classroom because she wanted the children to have concrete hands on experiences as opposed to experiences with a virtual surface like the Promethean board. She went on to explain her stance on children’s use of electronic devices and her perception of how children have so much exposure to that at home. She said,

I feel like they’re here to NOT have that. I want them to actually be playing with manipulatives and using their hands and using their bodies and NOT the electronic device. So this (the Promethean board) is a center and there are several great games. We’ll use this in bad weather so that we can have some music and movement (Logan_CT-SSI_2-19-29).

Here Mrs. Logan explained that she does not forbid the use of technology in the classroom but that she prefers to use it when there is an opportunity for the children to move their bodies and be physically active. Mrs. Logan’s explanation seemed to embody how her beliefs about the children needing to have concrete, practical learning experiences functioned as her ideals. In the case of the prior example, she okayed the use of the Promethean board in the case of a movement activity.
In addition, Mrs. Logan seemed to extend her belief about concrete and practical learning opportunities to include engaging in concrete, practical conversations with the children. For example, Mrs. Logan said:

We’ll talk about the letter ‘A’. Model how to write the letter ‘A’. We’ll read this (All About A chart). We’ll go over these pictures of things that start with ‘A’.

We’ll talk about it. And then every morning they’ll tell me other things that start with the letter ‘A’ (Logan_CT-SSI_2-19-19).

In the preceding example, Mrs. Logan referenced literacy materials in her classroom Morning Meeting area as she described opportunities for the children to engage with concrete materials in the environment. In addition, Mrs. Logan seemed to believe that children’s literacy learning required opportunities to engage in practical use of language focused on relevant literacy objectives.

**Who They Are: Summary**

Both Mrs. Sanchez and Mrs. Logan shared similar epistemic beliefs and beliefs about children’s learning, to a point. For example, although both teachers talked about multiple sources of knowledge for literacy instruction, at times as if they were interconnected, Mrs. Sanchez did more so. Formal preparation, such as college coursework or professional development emerged as a source of knowledge for literacy instruction for both teachers yet both teachers expressed acknowledgment that there were limits to what they learned in formal preparation. Mrs. Sanchez leaned more towards her enactive experience as a source of knowledge than Mrs. Logan. Mrs. Logan seemed to give more credit to formal bodies of knowledge as a source of knowledge for literacy instruction than Mrs. Sanchez. Mrs. Sanchez talked about her knowledge of literacy instruction as innate, whereas Mrs. Logan did not. Mrs. Logan made no comments about her
acquisition of literacy instruction knowledge as naturally occurring or innate. Likewise, Mrs. Sanchez explicitly mentioned her students as sources of knowledge for her literacy instruction while Mrs. Logan did not.

Mrs. Logan’s beliefs about knowledge structure were similar to that of Mrs. Sanchez. Both teachers expressed epistemic beliefs about the structure of literacy knowledge as connected to other developmental areas (e.g., social emotional development) and they both seemed to consider social emotional development as foundational to children's learning, yet their belief emanated with different specific foci. Mrs. Sanchez seemed to focus more on student centeredness while Mrs. Logan seemed to focus more on student’s autonomy. Both teachers seemed to believe that children’s active engagement was important to children’s literacy learning. Mrs. Sanchez made more explicit statements that referenced physical and verbal engagement while Mrs. Logan talked about more generic concrete and practical learning opportunities.

Contextual evidence of each teacher’s follow through on their epistemic beliefs and beliefs about children's learning in their classroom environments was evident. Although the teachers’ beliefs generally aligned with each other, differences emerged in how those beliefs emanated in the classroom environment, in student teacher interactions, and, as seen in the next chapter, in how each teacher engaged in epistemic cognition. In fact, prior to beginning the book selection think aloud, Mrs. Sanchez commented that I was “probably seeing two completely different teaching styles between her and Mrs. Logan” (Researcher Memo_3-11-19). In chapter five, I present my findings in relation to my research question: How do aspects of epistemic cognition emerge when early childhood teachers consider materials and plan instruction for literacy learning? I answer my research question by illustrating how aspects of epistemic
cognition emerged when two early childhood teachers considered materials and planned instruction for literacy learning. In my findings I describe how these teachers used their epistemic beliefs about early literacy instruction and beliefs about children’s learning as ideals to shape their epistemic aims for their students and inform their reliable processes.
CHAPTER 5: FINDINGS

In this chapter I answer my research question by illustrating how aspects of epistemic cognition emerged when two early childhood teachers considered materials and planned instruction for literacy learning. As I mentioned in Chapter Three, I gave each teacher two tasks intended to invoke their epistemic cognition: selecting a children’s book and planning a literacy lesson. I imposed an epistemic aim for the book selection task: namely, to select a children’s book for use in their classroom that would support their student’s literacy learning. In this task I presented each teacher with two books (i.e., *Move Over, Rover!* Beaumont, 2006 and *Peter Pan: A Little Golden Book*) and asked each teacher to think aloud as she evaluated the books. In the second, more authentic task, the teachers generated their own epistemic aim(s). In this task, I asked each teacher to think aloud during an actual literacy lesson planning session. I looked at data from both sources together to create a systematic perspective on how aspects of epistemic cognition emerged when these two early childhood teachers considered materials and planned instruction for literacy learning. Aims, ideals, and reliable processes emerged from these teachers while they engaged in these tasks.

In this chapter I illustrate the teachers’ engagement in epistemic cognition as they evaluated *Peter Pan* and *Move Over, Rover!* and as they planned their literacy lesson. My goal with these illustrations is to provide examples of the phenomenon of teachers’ engagement in epistemic cognition rather than to make evaluations of the teachers. I organize my findings in terms of how aims, ideals, reliable processes, and epistemic ends emerged across both tasks.

Both teachers engaged in epistemic cognition during both teaching tasks. Some aspects emerged in common, however, other aspects were unique. For example, in the more controlled task of book selection, they used a common reliable process and came to the same specific
epistemic end; selecting *Move Over Rover!* However, during lesson planning each teacher used different reliable processes to achieve their respective aims. Despite these differences, both came to the same global epistemic end in the lesson planning task, the design of a multi-tiered lesson. I also found that both teachers reached micro-epistemic ends while they engaged in epistemic cognition during book selection and lesson planning. In the lesson planning task, I found that these micro-epistemic ends evolved into other aspects of epistemic cognition. The design of a multi-tiered lesson as a final epistemic end contained a series of micro-epistemic ends for both teachers: choosing a book for a read aloud, deciding on a small group activity\(^5\), selecting materials for that activity, and embedding an assessment in the lesson. In essence, each teacher seemed to design their lesson like a recipe with the ingredients being the micro-epistemic ends. I describe these findings in detail below.

**Illustration of Teachers’ Epistemic Cognition**

Epistemic cognition is the actual mental process of thinking about knowledge in terms of how it is acquired, understood, justified, whether or not it changes, and how it is used (Greene et al., 2016a). I frame this analysis using the Epistemic Cognition in Learning and Teaching Framework (Buehl & Fives, 2016; Fives et al., 2017), which is based on the AIR process model of epistemic cognition (Chinn et al., 2014; Chinn & Rinehart, 2016). The AIR process model of epistemic cognition consists of three main components: epistemic Aims and values (knowledge related goals and attributed importance of achieving those goals), epistemic Ideals (benchmarks or norms used to determine if epistemic aims have been met), and Reliable processes (strategies or procedures used to successfully meet the epistemic aim; Chinn et al., 2014; Chinn & Rinehart, 2016). The interplay among these components should culminate in reaching an epistemic end.

\(^5\) Note that in my analysis and data excerpts, the term activity refers to a lesson or portion of a lesson.
Epistemic Aims for Learners and Selves

In this section I present my findings related to epistemic aims (knowledge related goals) that emerged during the think aloud tasks. Mrs. Sanchez and Mrs. Logan engaged in epistemic cognition for themselves during the book selection think aloud task and, in the lesson planning think aloud task, they simultaneously engaged in epistemic cognition for themselves and their learners. The examples from my data illustrate the symbiotic nature of the relationship between the teachers’ epistemic aims they set for themselves and the epistemic aims they set for their learners, which added to the complexity of the epistemic cognition process for these teachers. For clarity in this presentation I describe these two sets of aims separately to make clear the distinction between these two different types of aims.

**Epistemic aims the teachers set for their learners.** Epistemic aims for learners during the book selection and lesson planning task emerged differently. During the book selection think alouds both teachers demonstrated implied epistemic aims for their learners as they evaluated the books, which emerged as specific literacy learning objectives. During the lesson planning think alouds, Mrs. Sanchez and Mrs. Logan each stated explicit epistemic aims for their learners, which emerged as one broad goal with specific literacy learning objectives that would support the achievement of the goal. Looking across both tasks and both teachers, epistemic aims that emerged for learners consisted of specific literacy learning objectives. In the following paragraphs I address the epistemic aims for learners that emerged during the book selection think aloud followed by the epistemic aims for learners that emerged during the lesson planning think aloud.

**Book selection.** In the book selection task, Mrs. Sanchez and Mrs. Logan both seemed to have implicit epistemic aims for their learners that emerged as embedded projections of specific
literacy learning objectives they could address with the book during a read aloud. In this way, the epistemic aims the teachers implied for their learners seemed to drive their engagement in epistemic cognition during the book selection process, almost as if the epistemic aims for learners functioned as ideals of what features they were looking for in the books. For example, Mrs. Sanchez commented, “We could do prediction with Move Over Rover! AND they would be able to read the words with me and actually be able to see the letters in the words. (Sanchez_BS-TA_3-11-19). Within this statement, Mrs. Sanchez indicated two epistemic aims that could be met for her learners if she used Move Over, Rover! as a read aloud to her students: prediction and reading along with the story.

Mrs. Logan implied an epistemic aim for her learners about the students participating in the story by reading along using the rhyming words. She said, “And it’s rhyme so now the kids can join along” (Logan_BS-TA_3-7-19). She also alluded to having a discussion about the story and the characters when she said, “So we can talk about the snake is smaller. And the mouse. And they’re just kinda squeezing in there” (Logan_BS-TA_3-7-19). Mrs. Logan’s epistemic aims for learners were closely entwined with her ideals, or standards for evaluation regarding physical features of the book, such as the size of the text, as noted in the following statement, “And the print was also large so that I could track with my finger to show that left to right progression” (Logan_BS-TA_3-7-19). Here Mrs. Logan was talking about her ideal for the text being large enough so she could run her finger along under the text as she read to facilitate showing left to right progression, which could imply that an epistemic aim she had for her learners was to understand left to right progression. This entwined nature of ideals alluding to aims created a challenge to the analysis. It could also be, as argued in a subsequent portion of my
analysis, that these epistemic aims for learners functioned as ideals or a checklist of literacy learning supportive features that the teachers were looking for as they evaluated the books.

**Lesson planning.** In the lesson planning task, Mrs. Sanchez and Mrs. Logan each stated explicit epistemic aims for their learners, yet these aims emerged differently. Mrs. Sanchez set one overarching aim for her learners and two smaller epistemic aims, whereas Mrs. Logan set multiple mini-epistemic aims for her learners which I interpreted as a broader epistemic aim when combined. Although the epistemic aims for learners emerged differently for each teacher in this task, the specific aims both teachers set suggested a command of knowledge of literacy instruction.

Mrs. Sanchez set a broad epistemic aim for her learners in the following statement, “So my objective is to get them to understand what rhyming words are. Rhyming words are two words that sound the same. And I want them to understand, too, that you can make up a word also” (Sanchez_LP-TA_3-21-19). In the preceding excerpt, Mrs. Sanchez stated her epistemic aim for her learners was to understand the concept of rhyming. Understanding a concept such as rhyming is a broad objective and can be considered an overarching goal. Epistemic aims that fell under this broader goal of understanding rhyming, sub-aims, emerged interspersed in Mrs. Sanchez’s talking during the think aloud. She specified, “I want them to match. I want us to say: ‘This is a bat. Let’s look at the pictures. Which one sounds the same?’ (Sanchez_LP-TA_3-21-19). Mrs. Sanchez’s epistemic aim for her learners in the preceding statement was for them to be able to auditorily identify rhyming words when saying the names of the pictures out loud. She also indicated another epistemic aim for her learners under the umbrella of understanding rhyming; to identify and repeat rhyming words in a story. She explained to me how she would approach the story with her students, “Tell them. You’re gonna say: ‘night, night, fright, fright.
Those two words rhyme” (Sanchez_LP-TA_3-21-19). I inferred from this explanation that Mrs. Sanchez meant she wanted her students to be able to identify and repeat the rhyming words as she read them the story, meaning that was her epistemic aim for her learners.

Mrs. Logan verbalized multiple epistemic aims for her learners; recognizing the letter V in the Classroom News Chart, identifying the letter V in isolation, and stating a word that starts with the letter V. She also included discussion about vegetables and healthy eating as an epistemic aim. Mrs. Logan described her epistemic aims for her students as follows:

My initial objective would be to be able to locate and identify the letter V. Then to be able to state something that starts with V, meaning vegetables. If I ask them what starts with V, I want them to know that vegetables starts with V. Not broccoli. Not string beans. You know. Discussion on just vegetables and healthy eating (Logan_LP-TA_3-15-19).

She had an additional aim written in her planbook.com that she did not verbalize; tell what sound the letter V makes. (Logan_Image_3-15-19). All of these epistemic aims could be grouped under a broader epistemic aim or learning goal, understanding the letter V, although Mrs. Logan did not speak about it in this way. Mrs. Logan used these objectives as a guide for herself while she planned her lesson and selected and created materials for use during her lesson.

Both Mrs. Sanchez and Mrs. Logan attended to some aspect of the broad skill of phonological awareness with their epistemic aims for learners. In Ms. Sanchez’s case, she addressed rhyme and being able to identify oral rhymes. In Mrs. Logan’s case she addressed recognizing words with the same initial sound. Mrs. Logan also addressed the more specific skill of phonemic awareness by setting the epistemic aim for her learners of telling what sound the letter V makes in isolation. The setting of broad and sub-epistemic aims suggested, as indicated
in Chapter Four, that the teachers understood the structure of literacy learning as complex and multifaceted rather than simple and achieved with only one approach.

**Epistemic aims the teachers set for themselves.** In the book selection task, as mentioned earlier in this chapter, I imposed an epistemic aim for the teachers: namely, to select a children’s book for use in their classroom that would support their students’ literacy learning. In the lesson planning task, Mrs. Sanchez and Mrs. Logan each set epistemic aims for themselves. These aims were similar to each other in two ways. First, each teacher established an epistemic aim for herself with regard to figuring out how to design a particular lesson to help meet a specific objective(s) with their students. Second, each teacher established an epistemic aim for herself with the purpose of understanding their students’ literacy knowledge, which culminated in some form of assessment taking place as part of the lesson. Hence, each teacher developed two epistemic aims for herself during the lesson planning think aloud; understanding how to accomplish their literacy teaching task and understanding their students’ literacy knowledge. In both cases, the planned lessons doubled as assessment events, meaning the teachers both intentionally set out to meet epistemic aims for themselves and for their learners and approached assessment not as an isolated separate event but as an ongoing event, embedded in natural, interactive lessons which further exemplified the symbiotic nature of their engagement in epistemic cognition.

During the Lesson Planning Think Aloud Interview, Mrs. Sanchez set two distinct epistemic aims for herself. One epistemic aim was to figure out how to design a lesson to help her students understand rhyming; the second was to figure out what her students knew about rhyming.
Mrs. Sanchez told me she used an assessment connected to/aligned with the *Creative Curriculum*® (Dodge et al., 2016b): *Teaching Strategies GOLD*® (Dodge et al., 2016a). *Teaching Strategies GOLD*® (Dodge et al., 2016a) is an authentic assessment system based on teachers’ observations of and interactions with children during ordinary daily activities, such as play (Dodge et al., 2016a). She said, “Yesterday I was doing my assessments and out of seventeen children, three children understand what rhyming is” (Sanchez_LP-TA_3-21-19).

This recollection sparked the development of an epistemic aim for herself. She told me how she thought to herself, “How am I going to get these children to understand the concept of rhyming?” (Sanchez_LP-TA_3-21-19). Hence, her initial epistemic aim for herself was to figure out how to plan a lesson that would meet her objective for her students, to understanding rhyming, thereby connecting the aim she set for herself to the aim she set for her learners. Further, she said,

> And I know this is a ME problem. Not a THEM problem. But then I’m gonna find out if it’s a me problem or a them problem. You know. Or it’s a combination problem of are they there [ready to understand rhyming]? Or are they not developmentally there? Or is it me? (Sanchez_LP-TA_3-21-19).

In this comment Mrs. Sanchez was talking about trying to parse out if the children had a developmental understanding of rhyme that she had simply not tapped in her prior instruction or if the children were not yet ready to grasp the concept. Her questioning the source of the problem in terms of “Me” or “Them” indicated an epistemic aim, to construct an understanding of the problem supported by evidence. That is the aim of constructing an accurate interpretation of her students’ knowledge about rhyming.
Mrs. Logan also set two epistemic aims for herself during the lesson planning think aloud. First, Mrs. Logan prefaced her think aloud planning session when she said, “I want to plan something where I have, you know, where my objective is going to be met. Not just something that’s random” (Logan_LP-TA_3-15-19). Designing such a lesson seemed to be the epistemic aim Mrs. Logan set for herself. It was almost as if she asked herself, “How can I meet my literacy learning objectives for the students?” which established the task of figuring out how to do so. Hence, her initial epistemic aim for herself was to plan a lesson that would meet her objectives, thereby connecting the aim she set for herself to the aims she set for her learners. Second, during her planning, Mrs. Logan revealed another aim for herself; to find out if the students could recognize an upper and lowercase V. While planning Mrs. Logan said:

So, what I could have them do is I can have them, I could type up “My Favorite Vegetable” and print it out so that they have the title of it up on top. And then they could make a picture. And then each child individually [will circle the upper- and lower-case V]. So, I’ll see as a final assessment if they can locate (where) there is an uppercase and a lowercase V (Logan_LP-TA_3-15-19).

In the preceding excerpt, Mrs. Logan indicated that she wanted an outcome of the lesson to meet an epistemic aim she set for herself; to find out if the students could recognize an upper and lowercase V. She elaborated on this epistemic aim:

It just gives me another indicator. If they’ve grasped that that’s a V. And if not, at least to be able to identify it. To be able to see it and then to search for it. If they can't find it on their own, I’ll also have a large ‘V’ available [Mrs. Logan showed me a large letter ‘V’ printed on a piece of paper] so that they can see what the letter V looks like (Logan_LP-TA_3-15-19).
Here Mrs. Logan provided more detail about her epistemic aim. She wanted to know about her students’ understanding of the letter V in terms of their being able to recognize the letter V or simply match the letter V model to a V embedded in text.

The teachers’ setting of these epistemic aims for themselves points to their ongoing role of teachers as learners. These two teachers each had about twenty years of experience yet they were still asking themselves how best to design a lesson to reach the objectives they had set for their students. What is evident in these data excerpts are examples of the kinds of aims that early childhood teachers set for themselves while planning instruction: aims to support understanding how to accomplish their literacy teaching task and aims to support understanding of their students’ literacy knowledge.

**Ideals Emerged Across Teachers and Tasks**

In this section I present my findings related to epistemic ideals (i.e., standards for evaluation of knowledge related claims) that emerged during the think aloud tasks. These teachers used ideals as standards to evaluate literacy learning materials and to plan literacy instruction. Ideals emerged as a set of internalized expectations or criteria that both teachers used with few exceptions. During the book selection task, these ideals emerged throughout the task like a list. During the lesson planning task, an overarching ideal that literacy learning is a multi-tiered event emerged when looking at the entire task as a whole. In addition, I found evidence of the self-system playing a pronounced role in how both early childhood teachers enacted epistemic cognition. I saw beliefs functioning as ideals used by the teachers to evaluate certain materials (i.e., whether or not to select, when to use) and in planning how to use those materials.

Note, both teachers expressed some ideals in explicit statements, yet I inferred other ideals either in statements that expressed the opposite (i.e., what should not be) or as indirectly
implied within statements. For example, Mrs. Sanchez clearly stated, “I already like the fact that there are not a lot of words on the page” (Sanchez_BS-TA_3-11-19) and “I liked that the words were big” (Sanchez_BS-TA_3-11-19). Mrs. Logan also remarked on the text, “I like that the print is larger” (Logan_BS-TA_3-7-19). In these statements the ideals regarding amount and size of text are clear and stated directly, leaving little to infer. In other examples in this section ideals were implied and I discuss them as such.

