Professional Development Tools to Improve the Quality of Infant and Toddler Care: A Review of the Literature

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Professional Development Tools to Improve the Quality of Infant and Toddler Care: A Review of the Literature

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OVERVIEW

The literature review report for the Professional Development Tools to Improve the Quality of Infant and Toddler Care (Q-CCIIT PD Tools) project summarizes the state of the field, highlighting the most promising methods and approaches for enhancing caregiver interactions with young children, particularly caregivers serving infants and toddlers, those with limited education, and those in home-based and family child care (FCC) settings. The review is not exhaustive; instead, it identifies the professional development (PD) resources and components most pertinent to the development of new PD tools and the project's conceptual framework.

The review draws on several sources: recent reviews and meta-analyses conducted within the past 10 years, the websites of leading PD and research organizations, database searches for empirical studies published during the past 10 years, and expert and Office of Planning, Research, and Evaluation (OPRE) input. Together, the sources resulted in 122 studies, including 31 focused on caregivers serving infants and toddlers and 26 with caregivers in home-based or FCC settings. The report is accompanied by a set of appendix tables summarizing key aspects of each study included in the review.

Key findings from the review include:

- Few studies focus on caregivers in infant/toddler or home-based settings, but the broader literature discusses tools and approaches useful for these two groups. In addition, most tools/approaches and strategies have not been studied in isolation and instead are typically bundled together.
- Ongoing PD efforts can be more effective at sustaining caregiver or child outcomes than one-time PD approaches. More intensive delivery has the strongest evidence of effectiveness.
- The available literature points to a range of effective PD strategies, including positive provider-caregiver relationships, the active participation of caregivers in PD efforts, and performance feedback.
- Using a combination of strategies may foster better caregiver outcomes.
- Online tools are a cost-effective and successful approach to providing PD, particularly for caregivers in more isolated settings. They can provide collegial support for caregivers who are geographically or socially isolated, such as those in rural areas and home-based settings.
- PD can successfully influence caregiver practice even within a short timeframe, particularly when focused on specific practices.
- Caregivers need more support for developing skills to implement more complex curricula and approaches.
- Written PD materials should be clear, adapted for a range of audiences and literacy levels, and clearly translated for classroom practice.
- Most conceptual models in the literature are relatively simple and, at minimum, identify the strategies, method of delivery, and participants of the PD effort.

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I. INTRODUCTION

The literature review report for the Professional Development Tools to Improve the Quality of Infant and Toddler Care (Q-CCIIT PD Tools) project summarizes the state of the field, highlighting the most promising methods and approaches for enhancing caregiver[1] interactions with young children, particularly caregivers serving infants and toddlers, those with limited education, and those in home-based and family child care (FCC) settings.[2] The review is not exhaustive; instead, it identifies the professional development (PD) resources and components most pertinent to the development of new PD tools and the project's conceptual framework. We begin by offering an introduction to the report that describes the methodology used to identify and screen studies included in the review (Chapter I), and provide contextual information relevant to the review (Chapter II). We then provide a summary of key findings from the literature (Chapter III) and conclude by suggesting implications of the findings (Chapter IV).

A. Research questions guiding the literature review

The literature review serves as the foundation for subsequent Q-CCIIT PD Tools project tasks, including creation of the conceptual framework that will guide the project and the development of PD materials intended for supporting caregivers' interactions with infants and toddlers. Although a variety of findings have emerged regarding previous PD efforts and their relationship to outcomes for classrooms, teachers/caregivers, and children, very few studies have examined the effectiveness of PD strategies in working with infant/toddler nonparental caregivers (U.S. Department of Education 2010). Most early childhood research on coaching and PD has focused on the preschool years, involving caregivers who are more educated than the majority of infant/toddler caregivers (National Survey of Early Care and Education Project Team [NSECE] 2013). More information is needed about the potential benefits of different forms of PD for caregivers serving infants and toddlers (Institute of Medicine [IOM] and National Research Council [NRC] 2015; Whitebook 2014; U.S. Department of Education 2010).