**Ideals as internalized expectations.** During both tasks the teachers seemed to have an internalized set of ideals that they drew upon to evaluate the books and plan their lessons.

Neither one of the teachers used a checklist on paper during either think aloud yet they seemed to have a mental checklist or schema in their head that they referred to throughout the tasks, most prominently in book selection.

**Book selection: A common mental checklist.** For the most part, the teachers seemed to be drawing on a similar mental checklist of ideals when evaluating *Peter Pan* and *Move Over, Rover!*

Ideals common to both teachers centered around text features that directly support literacy learning such as limited amount of text, and large text size as mentioned above. Others centered on specific literary features. For example, Mrs. Sanchez made the following remarks, “I like books with repeating because then they’re able to repeat” and “So I like this because there’s rhyming” (Sanchez_BS-TA_3-11-19). Mrs. Logan made similar comments as follows, “Rhymes. Love it!” and “Oh! Now I like this too cause I’m assuming that *Move Over, Rover!* is going to be repetitive” (Logan_BS-TA_3-7-19). In the preceding quotes the teachers made explicit statements that revealed their shared ideals for a quality read aloud book; rhyme and repetition (literary features). In both cases, ideals about text features and ideals about literary features, the
teachers made these comments from their heads, meaning they did not follow any printed checklist or guide. This suggests that the teachers have committed to memory a list of ideals or features that should be present that they reference when evaluating children’s books.

In addition to common ideals that emerged during book selection which centered around features that directly support literacy learning, both teachers seemed to agree upon features that could be considered to indirectly support literacy learning such as a) containing content and characters to which children could make connections, b) that children’s books illustrations should be aesthetically pleasing, and c) illustrations should not depict scary or violent themes. For example, Mrs. Sanchez wanted the children to be able to make personal connections to the story. She said, “These (gesturing to Move Over, Rover!) are all recognizable animals. Animals they might see at their house. Animals they might see outside their house” (Sanchez_BS-TA_3-11-19). Similarly, Mrs. Logan made almost the same remarks when evaluating Move Over, Rover!: “It’s something they can relate to. Its animals that they know” (Logan_BS-TA_3-7-19). In these statements Mrs. Sanchez and Mrs. Logan were expressing an ideal of having familiar characters in the story, ones the children could possibly have seen in real life. These examples about the children relating to and connecting personally with the story hinted at how the teachers’ beliefs about the structure of knowledge as complex and interconnected functioned as their ideal when evaluating the books and emanated as the children being able to make connections between the story and their personal experience.

In Table 5.1, I provide a summarized list of the ideals that emerged during book selection across the two teachers. The table highlights that, while many of the ideals are common between the teachers, differences are evident.
Table 5.1 Ideals That Emerged During Book Selection

<table>
<thead>
<tr>
<th>Ideal</th>
<th>Sanchez</th>
<th>Logan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Literary Features</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rhyming</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Repetition</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Prediction</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Text features</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Large print</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Aesthetically pleasing</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Should not be wordy/Not too much print on page</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Pedagogical Opportunities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Have action words/opportunity for movement</td>
<td>✓</td>
<td>--</td>
</tr>
<tr>
<td>Opportunities to join in and verbally participate</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Stimulate imagination</td>
<td>--</td>
<td>✓</td>
</tr>
<tr>
<td>Connection to other domains</td>
<td>✓</td>
<td>--</td>
</tr>
<tr>
<td>Connection to self</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Connection to familiar stories</td>
<td>✓</td>
<td>--</td>
</tr>
<tr>
<td>Emotional Messages</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fun/Enjoyable</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Books should not be violent</td>
<td>✓</td>
<td>--</td>
</tr>
<tr>
<td>Books should not be scary</td>
<td>--</td>
<td>✓</td>
</tr>
</tbody>
</table>

**Literacy learning is a multi-tiered event.** The ideal that literacy learning is a multi-tiered event seems to be reflective of the teachers’ beliefs about the structure of knowledge as integrated and complex and as such, exemplified how beliefs about the structure of knowledge (i.e. interconnected and complex) affected their epistemic cognition. In other words, their beliefs about the structure of knowledge functioned as influencers or as part of their self-system. The
ideal that literacy learning is a multi-tiered event was evident in both the book selection and the lesson planning think aloud data.

During the book selection think aloud, both teachers hypothesized how they might follow through on a read aloud of the book selected to extend literacy learning across multiple activities. In other words, book selection was not merely to meet the end of choosing the best book to support literacy learning but also to find ways to extend the use of the book to support literacy learning. For example, when Mrs. Sanchez was talking about *Move Over, Rover!* She said, “Cause we’re always gonna go back and draw a picture. So, I feel like if they know the animals and they can relate to them, then I know they’re gonna be able to get something on their paper” (Sanchez_BS-TA_3-11-19). In this comment, Mrs. Sanchez meant that she would extend the children's experience with the book as part of their literacy learning. The literacy learning that occurred during a read aloud did not end when the reading of the story was over. For Mrs. Sanchez, the literacy learning stretched into other experiences for the children. The same was true for Mrs. Logan who explained how she extended literacy learning after a read aloud by providing an opportunity for the children to get their hands on the book and explore it independently. She said, “I would make sure that the book is accessible for the children on their own if they wanted to take it to a table or lay on the carpet and perhaps look at it themselves” (Logan_BS-TA_3-7-19). In both these examples, the teachers talked about ways that they intentionally incorporated another tier of literacy learning based on a children’s book. Planning multiple opportunities for children to engage with a book seems to be reflective of the teachers’ beliefs about the structure of knowledge as integrated and complex and suggests that their beliefs about the structure of knowledge functioned as their ideals and subsequently affected their epistemic cognition.
The ideal that literacy learning is a multi-tiered event also became evident when looking at the broader picture of the teachers’ lesson planning think aloud, it became clear that both teachers planned their lessons not as one distinct, finite package but rather as multi-tiered events that stretched over two or more planned activities, suggesting that their ideal for a good lesson could be construed as one that included multiple, related opportunities for meeting epistemic aims for learners that build on or relate to each other. For instance, each teacher chose a book for read aloud as part of their lesson planning. During the lesson planning think aloud Mrs. Sanchez stated, “I knew in my head that I wanted to definitely read a book” (Sanchez_LP-TA_3-21-19). Mrs. Sanchez was referring to wanting to find a book to read aloud to the children that would reinforce the concept of rhyming. Mrs. Logan seemed to share the same ideal during her lesson planning for understanding the letter V. As she planned she said:

I know I have a vegetable book in my big book bin. So now I’m gonna go over there. And I’m gonna see what it is. Aaaand, it’s Growing Vegetable Soup (Figure 5.1_Logan_Growing Vegetable Soup Cover_3-15-19). So this is going to be my read aloud today in Morning Meeting… So I’m gonna read this story this morning in my Morning Meeting for my read aloud. But then AFTER Morning Meeting we’re gonna have small group instruction” (Logan_LP-TA_3-15-19).

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6 Ehlert (2004)
In these examples, the ideal seemed to be that when planning a lesson there should be a children's book involved, thereby adding an additional dimension or tier to the lesson. Both of these situations were the inverse of the book selection think aloud where the teachers started with a book and thought about how to extend its use to support literacy learning. In lesson planning, however, the teachers thought about their epistemic aim first then selected a book to support the achievement of that aim because their ideal was that including a book was another way to support the children's literacy learning.

I argue that the ideal, of literacy learning being a multi-tiered event stems from the teachers’ beliefs about the structure of knowledge as integrated and connected and offers another example of how the teachers’ beliefs, functioning as their ideals, played a role in their process of epistemic cognition. To be clear, I am claiming here that the teachers’ beliefs about the structure of knowledge (i.e. interconnected and complex) affected their epistemic cognition. In other words, their beliefs about the structure of knowledge functioned as influencers or as part of their self-system. In the next section I provide additional exemplars of this phenomenon.

**The self-system looms large.** Prior evidence suggested that the teachers’ epistemic beliefs and beliefs about children’s learning functioned as ideals to shape their epistemic cognition. In this section I focus on specific exemplars of this phenomenon. The selected examples show how the teachers’ beliefs that social emotional development was important for literacy learning, and how their beliefs about children’s literacy learning being related to opportunities for active engagement functioned as ideals that influenced their engagement in epistemic cognition during book selection and lesson planning. In addition, these examples illustrate how their beliefs about the structure of knowledge as interconnected also functioned as
ideals that influenced their engagement in epistemic cognition during book selection and lesson planning.

**Social emotional learning is important.** Mrs. Sanchez and Mrs. Logan both seemed to tune into the social emotional needs of their students during the book selection process. Mrs. Sanchez made four distinct comments on the illustrations in *Peter Pan* that revealed her implicit ideal that children’s book should not depict violence. As she flipped through the pages in *Peter Pan*, she made her first comment, “And here I’m noticing they are not shooting with guns. They are shooting with arrows. But still that same concept” (Sanchez_BS-TA_3-11-19). She then compared the two books when she said,

I feel like with everything that is going on in the world that if we can talk about *Move Over, Rover!* and shoving animals and having fun that way. More so than *Peter Pan* and Hook wanting to hurt people and the fighting and stuff like that (Sanchez_BS-TA_3-11-19).

By shoving, Mrs. Sanchez was referring to the animals all squeezing into the same small doghouse to get out of the rain. Mrs. Sanchez meant that the animals in *Move Over, Rover!* were having fun; that their squeezing in together was for a common positive goal to stay dry. In the preceding example she compared this type of harmless physical action in *Move Over, Rover!* to the depiction of action with a malicious intent in *Peter Pan*. In a third comment Mrs. Sanchez said, “And there is violence in this book [holding Peter Pan]” (Sanchez_BS-TA_3-11-19). Finally, in a second pass through of *Peter Pan* she pointed to an illustration and said, “This one too. Look. We’ve got knives. Oh. There going over [the plank]” (Sanchez_BS-TA_3-11-19). In these examples, Mrs. Sanchez’s beliefs about the importance of her students’ social emotional development, acted as her ideals and influenced her engagement in epistemic cognition.
contributing to her ultimate decision not to choose the *Peter Pan* book; the ideal I inferred here was that children’s books should not depict violence.

Mrs. Logan also focused on the illustrations in *Peter Pan* in the following comment from the Book Selection Think Aloud. She actually turned to a specific page as she described the illustrations and commented on them as follows:

That’s a little bit frightening I think [Mrs. Logan pointed to a picture of fireball heading towards a ship]. Even this illustration [Mrs. Logan pointed to an illustration of a tree full of holes and bare of leaves]. To me there’s nothing attractive or happy about either of these illustrations (Logan_BS-TA_3-7-19).

Mrs. Logan was emphatic in her reaction to and evaluation of the illustration of the fireball heading towards the ship. She was definitive in her evaluation of the scene as being scary. In this example, Mrs. Logan’s beliefs about the importance of her students’ social emotional development, acted as her ideals and influenced her engagement in epistemic cognition contributing to her ultimate decision not to choose the *Peter Pan* book; the inferred ideal here being children’s books should not be scary.

Both of these examples also illustrate how the teachers’ beliefs about the structure of knowledge as interconnected functioned as ideals that influenced their engagement in epistemic cognition during book selection because the teachers went beyond considering ideals directly related to literacy learning (rhyming, prediction, text size) to considering ideals related to another body of knowledge, social emotional learning. Considering these multiple bodies of knowledge simultaneously added to the complexity of epistemic cognition for these teachers.
Children’s active engagement is important. Mrs. Sanchez’s and Mrs. Logan’s beliefs about needing to actively engage their students in literacy learning functioned as ideals that influenced their engagement in epistemic cognition across both tasks. While Mrs. Sanchez’s beliefs centered on the children’s physical activity, Mrs. Logan’s beliefs about the importance of active engagement took the form of opportunities for children to talk. For Mrs. Sanchez, a basic premise for selecting a book seemed to be because it had action words that she could ask the children to get up and physically do: make those moves, make those sounds, repeat those words. For example, when I asked, “What’s really important to think about when you’re choosing books for the children in your class?” Mrs. Sanchez responded, “I’m into stories where the children can participate. And if I am here, sitting here reading a bunch of words on a page, I feel like they’re not, they’re just not getting it” (Sanchez_BS-TA_3-11-19). More specifically, as Mrs. Sanchez was evaluating the text and telling reasons why she liked *Move Over, Rover!*, she noted action words on the page, “romping, racing, jumping, chasing.” She said, “I would have the students actually get up and do that. So, we would have a little bit of movement with our book” (Sanchez_BS-TA_3-11-19). Mrs. Sanchez’s beliefs about needing to physically engage her students in literacy learning influenced her engagement in epistemic cognition while making a decision about choosing a specific book to read aloud to her class. In this case the learning involved physically doing an action thereby making the inferred ideal that children’s books should include some opportunity for the children’s physical engagement. In another example from the lesson plan think aloud interview, Mrs. Sanchez shed light on her thoughts driving her lesson plan design, which addressed students’ learning about rhyming in an active way. She explained:
I want them to cut. I want them to have some kind of art. Just some kind of manipulation. I want them to use their fine motor. I just don’t want them to sit there and just look at two pictures and match. I want them to have a little bit of motion while we’re doing this activity (Sanchez_LP-TA_3-21-19).

Mrs. Sanchez also wanted the students to physically place the two cut out rhyming pictures together, not just look at the pictures and say whether or not they rhymed. Mrs. Sanchez’s belief that the students’ physical involvement in the process contributed to their learning about rhyming functioned as an ideal that influenced her epistemic cognition process during lesson planning. For Mrs. Sanchez the cutting, matching, and fine motor movement was the physical part of the children’s literacy learning. Mrs. Sanchez’s belief that literacy learning has a physical component is further evidence of her notion of the structure of knowledge as complex and integrated.

Mrs. Logan’s beliefs about needing to actively engage her students in literacy learning also functioned as ideals that influenced her engagement in epistemic cognition across both tasks. In the next two examples, Mrs. Logan talked about wanting the book to have features that lent themselves to children’s verbal engagement. For instance, during the book selection think aloud Mrs. Logan commented,

’Cause I need to turn that page to keep the students going. And the more that they can understand the story and then take part in the story, read it again and be able to repeat some of those words with me, that’s excellent for the children (Logan_BS-TA_3-7-19).

Here, Mrs. Logan was talking about why she liked the book to have repetition. She emphasized the students taking part in the story, meaning she wanted the students to be able to verbally
participate by reading along with her and the feature of repetition would support the students’ ability to do so. In another example, Mrs. Logan was explaining why she liked the cover on *Move Over, Rover!* In the following excerpt she explained how she would involve the children in a conversation about the cover to build their interest in the story:

> We could look at the picture. We could ask what sort of animal that is. Talk about the title *Move Over, Rover!* [Mrs. Logan gives examples of questions she would ask the children about the book] “Why do you think Rover has to move? Where do you think he’s going?” I don’t think any of them are going to realize that he’s in a doghouse. And they might just refer to their own experiences at home where the dog has to move, maybe away from the front door, cause somebody’s coming in. Or what not. And just have some conversation there about the cover: “And we’re gonna have to see where does Rover move? Let’s see where he has to go.” Sort of a thing to hook them in so that they want to find out more about the story (Logan_BS-TA_3-7-19).

In the preceding excerpt, Mrs. Logan’s ideal is implied; she wants the book to have features that lend themselves to a discussion with the children and thereby peak the children's interest in the story. Mrs. Logan’s belief that the students’ active verbal involvement in the read aloud contributed to their literacy learning functioned as an ideal that influenced her epistemic cognition process during book selection. For Mrs. Logan, books were not just for reading to children. Mrs. Logan believed children should actively participate in the reading of the story in multiple ways, by reading along and by having a conversation about the content. In other words, she believed children’s books are a means to support literacy learning through verbal engagement so she looked for features in books that were in alignment with this ideal. Further,
wanting the book to have features that supported multiple ways of verbally engaging the children and that supported having a conversation with the children about ways they could relate to the story also suggested how Mrs. Logan’s beliefs about the structure of knowledge as interconnected functioned as her ideal while selecting a book.

In another example from the lesson planning think aloud interview, Mrs. Logan talked about including a discussion of vegetables during the lesson. Recall that the implied broad epistemic aim she set for her learners was for them to understand the letter V and a specific aim she set for her learners was to discuss the letter V as in vegetable. She said,

But then, AFTER Morning Meeting, we’re gonna have small group instruction. And I want to stick with vegetables and the letter V. I’m thinking that something that might be a good idea for them to do is maybe we could talk a little bit about vegetables. And maybe they could make a picture of their favorite vegetable. Because not everybody liked broccoli and that was part of our big discussion yesterday. So we can continue [the discussion] (Logan_LP-TA_3-15-19).

Here, her intentional incorporation of discussion into her lesson suggested how she considered the opportunity for the children to talk an ideal of what should be included as part of a lesson. Also, making discussion part of her lesson and ensuring that the children had multiple ways to understand the letter V by talking about it and relating to their experience with vegetables, a word that starts with the letter V, suggested how Mrs. Logan’s beliefs about the structure of knowledge as integrated acted as an ideal that influenced her epistemic cognition. The preceding examples show how Mrs. Logan’s beliefs about children’s literacy learning being related to them having opportunities to talk and about the structure of knowledge as interconnected functioned as
Reliable Processes Emerged Across Teachers and Tasks

In this section I present my findings related to reliable processes (strategies used to meet the epistemic aim) that emerged during the think aloud tasks. Mrs. Sanchez and Mrs. Logan each employed reliable processes in both tasks that enabled them to apply their ideals for evaluation and support their achievement of epistemic aims for themselves and their learners. Both teachers used reliable processes of a mental checklist in the book selection task, and in both tasks they both engaged in a reliable process to take their students into consideration. Each teacher also enacted reliable processes that were unique during the lesson planning task. Below I provide evidence of the common reliable processes followed by those that were unique to each teacher.

**Reviewing a mental checklist.** During the book selection task, each teacher went through a series of similar reliable sub-processes to evaluate each of the books. Their mental checklists involved four reliable processes: activation of prior knowledge, analysis of the text, analysis of the illustrations, and analysis based on reading aloud to themselves. Embedded in each of these processes the teachers seemed to have a mental checklist of key elements to evaluate and associated ideals as indicated in table 5.1 when considering each book. These reliable processes emerged via the physical act of looking at the book, handling the book, and reading the book out loud in order to apply the ideals they used for evaluation.

**Activate prior knowledge and experience.** Before even opening the books, both teachers reviewed the cover of each book. It seemed that they used a review of the cover to orient themselves to the texts and to activate any prior or existing knowledge about books, literacy,
read alouds, and the stories themselves. Each teacher actually picked up the book and looked at the cover.

Mrs. Sanchez picked up *Peter Pan* first and said,

> Of course, I know the story of *Peter Pan*. And already in my head I’m thinking that it’s going to be very wordy. So, the first thing I think of is, if I’m going to read this book I’m going to have to paraphrase to keep their attention

(Sanchez_BS-TA_3-11-19).

In the preceding comment Mrs. Sanchez referenced her prior knowledge of *Peter Pan*; she knows it is wordy and will not hold her students’ attention. Recall that one of her ideals is that children’s books should not be too wordy making her reliable process of noticing the amount of words in the book, related to her ideals. Mrs. Sanchez also commented about the cover of *Move Over, Rover!* She said, “I liked that the words were big” (Sanchez_BS-TA_3-11-19). Recall that one of her ideals is for the print to be large, making her reliable process of noticing the size of the text, related to her ideals.

Mrs. Logan also picked up the *Peter Pan* book first. She commented on the fact that it was a *Little Golden Book*. She looked at the cover and said,

> Looking at the cover it’s *Peter Pan*. It's nice and colorful. I think the children would be attracted to it because it’s a character that they may or may not know from Walt Disney. I’m also going back to *Engage New York*\(^7\) in years gone by.

*Peter Pan*, there was a big unit on it when I taught third grade. So, I have that in the back of my mind with a lot of ideas (Logan_BS-TA_3-7-19).

\(^7\) EngageNY is a website maintained by The New York State Education Department (NYSED) to provide curricular materials for parents and educators.
These positive comments led me to believe she would consider this book for use in her classroom because she seemed to be considering her ideals that the book be aesthetically pleasing (nice and colorful) and relatable (character they may know). Then Mrs. Logan paused. Without opening the book she made the following definitive statement: “If I were picking out a read aloud I would not choose anything that was Disney related (Logan_BS-TA_3-7-19)” In the preceding comment, Mrs. Logan used her prior knowledge of Disney as a source of literacy materials that did not adhere to her ideals of what to look for in a children’s book. For Mrs. Logan, her initial reliable process of reviewing the cover to activate prior knowledge and experience was enough for her to reach an epistemic end. It is possible that the ideas she had in the back of her mind from prior experience were what discouraged her from using the book.

Mrs. Logan made the following string of comments while looking at the cover of Move Over, Rover!

So now: Move Over, Rover! Okay. I love dogs. I have a dog. So, right away I’m attracted to this. I’m attracted to the size of the book, the feel of the book. I like that the print is larger. It’ just fitted more for my age of students. I like how the author and illustrator, also, that’s nice and large. There’s not too much on the cover. The mouse. The flowers. The dog looking out the window. So, I’m good already (Logan_BS-TA_3-7-19).

Mrs. Logan included multiple evaluations of the book just by looking at the cover. She referred to her experience with her age of students and her own relatability (having a dog). She referenced her ideal about text size and the simplicity of the illustrations.

**Analysis based on the text.** The teachers analyzed the text from two perspectives: ideals regarding print features and ideals regarding literary features throughout the books.
Text features. The text-based analysis of print features happened early in each teacher’s book selection process. Comments about text size and amount of text were among the first to emerge meaning that the teachers used this level of analysis as an initial screen to evaluate the books. Mrs. Sanchez commented about the amount of text in *Peter Pan*:

There’s just so many words. And I feel that when I look at this sometimes it’s overwhelming for me, because I’m like: “Are they gonna sit? How am I gonna paraphrase? How?” And then they’re looking at this smaller picture. I feel if there’s more picture than words, I feel like for them it’s more engaging”

(Sanchez_BS-TA_3-11-19).

Mrs. Logan made the following comment immediately after opening *Peter Pan*, “Now, right here I’m looking at the print. The print is too small for the children to really see and track” (Logan_BS-TA_3-7-19). In these comments it is evident that both teachers employed the reliable process of analyzing text for print features as a way to reach their epistemic aim of selecting a children’s book that would support their student’s literacy learning.

Literary features. The text-based analysis of literary features (i.e., rhyme, repetition, predictability) happened throughout the book selection process. Each teacher seemed to notice literary features that they held as ideals as they analyzed the text of *Move Over, Rover!* For example, it was while Mrs. Logan visually scanned through *Move Over, Rover!* that she said, “Rhymes. Love it!” (Logan_BS-TA_3-7-19). A visual scan of the text allowed Mrs. Logan to apply her ideal that children’s books should have rhyme. However, comments about literary features made while they analyzed the text in *Peter Pan* indicated that teachers sometimes saw the opposite of their ideals as they analyzed text. For instance, Mrs. Sanchez gestured to a page in *Peter Pan* and said, “Where here they [students] would just be listening. And there wouldn't
really be too much interaction because they’re [authors] explaining everything that’s going on IN the picture” (Sanchez_BS-TA_3-11-19). What Mrs. Sanchez meant was that *Peter Pan*’s text included too much detail, meaning it did not have the literary feature of predictability that she was looking for in a children’s book. Mrs. Sanchez wanted the children to be able to understand the story for themselves and the literary feature of predictability helped the students to do so.

**Analysis based on the illustrations.** Both teachers analyzed the illustrations as another reliable process to determine if the books met their ideals. For example, Mrs. Sanchez commented on an illustration on one specific page in *Move Over, Rover!* She said, “‘Cause you can see the fur here is blowing. We just read a Scholastic book about wind and that was exactly what they were looking at” (Sanchez_BS-TA_3-11-19). This analysis allowed her to access her ideal about the children being able to make connections to other stories that they had read.

Initially it seemed that Mrs. Sanchez was willing to try to find a way to use *Peter Pan* in her classroom by working around the text features that did not meet her ideals which hinted at flexibility in her thinking. However, as her evaluation continued the micro-epistemic ends embedded in her comments turned to justifications for not selecting *Peter Pan*. This shift occurred when Mrs. Sanchez began her analysis of the illustrations. She said “I think this book would be a little intense” (Sanchez_BS-TA_3-11-19). Meaning that the illustrations depicted images that might be inappropriate for the children. While looking at one page with the characters holding guns and arrows she explained,

And then we’re gonna talk about shooting. That’s a whole other subject. And I can see this then getting into a whole [here Mrs. Sanchez is stating what she thinks the students may say based on pictures in the story]: “I have nerf guns at
home!” And: “I have this.” And: “I hit my brother and sister.” And: “I got hit in the eye.” And then I can see losing control (Sanchez_BS-TA_3-11-19).

Here Mrs. Sanchez was stating what she thought the students might say based on the illustrations in the story. She was concerned about how the children would respond to the illustrations. She then predicted a loss of control, possibly a loss of the children’s attention to the story, which would interfere with the students’ literacy learning. In this case, even though the children might have made a connection to the story (i.e., an ideal for Mrs. Sanchez), it was not the kind of connection that Mrs. Sanchez saw as supportive of their literacy learning. With the two preceding examples Mrs. Sanchez began to shift her thinking away from ways she could use *Peter Pan* to reasons why she would not select it. Her analysis of the illustrations served as a turning point in her epistemic cognition which suggests that her analysis based on the illustrations served as a powerful catalyst in her epistemic cognition process during book selection.

Illustrations also seemed important to Mrs. Logan. After she commented on the frightening illustrations in *Peter Pan* she elaborated,

I was very, very, very careful when I picked out Halloween stories for example. So that there aren't skeletons and vampires. It’s more just happy little pumpkins. *Five Little Pumpkins Sitting on a Gate* and cute little stories like that (Logan_BS-TA_3-7-19).

Here, Mrs. Logan added information about what she looked for when selecting Halloween books for the children. She explained how she avoided scary images and opted for non-threatening images, thereby projecting her application of this ideal that books should not be scary beyond the
current task. She also commented on the overall illustrations in *Move Over, Rover!* She said, “I found the illustrations were also very attractive as well” (Logan_BS-TA_3-7-19).

**Analysis based on reading aloud to self.** Without prompting, each teacher read the book *Move Over, Rover!* out loud. However, their approaches to this reliable process differed. Mrs. Sanchez’s reading of the book was quick, quiet, and in a monotone. She did not read the entire book out loud, only excerpts. For example, she read out loud the action words on the last page of the book, “romping, racing, jumping, chasing” (Sanchez_BS-TA_3-11-19). Then she said, “I would have the students actually get up and do that” (Sanchez_BS-TA_3-11-19). In this instance, reading some of the words out loud provided a way for Mrs. Sanchez to evaluate the book using her ideal that children’s books should have action words or provide some opportunity for children to physically engage with the story.

Unlike Mrs. Sanchez, Mrs. Logan read aloud the entire book, *Move Over, Rover!*, with animation, as if she were reading to her students. She made comments along the way. For instance, mid-way through the book, she said, “Everything’s being repeated” (Logan_BS-TA_3-7-19) and at another point she commented, “So we can talk about the snake is smaller” (Logan_BS-TA_3-7-19). Although both teachers approached the reliable process of reading all or part of the book out loud to themselves in a different way, they both used this reliable process as an avenue to apply their ideals. Of note, Mrs. Logan did not read any of *Peter Pan* out loud, whereas Mrs. Sanchez read one line out loud when she explained the lack of predictability in the book. Thus, it seemed that actually reading the book aloud was a gateway for analysis, at least in Ms. Logan’s case. That is, perhaps she did not read *Peter Pan* aloud because she knew after reviewing the cover that she would not choose it. In contrast, she seemed less familiar with *Move
Over, Rover!, and after it “passed” some initial hurdles (e.g., not Disney; rhyming) she needed to read the book aloud to imagine how it could be used with her students.

**Considering students in the class.** Mrs. Sanchez and Mrs. Logan each used the reliable process of considering their current students as a means to achieve their epistemic aims across both the book selection and lesson planning tasks. When evaluating the books during the book selection task, Mrs. Sanchez said the following about Move Over, Rover!, “And these are really good animals too; that I know that they [students] would like. They like snakes” (Sanchez_BS-TA_3-11-19). She later added, “And skunks? Forget it. They love to have a field day with skunks” (Sanchez_BS-TA_3-11-19). Thus, Mrs. Sanchez considered what she knew about students as an additional ideal by which to evaluate the book.

Mrs. Logan also commented on the nature of her students, situating the book selection task within her current teaching context. She pointed to a page in Peter Pan and said,

> This fireball coming at the ship. This might scare some kids! This is frightening for some kids! I’ve got some little nervous nellies in here! That’s a scary scene! (Logan_BS-TA_3-7-19).

Here she explained another reason why she would not choose the Peter Pan book for her class. This statement revealed that there were specific students in her class who may be frightened by some of the illustrations in Peter Pan. Here, Mrs. Logan’s belief about children’s social emotional learning as part of their literacy learning functioned as an ideal and, in turn, influenced her determination in meeting the epistemic aim of selecting a book to support her students’ literacy learning. The preceding examples show how both teachers used a reliable process of considering their students as a way to meet their epistemic aim of selecting a book that would support their students’ literacy learning.
The teachers also used the reliable process of considering their current students as a means to achieve their epistemic aims in lesson planning. Recall, that for lesson planning Mrs. Sanchez’s epistemic aim was to figure out how to design a lesson to help her students understand rhyming. She explained why she selected certain pictures of rhyming words over others for her lesson. In reference to some of the choices she said, “They [students] won’t even know what that [referring to pictures she did not select] is” (Sanchez_LP-TA_3-21-19). In this statement Mrs. Sanchez used her knowledge about her students’ knowledge to guide her decision making. She knew her students would not be able to label some of the more complex pictures (e.g., harbor and barber) therefore, they would not be able to rhyme the words. She also considered her students preferences explaining the inclusion of coloring as part of a small group activity. She said, “But they [students] like to color” (Sanchez_LP-TA_3-21-19). Mrs. Sanchez meant that she decided to include coloring as part of the lesson because she knew her students favored this activity.

Mrs. Logan described her reasoning behind the timing of when to incorporate a story called *Wemberly Worried* by Kevin Henkes (2000) into her letter W lesson plan. In the story, a young girl is worried about her first day of school. Mrs. Logan explained:

Next week, for example, our focus letter is the letter W. So, I have the story *Wemberly Worried* and I wanted to read it in the beginning of the year. It was part of the beginning of the year *Creative Curriculum*. But I did NOT read it because I have a student who was very nervous. And that would be an understatement. She would barely walk in the room. Holding her tissue. Crying while looking at her family picture. Still, to this day, [she] has to sleep [during nap time] in front of her closet to see her mom [in family photo posted on child’s

8 Henkes, (2000)
closet/cubby]. Not a day goes by that she doesn’t make a picture of her entire family. And it goes home. So, I did not want to read that story. I thought it would upset her. I plan on reading it next week. I’m gonna read *Wemberly Worried*. And I’m gonna talk about feelings and school (Logan_LP-TA_3-15-19).

In this example, Mrs. Logan used her knowledge of a particular child, combined with her belief about the importance of children’s social emotional development in their learning, to delay the reading of a story that she felt may exacerbate a specific student’s separation anxiety at the beginning of the school year. Mrs. Logan’s belief about children’s social emotional learning being part of their literacy learning functioned as an ideal and, in turn, influenced her choice of considering her students as a reliable process to meet her epistemic aim of how to plan a literacy lesson to meet her objective for her learners; understanding the letter W. Mrs. Logan also talked about how she could tie in a class discussion of feelings and school, further exemplifying how Mrs. Logan enacted her beliefs about the structure of knowledge as integrated and complex by incorporating social emotional learning within the context of a literacy lesson. In this way, Mrs. Logan’s beliefs about children’s learning and her epistemic beliefs both influenced her enactment of epistemic cognition.

**Varied reliable processes for lesson planning.** Recall that during the lesson planning task each teacher set epistemic aims for themselves and epistemic aims for their learners. Mrs. Sanchez and Mrs. Logan each employed reliable processes that enabled them to apply their ideals for evaluation and support their achievement of these aims. Because the focus of this investigation is on the teachers, I confine my analysis in this section to the epistemic aims the teachers set for themselves during lesson planning. Of note, to achieve their respective aims the teachers used different reliable processes. Mrs. Sanchez sought expert knowledge. Mrs. Logan
used three reliable processes: holding her students’ objective in mind, using multiple sources of knowledge, and conducting a classroom search.

**Mrs. Sanchez.** Mrs. Sanchez established the epistemic aim of designing a lesson on rhyming and gaining a better interpretation of her students rhyming knowledge. She explained an attempted initial process that she thought would be useful – but was not:

Mrs. Sanchez: I kept going on the computer looking for something to help me
and I didn’t like ANY of it. Or you had to pay for it. And I wasn’t
being cheap or anything.

Kit: But what do you mean you went on the computer? You went online?

Mrs. Sanchez: I went online and just Googled rhyming games. I Googled
rhyming worksheets, rhyming, anything. And then Pinterest came
up and they had a whole bunch of different things and activities to
do for rhyming. But, I just felt some of them, they just weren't
where I wanted to be. I wanted simple, yet challenging. And then
I can really assess to see what they know (Sanchez_LP-TA_3-21-19).

In the preceding exchange Mrs. Sanchez described her frustration with the results of her initial reliable process, an online search for literacy lesson ideas.

After her unsuccessful attempt at an online search for materials to help her design a lesson on rhyming she decided to take a different approach. She explained, “So I went into the AIS, the reading AIS teacher” [Academic Intervention Services⁹] (Sanchez_LP-TA_3-21-19).

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⁹ In New York State an Academic Intervention Specialist provides Academic Intervention Services; instruction designed to supplement or help students access the general curriculum. [http://www.p12.nysed.gov/part100/pages/AISQAweb.pdf](http://www.p12.nysed.gov/part100/pages/AISQAweb.pdf)
Mrs. Sanchez meant that her next step was to consult an expert in the building, the reading specialist. This reliable process reflected her belief that colleagues, specifically in this case expert colleagues, are a source of knowledge for literacy instruction and exemplified how her belief functioned as an ideal during her engagement in epistemic cognition. She confirmed her belief that she could gain knowledge from her colleague when she said:

I was planning for literacy. I wanted her to really help me with it. And to really get me on the right track. Because even though I think I know, I still want to use those resources [meaning the AIS as a resource] to make sure that I am doing things right. And I feel that she really is the expert cause this is what she does every day for students that may be struggling with such a specific concept (Sanchez_LP-TA_3-21-19).

In the preceding excerpt, Mrs. Sanchez explicitly referred to the AIS as ‘the expert’ and seemed to use the enactive experience of the AIS as a justification for her appeal to the AIS as an authority.

Mrs. Logan. Mrs. Logan talked about two reliable processes that she used to meet the epistemic aim of planning a lesson that would meet the objectives for her learners. She demonstrated a third. First, she held her objective in her mind while she was planning and she used multiple sources of knowledge to approach her planning task. She stated:

So, my objective is always in mind first and then I take it from there. And then I use tricks that I have up my sleeves: different teacher guides and picture books that I've had forever. We use the Creative Curriculum so I look at that for some transitions or the Question of the Day (Logan_LP-TA_3-15-19).
In the preceding comment, Mrs. Logan emphasized the importance of her learning objective, which is typically an epistemic aim for her learners, as a central touchstone to her planning process. Second, she referred to the use of multiple sources of knowledge; prior, intuitive knowledge, and formalized bodies of knowledge. She consulted her personal collection of teacher guides, her personal collection of picture books (children's literature), and her formal preK curriculum, as well as on her own expertise (i.e., “tricks that I have up my sleeve” (Logan_LP-TA_3-15-19). She also included her vast collection of children’s literature (picture books) as a source of knowledge. Both these reliable processes, holding onto the objective and referencing multiple knowledge sources seemed informed by her belief that formal bodies of knowledge provide a source of knowledge for literacy instruction and her belief that her prior enactive experience as a classroom teacher was a source of literacy instruction knowledge for her.

Third, woven throughout the planning session, I noticed what seemed to be an overall reliable process that Mrs. Logan used to address her epistemic aim for designing a lesson: the conducting of a physical search of the classroom. As she engaged in lesson planning, she walked around the classroom from one area to another, searching through and gathering materials as she talked me through her thinking. For example, Mrs. Logan started her planning session standing in the middle of her Morning Meeting area. She said, “I want to go over to my Classroom News chart [see Figure 5.2_Logan_Image-Classroom News_3-15-19]. And I want to start there because something is happening over there. And that's where I want to focus in on my lesson today in my instruction” (Logan_LP-TA_3-15-19). Mrs. Logan meant that she wanted to review her learning objective for her students, which she embedded in her Classroom News, before she
began her planning. In this way Mrs. Logan seemed to be reminding herself of her learning objective(s) for her students, the one(s) she wanted to keep in mind.

Figure 5.2 Classroom News_3-15-19

After spending time reviewing materials (e.g., Classroom News, All About V chart) in the Morning Meeting area she said, “I know I have a vegetable book in my big book bin. So now I’m gonna go over there. And I’m gonna see what it is” (Logan_LP-TA_3-15-19). Mrs. Logan then walked to her big book bin to select a book. Once she found the book, she was looking for she walked back across the classroom towards her desk to locate materials and prepare an activity for small group instruction. She did so in a methodical, intentional way. It is possible that the physical act of gathering and preparing of materials was a reliable process for Mrs. Logan to meet her epistemic aim. She did not seem to require detailed notes or elaborate lesson plans. In other words, it seemed she had an internal script or routine that she followed. It could be that the materials themselves served as cues or reminders for Mrs. Logan as she actually
planned her lessons based on her reliance on prior experience. In this case, based on my earlier analysis of her epistemic beliefs, her belief about enactive experience serving as a source of literacy instruction knowledge (i.e., relying on literacy instruction materials she used in the past and had in her teaching environment) seemed to function as an ideal that influenced how she approached the achievement of her epistemic aim.

Although each teacher employed different reliable processes to meet their epistemic aims during lesson planning, they each approached their planning with intention. Each teacher employed a reliable process that allowed them to make a comparison with their internalized ideals of what to include in a literacy lesson (read a book), how a literacy lesson should happen (multi-tiered), and how the materials selected would meet the literacy learning needs of their students.

**Epistemic Ends That Emerged Across Teachers and Tasks**

Epistemic ends are the outcomes of epistemic cognition. In the book selection task, Mrs. Sanchez and Mrs. Logan both came to the same final, specific, epistemic end: choosing *Move Over, Rover!* In the lesson planning task, each teacher came to the same final, global, epistemic end: design of a multi-tiered lesson that included multiple components (i.e., a read aloud, small group activity, assessment). Within each teacher’s epistemic cognition process during each task, I found evidence of the cognitive interplay happening in the teachers’ minds amidst the interaction of aims and values, ideals, and reliable processes towards the final epistemic end. I refer to the dance between ideals and reliable processes as micro-epistemic ends.

Throughout the epistemic cognition process during both tasks, each teacher reached micro-epistemic ends. Within the larger process of epistemic cognition, in between setting the epistemic aim and reaching the final epistemic end, there seemed to be an epistemic dance
between ideals and reliable processes. In other words, throughout the epistemic cognition process, each teacher reached micro-epistemic ends. Rather than being temporary epistemic ends (i.e., the teachers are changing their minds), these micro-epistemic ends seemed to serve as a piling up of justifications towards the final epistemic end of which book to ultimately select or the culminating final lesson plan. I argue that this dance is the core of the epistemic cognition process and that closer examination of this going back and forth requires intimate consideration of a different grain size of epistemic cognition than a broad analysis can provide. In the remainder of this section I highlight micro-epistemic ends that the teachers reached during book selection and during lesson planning.