[1] Throughout this report, we primarily use the term "caregivers" to refer to those who provide early care services to young children. However, when describing study findings, we at times use the sample terminology used by study authors (for example, practitioners or educators).

[2] Because the terms are used interchangeably in the literature, in the remainder of this report we use "home based" broadly to refer to caregivers in home visiting settings, FCC or home-based settings, and kith and kin childcare. When possible, we use the terms that studies explicitly used to describe the setting or caregiver when describing study methodology. All but three of the reviewed studies focused on FCC providers, with one focusing on kith and kin settings and two on home visitors. Findings, therefore, are primarily based on caregivers in FCC settings.

Ultimately, the literature review is guided by the following questions:

1. What PD tools/approaches and strategies[3] are used in settings serving infants/toddlers? In home-based settings? What are caregivers' perspectives on these approaches and strategies?
2. How is technology used in PD efforts in settings serving infants/toddlers? In home-based settings? What are caregivers' perspectives on the use of technology?
3. What are challenges and barriers to PD implementation in infant/toddler and home-based settings?
4. What do we know about effective PD strategies for supporting interactions between caregivers and children, particularly for infants and toddlers?
5. What do we know about approaches that might be particularly helpful for supporting FCC providers, caregivers with limited education, or those in isolated settings?
6. Are there available conceptual frameworks that can inform our work and/or specific materials or approaches that provide insight into development of the Q-CCIIT PD tools?

B. Sources of information for the literature review

To address these questions, the literature review draws on several sources: recent reviews and meta-analyses conducted within the past 10 years, the websites of leading PD and research organizations, database searches for empirical studies published during the past 10 years, and expert and Office of Planning, Research, and Evaluation (OPRE) input. We describe each of these sources in this section, including the number of studies identified by each.

1. Meta-analyses/literature reviews and website review

Our review builds on recent reviews and meta-analyses in the PD literature (Aikens and Akers 2011; IOM and NRC 2015; U.S. Department of Education 2010), emphasizing findings and implications for caregivers in infant/toddler settings. In addition, we consulted key websites, such as those of the National Association for the Education of Young Children (NAEYC) and ZERO TO THREE, to identify non-peer-reviewed literature not available through a library search. Table I.1 provides the list of summary reviews (literature reviews, meta-analysis, and seminal articles) and existing websites reviewed for relevant literature. We identified some summary reviews via the database and website searches, whereas others were identified prior to those activities.

2. Database searches

We implemented a database search to identify recent literature addressing our research questions. To ensure we included relevant literature in our review while avoiding the processing of many irrelevant references, we considered only journal articles and grey (unpublished) literature, such as project reports, white papers, and government reports, from the past decade.

[3] As we describe in a subsequent section, we make a distinction between PD "tools/approaches" and "strategies" in this report. By "tools and approaches," we mean the vehicle by which PD is delivered or *how* it is delivered (for example, coaching, online course, or workshop). "Strategies" refer to the elements used in PD efforts or *what* is a part of those approaches (for example, frequent performance feedback, building of trusting relationships).

Specifically, we included research using experimental, quasi-experimental, regression discontinuity, and single-case designs, along with correlational and descriptive studies, implementation studies, psychometric studies, literature reviews, and meta-analyses. We also included studies that could help us to draw lessons from efforts with preschool teachers, focusing primarily on information those studies can give us about what is known and what needs to be known about PD efforts for supporting caregiver interactions and considering how those lessons might generalize to caregivers of infants and toddlers.

Table I.2 includes a list of databases included in the search, as well as search terms. We used the PD search terms listed below in combination with "infant*," "toddler*," and "early childhood." Because the search terms generated a large number of articles, we applied sets of search terms (also listed in the table) to ensure we targeted relevant topic areas, including setting (for example, child care, Head Start, early childhood education, or special education) and study design (primarily to exclude conceptual and theoretical studies).

This database search generated 516 studies, including empirical studies, literature reviews, and meta-analyses.