**Move Over, Rover!: No contest.** Mrs. Sanchez and Mrs. Logan both ultimately reached the same epistemic end during the book selection task; selecting *Move Over, Rover!* Mrs. Sanchez seemed to reach a final epistemic end without even opening up both of the books. After evaluating *Move Over, Rover!* using a series of reliable processes, Mrs. Sanchez hugged *Move Over, Rover!* to her and said “I’ve already made my decision. That I absolutely, without even opening up *Peter Pan*, I just love this book” (Sanchez_BS-3-11-19). I found this comment to be in alignment with Mrs. Sanchez’s overall demonstrated spontaneity. Although this statement did match her final epistemic end, recall that Mrs. Sanchez used a series of reliable processes; reviewing of a mental checklist of her internalized ideals, to make a definitive epistemic end. I suggested to Mrs. Sanchez to “Take a little bit more time with *Peter Pan* and tell me why” (Sanchez_BS-3-11-19).

With this prompting, Mrs. Sanchez then used the same reliable process with *Peter Pan* that she had with *Move Over, Rover!* Mrs. Sanchez came to numerous micro-epistemic ends during her evaluation of *Peter Pan*. As she got deeper into the analysis of *Peter Pan*, her micro-
Epistemic ends seemed to shift from ways she could possibly use *Peter Pan* to a list of reasons why she would not use *Peter Pan*. As mentioned earlier, one of Mrs. Sanchez’s ideals for children’s books is that they should not be too wordy, she quickly determined that she would not be able to read *Peter Pan* word for word and keep the children engaged. Thus, this was another micro-epistemic end. An additional micro-epistemic end she reached related to the timing of the reading of the book and how it could be used in class. She said, “This would probably be a book that I probably would read over two days. Or I would read some in the morning and some in the afternoon so we could get the whole story in” (Sanchez_BS-TA_3-11-19).

At various points it seemed that Mrs. Sanchez was willing to try to find a way to use *Peter Pan* in her classroom by working around the text features that did not meet her ideals which hinted at flexibility in her thinking. However, as her evaluation continued the micro-epistemic ends embedded in her comments turned to justifications for not selecting *Peter Pan*. This shift occurred when Mrs. Sanchez began her analysis of the illustrations in the previous section on reliable processes. When I asked Mrs. Sanchez if she had made her final decision she confirmed, “So definitely *Move Over, Rover!*” (Sanchez_BS-TA_3-11-19). Mrs. Sanchez’s final epistemic end was the selection of *Mover Over, Rover!*

Mrs. Logan also seemed to reach her final epistemic end before using a reliable process with both books. At the beginning of the think aloud she analyzed the cover of *Peter Pan* and said “So just looking at the cover, this would not be anything that I would choose” (Logan_BS-TA_3-7-19). Recall, she would not choose anything Disney related. Thus, she formed a micro-epistemic end before she even opened the book. Then she asked me, “Am I supposed to go through it?” (Logan_BS-TA_3-7-19). After I indicated she should go through her typical process when evaluating a book, she began to flip through the pages. In a series of statements, she then
reached several micro-epistemic ends. Based on her analysis of the text she said, “The print is too small for the children to really see and track” (Logan_BS-TA_3-7-19). She followed up with “They’d be lost. Lost in the sauce. I would lose their attention. It’s too long. I could not sit and read this whole thing to four-year-olds” (Logan_BS-TA_3-7-19). In the preceding quotes, Mrs. Logan compiled a list of justifications for her final epistemic end, each serving as its own micro-epistemic end.

Mrs. Logan went on to use her full reliable process with *Move Over Rover!* As with *Peter Pan* several micro-epistemic ends were achieved before she finally stated: “Absolutely. *Move over, Rover! Hands down*” (Logan_BS-TA_3-7-19). Thus, the selection of *Move Over, Rover!* as a final epistemic end for both teachers was the culmination of a series of micro-epistemic.

**Design of a multi-tiered lesson: A recipe for early literacy instruction.** Each teacher reached a similar epistemic end to meet the epistemic aims they set for themselves during the lesson planning think aloud: the design of a multi-tiered lesson that included multiple components (i.e., a read aloud, small group activity, assessment). How each teacher’s lesson differed was respective of the different epistemic aims they set for their learners. However, both teachers seemed to design their literacy lesson with the same ideal in mind; that literacy learning is a multi-tiered event.

**Include a read aloud.** The first epistemic end both teachers reached was to include a read aloud as part of their literacy lesson. Each teacher selected a book to read aloud as part of the instruction, yet the books selected differed from each other. Mrs. Sanchez referred to the book the AIS suggested and said, “I am going to do *Who’s in the Shed?*” (Sanchez_LP-TA_3-21-19). Mrs. Sanchez selected *Who’s in the Shed?* as her epistemic end because it emphasized the

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10 Parkes, 1997
concept of rhyming, which she was trying to get the students to understand. The read aloud, in turn, became one reliable process she used during instruction to facilitate the meeting of the epistemic aim she set for her learners: to understand rhyming.

As a micro-epistemic end towards meeting the epistemic aim she set for herself; figuring out how to design a lesson to help her students understand rhyming, Mrs. Sanchez decided to integrate a book the AIS suggested to her into her plans as her read aloud for the day. She said, “So I’m going to read the story” (Sanchez_LP-TA_3-21-19). In turn, the reading of the book as instructed by the AIS then became a reliable process Mrs. Sanchez would use to help her students meet the epistemic aim of understanding rhyming. In this way, it becomes evident how an epistemic end for one aim can become a reliable process to achieve another epistemic aim.

Mrs. Logan selected a book that would reinforce the letter V with a V word the children were familiar with. She said “Wanting to stick with vegetables, I’m not exactly sure which one [book] I have. But, I know I have a vegetable book in my big book bin” (Logan_LP-TA_3-15-19). When she found it, she announced, “Aaaand, it’s Growing Vegetable Soup. This is going to be my read aloud today in Morning Meeting” (Logan_LP-TA_3-15-19). Mrs. Logan reached an epistemic end of selecting Growing Vegetable Soup for her read aloud. The read aloud, in turn, became one reliable process she used to meet the epistemic aim she set for her learners to understand V is for vegetables.

During Mrs. Logan’s efforts to meet her epistemic aim of designing a lesson that would meet her objective; in this case understanding the letter V, she reached micro-epistemic ends. For example, after searching through her big book bin she reached a micro-epistemic end; to use the book Growing Vegetable Soup as her read aloud for the day. Recall that Mrs. Logan also set multiple epistemic aims for her learners, one of which was for them to have discussion of V is
for vegetables. It seemed that once Mrs. Logan reached the micro-epistemic end of choosing the book *Growing Vegetable Soup*, reading the book then became a reliable process for meeting the epistemic aim set for her learners of discussing vegetables. Like the example from Mrs. Sanchez, when Mrs. Logan reached an epistemic end for one aim it became a reliable process to achieve another epistemic aim.

**Include a small group activity.** A second epistemic end both teachers reached was to include a small group activity as part of their literacy lesson. Each teacher prepared a small group activity as part of their literacy lesson, yet the small group activity each teacher prepared differed in focus based on the epistemic aims the teachers had set for their learners and the teachers’ ideals. Mrs. Sanchez prepared an activity that designed to help her learners achieve the epistemic aim she set for them: to understand rhyming. She explained her activity as follows,

> What I really want to do is I want them to cut. Like I want them to have some kind of art. Just some kind of manipulation. I want them to use their fine motor skills. I just don’t want them to sit there and just look at two pictures and match. And I want them to match. I want us to say, “This is a bat. Let’s look at the pictures. Which one sounds the same?” And we would do it as a group and they’re gonna put them on a piece of paper. Match them up and line them up.

(Sanchez_LP-TA_3-21-19).

In this example, Mrs. Sanchez’s beliefs about children being physically engaged in their learning functioned as her ideal, which influenced her engagement in epistemic cognition. The activity would in turn become the reliable process she used meet the epistemic aim she set for her learners to understand rhyming.
Mrs. Logan explained how she planned to carry over her lesson from one activity to the next; from Morning Meeting (which included the read aloud) to a small group activity. She said, “But then AFTER Morning Meeting, we’re gonna have small group instruction. And I want to stick with vegetables and the letter V” (Logan_LP-TA_3-15-19). The preceding statement is a clear example of how Mrs. Logan’s ideal that literacy learning is a multi-tiered event influenced her engagement in epistemic cognition.

**Include an assessment.** A third epistemic end both teachers reached was to embed an assessment as part of their literacy lesson. Mrs. Sanchez simultaneously prepared an activity designed to help her students achieve their target epistemic aim and she embedded an assessment component in the activity that would meet the epistemaim she set for herself, to figure out what her students knew about rhyming. She later clarified the purpose of her assessment when she explained, “I will know during that activity who can and who can’t [rhyme] (Sanchez_LP-TA_3-21-19).

Mrs. Logan also indicated that she wanted an outcome of the lesson to meet an epistemic aim she set for herself; to find out if the students could recognize an upper and lowercase V. She said, “So I’ll see as a final assessment if they can locate (where) there is an uppercase and a lowercase V” (Logan_LP-TA_3-15-19). Like Mrs. Sanchez, Mrs. Logan had reached an epistemic end to assess the students during her small group (i.e., as part of her literacy lesson) in order to achieve her epistemic aim of finding out if the students could recognize an upper and lowercase V.

I found similarities and differences in the epistemic ends each teacher reached in each task. For each teacher there was the big end, the final epistemic end; each teacher selected a book and each teacher designed a multi-tiered lesson. However, I found along the way between
the epistemic aim and the final epistemic end, the teachers came to micro-epistemic ends; smaller epistemic ends, which added up to a final epistemic end or evolved into other aspects of epistemic cognition (i.e., became reliable processes) suggesting that there is not always a neat, finite end to epistemic cognition.
CHAPTER 6: DISCUSSION, CONCLUSION, AND IMPLICATIONS

The purpose of this study was to uncover and understand aspects of epistemic cognition that emerged when early childhood teachers considered materials and planned instruction for literacy learning. My goal was to provide a holistic, in-depth description and deep explanatory analysis of this phenomenon. The following research question guided my inquiry: How do aspects of epistemic cognition emerge when early childhood teachers consider materials and plan instruction for literacy learning? To explore this question I used qualitative case study methodology. Specifically, I conducted a multi-case case study with two participants. I collected data across six rounds, which took place over a ten-week period. Data sources included observations, interviews (i.e., semi-structured, stimulated recall, and think aloud), classroom artifacts, and documents. I engaged in a rigorous and iterative multi-phase analysis of my data. In the bulk of this chapter I describe the significance of my findings in relation to my research question and in the context of the relevant literature. I then acknowledge limitations of my study. I conclude with final summative comments and offer suggestions for theory, research, and practice.

Discussion

In this investigation I intentionally designed think aloud tasks that were intended to invoke and externalize participants’ engagement in epistemic cognition. I prompted teachers to comment on aspects of epistemic cognition during teaching tasks related to early literacy instruction, specifically book selection and planning. In this section I discuss how epistemic aims, ideals, reliable processes, and epistemic ends emerged across both teachers across both tasks. I situate my discussion in relation to the relevant literature and within the context of The
Epistemic Cognition in Learning and Teaching Framework (Buehl & Fives, 2016; Fives et al., 2017).

**Epistemic Aims**

Buehl and Fives (2016) and Fives et al., (2017) argued for the importance of considering teachers’ epistemic aims for themselves (e.g., learning how to teach or to understand their students knowledge) and teachers’ epistemic aims for their learners (e.g., to understand a construct or explain a math problem). The teachers in my study each set epistemic aims for themselves and their learners in the lesson planning task. This ability for the teachers in my study to shift smoothly between their aims suggests an ability to engage in epistemic cognition over concurrent planes of knowing.

In one of the few other studies using a process model of epistemic cognition, Barzilai (2017) identified adolescents’ multiple “layers of knowing” in the complex task of digital game playing (p. 51). Her data revealed that the participants engaged in epistemic cognition in the context of three layers; knowing during the playing of the game, knowing how to play the game, and knowing about how the game portrayed real life. The findings of my study suggest that early childhood teachers’ engagement in epistemic cognition is a multi-layered knowledge event (knowing about their practice, knowing about their learners, helping their learners to know). While planning instruction, each teacher set an epistemic aim for herself to support their understanding of how to accomplish their literacy teaching task and an aim to support their understanding of their students’ literacy knowledge as well as one or multiple epistemic aims for their learners. In addition, the teachers needed to consider and integrate their knowledge of early literacy teaching strategies, the content knowledge of literacy itself as well as knowledge about how children develop essential literacy skills and knowledge.
Following the thread of teachers’ epistemic aims for themselves and teachers’ epistemic aims for their learners through one event, such as lesson planning, is a core task in the analysis of teachers’ epistemic cognition because teachers’ may engage simultaneously with different epistemic aims, ideals, and reliable process in different layers of knowing. The teachers’ simultaneous engagement in epistemic cognition for themselves and for their learners accentuated the symbiotic nature of the relationship between the teachers’ epistemic aims they set for themselves and the epistemic aims they set for their learners, which added to the complexity of the epistemic cognition process for these teachers.

Moreover, Barnes et al. (in revision, 2019) found that teachers seemed to shift back and forth between different levels of grain size (e.g., focused on a particular learner or the whole class, focused on immediate instruction or broader curriculum) and at times, one level seemed to inform the other. In my study, this issue of grain size became evident when I took a broader look at the data, meaning, when I stepped back from looking at the data in terms of the separate aspects and looked at the data as a whole I saw the cycle turning within itself. In other words, when I shifted my focus of analysis from the individual aspects of epistemic cognition to the entire cycle I noticed cycles within cycles. For example, epistemic aims were targeted at the teachers themselves and those of their learners. Alexander (2017) drew attention to the importance of distinguishing what cycle of epistemic cognition is the focus of the inquiry; considering “grain size” (p. 310) when studying teachers' epistemic cognition.

Finally, there are many ways to design a literacy lesson; not one right way. This leads to the perspective that designing a literacy lesson is what Kitchener (1983) referred to as an ill-structured problem, one without a sole, indisputable solution. In the cases of the teachers in my study, they considered their students, making inherent the need for a solution to their aim that
was pertinent to the situation; their unique student context. This creates a situation where the aim becomes a moving target; the aim may change based on the students’ needs or interests.

**Epistemic Ideals**

Ideals are benchmarks or norms used to determine if epistemic aims have been met (Chinn et al., 2014; Chinn & Rinehart, 2016). Buehl and Fives (2016) argued that teachers’ epistemic beliefs become part of their self-system and may act as their ideals. My analysis of the data revealed that the teachers’ epistemic beliefs and their beliefs about children’s learning functioned as their ideals. I found larger cycle ideals, such as literacy learning is a multi-tiered event and more specific ideals, such as a literacy lesson should contain a story. The teachers drew on this internalized set of ideals to evaluate the books and plan their lessons.

Researchers have found that early childhood teachers who held more sophisticated epistemic beliefs, that is beliefs in knowledge as constructed, evolving, coming from multiple sources, and complex (e.g., evaluativist), tended to hold constructivist beliefs about how children learn (i.e., Brownlee et al., 2004; Brownlee et al., 2008; Brownlee et al., 2011a; Walker et al., 2011; Walker et al., 2012b). My findings add to this literature and suggest that early childhood teachers’ beliefs about the structure of knowledge as complex and integrated combined with their beliefs that children should be actively engaged in their literacy learning functioned as ideals that influenced their engagement in epistemic cognition during materials selection and planning of literacy lessons.

My findings are also in alignment with Yadav and Koehler’s (2007) findings that teachers’ epistemic beliefs informed their identification and explanation of good literacy instruction and Prestridge and de Aldama’s (2016) findings that teachers’ epistemic beliefs informed their choice and use of materials for literacy instruction. Hence, the books the teachers
in my study selected and the lessons they planned contributed to a climate of learning that served to promote children's construction of their own literacy learning. Feucht (2011) found that epistemic beliefs informed the teachers’ instructional approaches in literacy. To see if epistemic beliefs informed the teachers instructional approaches enacted in literacy instruction further inquiry is necessary.

Scholars have argued that constructivist learning experiences are critical to children’s early literacy learning (Morrow, 2001, Roskos & Neuman, 2011, Wortham, 2002). Feucht (2010) referred to an epistemic climate as relevant to the nature of knowledge and knowing of an entire classroom dynamic to include; the teachers’ epistemic beliefs, the students’ epistemic beliefs, the epistemic messages embedded in instruction, and the epistemic messages embedded in learning materials as well as the reciprocal relationships among these factors. In my study, the teachers seemed to be making intentional choices about materials to use and approaches to instruction that supported children’s constructivist learning experiences. They shaped the epistemic climate in their classrooms in a way that reflected their epistemic beliefs and beliefs about children’s literacy learning.

**Reliable Processes**

Across the two tasks I found that these teachers used consideration of their current students as a reliable process. When engaged in book selection teachers used an additional reliable process to guide their evaluation of the books in alignment with their epistemic ideals. This reliable process emerged as a mental checklist that the teachers seemed to take themselves through during the selection and evaluation processes.

The teachers in my study used the reliable process of considering their current students as a means to achieve their epistemic aims across both the book selection and lesson planning tasks.
Hall (2013) and The International Literacy Association (2018) support the intentional selection of literacy learning materials and approaches based on what teachers deem most fitting for each child or group of children rather than one particular, generic approach. To do so, teachers must consider their individual students as well as their current class dynamic. Barzilai and Chinn (2018) described *apt epistemic performance* as the ability to “reliably succeed, through competence, in epistemic activities such as forming accurate judgments or evaluating arguments, across a range of situations” (p. 362). For example, they suggested that one component of this ability was to be able to choose and modify which reliable processes would be more appropriate to a specific task or situation. Perhaps, in my study, the teachers' consideration of their students was their way of ensuring the aptness of their approach to book selection and lesson planning.

Fives and Buehl (2010) identified teachers’ knowledge of specific students in their classroom as a needed domain of knowledge for teaching. In considering their students as a reliable process, the teachers in my study held multiple domains of knowledge in mind in addition to knowledge of literacy, pedagogy, and child development. The complex mental work of holding multiple bodies of knowledge in mind reiterates the importance for early literacy teachers to engage in epistemic cognition because they must attend to and integrate multiple domains of knowledge as they seek to meet their own epistemic aims and those they set for their learners (Fives et al., 2017).

During book selection both teachers reviewed a mental checklist of internalized ideals as a reliable process. The teachers seemed to use the mental checklist to justify their claim of which book was the best option for their class. The mental checklist contained multiple criteria for selecting books which are normative to the field based on criteria embedded within early literacy literature (rhyming, prediction, repetition, knowledge of students; see Lane & Wright, 2007;
McGee & Schickedanz; 2007). With regards to epistemic cognition, knowledge and use of accepted normative practices in a field contribute to making effective judgments (Greene & Yu, 2016; Sandoval, 2012). While guidance on how to read aloud to young children (see, Fox, 2008; McGee, 2014) and guides regarding selecting appropriate themes in children's literature (see Trelease & Giorgis, 2019) seem widely available in lengthy narrative formats, I was not able to identify straightforward inventories of features to look for when selecting children’s books. Embedded within the aforementioned literacy literature and guides are hints of features to look for in children's books yet the focus is on when, how, and why to read aloud. Even if the teachers seek out the related literature, they are left to themselves to unpack the criteria for selection from amidst the greater narrative, which may prove problematic for a preservice or novice early childhood teacher with limited experience and prior knowledge from which to pull.

**Epistemic Ends**

Epistemic ends are the outcome of the epistemic cognition process (Chinn et al., 2014). Buehl and Fives (2016) used the term “epistemically informed practice” (p. 259) to describe teachers’ enacted instructional decisions based on the outcome of epistemic cognition. In my study, both teachers came to micro-epistemic ends; smaller epistemic ends, across both tasks. These micro-ends had the quality of a quick shuttling back and forth between ideals and reliable processes; like the inner workings of a larger mechanism, in this case the larger mechanism being the epistemic cognition process. These micro-epistemic ends added up to a final epistemic end or evolved into other aspects of epistemic cognition (i.e., became reliable processes) suggesting that there is not always a neat, finite end to epistemic cognition. The teachers’ accumulation of micro-epistemic ends, specifically in the book selection task may have served as a form of cumulative justification (Greene & Yu, 2016). In other words, book selection was not
merely to meet the end of choosing the book but also became a question of: “How can I extend the use of this book to support literacy learning?” It seemed as if the teachers had a continual cycle of epistemic cognition operating in the back of their minds as they approached these think aloud tasks.