Table I.1. List of summary reviews and websites included in the Mathematica review

Source type	Sources
Summary reviews	Ackerman 2008 Aikens and Akers 2011 Artman-Meeker et al. 2015 Cox et al. 2015 Dunst et al. 2015 Fukkink and Lont 2007 Hernandez et al. 2015 IOM and NRC 2015 Nagro and Cornelius 2013 Paulsell et al. 2010 Schachter 2015 Snyder et al. 2012 Trivette et al. 2012 U.S. Department of Education 2010 Werner et al. 2015 Whitebook 2014
Websites	**Coaching and related PD organizations** Coaching in Early Childhood National Association for Early Childhood Teacher Education (NAECTE) National Association for the Education of Young Children (NAEYC) National Early Childhood Technical Assistance Center (NECTAC)
	Targeted research websites Abt Associates American Institutes of Research Build Initiative Center for Research on Education, Diversity & Excellence Child Care & Early Education Research Connections Child Trends Education Development Corporation Educare Frank Porter Graham Child Development Institute

Source type	Sources
	ICF, International Mathematica Policy Research MDRC National Association for Family Child Care National Association of Early Childhood Teacher Educators National Center for Education Evaluation and Regional Assistance (NCEE) Regional Educational Laboratory (REL) Program National Center for Research on Early Childhood Education National Child Care Information Center National Institute of Child Health & Human Development Early Learning and School Readiness Program National Institute of Early Education Research National Research Council Office of Planning, Research, and Evaluation/Administration for Children and Families/DHHS RAND Corporation SRI International WestEd ZERO TO THREE

Table I.2. Parameters of the literature search

Databases	Academic Search Premier Campbell Collaboration CINAHL with Full Text Cochrane Central Register of Controlled Trials Cochrane Database of Systematic Reviews Cochrane Methodology Register Education Research Complete ERIC MedLine PsycINFO Sage Journals SocINDEX with Full Text
PD search terms	adult learn* coach* consultation developmental evaluation in-service train* workshops peer coach* peer supervision process consultation professional development reflective supervision reflective practice technical assistance
Setting search set	child care, childcare, Head Start, early childhood education, special education, preschool, day care, daycare, center-based care, home-based care, family-based care, family child care
Study design search set	ABAB design*, alternating treatment*, assignment, baseline, case study, causal, “changing criterion design,” “comparison group,*” “control group,*” correlational, counterfactual,* descriptive, experiment,* “implementation study,” “literature review,” “replication design,” “matched group,*” “meta-analys,*” metanalys,* “multi-element design,” “multielement design,” “multiple baseline design,” posttest, “post-test,” pretest, “pre-test,” QED, psychometric, “quasi-experiment,*” quasiexperiment,* SCD, random,* RCT, RDD, “regression discontinuity,” “reversal design,” “simultaneous treatment,*” “single case design,*” “single subject design,*” “withdrawal design”

Truncation is represented by an asterisk in the table. When using truncation, search engines find all forms of the word (for example, “coach” finds coach, coaches, and coaching).

3. Expert and OPRE input

Finally, to supplement our database searches and ensure we had captured the most recent work, we solicited recommendations for key research to review from two of the project consultants, Margaret Burchinal and Martha Zaslow. Their input generated an additional report not already captured by the database search and website review. Recommendations from OPRE staff also generated three additional reports. We also solicited input from the OPRE-sponsored Network of Infant Toddler Researchers (NITR)[4] but did not identify additional reports from that effort.

4. Screening

Trained staff screened the studies and reports identified in both the database search and website review for relevance. During this step, the screeners and task leads considered on a case-by-case basis whether to include literature focused on settings and professionals serving children older than preschoolers or outside the United States or studies primarily theoretical or conceptual in nature. We eliminated studies that were off topic, not a relevant document type (for example, conceptual or theoretical pieces or dissertations with small samples that were purely descriptive), or published in languages other than English. We also eliminated duplicate references received from more than one source. This screening left 88 studies from the library (database) search and 24 from the website review eligible for inclusion in the review.