That teachers engaged in the design of multi-tiered lessons, reaching micro-epistemic ends along that way that evolved into reliable processes to meet aims for learners, begs the question: When does the epistemic cognition end—or does it? Based on my analysis of the data from my study, epistemic cognition does not occur as a neat, finite package. Again, this goes back to the issue of grain size, meaning at what level I was looking at this phenomenon (Alexander, 2017). In a qualitative study such as mine, I could see small micro-epistemic ends that happened throughout the process because I focused on the inner workings of the process rather than the global outcome. I focused on how the aspects of epistemic cognition emerged rather than the ultimate outcome. Barnes et al. (in revision, 2019) made similar findings in a microanalysis of one of their participants’ data. In their study, their participant seemed to be reaching micro-epistemic ends in terms of changing his mind about his decisions. In my study, the participants seemed to be reaching micro-epistemic ends in terms of building justification towards a final epistemic end. Consider the metaphor of writing a dissertation. A big end is reached but many mini-ends happen, get undone, and redone to get to the big end. Then the implications for research suggest further ends to be reached so the next study is conducted and so on; so there is no real end to get to one true answer, no end to epistemic curiosity.

Limitations

The findings and implications from this investigation must be considered in light of its limitations, which include: a lack of generalizability, the built-in difficulty of studying a latent
construct, and the possibility of researcher bias throughout data collection and analysis. Because this was a short term, qualitative study with two participants it is not be possible to generalize findings to the practice of other early childhood teachers or to early childhood teachers’ instruction in other domain contexts such as planning instruction for science learning. However, as Flyvbjerg (2006) pointed out, in the study of human matters, practical, context specific knowledge is more valuable than universal knowledge with the power of single case examples typically underrated in contribution to understanding of theory. The goal of my research was not to produce generalizable findings but to provide deeper insight into the phenomenon of early childhood teachers’ engagement of epistemic cognition in a specific context.

There is inherent difficulty in studying a latent construct. Because epistemic cognition is an internal mental process it is not directly observable by what one can see or hear and is therefore considered a latent construct (Remler & Van Ryzin, 2015). To address this, I designed my research study to include opportunities for participants to think-aloud during specific teaching tasks and I developed interview questions in such a way that elicited participants’ engagement in epistemic cognition.

Potential for bias is a third weakness of my study. Since I was trying to elicit early childhood teachers’ engagement in epistemic cognition, I maintained careful consideration of and adherence to my pre-determined interview questions and prompts so that questions and prompts were not too directive during the interview process. I also strived to remain aware of my own epistemic beliefs, to avoid imposing these beliefs on participants in my line of questioning, and to avoid implying that one type of epistemic belief had value over another.
Conclusions

Findings from my study are compelling for scholarship and practice related to early childhood teachers’ epistemic cognition. This study is one of few qualitative investigations of teachers’ epistemic cognition using the new process models forwarded by Chinn et al. (2014) and Fives et al. (2017) and is the only such study to date situated in the context of early literacy instruction. My findings contribute to the understanding of how the process of epistemic cognition works within the context of early literacy instruction. Since epistemic cognition is conceived of as a process specific to a domain of knowledge (Buehl & Fives, 2016), my findings benefit scholars with regards to developing theory by explaining how this process might work in the context of early literacy instruction.

I conclude with the four following points. First, the teachers in my study were able to shift smoothly between epistemic aims for themselves and epistemic aims for their learners suggesting an ability to engage in epistemic cognition over concurrent planes of knowing. Second, the teachers’ epistemic beliefs and their beliefs about children’s learning functioned as their ideals and influenced all aspects of their engagement in epistemic cognition. This influence seemed to lead the teachers to create an epistemic climate supportive of constructivist learning principles through their engagement in epistemic cognition and, in turn, may have influenced the learning and modeled the process of epistemic cognition for their students (Feucht, 2010). Third, the teachers employed multiple types of reliable processes to apply their ideals and meet their aims. Employing multiple types of reliable processes, or justifications, provide the most robust arguments for decision making (Greene & Yu, 2016). Fourth, the teachers in my study came to micro-epistemic ends; smaller epistemic ends, across both tasks before reaching their final
epistemic ends, thereby providing insight into the inner workings of the process of early childhood teachers’ epistemic cognition during literacy instruction tasks.

My analysis of the data shows that early childhood teachers are not nose wiping, shoe tying robots. Far from it; they are thinking from the heart. My overall takeaway is a direct refutation of the common assumption that preschool teachers are glorified babysitters. Evident in my analysis of my data was the overall idea that epistemic cognition is not this robotic thing and that there is this heart of decision making within it. As evident from my analyses, the two UPK teachers in my study, contrary to popular belief, think, and think deeply about their work.

**Implications**

In this section I present a series of implications for theory, research, and practice based on the findings from my study.

**Implications for Theory**

Fives et al. (2017) built on Chinn et al.’s (2014) model to create the Epistemic Cognition in Learning and Teaching Framework, which further contextualized the process of epistemic cognition within learning and teaching tasks and placed an accent on the role of the self-system.

In my analysis of the data, I found evidence of the self-system playing a pronounced role in how both early childhood teachers enacted epistemic cognition. The teachers set epistemic aims for their learners at both broad and skill specific levels reflecting their shared beliefs about the structure of knowledge as complex. I saw beliefs functioning as ideals used by the teachers to evaluate certain materials and in planning how to use those materials. I also saw instances of the teachers beliefs informing their choice of reliable processes to meet their epistemic aims. These findings support Fives et al.’s (2017) claim that teachers’ beliefs influence the epistemic cognition process as part of the self-system and could serve to refine existing models. The self
system seemed to be creating noise around all of the aspects of epistemic cognition; epistemic aims, ideals, reliable processes and epistemic ends leaving the role of the self-system in the process of epistemic cognition open for further conceptualization.

In addition, the emergence of micro-epistemic ends throughout each teacher’s engagement in the epistemic cognition process poses new considerations of what it means to reach an epistemic end. As such, when considering early childhood teachers’ epistemic cognition the AIR model (Chinn et al., 2014) can no longer be viewed as a clean, defined cycle of starting with an epistemic aim and ending with some type of finite epistemic end. For example, in the context of early literacy instruction, the teacher has both the objective of the analysis of the children’s book, which does not change much, and also the moving target of a personal analysis of their class, which is fluid from year to year and even day-by-day based on the children’s lived experiences. This added component separates the process of teachers’ epistemic cognition from that of a general layperson who may be deciding about climate change because they don’t have the simultaneous day-to-day considerations involved.

Questions about process models of epistemic cognition remain. For example: How are reliable processes connected to justification? Greene and Yu (2016) listed three types of justification; testimony (i.e., source/appeal to authority); reliable processes (i.e., evaluation of evidence); and both as the types of justification needed in epistemic cognition. Understanding the relationship among process models of epistemic cognition could enhance the potential for these models in shaping further inquiry into teachers’ decision making.

**Implications for Research**

One overall implication for research that emerged from how I conducted my inquiry is the limited benefit of a strand-by-strand type of analysis of the aspects of epistemic cognition.
Throughout my analysis, it became evident that, for these teachers, the aspects of epistemic cognition were wrapped together like a ball of yarn and my analysis took on the quality of pulling one end of the yarn to see the entire process unravel. In other words, all of the aspects were so entwined with one another that it was difficult to think of them, and therefore analyze them, in isolation. For the researcher, this creates a mist around trying to explicate the epistemic aims, ideals, reliable processes and epistemic ends from the entire process as a whole.

Considerations of what type of analysis makes the most sense for these types of qualitative investigations are important because even if a study is designed to look at epistemic cognition in situ, when data is untangled for analysis the representation is not the reality. This is also problematic for communicating findings. On the one hand, when writing about the aspects singularly the nuances of the overall process and the iterative nature of the process are obscured. On the other hand, writing about epistemic cognition as actual real time documentation makes for dense reading. Finding a solution to this methodological issue is a consideration for future research endeavors. Making findings accessible to scholars and practitioners is a priority concern for moving the field forward.

In my analysis of the book selection think aloud data, teasing apart ideals and reliable processes became a major focal task because the teachers did the reliable process and then spoke about the ideals. For instance, as part of a reliable process they touched, picked up, and looked at the books. This reliable process allowed for a comparison with the teachers’ internalized list of ideals; expectations for children’s literature, and how the specific books would meet the literacy learning needs of their students. In other words, it seemed like the teachers’ had a checklist in their head of their ideals, what qualities they were looking for in children’s literature, and the physical engagement with the book (part of their reliable process) was the medium to apply their
ideals, making the use of the rubric in their heads a reliable process, just as if they were following a written rubric. Throughout the epistemic cognition process for each task, these teachers reached micro-epistemic ends. Rather than being temporary epistemic ends (i.e., the teachers are changing their minds), these micro-epistemic ends seemed to serve as a piling up of justifications towards the final epistemic end of which book would ultimately be selected. It may be important to explore if and how such reliable processes are connected to justification types (Greene & Yu, 2016).

In addition, because epistemic cognition is context sensitive (Hofer & Bendixen, 2012) as well as task and domain specific (Buehl & Fives, 2016; Fives & Buehl, 2010) it is important to look at epistemic cognition in different cultures, contexts, and within different knowledge domains. For example, there is a need to look across contexts (e.g., urban/rural), levels of teacher expertise (e.g., preservice or novice teachers), and similar tasks related to other domains (e.g., math, science). Researchers have found that school context played an influential role in teachers’ epistemic beliefs (Brownlee et al., 2012; Chai, 2010; Lunn Brownlee et al., 2016) making it important to conduct future studies across varied school contexts such as teachers in different programs or settings (i.e., urban/rural). Likewise, the teachers in my study had similar beliefs profiles and their epistemic beliefs functioned as ideals in their epistemic cognition. Exploring epistemic cognition of early childhood teachers with more prominent differences in their epistemic beliefs may serve to confirm or challenge the findings of my study. Also, intervention research looking at the before and after engagement in epistemic cognition in the context of preservice early childhood teacher education course experiences or inservice professional development using qualitative and quantitative methodologies combined may contribute to further understanding of how early childhood teachers epistemic cognition changes or develops.
Further, my inquiry stopped short of investigating how early childhood teachers' engagement in epistemic cognition translated to their enacted teaching practice, meaning, I did not look to see if the teachers carried through on the epistemic aims they set for themselves or for their learners in their instruction. Hence, I did not see if they made adjustments in their practice along the way to stay on target with their epistemic aims. Further inquiry is required to determine the application of process models of epistemic cognition in the situated context of implementing early childhood instruction. Doing so would allow for juxtaposition with the instructional component of other relevant models such as Feucht’s (2010) educational model of personal epistemology.

Other suggestions for future research include research exploring preservice teachers early in their program to see if they approach the tasks the same way. For example, do preservice teachers have the same level of awareness of what to look for in a children’s book? In addition researchers need to consider how to unpack the influence of the self-system within each aspect of epistemic cognition. For example, throughout my analysis I found the need to read between the lines to identify the teachers’ ideals to be a major task. Researchers should consider a better way to access teachers ideals through alternate research design to make the beliefs explicit for examination.

Implications for Practice

Although *The Creative Curriculum® for Preschool* (Dodge et al., 2016b), the curriculum the teachers in the study were required to use, provides a brief two-page guide for the types of books to select for the classroom library (e.g., predictable, alphabet), I am not aware of a simple checklist or guidebook consisting of features to look for (or to avoid) when selecting children's books based on the features as analyzed by the teachers in this study. If in fact such a document
does not exist, it may be a useful endeavor for teacher educators to develop a tool for use, particularly with preservice and novice teachers who have not had the chance to internalize this information into their funds of working knowledge. Preservice teachers may benefit from such a concrete document as they begin to acclimate to the important task of evaluating children’s books. Novice teachers could keep such a document handy as a quick screening tool until they commit the desirable features to memory. It is important to make these ideals for quality children’s books explicit and possibly for teacher educators to incorporate them into learning about literacy instruction because book selection is such a high frequency task and novice teachers need a quick way to accomplish it. Such an activity might be a practical inclusion in early literacy coursework. For example, asking the preservice teachers: Which book would you choose and why? Or asking: How would you plan this lesson and why? Engaging in such activities as a learning experience then afterward picking them apart and pointing out a more structured, epistemic way to approach the tasks could be a useful addition to early childhood teacher education curricula.

In addition, since literacy instruction was a multi-tiered ideal for the teachers in my study, teacher educators might need to consider how to build this multi-tiered understanding of early literacy instruction as a foundational learning trajectory for preservice teachers. Early literacy instruction by nature is an ill-structured event consisting of multiple contributory aims. Teachers must simultaneously attend to comprehension, oral language, and development of meaningful content knowledge as well as emphasize letter identification, phonological awareness, print knowledge, and letter-sound correspondences, (Lonigan et al., 2013; Morrow, 2001; Teale et al., 2007). Balancing a solid learning objective with the more fluid knowledge of children could be a significant challenge for preservice or novice teachers because they have to consider both at the
same time. It may be helpful for teacher educators to help preservice or novice teachers identify tasks with clear aims; making sort of a checklist for teachers to follow and employ explicit methods for teaching reliable processes for early literacy instruction tasks. Also, because the self-system wrapped around every aspect of epistemic cognition, it becomes important for teacher educators to find ways to help preservice teachers make their beliefs explicit for examination. Whether examined or not, their beliefs will influence their mental activity (Bandura, 1978).
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APPENDICES
## APPENDIX A: Research on Early Childhood Teachers’ Epistemic Cognition

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Relevant Purpose</th>
<th>Term/Framing Theory/Theorist</th>
<th>Participants and Location (if indicated)</th>
<th>Design/Method of Analysis</th>
<th>Key Findings</th>
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<tbody>
<tr>
<td>Adibelli-Sahin &amp; Bailey (2017)</td>
<td>To explore in greater detail epistemological worldviews about teaching science in the context of a 'typical' elementary science methods course</td>
<td>Epistemological worldview (Schraw &amp; Olafson, 2008) Ontological worldview (Schraw &amp; Olafson, 2008)</td>
<td>61 preservice teachers enrolled in elementary science methods course 6 participated in interviews Turkey</td>
<td>Mixed: Multiple case study (Yin, 2003)-analysis within each case and across cases Sequential explanatory design (Creswell, Plano Clark, Gutman, &amp; Hanson, 2003) The sign test (nonparametric equivalent of the t-test) Kendall’s tau Wilcoxon-Mann-Whitney (nonparametric equivalent of two-sample t-test)</td>
<td>No significant change in epistemological worldview over the semester. Interview analyses indicated that preservice elementary teachers shaped their EWV about teaching science based on their own science learning and teaching experiences, their knowledge about science teaching methods, and the grade level of their students.</td>
</tr>
<tr>
<td>Adibelli-Sahin et al. (2016)</td>
<td>To investigate to what extent learning conceptions, epistemological beliefs, and learning approaches in science explain the variance in conceptions of teaching science.</td>
<td>Epistemological beliefs-Schommer (1990) Multidimensional</td>
<td>157 preservice elementary teachers (72 enrolled in elementary science ed program to teach science only in grades 5-8, 77 enrolled in general elementary program to teach grades 1-4 all content areas) Turkey</td>
<td>Quantitative: Descriptive statistics Stepwise multiple regression</td>
<td>Non-adaptive epistemological beliefs contributed to teacher centered conceptions of science teaching.</td>
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<tr>
<td>Author(s)</td>
<td>Relevant Purpose</td>
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<td>Participants and Location (if indicated)</td>
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<td>Berthelsen et al. (2002)</td>
<td>To increase understanding about the nature of the epistemological beliefs of caregivers in early childhood programs and the relationship between these beliefs and their conceptions of caregiving.</td>
<td>Epistemological beliefs-Perry (1970) dualism to relativism</td>
<td>6 caregivers in toddler (aged 18 months to three years) programs Australia</td>
<td>Qualitative: Thematic analysis</td>
<td>Noted relationship in patterns of relativistic epistemological beliefs and constructivist teaching. In contrast the less adaptive thinkers (those with multiplistic and mixed epistemological beliefs) did not evidence the same degree of reflective or metacognitive ability.</td>
</tr>
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<td>Bondy et al. (2007)</td>
<td>To explore how preservice teachers approach their learning in a unified teacher education program.</td>
<td>Personal epistemology (Hofer, 2002; Hammer &amp; Elby 2002)</td>
<td>14 elementary and special ed. preservice students (K-6) United States</td>
<td>Qualitative: Thematic analysis</td>
<td>Relationship between personal epistemology and approaches to learning. Preservice teachers were more likely to engage in meaningful approaches to learning when they believed knowledge was uncertain and integrated. Epistemological beliefs appeared sensitive to context.</td>
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<td>Brownlee &amp; Berthelsen (2008)</td>
<td>To explore the referential dimension of epistemological beliefs.</td>
<td>Personal epistemology (Hofer &amp; Pintrich, 1997)</td>
<td>77 preservice child care providers completing a 2 year full time diploma of children's services Australia</td>
<td>Qualitative: not described</td>
<td>Preservice teachers who ascribed to more adaptive epistemological beliefs (complex and practical evaluativist) engaged in an active meaning making process of theoretical and practical evidence compared to those who ascribed to less adaptive epistemological beliefs (subjectivist or objectivist)</td>
</tr>
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<td>Brownlee et al. (2004)</td>
<td>To investigate the nature of personal epistemological beliefs of toddler teachers in child care and explore the relationships between these beliefs and their practices.</td>
<td>Personal epistemology (Perry (1970) dualism to relativism)</td>
<td>6 inservice group leaders (toddler classroom teachers) in 6 child care centers Australia</td>
<td>Qualitative: Thematic analysis</td>
<td>Both personal epistemological beliefs and beliefs about children's learning informed caregiving practices. Caregivers with relativistic beliefs see children as constructing meaning and, thus, as learners in their own right. Those with multiplistic beliefs were not as focused on these young children as &quot;meaning-makers&quot;</td>
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<td>Brownlee et al. (2008)</td>
<td>To investigate the nature of epistemological beliefs and the relationship between those beliefs in a sample of pre-service child care students.</td>
<td>Epistemological beliefs (Kuhn &amp; Weinstock, 2002)</td>
<td>17 first and second year students studying to become group leaders (teachers) in child care centers Australia</td>
<td>Qualitative: Content analysis (Berg, 2007)</td>
<td>Most students described either complex or practical evaluativistic beliefs. Only the students who espoused complex evaluativistic epistemological beliefs viewed learning as transformative for themselves and children.</td>
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<td>Author(s)</td>
<td>Relevant Purpose</td>
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<tr>
<td>Brownlee et al.</td>
<td>To investigate the relationship between preservice child care students’ personal epistemology and their beliefs about children’s learning as they engaged in teaching practices with young children.</td>
<td>Personal epistemology (Hofer &amp; Pintrich, 1997) Self-authorship theory (Kegan, 1994)</td>
<td>31 preservice child care students completing a field placement for their vocational course Australia</td>
<td>Qualitative: Inductive thematic analysis</td>
<td>Student teachers with more evaluativist beliefs tended to evidence child-centered, constructivist interactions in their teaching.</td>
</tr>
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<td>(2011a)</td>
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<td>Brownlee et al.</td>
<td>To explore the nature of epistemic beliefs and beliefs about teaching practices for moral learning in the early years of primary school education.</td>
<td>Epistemic beliefs (Kuhn &amp; Weinstock, 2002)</td>
<td>11 inservice teachers of 5-8 year olds Australia</td>
<td>Qualitative: three stage thematic analysis</td>
<td>Identified a more nuanced understanding of evaluativism. A relationship exists between epistemic beliefs and beliefs about teaching practices. Complex epistemic beliefs seem linked to constructivist beliefs about teaching practices for moral learning.</td>
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<td>(2015)</td>
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<td>Brownlee et al.</td>
<td>To explore how preservice teachers’ epistemological beliefs change as they engage in a teaching program designed to focus on integration of knowledge across units.</td>
<td>Personal epistemology (Schommer’s 1993 multidimensional view)</td>
<td>73 preservice early childhood ed. teachers (quant survey) 25 preservice early childhood ed. teachers (qual. open ended survey questions) Australia</td>
<td>Mixed: 2 point repeated measures t-tests, content analysis for emerging patterns and themes (Berg, 2007)</td>
<td>Statistically significant changes in students’ epistemological beliefs about the structure of knowledge over the course of the semester. Individual differences emerged in qualitative data in how students viewed knowledge as integrated in ways of thinking rather than isolated facts.</td>
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<tr>
<td>Brownlee et al.</td>
<td>To determine what changes take place in preservice teachers’ epistemological beliefs as a result of a teaching program designed to help them reflect explicitly on such beliefs.</td>
<td>Epistemological beliefs (Schommer, 1990)</td>
<td>29 preservice graduate primary (elementary) ed. students enrolled in year long ed. psych. course 25 students in comparison group enrolled in other year long ed. psych. Course Australia</td>
<td>Mixed: 2-way ANOVA, inductive thematic analysis</td>
<td>Preservice teachers who kept a journal throughout their course were statistically and qualitatively more likely to view knowledge as uncertain and learning as slower after the intervention than those in the comparison group who simply wrote pre and post statements about their epistemological beliefs.</td>
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<td>(2001)</td>
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<tr>
<td>Brownlee et al. (2012)</td>
<td>To examine the relationship between children’s personal epistemologies, teachers’ personal epistemologies and pedagogies, and school contexts for moral learning.</td>
<td>Personal epistemology (Feucht’s Educational Model for Personal Epistemology (EMPE) 2010)</td>
<td>Two early years inservice teachers in two different early education program contexts Australia</td>
<td>Qualitative: two case studies, Creswell’s data analysis spiral (2005), Braun &amp; Clarke’s thematic analysis (2006)</td>
<td>In school where teacher described evaluativistic beliefs and school valued children’s democratic participation in school life, children had more sophisticated (subjectivist) responses reflecting knowledge as personally constructed. In school where teacher described a subjectivist epistemology, the children held less sophisticated personal epistemologies, and the classroom and school valued modeling the ‘right’ social behavior and rules to the children.</td>
</tr>
<tr>
<td>Brownlee et al. (2009)</td>
<td>To investigate the nature of epistemological beliefs in first year teacher education and creative writing students and the relation of these beliefs to beliefs about learning.</td>
<td>Personal epistemology (Kuhn &amp; Weinstock, 2002)</td>
<td>15 preservice early childhood 14 preservice primary ed. 6 creative writing students Australia</td>
<td>Qualitative: content analysis (Berg, 2007)</td>
<td>A pattern emerged in the data to suggest that a relationship exists between core beliefs about knowing and beliefs about learning for all three groups of students. Complex evaluativistic beliefs (i.e., availing) associated with qualitative (i.e., more adaptive) conceptions of learning.</td>
</tr>
<tr>
<td>Chai (2010)</td>
<td>To explore the epistemic and pedagogical beliefs of Singaporean elementary teachers and the relationship between the two.</td>
<td>Epistemic beliefs (Perry, 1970 and Schommer, 1990)</td>
<td>7 inservice primary teachers Singapore</td>
<td>Qualitative: case study based on constructivist inquiry (Guba &amp; Lincoln, 1989) and constant comparative analysis (Strauss &amp; Corbin, 1990)</td>
<td>The teachers that espoused more relativistic beliefs appeared to prefer constructivist teaching practices. The participants in the study seemed to hold an array of epistemic beliefs</td>
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<td>Author(s)</td>
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<td>Corkin et al.</td>
<td>To determine the extent that math background variables (years of teaching math and college hours in math) predicted teachers' self-efficacy for teaching math, internal locus of control, and epistemic beliefs about math at the beginning of a professional development program and the change in these beliefs after the professional development program.</td>
<td>Epistemic beliefs (Schommer, 1994)</td>
<td>151 inservice K-12 teachers in high poverty urban schools who participated in a three-week professional development intervention aimed at improving teachers math content and pedagogical knowledge K-6th grade n=77 7-12th grade n=74 Southwestern United States</td>
<td>Quantitative: descriptive statistics, 6-two step hierarchical regressions, correlation analysis, paired sample t-tests, independent samples t-tests</td>
<td>Statistically significant decrease in non-availing epistemic belief scores after professional development. Teachers' epistemic beliefs were the strongest predictor of their math knowledge for teaching. Higher levels of non-availing epistemic beliefs associated with poorer performance on an assessment of teaching math.</td>
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<tr>
<td>Edwards et al.</td>
<td>To explore the beliefs that child care practitioners hold about their professional learning and their practices for working with young children as they transition form a vocational education course to working in a child care setting.</td>
<td>Personal epistemology (Kuhn &amp; Weinstock, 2002) Self-authorship (Baxter Magdola, 2001)</td>
<td>15 inservice early childhood educators Australia</td>
<td>Qualitative: Deductive thematic analysis</td>
<td>Minimal changes evident in participants’ personal epistemologies as they moved from educational to workplace setting. Only four of ten participants demonstrated evidence of more adaptive personal epistemology over the transition Development of professional identity may be influenced by immediate childcare work contexts and the culture of the workplace.</td>
</tr>
<tr>
<td>Feucht (2011)</td>
<td>To explore the epistemic underpinnings of one fourth grade reading teacher during and after a lesson on drawing conclusions.</td>
<td>The Educational Model for Personal Epistemology (EMPE; Feucht, 2010), Personal epistemology (Hofer, 2001; Kuhn, 1999)</td>
<td>1grade 4 inservice teacher</td>
<td>Qualitative: content analysis (Flick, 2002) three systematic steps of summarizing, explicating, and structuring</td>
<td>Absolutist and evaluativist beliefs found in teachers epistemic beliefs pattern. Teacher's espoused epistemic beliefs about reading did not match her enacted epistemic beliefs about teaching reading. The teacher's instruction on what sources to use when drawing conclusions seemed to contradictory.</td>
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<td>Feucht (2017)</td>
<td>To explore and establish the epistemic climate of a science lesson in the context of a 4th grade science curriculum.</td>
<td>The Educational Model for Personal Epistemology (EMPE; Feucht, 2010), Personal epistemology (Hofer, 2001; Kuhn, 1999)</td>
<td>1 grade 4 inservice teacher</td>
<td>Qualitative: content analysis (Flick, 2002) three systematic steps of summarizing, explicating, and structuring</td>
<td>Along the dimensions of structure, justification, and source of knowledge the teachers' epistemic beliefs were evaluativistic. Along the stability dimension the beliefs were absolutistic. Teacher's instruction and use of educational materials portrayed science knowledge as absolutistic rather than in accordance with her espoused, more evaluativistic beliefs about science.</td>
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<tr>
<td>Feucht &amp; Bendixen (2010)</td>
<td>To shed light on the epistemological beliefs of inservice teachers in German and U. S. fourth-grade classrooms</td>
<td>Personal epistemology</td>
<td>20 inservice grade 4 teachers (n=10) Germany, (n=10) United States</td>
<td>Qualitative: Content analysis (Mayring, 2002)</td>
<td>Differences: German teachers included internal sources of knowledge such as intuition and feelings as important. U.S. teachers included external sources of knowledge such as people and other resources within the community as important. Similarities in the uncertain and changing nature of knowledge and the domain specificity of knowledge (e.g., science vs. fine arts) were found in both groups of teachers.</td>
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<tr>
<td>Gholami (2017)</td>
<td>To examine teachers' reasoning behind their pedagogical practice and beliefs.</td>
<td>Epistemic standards/ Aristotelian perspective/practical reasoning</td>
<td>6 inservice teachers (grade 3-5) Helsinki</td>
<td>Qualitative: grounded technique (Cohen, Manion, &amp; Morrison, 2011), open coding, axial coding, pattern coding</td>
<td>Teachers used contextual reasoning to support their practices and knowledge claims. Contextual grounds included three main categories: professional, situational, and personal context.</td>
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<tr>
<td>Hennessey et al. (2013)</td>
<td>To pilot a new instrument designed to assess teachers' beliefs about the usefulness of different pedagogical practices designed to teach students how to provide justification.</td>
<td>Personal epistemology (Pollock &amp; Cruz, 1999; Schommer, 1990)</td>
<td>54 preservice and 16 inservice K-5 teachers Eastern United States</td>
<td>Quantitative: Descriptive statistics, Cronbach’s alpha, correlations</td>
<td>Internal reliability scores acceptable. Composite scores stable over multiple administrations of measure. Lower correlations for inservice sample than preservice sample. No teachers exhibited a primarily foundationalist response pattern.</td>
</tr>
<tr>
<td>Lunn et al. (2016)</td>
<td>To explore the nature of and alignment between teachers' personal epistemologies and practices for promoting critical values education in elementary education.</td>
<td>Personal epistemology (Kuhn &amp; Weinstock, 2002)</td>
<td>29 early years teachers years 1 (ages 6-7) and 2 (ages 7-8) classrooms Australia</td>
<td>Qualitative: Inductive analysis, deductive analysis (using Buehl and Beck’s (2015) framework of beliefs-practice relationships</td>
<td>Four patterns of beliefs and practices emerged: evaluativism (n=4), towards evaluativism (subjectivist with some elements of evaluativism) (n=15), practical reflection (n=5), and practical implementation (n=1).</td>
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<td>Muis &amp; Foy (2010)</td>
<td>To examine relations between teachers' epistemic and teaching and learning beliefs about mathematics, and elementary students' achievement goal orientations, self-efficacy, epistemic and learning beliefs, and achievement in the context of mathematics problem-solving.</td>
<td>Epistemic beliefs (Schommer-Aikens, 2004)</td>
<td>55 inservice elementary teachers (grade 4 and 5) Southwestern United States</td>
<td>Quantitative: Descriptive statistics, MANOVA, factorial analysis, structural equation modeling</td>
<td>Teachers' beliefs were significant predictors of students' beliefs and student achievement.</td>
</tr>
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<td>Pearrow &amp; Sanchez (2008)</td>
<td>To examine the personal epistemology of urban elementary school teachers.</td>
<td>Personal epistemology based on social construction theory (Unger, Draper, &amp; Pendergrass, 1986)</td>
<td>73 inservice urban public elementary school teachers (K-5) United States</td>
<td>Quantitative: Descriptive statistics, t-tests, correlational analysis</td>
<td>Statistically significant relationship between teachers between teachers' certification and Individual Determinism factor. Teachers scores on the AAR tended toward logical positivist position.</td>
</tr>
<tr>
<td>Prestridge &amp; de Aldama (2016)</td>
<td>To explore teachers' beliefs and pedagogical practices for the use of digital technologies in the classroom</td>
<td>Epistemic beliefs</td>
<td>3 inservice teachers (1 year one, 1 year two, and 1 year five) Australia</td>
<td>Qualitative: Case study analysis not attributed to any one method. Used a classification framework for technology-enabled practice designed by authors.</td>
<td>Evidence of alignment of teachers’ epistemic beliefs with the pedagogical practices they used to direct both their choice of digital literacy game and how to use it in their classroom.</td>
</tr>
<tr>
<td>Schraw et al. (2017)</td>
<td>To examine the relationship between preservice teachers teaching knowledge, epistemological beliefs, and instructional pedagogy and change in these variables after a one semester course</td>
<td>Epistemological and ontological worldview-realist/relativist (Schraw &amp; Olafson, 2002; 2008)</td>
<td>42 graduate students enrolled in early childhood methods course for math, science and social studies United States</td>
<td>Quantitative: Descriptive statistics, dependent t-tests, correlations, paired sample scores, 2 X 3 ANOVA</td>
<td>Epistemological and ontological beliefs changed. Instructional pedagogy preference did not change. No statistically significant correlation between epistemological and ontological worldview and sources of teaching knowledge.</td>
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<td>Schwartz &amp; Jordan (2011)</td>
<td>To explore the epistemological beliefs of elementary teachers in inclusive classrooms and how these beliefs relate to their beliefs about ability/disability and to their interactions with students.</td>
<td>Epistemological beliefs: Teachers’ Epistemological Beliefs Framework (TEBF; Schwartz, 2009). Draws on theoretical work of Schommer (1990, 1994) and Belenky, et al., (1986)</td>
<td>12 inservice elementary teachers in inclusive classrooms (grade 1-8)</td>
<td>Qualitative: Iterative analysis</td>
<td>Teachers who stated belief about learning as a gradual process, learning takes place best in cooperative groupings, and that they were primarily responsible for their students’ learning were observed to be highly effective for both regular and special education students. Teachers who stated belief that knowledge is certain, factual, and to be memorized were observed as less effective for both regular and special education students.</td>
</tr>
<tr>
<td>Stacey et al. (2005)</td>
<td>To examine the development of epistemological beliefs among early childhood pre-service teachers.</td>
<td>Epistemological beliefs (Schommer, 1998)</td>
<td>65 preservice teachers enrolled in research methods in early childhood education course Australia</td>
<td>Quantitative: Repeated measures t-tests</td>
<td>General increase towards more availing epistemological beliefs after intervention in dimensions, specifically participants were more likely to believe knowledge was complex and uncertain, that learning takes effort and time, and to question expert authority.</td>
</tr>
<tr>
<td>Thomson &amp; Nietfeld (2016)</td>
<td>To investigate teacher typologies of elementary teachers based on their reformed science teaching beliefs and compare with respect to science content knowledge, self-efficacy, and epistemic beliefs.</td>
<td>Epistemic beliefs (Schraw, Bendixen, &amp; Dunkle, 2002)</td>
<td>132 inservice elementary teachers (K-5) United States</td>
<td>Mixed: Sequential explanatory design, Descriptive statistics, Principal Component Factor Analysis (only for BARSTL Survey), ANOVA, correlations, thematic analysis</td>
<td>Three clusters identified based on reformed science teaching beliefs. Typologies varied with respect to science content knowledge, efficacy beliefs, and epistemic beliefs. Teacher belief systems were the definitive factor in cluster variation with no significant differences among clusters with respect to science content knowledge.</td>
</tr>
<tr>
<td>Valenides &amp; Angeli (2011)</td>
<td>To examine how teachers with different personal epistemologies reasoned about a controversial ill-defined issue individually and with others in dyads.</td>
<td>Personal epistemology (Schommer 1990, 1994)</td>
<td>20 inservice elementary teachers -all pursuing masters degree in ed. sciences</td>
<td>Mixed; Descriptive statistics, repeated measures ANOVA, grounded theory coding (Strauss &amp; Corbin, 1990)</td>
<td>No connection noted between personal epistemology and ill-defined problem solving in either solo or dyadic contexts. Teachers used more cognitive (inferences) statements to support their point of view thought alone. Teachers used more cultural and emotional statements to support their reasoning in dyads. Significant within-subjects effects found for cognitive and emotional elements. No significant between subject effects.</td>
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</table>
| Walker et al. (2011) | To investigate the relationship between personal epistemologies and beliefs about learning AND changes in personal epistemologies and beliefs about learning for a group of early childhood and primary preservice teachers as they progressed through the first 3 years of a 4-year Bachelor of Education p. 87 | Personal epistemology (Kuhn & Weinstock, 2002)                                                                                                           | Phase 1: 194 early childhood ed. students and 136 primary ed. students THEN interviews with 29 students (15 early and 14 primary)  
Phase 2: 80 early childhood ed. students and 131 primary ed. students THEN interviews with 8 early and 5 primary students | Mixed: Paired sample t-tests, descriptive statistics, content analysis (Berg, 2007)                                                                                                          | Statistical differences in sub-scales of Speed (-4.17), Structure (-4.17), Structure (-2.48), and Truth (-2.03). No significant change in subscales of Construction or Success.                                             |
| Walker et al. (2012a) | To determine if changes take place in preservice teachers' personal epistemologies as they progress through their university degrees and explore the perceived reasons for reported changes in personal epistemologies. | Personal epistemology (Schommer-Aikens, 2004)                                                                                                           | Preservice early childhood ed. students  
Time 1 (n = 430)  
Time 2 (n = 242)  
Time 3 (n = 178)  
Australia                                                                 | Mixed: Paired sample t-test, thematic analysis                                                                                                          | Statistically significant change noted towards more availing epistemic beliefs in the dimensions of certainty, ability, and structure. Half of participants cited field experience as a reason for epistemic beliefs change. |
| Walker et al. (2012b) | To investigate the relationships between early years teachers' epistemic beliefs and their beliefs about children's moral learning.                                                                                   | Epistemic beliefs (Schommer, 1990; Kardash & Wood, 2000)                                                                                              | 379 inservice teachers of 5-8 year olds  
Australia                                                                                                                                  | Quantitative: Principle Components Factor Analysis on both measures, Descriptive statistics, Correlations                                                                                                         | Participants held somewhat adaptive epistemic beliefs although there was wide variation in responses. Teachers with more adaptive epistemic beliefs viewed children as able to take responsibility for their own moral learning and teachers who held less adaptive personal epistemic beliefs were prone to agree that children should learn the rules for behavior and that teachers contributed to children's moral learning. |
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<th>Author(s)</th>
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<th>Key Findings</th>
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<td>Watkins et al. (2017)</td>
<td>To document and discuss changes in elementary teachers’ epistemological dynamics over months and years throughout a professional development experience.</td>
<td>Personal epistemology (epistemological resources, Hammer &amp; Elby, 2002)</td>
<td>8 inservice elementary teachers participating in science professional development (grade level unspecified) United States</td>
<td>Qualitative</td>
<td>Participants made progress towards stability in their own scientific inquiry. They were better able to sustain disciplinary engagement at the end of the professional development than at the beginning.</td>
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<tr>
<td>Yadav &amp; Koehler (2007)</td>
<td>To investigate how epistemological beliefs may play a role in how student teachers interact with, and perceive cases in a case-based hypermedia environment.</td>
<td>Epistemological beliefs (Schommer, 1990)</td>
<td>11 preservice elementary ed. students enrolled in elementary literacy methods course Midwestern United States</td>
<td>Mixed: case study, deductive coding, 2 X 11 ANOVA</td>
<td>Participants’ prior beliefs about knowledge (as being either simple or complex) predicted views of knowledge featured in video clips they selected. Participants who did not believe in innate ability were more likely to espouse constructive teaching practices. Participants who believed in innate ability were more likely to espouse transmissionist teaching practices.</td>
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APPENDIX B: School Leader Recruitment Script

Hello __________.

I am writing to ask if you could identify one or more teachers in your school for participation in a research study about early childhood teachers’ thinking during their literacy instruction practices.

My name is Kit SaizdeLaMora from Montclair State University. I am a doctoral candidate in the Teacher Education and Teacher Development Program at MSU. For my dissertation study I am investigating aspects of epistemic cognition that emerge when early childhood teachers consider materials and plan instruction for literacy learning. Epistemic cognition has to do with “how people acquire, understand, justify, change, and use knowledge in formal and informal contexts.” (Greene, Sandoval, & Bråten, 2016, p. 1). Epistemic cognition is basically the process individuals engage in while they think about, develop, use or mentally manipulate knowledge (Fives & Buehl, 2016). Epistemic cognition is conceptualized as specific to a domain of knowledge and in the case of my study the domain is early literacy instruction. My goal in this study is to provide a holistic, in-depth description and deep explanatory analysis of this phenomenon.

Eligibility criteria for participating in this study includes:

- Teacher certification in early childhood or early childhood special education
- Teacher in state-funded pre-kindergarten classroom
- Five years experience with pre-kindergarten population

The time commitment for participation in this study would involve five classroom observations of the teacher and seven interviews with the teacher over the course of three months. These will be scheduled at a mutually agreed upon time that is as convenient to the teacher’s schedule as possible. Please see the attached consent form, which describes the study in more detail.

You may contact me at saizdelamok1@montclair.edu or 914-261-8673 if you have more questions about this study.

If you can identify and would permit me to contact eligible participants for this study please email or call me with their contact information so that I can send them a letter of invitation. If I do not hear from you in two weeks I will send a follow-up email to confirm whether or not you have identified one or more teachers for participating in the study.

Thank you for considering the opportunity to have one or more of your eligible teachers participate in this research study.

Sincerely,

Kit SaizdeLaMora
Doctoral Candidate
Teacher Education and Teacher Development Program
Montclair State University
APPENDIX C: Participant Recruitment Script

Hello __________.

I am writing to invite you to participate in a research study about early childhood teachers’ thinking during their literacy instruction practices.