Together, the sources (that is, prior reviews, expert and OPRE recommendations, library search, and website review) resulted in 122 references that were screened as relevant and included for this review. Table I.3 provides a count of the studies that we reviewed, overall and by age group (infants and toddlers, and preschool). Table I.4 provides similar information by early childhood education setting. We recognize that caregivers serving children of different age groups typically differ in terms of experience and education. Because many of the 122 studies that we reviewed reported on more than one age group or setting, the age and setting category subtotals reflect double counting of studies that reported on more than one age group or setting. In addition, some studies did not report child age groups or early childhood settings and are therefore only included in the total columns.

C. Reviewing the literature

After receiving full text for the studies that passed the screening process, we used a study template to extract descriptive information from each study (Appendix A). We collected information on the following:

- Study information (including field of study, topics addressed, study design, methodological concerns)

[4] OPRE founded NITR in 2011 to address research questions of interest to the Administration for Children and Families about programs serving infants and toddlers. NITR brings together a consortium of researchers to identify existing research, identify research gaps, and build capacity for future research efforts.

- Sample characteristics (including study setting; sample size overall and by treatment condition, if applicable; characteristics of the child sample; characteristics of teachers/caregivers; and timing of data collection—for example, baseline, during the intervention, post-intervention)
- PD strategies and details (approaches employed, dosage and intensity of intervention, goals)
- Context of PD implementation (inclusion of assistant teachers and directors in center-based settings; whether PD is selective or program wide; how coaches or mentors are selected, trained, and supervised; whether PD is required or voluntary; whether PD providers are available on an ongoing basis)
- Study measurement and findings (for example, outcomes measured and tools used, the use of fidelity-type instruments, key findings, subgroup findings)
- Whether the studies included conceptual frameworks and description of the framework

Table I.3. Characteristics of studies included in the review, by child age

	Number of studies		
	Total[a]	Infant/toddler	Preschool
Study design			
Empirical			
Experimental or QED	62	7	46
Implementation study	27	3	22
Descriptive—Non-psychometric or correlational	19	10	9
SCD	4	1	3
Descriptive—Psychometric	2	2	1
Regression discontinuity	1	1	1
Literature review or meta-analysis	16	11	5
PD approach used[b]			
Coaching	73	18	54
Workshops	39	9	31
In-person courses	34	3	27
Mentoring/supervision	32	7	29
Curricula	22	3	16
Reflective supervision	14	5	9
Online courses	12	2	9
Intensive workshops	11	3	5
PD strategies used			
Opportunity for practice	59	12	44
Frequent feedback	57	11	44
Active learning	52	7	43
Quality observations	42	13	28
Modeling	40	7	29
Self-reflection	32	7	23
Goal setting	31	5	21
Coaching based on video-recorded practice	28	6	20
Trusting relationships	28	6	22
Use of technology			
Use of video	46	7	34
Online courses or coaching[b]	32	4	27
Social media	2	1	1
Other uses of technology (audiorecording, PDAs, mobile devices)	16	2	14
ECE setting			
Center	101	23	86
Home-based care	26	13	16
Agency setting			
Early Head Start or Head Start	49	8	44
Public prekindergarten	38	5	38
Child care	34	14	19
Total number of studies	122	31	88

Notes: We classified studies as infant/toddler if they included any children age 0 to 36 months. Analyses did not need to be presented separately for the group to be considered an infant/toddler study.

Some studies did not report PD approach, strategy, use of technology, or setting, and others reported more than one approach, strategy, use of technology, or setting

[a]Studies that reported on more than one age group are double-counted in the age-specific columns. Thus, the total number of studies in the age-specific columns sums to more than 122. In addition, some studies did not report child age groups or early childhood settings and are therefore only included in the total column.

[b]Online courses or coaching include studies that use the computer or web for delivery of any aspect of PD.

QED = quasi-experimental design.

SCD = single-case design.

NA = not applicable.