My name is Kit SaizdeLaMora from Montclair State University. I am a doctoral candidate in the Teacher Education and Teacher Development Program at MSU. For my dissertation study I am investigating aspects of epistemic cognition that emerge when early childhood teachers consider materials and plan instruction for literacy learning. Epistemic cognition has to do with “how people acquire, understand, justify, change, and use knowledge in formal and informal contexts.” (Greene, Sandoval, & Bråten, 2016, p. 1). Epistemic cognition is basically the process individuals engage in while they think about, develop, use or mentally manipulate knowledge (Fives & Buehl, 2016). Epistemic cognition is conceptualized as specific to a domain of knowledge and in the case of my study the domain is early literacy instruction. My goal in this study is to provide a holistic, in-depth description and deep explanatory analysis of this phenomenon.

Participation in this study would involve five classroom observations and seven interviews over the course of three months. These will be scheduled at a mutually agreed upon time that is as convenient to your schedule as possible. Please see the attached consent form, which describes the study in more detail.

You may contact me at saizdelamok1@montclair.edu or 914-261-8673 if you have more questions about this study.

If you would like to participate in this study please email or call me so that we can schedule an initial meeting in person. If I do not hear from you in two weeks I will send a follow-up email to confirm whether or not you are interested in participating in the study.

Thank you for considering the opportunity to participate in this research study.

Sincerely,

Kit SaizdeLaMora
Doctoral Candidate
Teacher Education and Teacher Development Program
Montclair State University
APPENDIX D: Study Timeline

<table>
<thead>
<tr>
<th>Timeframe</th>
<th>Task</th>
<th>Product</th>
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<tr>
<td>Dec.-Jan. 2019</td>
<td>Wrote and submitted IRB Application</td>
<td>• IRB approved (1/29/19)</td>
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<tr>
<td>Early Feb. 2019</td>
<td>Recruited Participants</td>
<td>• Teacher participants</td>
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<td>• Contacted school leaders</td>
<td>• Interview schedule</td>
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<td>• Identified potential participants</td>
<td>• Scheduled Initial Meeting with Teachers (2/15)</td>
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<td>• Obtained site consent</td>
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<td>• Scheduled interviews and observations for data collection</td>
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<td>Week of 2/11 and 2/18</td>
<td>Round 1: Data Collection &amp; Initial Analyses</td>
<td>• Acclimated to classroom and teacher</td>
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<td><strong>Data Collection</strong></td>
<td>• Teacher demographic information</td>
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<td>• Explained study and obtained written consent (2/15)</td>
<td>• Written response data from Epistemic Beliefs Questionnaire</td>
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<td>• Conducted 2 Classroom Tour Interviews-2/19 and 2/20)</td>
<td>• Descriptive narrative sketch of each school and classroom</td>
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<td>• Teachers completed Demographic Questionnaire (2/15)</td>
<td>• Artifacts and documents</td>
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<td>• Teachers completed Epistemic Beliefs Questionnaire</td>
<td>• Interview transcripts</td>
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<td>• Collected and organized classroom artifacts and documents</td>
<td>• Field notes</td>
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<td><strong>Analysis</strong></td>
<td>• Emerging code memos</td>
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<td>• Mined artifacts and documents to gain information about context</td>
<td>• Initial case sketches</td>
</tr>
<tr>
<td></td>
<td>• Transcribed interviews</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Journal notes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Analytic Memos</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Generated initial codes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Peer debriefing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Member checking</td>
<td></td>
</tr>
<tr>
<td>Timeframe</td>
<td>Task</td>
<td>Product</td>
</tr>
<tr>
<td>---------------------------</td>
<td>----------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Week of 2/18 and 2/25</td>
<td>Round 2: Data Collection &amp; Initial Analyses</td>
<td>- Teachers’ beliefs profile</td>
</tr>
<tr>
<td></td>
<td><em>Data Collection</em></td>
<td>- Interview transcripts</td>
</tr>
<tr>
<td></td>
<td>- Conducted 2 follow-up interviews on Epistemic Beliefs Questionnaire responses (2/21 and 2/27)</td>
<td>- Field notes</td>
</tr>
<tr>
<td></td>
<td>- Observed full session/day (2/21 and 2/27)</td>
<td>- Emerging code memos</td>
</tr>
<tr>
<td></td>
<td>- Collected and organized classroom artifacts and documents related to observation</td>
<td>- Initial case studies</td>
</tr>
<tr>
<td></td>
<td><em>Analysis</em> (see Round 1)</td>
<td>- Protocol refinements if necessary</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Document emerging ideas about themes/patterns</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Adjustments to data analysis as necessary</td>
</tr>
<tr>
<td>Week of 3/4 and 3/11</td>
<td>Round 3: Data Collection &amp; Initial Analyses</td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Data Collection</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Observed read aloud</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Conducted 2 BS-TAI 3/7 and 3/11</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Collected and organized classroom artifacts and documents related to observation</td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Analysis</em> (see Round 1)</td>
<td></td>
</tr>
<tr>
<td>Week of 3/11 and 3/18</td>
<td>Round 4: Data Collection &amp; Initial Analyses</td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Data Collection</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Observed</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Conducted 2 LP-TAI 3/15 and 3/21</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Collected and organized classroom artifacts and documents related to observation</td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Analysis</em> (see Round 1)</td>
<td></td>
</tr>
<tr>
<td>Week of 3/11 and 3/18</td>
<td>Round 5: Data Collection &amp; Initial Analyses</td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Data Collection</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Observed lesson described in LP-TAI 3/15 and 3/21</td>
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<tr>
<td>Timeframe</td>
<td>Task</td>
<td>Product</td>
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<td>-------------------</td>
<td>----------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Week of April 15</td>
<td><strong>Round 6: Data Collection &amp; Initial Analyses</strong></td>
<td>- Interview transcripts</td>
</tr>
<tr>
<td></td>
<td><strong>Data Collection</strong></td>
<td>- Field notes</td>
</tr>
<tr>
<td></td>
<td>• Conducted 2 Closing Interviews 4/17 and 4/18</td>
<td>- Emerging code memos</td>
</tr>
<tr>
<td></td>
<td>• Collected and organized classroom artifacts and documents related</td>
<td>- Initial case studies</td>
</tr>
<tr>
<td></td>
<td>to observation</td>
<td>- Protocol refinements if necessary</td>
</tr>
<tr>
<td></td>
<td><em>Analysis (see Round 1)</em></td>
<td>- Document emerging ideas about themes/patterns</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Adjustments to data analysis as necessary</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Thematic map revision</td>
</tr>
<tr>
<td>May/June</td>
<td><strong>Iterative Data Analysis</strong></td>
<td>- Collated codes</td>
</tr>
<tr>
<td></td>
<td>• Reviewed Entire Data Set</td>
<td>- Individual case studies</td>
</tr>
<tr>
<td></td>
<td>• Finalized and collated codes</td>
<td>- Initial themes</td>
</tr>
<tr>
<td></td>
<td>• Developed initial themes</td>
<td>- Thematic map revision</td>
</tr>
<tr>
<td></td>
<td>• Begin to look across cases</td>
<td></td>
</tr>
<tr>
<td></td>
<td>○ reviewed codes within each theme</td>
<td></td>
</tr>
<tr>
<td></td>
<td>○ reviewed themes for prevalence across data set</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Peer debriefing</td>
<td></td>
</tr>
<tr>
<td>July/August</td>
<td><strong>Iterative Data Analysis</strong></td>
<td>- Final individual case studies</td>
</tr>
<tr>
<td></td>
<td>• Refined, defined, and named themes</td>
<td>- Broader themes that emerged across participants</td>
</tr>
<tr>
<td></td>
<td>• Individual case analysis</td>
<td>- Multi-case study</td>
</tr>
<tr>
<td></td>
<td>• Cross case analysis</td>
<td>- Final Thematic Map</td>
</tr>
<tr>
<td></td>
<td>• Completed preliminary analysis</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Peer Debriefing</td>
<td></td>
</tr>
<tr>
<td>September/October</td>
<td>• Completed final analysis</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Selected final data extracts/examples</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Wrote report</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Completed dissertation</strong></td>
</tr>
</tbody>
</table>

*Note.* SSI = Semi-structured Interview; SRI = Stimulated Recall Interview; BS-TAI = Book Selection Think Aloud Interview; LP-TAI = Lesson Planning Think Aloud Interview.
APPENDIX E: Participant Consent Form

Please read below with care. You can ask questions at any time, now or later. You can talk to other people before you sign this form.

Study’s Title: Understanding the aspects of epistemic cognition that emerge when early childhood teachers consider material and plan instruction for early literacy teaching

Study Number: IRB-FY18-19-1327

Why is this study being done? The purpose of this study is to learn about the mental process early childhood teachers’ use when they consider materials and plan instruction for literacy learning. My goal in this study is to provide a holistic, in-depth description and deep explanatory analysis of this phenomenon.

What will happen while you are in the study? How much time will it take? This study will take place over 3 1/2 months (February –May, 2019). Interviews/observations will be scheduled for a time as convenient to you as possible and will occur every other week. I will attempt to remain as unobtrusive as possible during observations. Times are approximate.

1. Initial Interview (45 minutes)
2. First observation (entire teaching session) followed by Interview 2 (45 minutes)
3. Second observation (approximately 1 hour) followed by Interview 3 (45 minutes)
4. Third observation (approximately 1 hour) followed by Interview 4 (45 minutes)
5. Fourth observation (approximately 1 hour) followed by Interview 5 (45 minutes)
6. Fifth observation (approximately 1 hour) followed by Interview 6 (45 minutes)
7. Closing Interview (45 minutes)

What are the risks of participating in this study? No study is without risks. The risks associated with this study are minimal and common to those you experience as part of your professional practice. These risks and how they will be managed include:

a) Inconvenience of time and logistics is a risk that may occur because of your workload. I will schedule observations and interviews with consideration given to your time availability and workload.

b) Perception of coercion may occur at minimal risk because, as the researcher, I am not in a position of power. Participation is voluntary and you may withdraw from the study at any time.

c) Confidentiality is at minimal risk because the data from interviews may be identifiable. All comments and responses will be treated confidentially. I will use pseudonyms and your name will not be revealed in any publication or presentation. Although I will keep your identity confidential as it relates to this research project, if I learn of any suspected child abuse or neglect I am required by law to report that to the proper authorities immediately.

d) You may feel overwhelmed, frustrated, confused, or challenged by the topic of discussion while participating in this study. If this happens you can ask for a break or express your
concerns to me, the researcher. I will work with you to ease any pressure or confusion. I will do my best to answer any questions that arise.

**What are the benefits of you participating in this study?** You may benefit from participating in this study through opportunities to reflect on your own literacy teaching practice. Others in the field of teacher education and development may benefit from your participation in this study. The results of this study will inform the field with respect to understanding how early childhood teachers engage in thinking about literacy instruction. Looking at teachers’ epistemic cognition during early literacy instruction may provide a deeper understanding of why and how teachers’ make pedagogical decisions for early literacy instruction. Such understanding could be used as a starting point in helping teacher educators support teachers in their practice and could help make teachers themselves aware of the cognitive process they use when choosing early literacy teaching materials, deciding how those materials are used in the classroom, and in how they structure literacy learning experiences for their students.

**Compensation:** To compensate you for the time you spend in this study, you will receive a $25 gift certificate to Barnes & Noble. You will receive compensation upon completion of the activities listed in the “What will happen to you…” section of this document. In addition, you will receive copies of two preselected children’s books for your classroom after completion of Interview 5.

**Who will know that you are in this study?** In the reporting of results, only I, the researcher, will know that you are in this study. Only I, the researcher, will have access to the data, which will be securely stored in a password protected digital format. I will attempt to ensure that you will not be linked to any presentations or publications. I will make every effort to keep who you are confidential. You should know that New Jersey/New York requires that any person having reasonable cause to believe that a child has been subjected to child abuse or acts of child abuse shall report the same immediately to the Division of Youth and Family Services.

**Do you have to be in the study?**
You do not have to be in this study. You are a volunteer! It is okay if you want to stop at any time and not be included in the study. You do not have to answer any questions you do not want to answer. You will still receive compensation for your participation as described above if you complete all the study activities.

**Do you have any questions about this study?** Phone or email the researcher, Kit SaizdeLaMora at 914-261-8673 or saizdelamok1@montclair.edu or my faculty advisor Dr. Helenrose Fives at 973-655-7162 or fivesh@montclair.edu , 2135, University hall, Montclair State University, 1 Normal Avenue, Montclair New Jersey, 07043

**Do you have any questions about your rights as a research participant?** Phone or email the IRB Chair, Dr. Katrina Bulkley, at 973-655-5189 or reviewboard@montclair.edu.

**Future Studies** It is okay to use my data in other studies: Initial:__ Yes ______ No
Will I be *audiotaped as part of this study*? Ideally, yes. Audiotaping is the best way for me to ensure the accuracy of what was said during interviews. However you may decline to be audiotaped, in which case the interviews may take longer than described above so that I may have time to write down your responses.

As part of this study, it is okay to audiotape interviews.
Please initial: _______ Yes _______ No

Will I be *photographed as part of this study*? You will not be photographed. However, using photographs of the classroom environment and literacy related documents/artifacts is the best way for me to accurately capture the context of the teacher’s literacy environment. However you may decline to have certain documents or material artifacts photographed, in which case the observations may take longer than described above so that I may have time to describe them in writing.

As part of this study, it is okay to photograph documents and material artifacts pertinent to the study:
Please initial: _______ Yes _______ No

**One copy of this consent form is for you to keep.**

**Statement of Consent**
I have read this form and decided that I will participate in the project described above. Its general purposes, the particulars of involvement, and possible risks and inconveniences have been explained to my satisfaction. I understand that I can withdraw at any time. My signature also indicates that I am 18 years of age or older and have received a copy of this consent form.

<table>
<thead>
<tr>
<th>Print your name here</th>
<th>Sign your name here</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name of Principal Investigator</td>
<td>Signature</td>
<td>Date</td>
</tr>
</tbody>
</table>
**APPENDIX F: Teacher Demographic Questionnaire**

<table>
<thead>
<tr>
<th>Name:</th>
<th>School:</th>
</tr>
</thead>
</table>

1. Race/ethnicity: Please choose the category you feel most closely represents your race/ethnicity, you may select more than one option.
   - [ ] African American
   - [ ] Anglo-American (Caucasian)
   - [ ] Asian American
   - [ ] Hispanic-American
   - [ ] Native American
   - [ ] Other (Please describe.)

2. Gender: Please describe your gender.

3. How old are you?

4. Education: Please describe your education history.
   - Bachelor’s degree
     - Title of degree:
     - College/University:
   - Have you taken any additional graduate level courses?
   - Master’s degree
     - Title of degree:
     - College/University:
   - Have you taken any additional graduate level courses?
   - Doctoral degree
     - Title of degree:
     - College/University:
   - Have you taken any additional graduate level courses?

5. Please list your certification(s).

6. Please list any professional development you have had related to literacy instruction.

7. Total number of years teaching =

8. Number of years teaching in this school =

9. Total number of years teaching pre-kindergarten =

10. Number of years teaching pre-kindergarten in this school =

11. Please list additional education/grade levels taught and number of years.
<table>
<thead>
<tr>
<th>Education/grade levels taught</th>
<th>Number of years</th>
</tr>
</thead>
</table>
### APPENDIX G: Data Sources: Purpose and Description

<table>
<thead>
<tr>
<th>Data Source</th>
<th>Purpose</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observations: Field notes</td>
<td>To gain understanding of teachers’ literacy teaching practices</td>
<td>5 observations of each teacher</td>
</tr>
<tr>
<td></td>
<td>To provide a focal point for the first stimulated-recall interview</td>
<td>1 full session/day classroom observation</td>
</tr>
<tr>
<td></td>
<td>To help me create a thick rich description of the context of the phenomenon</td>
<td>4 targeted classroom observations during read aloud and other literacy related activities</td>
</tr>
<tr>
<td>2 Semi-structured Interviews (SSI): Transcription</td>
<td>Epistemic Beliefs-To access early childhood teachers’ beliefs about:</td>
<td>1 forty-five minute semi-structured interview with each teacher using protocol adapted from Brownlee et al., (2008)</td>
</tr>
<tr>
<td></td>
<td>how young children learn literacy</td>
<td></td>
</tr>
<tr>
<td></td>
<td>their own personal learning related to early literacy instruction</td>
<td></td>
</tr>
<tr>
<td></td>
<td>knowledge related to literacy teaching</td>
<td></td>
</tr>
<tr>
<td></td>
<td>To help develop Teachers’ Beliefs Profile</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Closing-Follow-up and member checking</td>
<td></td>
</tr>
<tr>
<td>2 Stimulated Recall Interviews (SRI): Transcription</td>
<td>Class Tour-To get the teachers comfortable talking with me about their literacy teaching practice</td>
<td>1 forty-five minute stimulated-recall interview with each teacher during teacher guided class tour</td>
</tr>
<tr>
<td></td>
<td>Observed Lesson-To stimulate early childhood teachers’ explanations of how they select and use literacy materials in the classroom</td>
<td>1 forty-five minute stimulated-recall interview based on observed lesson</td>
</tr>
<tr>
<td></td>
<td>To help me to access a different grain size of epistemic cognition</td>
<td></td>
</tr>
<tr>
<td>2 Think Aloud Interviews (TAI):</td>
<td>To allow me to access the teachers’ internal mental activity (i.e., epistemic cognition) during an actual teaching task (i.e.,</td>
<td>1 forty-five minute think aloud interview with each teacher where the teacher is asked to choose one of two children’s books for read aloud, explain</td>
</tr>
<tr>
<td>Book Selection Imposed Task (BS-TAI)</td>
<td></td>
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</tr>
<tr>
<td>Data Source</td>
<td>Purpose</td>
<td>Description</td>
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<td>--------------------------------------</td>
<td>-------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Lesson Planning</td>
<td>consideration of materials and planning for literacy instruction.</td>
<td>why one book chosen and other book not chosen, and explain how the book would be used for literacy instruction. 1 forty-five minute think aloud interview with each teacher where the teacher is asked to plan literacy instruction for the next day or week</td>
</tr>
<tr>
<td>Authentic Task (LP-TAI)</td>
<td></td>
<td></td>
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<tr>
<td>Transcription</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Material Artifacts and Documents</td>
<td>To use as possible prompts during interviews</td>
<td>Material Artifacts: items generated by the teacher for the teacher’s own use (e.g., lesson plans, checklists, daily schedule, or classroom wall display)</td>
</tr>
<tr>
<td>Photos or scanned copies</td>
<td>To support my understanding of early childhood teachers’ literacy teaching practices in context</td>
<td>Documents: items related to the broader school or state-funded pre-kindergarten program context (e.g., school mission statement, parent handbook, or marketing materials, curriculum)</td>
</tr>
</tbody>
</table>
APPENDIX H: Epistemic Beliefs Questionnaire

Please respond to the items to the best of your ability. There are no wrong answers just different points of view. We’ll talk about your responses in our next interview.

Your Literacy Instruction

1. What are your literacy related goals for the children during the common activities of ... ?
   a. circle
   b. read aloud
   c. small groups
   d. centers

2. Describe an experience you have had with a child where you really noticed that he or she had learned something literacy related. How did you know that the child had learned?

Your Literacy Instruction Knowledge

3. What sources of knowledge for early literacy instruction have you used?

4. What are the most important sources of knowledge that influence your practice as a teacher in early literacy instruction? Why are these most important to you?

5. Some people say that there are no right answers in early literacy instruction. What are your views?

6. What you think about the idea that anybody’s opinion about early literacy instruction is as good as another?

7. What criteria do you use to evaluate new approaches to early literacy instruction?

8. In the next 20 years . . .
   a. How much do you think the knowledge base of early literacy instruction will change?
   b. In what way(s) do you think the knowledge base of early literacy instruction will change?
   Please provide specific examples.
   (Fives & Buehl, 2008)

9. What is the relationship between your knowledge of literacy instruction and your overall knowledge of teaching?
APPENDIX I: Observation Protocol

<table>
<thead>
<tr>
<th>Section I: Session Overview</th>
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<tbody>
<tr>
<td>Program Name</td>
</tr>
<tr>
<td>Classroom # or name</td>
</tr>
<tr>
<td>Participant</td>
</tr>
<tr>
<td># of Observation:</td>
</tr>
<tr>
<td>Date:</td>
</tr>
<tr>
<td>Time:</td>
</tr>
<tr>
<td>Duration:</td>
</tr>
<tr>
<td>Additional Individuals Present:</td>
</tr>
<tr>
<td># Program Staff</td>
</tr>
<tr>
<td># Students</td>
</tr>
<tr>
<td>Role of Additional Adults Present:</td>
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</tbody>
</table>

<table>
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<tr>
<th>Section III: Observation Summary/Reflection</th>
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<table>
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<tr>
<th>Section III: Material Artifacts or Documents Collected</th>
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</thead>
</table>

<table>
<thead>
<tr>
<th>Section IV: Running Record (include 15 minute summaries of group activities, direct quotes of participants’ discussions with other staff or children, major shifts in activity, actions and interactions related to literacy, notes on physical setting related to literacy)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time</td>
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<tr>
<td>------</td>
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</tbody>
</table>
APPENDIX J: Epistemic Beliefs Follow-up Semi-Structured Interview

Purpose of interview:
- To ask follow-up questions to clarify written responses to Epistemic Beliefs Questionnaire responses as needed
- To allow teachers to validate excerpts of written responses for accuracy

<table>
<thead>
<tr>
<th>Introduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hello __________. Thank you for agreeing to participate in this research study. I appreciate your time and dedication to the research process. Remember, there are no wrong answers just different points of view. Keep in mind that I am just as interested in negative responses and comments as positive response and comments. Although I will audiotape the interview your identity will never be revealed or connected in any way to your responses or comments. You are free to stop participating or withdraw at any time. If I pose a question you would like to skip altogether or come back to just let me know.</td>
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</table>

<table>
<thead>
<tr>
<th>Opening Statement</th>
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<tbody>
<tr>
<td>Today I have a few follow-up questions to clarify your written responses to the Epistemic Beliefs Questionnaire. I will identify some of your responses for clarification and ask you to explain your response more to me.</td>
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</table>

<table>
<thead>
<tr>
<th>Follow-up Questions (prompts will differ by participant)</th>
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</thead>
<tbody>
<tr>
<td>Is there anything you would like to add to or clarify about your response?</td>
</tr>
<tr>
<td>Can you tell me more about that?</td>
</tr>
<tr>
<td>What do you mean by….?</td>
</tr>
<tr>
<td>Can you give me an example?</td>
</tr>
<tr>
<td>Why do you say that?</td>
</tr>
</tbody>
</table>
APPENDIX K: Semi-structured Interview: Closing Interview

Purpose of interview:
- To ask follow-up questions to clarify prior responses as needed
- To allow teachers to validate excerpts of transcriptions of prior responses for accuracy

**Introduction**
Hello __________. Thank you for agreeing to participate in this research study. I appreciate your time and dedication to the research process. This is the final closing interview. It should take approximately 45 minutes. Please answer the questions or respond to the prompts to the best of your ability. There are no wrong answers just different points of view.

Keep in mind that I am just as interested in negative responses and comments as positive response and comments. Although I will audiotape the interview your identity will never be revealed or connected in any way to your responses or comments. You are free to stop participating or withdraw at any time. If I pose a question you would like to skip altogether or come back to just let me know.

**Opening Statement**
Today I would like to ask you some follow-up questions to help me clarify any points that came up during prior interviews. I would also like to conduct an important part of research called member checking. This means that you get a chance to add to or clarify what you said in portions of prior interviews and validate my interpretation of your prior responses. I am going to play back audio recordings of your responses or read back transcribed excerpts from your responses to prior interviews and I would like you to tell me if the transcription is accurate to your memory. I may also restate or summarize information you shared with me during prior interviews and I would like you to verify if my summary reflects your views and make any suggestions for revision that you see fit.

**General prompts to use:**

<table>
<thead>
<tr>
<th>To increase elaboration</th>
<th>To prompt epistemic ...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can you tell me more about that?</td>
<td>How has your thinking around that changed? (certainty)</td>
</tr>
<tr>
<td>What do you mean by….?</td>
<td>Can you be certain about…? (certainty)</td>
</tr>
<tr>
<td>Can you give me an example?</td>
<td>How connected do you see this to whatever else you are doing? (structure)</td>
</tr>
<tr>
<td>Why do you say that?</td>
<td>How do you know? (justification)</td>
</tr>
<tr>
<td>Where did your understanding of this come from?</td>
<td>(source)</td>
</tr>
</tbody>
</table>

Interview response quotes: selected prior to closing interview, will vary by teacher

Probing Questions
<table>
<thead>
<tr>
<th></th>
<th>Interview response quote 1</th>
<th>Is there anything you would like to add to or clarify about your response?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Interview response quote 2</td>
<td>Is there anything you would like to add to or clarify about your response?</td>
</tr>
<tr>
<td></td>
<td>Interview response quote 3</td>
<td>Is there anything you would like to add to or clarify about your response?</td>
</tr>
<tr>
<td></td>
<td>Interview response quote 4</td>
<td>Is there anything you would like to add to or clarify about your response?</td>
</tr>
<tr>
<td></td>
<td>Interview response quote 5</td>
<td>Is there anything you would like to add to or clarify about your response?</td>
</tr>
<tr>
<td></td>
<td>Interview response quote 6</td>
<td>Is there anything you would like to add to or clarify about your response?</td>
</tr>
</tbody>
</table>

**Follow-up Questions: prepared prior to closing interview, will vary by teacher**

|   | Follow-up Question 1 | Can you tell me more about that?  
|   |                | What do you mean by....?  
|   |                | Can you give me an example?  
|   |                | Why do you say that? |
|   | Follow-up Question 2 | Can you tell me more about that?  
|   |                | What do you mean by....?  
|   |                | Can you give me an example?  
|   |                | Why do you say that? |
|   | Follow-up Question 3 | Can you tell me more about that?  
|   |                | What do you mean by....?  
|   |                | Can you give me an example?  
|   |                | Why do you say that? |
|   | Follow-up Question 4 | Can you tell me more about that?  

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What do you mean by….?
Can you give me an example?
Why do you say that?

Follow-up Question 5

Can you tell me more about that?
What do you mean by….?
Can you give me an example?
Why do you say that?

Follow-up Question 6

Can you tell me more about that?
What do you mean by….?
Can you give me an example?
Why do you say that?

Thank you for your time and dedication to this research process!!
APPENDIX L: Stimulated Recall - Class Tour

Purpose of interview:
- To access early childhood teachers’ epistemic cognition in hindsight and to access a larger cycle of epistemic cognition, a micro-cycle, meaning it may prompt the teacher to reference a larger unit of instruction than what may emerge during a think aloud interview
- To prompt the teachers to talk about their decision making regarding literacy planning and instruction
- To help me to access a different grain size of epistemic cognition which is important for development of “finer grained frameworks with a higher predictive power” of the construct (Barzilai & Zohar, 2014, p. 27).

Introduction
Hello __________. Thank you for meeting with me again. As a reminder, this study is about the mental process early childhood teachers engage in when they consider material and plan instruction for literacy learning. Since my goal in this study is to provide a holistic, in-depth description and deep explanatory analysis of this phenomenon, I am just as interested in negative responses and comments as positive response and comments. Please answer the questions or respond to the prompts to the best of our ability. There are no wrong answers just different points of view.

Although I will audiotape the interview your identity will never be revealed or connected in any way to your responses or comments. You are free to stop participating or withdraw at any time. If I pose a questions you would like to skip altogether or come back to just let me know.

Opening Statement
This interview should take approximately 45 minutes. Today I would like you to take me on a tour of your classroom with a particular focus on those aspects related to early literacy instruction.

General prompts to use:

<table>
<thead>
<tr>
<th>To increase elaboration</th>
<th>To prompt epistemic beliefs ...</th>
<th>To expose epistemic cognition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can you tell me more about that?</td>
<td>How has your thinking around that changed? (certainty)</td>
<td>What is your intention here? (EP-A)</td>
</tr>
<tr>
<td>What do you mean by....?</td>
<td>Can you be certain about...? (certainty)</td>
<td>What do you hope the children will learn? (EP-I)</td>
</tr>
<tr>
<td>Can you give me an example?</td>
<td>How connected do you see this to whatever else you are doing? (structure)</td>
<td>Can you tell me about your plan for accomplishing this objective?</td>
</tr>
<tr>
<td>Why do you say that?</td>
<td>How do you know? (justification)</td>
<td>What strategies will you use? (REL-PR)</td>
</tr>
<tr>
<td></td>
<td>Where did your understanding of this come from? (source)</td>
<td>Have you made any adjustments to any of these strategies and if so what? If not, why not? (EP-INF-PR)</td>
</tr>
</tbody>
</table>
APPENDIX M: Stimulated Recall After Lesson

Purpose of interview:

- To access early childhood teachers’ epistemic cognition in hindsight and to access a larger cycle of epistemic cognition, a micro-cycle, meaning it may prompt the teacher to reference a larger unit of instruction than what may emerge during a think aloud interview
- To prompt the teachers to talk about their decision making regarding literacy planning and instruction
- To help me to access a different grain size of epistemic cognition which is important for development of “finer grained frameworks with a higher predictive power” of the construct (Barzilai & Zohar, 2014, p. 27).

<table>
<thead>
<tr>
<th>Introduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hello _________. Thank you for meeting with me again. As a reminder, this study is about the mental process early childhood teachers engage in when they consider material and plan instruction for literacy learning. Since my goal in this study is to provide a holistic, in-depth description and deep explanatory analysis of this phenomenon, I am just as interested in negative responses and comments as positive response and comments. Please answer the questions or respond to the prompts to the best of our ability. There are no wrong answers just different points of view. Although I will audiotape the interview your identity will never be revealed or connected in any way to your responses or comments. You are free to stop participating or withdraw at any time. If I pose a questions you would like to skip altogether or come back to just let me know.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Opening Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>This interview should take approximately 45 minutes. Today the interview will be centered on observations I made while visiting in your classroom observing early literacy instruction. We will use these observations as a point of discussion.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>General prompts to use:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>To increase elaboration</strong></td>
</tr>
<tr>
<td>Can you tell me more about that?</td>
</tr>
<tr>
<td>What do you mean by....?</td>
</tr>
<tr>
<td>Can you give me an example?</td>
</tr>
<tr>
<td>Why do you say that?</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
APPENDIX N: Think Aloud Interview: Imposed

Prompting Epistemic Cognition During Selection of Children’s Literature for Read Aloud

Purpose of interview:
- To help me access early childhood teachers’ epistemic cognition in real time.
- To promote and make external early childhood teachers’ engagement in epistemic cognition during typical literacy teaching tasks.
- To prompt epistemic cognition during an imposed teaching task; children’s book selection for read aloud (Walt Disney’s Peter Pan, Author, 2014 and Move Over, Rover! by Karen Beaumont, 2006)

Introduction
Hi_____. Thanks for taking the time to meet with me again today.

This interview should take approximately 45 minutes. Please answer the questions or respond to the prompts to the best of your ability. There are no wrong answers just different points of view.

Keep in mind that I am just as interested in negative responses and comments as positive responses and comments. Although I will audiotape the interview your identity will never be revealed or connected in any way to your responses or comments. You are free to stop participating or withdraw at any time. If I pose a question you would like to skip altogether or come back to later in the interview just let me know.

Opening Statement

Today I am going to be using a method called think-aloud to gather some information from you. In this interview, I will supply two selections of children’s literature for you to consider and eventually choose which one you would use for a read aloud in your classroom. As you are examining the books and making your decision, I want you to say your thoughts out loud so I can hear what you’re thinking. I may prompt you to remind you to think out loud while you are making this decision. At the end of this interview, you may keep both of the books I brought with me today.

General prompts to use:

<table>
<thead>
<tr>
<th>To increase elaboration</th>
<th>To prompt epistemic ...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can you tell me more about that?</td>
<td>How has your thinking around that changed? (certainty)</td>
</tr>
<tr>
<td>What do you mean by….?</td>
<td>Can you be certain about…? (certainty)</td>
</tr>
<tr>
<td>Can you give me an example?</td>
<td>How connected do you see this to whatever else you are doing? (structure)</td>
</tr>
<tr>
<td>Why do you say that?</td>
<td>How do you know? (justification)</td>
</tr>
<tr>
<td></td>
<td>Where did your understanding of this come from? (source)</td>
</tr>
<tr>
<td>Preliminary Questions</td>
<td>Suggested Probing Questions</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------</td>
</tr>
<tr>
<td>I remember one of the things I used to do as an early childhood teacher was to select children’s books to use in my classroom with the children. Could you tell me about what that process is like for you? (What steps do you take? What do you think about?)</td>
<td>Can you tell me more about that? What do you mean by….? Can you give me an example?</td>
</tr>
<tr>
<td>What do you think is important to know when selecting books for the children in your class?</td>
<td>Can you tell me more about that? What do you mean by….? Can you give me an example?</td>
</tr>
<tr>
<td>What do you think is important to know when deciding how to use the books you selected with your class?</td>
<td>Can you tell me more about that? What do you mean by….? Can you give me an example?</td>
</tr>
</tbody>
</table>

**Now comes the think-aloud part.**

I would like you to take a look at two children’s books, *Walt Disney’s Peter Pan* and *Move Over, Rover!* by Karen Beaumont.

I want you to take the time you need with these books deciding which one you would choose to use in your classroom. As you are deciding, I want you to say your thoughts out loud so I can hear what you’re thinking as you make this decision. I may prompt you to remind you to think out loud while you are making this decision. Once you make your decision I will ask you some questions. Remember, I am not interested in a *correct* answer. I am interested in your views and how you came to your decision.

I will use a ‘KEEP TALKING’ sign or quietly remind you to verbalize all your thoughts because I don’t want to interfere with your thinking (Sugirin, 1999). Even though I am audio recording you I may take notes to help me remember if there are any points I want to follow up on when you are finished or to further clarify your thinking (Fonteyn et al., 1993).

**Have you made your decision?**

<table>
<thead>
<tr>
<th>Which book would you select to use in your classroom?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First, can you tell me why you decided against using_______.</strong></td>
</tr>
<tr>
<td><strong>Now let’s turn to the book you did choose. You chose _______. Can you tell me why you chose this book?</strong></td>
</tr>
<tr>
<td><strong>Can you tell me how you would build a lesson around this book?</strong></td>
</tr>
</tbody>
</table>
Can you walk me through exactly what you would do, from every minor detail. (allow for think-aloud here before going on)

| What do you hope the children will learn? (EP-I) |
| Can you tell me about your plan for accomplishing this objective? What strategies will you use? (REL-PR) |
| Can you see yourself making any adjustments to any of these strategies and if so what? If not, why not? (EP-INF-PR) |

Thank you for your time today!!
APPENDIX O: Think Aloud Interview: Authentic Task

**Prompting Epistemic Cognition During Planning for Literacy Instruction**

**Purpose of interview:**
- To help me access early childhood teachers’ epistemic cognition in real time.
- To promote and make external early childhood teachers’ engagement in epistemic cognition during typical literacy teaching tasks.
- To prompt epistemic cognition during an authentic teaching task; planning literacy instruction for the following day or week.

In this interview, I will not supply any predetermined materials or resources. I plan to collect any relevant artifacts or documents used or referenced by the teacher during lesson planning think aloud to aid me in my subsequent analysis of the interview transcripts.

**Introduction**

Hi______. Thanks for taking the time to meet with me again today. This interview should take approximately 45 minutes. Please answer the questions or respond to the prompts to the best of your ability. There are no wrong answers just different points of view. Keep in mind that I am just as interested in negative responses and comments as positive responses and comments. Although I will audiotape the interview your identity will never be revealed or connected in any way to your responses or comments. You are free to stop participating or withdraw at any time. If I pose a question you would like to skip altogether or come back to later in the interview just let me know.

**Opening Statement**

Today I am going to be using a method called think-aloud to gather some information from you. As you are planning for literacy instruction over the next day or week, using your usual materials, resources, and methods, I want you to say your thoughts out loud so I can hear what you’re thinking. I may prompt you to remind you to think out loud while you are planning. I would like to take photos or make copies of the resources and materials that you are using during your planning. Is that okay?

**General prompts to use:**

<table>
<thead>
<tr>
<th>To increase elaboration</th>
<th>To prompt epistemic ...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can you tell me more about that?</td>
<td>How has your thinking around that changed? (certainty)</td>
</tr>
<tr>
<td>What do you mean by....?</td>
<td>Can you be certain about….? (certainty)</td>
</tr>
<tr>
<td>Can you give me an example?</td>
<td>How connected do you see this to whatever else you are doing? (structure)</td>
</tr>
<tr>
<td>Why do you say that?</td>
<td>How do you know? (justification)</td>
</tr>
<tr>
<td></td>
<td>Where did your understanding of this come from? (source)</td>
</tr>
</tbody>
</table>
## Preliminary Questions

<table>
<thead>
<tr>
<th>Preliminary Questions</th>
<th>Suggested Probing Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>I remember one of the things I used to do, as an early childhood teacher was to plan for literacy instruction. Could you tell me about what that process is like for you? (What steps do you take? What do you think about?)</td>
<td>Can you tell me more about that? What do you mean by…..? Can you give me an example?</td>
</tr>
<tr>
<td>What do you think is important to know when planning literacy instruction for the children in your class?</td>
<td>Can you tell me more about that? What do you mean by…..? Can you give me an example?</td>
</tr>
</tbody>
</table>

### Now comes the think-aloud part.

I would like you to actually plan for literacy instruction over the next day or week. I want you to take the time you need with the materials you brought here today. As you are planning, I want you to say your thoughts out loud through the entire process so I can hear what you’re thinking as you plan. I may prompt you to remind you to think out loud while you are planning. Once you finish planning or in about 30 minutes, I will ask you some questions. I am not interested in a correct answer. I am interested in your views and how you came to your planning decisions.

I will use a ‘KEEP TALKING’ sign or quietly remind you to verbalize all your thoughts because I don’t want to interfere with your thinking (Sugirin, 1999). If it is okay I would like to sit next to, rather than across from you so that I can see the materials you are looking at while you plan and what you are writing. Even though I am audio recording you I may take notes to help me remember if there are any points I want to follow up on when you are finished or to further clarify your thinking (Fonteyn et al., 1993).

### Have you finished planning?

<table>
<thead>
<tr>
<th>How do you think the planning process went for you today?</th>
<th>Can you tell me more about that? What do you mean by…..? Can you give me an example?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can you talk a little more about how you would use this activity with your students? Walk me through exactly what you would do, from every minor detail.</td>
<td>What is your intention here? (EP-A) What do you hope the children will learn? (EP-I) Can you tell me about your plan for accomplishing this objective? What strategies will you use? (REL-PR) Can you see yourself making any adjustments to any of these strategies and if so what? If not, why not? (EP-INF-PR)</td>
</tr>
<tr>
<td>What are your literacy related goals for the children here during circle?</td>
<td>What is your intention here? (EP-A) What do you hope the children will learn? (EP-I)</td>
</tr>
</tbody>
</table>
Can you tell me about your plan for accomplishing this objective? What strategies will you use? (REL-PR)
Can you see yourself making any adjustments to any of these strategies and if so what? If not, why not? (EP-INF-PR)

<table>
<thead>
<tr>
<th>Question</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>What are your literacy related goals for the children during read aloud?</td>
<td>What is your intention here? (EP-A) What do you hope the children will learn? (EP-I) Can you tell me about your plan for accomplishing this objective? What strategies will you use? (REL-PR) Can you see yourself making any adjustments to any of these strategies and if so what? If not, why not? (EP-INF-PR)</td>
</tr>
<tr>
<td>What are your literacy related goals for the children during centers?</td>
<td>What is your intention here? (EP-A) What do you hope the children will learn? (EP-I) Can you tell me about your plan for accomplishing this objective? What strategies will you use? (REL-PR) Can you see yourself making any adjustments to any of these strategies and if so what? If not, why not? (EP-INF-PR)</td>
</tr>
<tr>
<td>What are your literacy related goals for the children when you work with them in small groups?</td>
<td>What is your intention here? (EP-A) What do you hope the children will learn? (EP-I) Can you tell me about your plan for accomplishing this objective? What strategies will you use? (REL-PR) Can you see yourself making any adjustments to any of these strategies and if so what? If not, why not? (EP-INF-PR)</td>
</tr>
</tbody>
</table>

Thank you for your time today!