Table I.4. Characteristics of studies included in the review, by setting

	Number of studies		
	Total[a]	Center-based care	Home-based care
Study design			
Empirical			
Experimental or QED	62	56	10
Implementation study	27	24	5
Descriptive—Non-psychometric or correlational	19	12	3
SCD	4	4	0
Descriptive—Psychometric	2	2	1
Regression discontinuity	1	1	0
Literature review or meta-analysis	16	10	11
PD approach used			
Coaching	73	62	14
Workshops	39	31	1
In-person courses	34	27	1
Mentoring/supervision	32	25	6
Curricula	22	18	3
Reflective supervision	14	11	3
Online courses	12	8	0
Intensive workshops	11	9	5
PD strategies used			
Opportunity for practice	59	51	12
Frequent feedback	57	49	12
Active learning	52	46	6
Quality observations	42	36	5
Modeling	40	33	11
Self-reflection	32	24	9
Goal setting	31	25	7
Coaching based on video-recorded practice	28	26	5
Trusting relationships	28	24	8
Use of technology			
Use of video	46	41	12
Online courses or coaching[b]	32	23	8
Social media	2	1	0
Other uses of technology (e.g., audiorecording, PDAs, mobile devices)	16	11	6
Agency setting			
Early Head Start or Head Start	49	44	9
Public prekindergarten	38	34	7
Child care	34	30	9
Total number of studies	122	101	26

Notes: As we describe in the introduction, home-based care includes home-based, FCC, and kith and kin settings. In some instances, studies used terms interchangeably or used the term "home based" to refer to caregivers other than only home visitors. Most of the reviewed studies focused on FCC providers, with one focusing on kith and kin settings and two on home visitors.

Some studies did not report PD approach, strategy, use of technology, or setting, and others reported more than one approach, strategy, use of technology, or setting.

[a]Studies that reported on more than one setting are double-counted in the setting columns. Thus, the total number of studies in the settings columns sum to more than 122. In addition, some studies did not report child age groups or early childhood settings and are therefore only included in the total column.

[b]Online courses or coaching include studies that use the computer or web for delivery of any aspect of PD.

QED = quasi-experimental design.

SCD = single-case design.

NA = not applicable

II. CONTEXT FOR THE LITERATURE REVIEW

Before summarizing findings from the literature, we offer contextual background relevant to the review. This includes a brief summary of what is known about supporting adult learning, the context of PD in infant/toddler settings, and gaps in the literature.

A. Supporting adult learning

The PD strategies that have been identified as helpful to early educators align with theories of developmental evaluation, process consultation, and adult learning in particular. Each of these theoretical perspectives recognizes the importance of creating a cooperative learning climate. Developmental evaluation (Dozois et al. 2010; Guss et al. 2013) emphasizes the importance of relationship building. Similarly, process consultation (Schein 1999) emphasizes the importance of a trusting, respectful relationship, goal setting, and use of affirmative feedback. Adult learning principles (Knowles 1970) recognize the importance of internal motivation, self-directedness, and respect for the learners and what they bring to the task. Adults bring life experiences and prior knowledge to their learning and thrive when learning is goal oriented, personally relevant, and practical. Assessment and recognition of the adult learner's motivation, experience, engagement in the learning process, and application of new learning are vital aspects of any learning experience. Active learning, combined with observation and individualized feedback, are key components of adult learning (U.S. Department of Education 2010).

Research also has highlighted the importance of the relationships between caregivers and PD providers. For instance, early childhood education (ECE) caregivers implementing a parent engagement intervention in Early Head Start and Head Start programs reported that supportive relationships with coaches were essential to the success of the intervention (Brown et al. 2009). Data from a nationally representative survey found the most important characteristic of mental health consultants in Head Start programs was their ability to build positive collaborative relationships with program staff members (Green et al. 2006). In a small-scale study with five teachers employed by a publicly funded community child care program, teachers noted they liked learning from the coach what they were doing well (Diamond and Powell 2011). These and other findings underscore the importance of the relationship-building skills of PD providers.

B. Context of professional development in infant/toddler settings: The ECE workforce and challenges in ECE settings

The PD needs of the ECE workforce—and the types of PD that will be effective for early childhood educators—are influenced by a number of contextual factors that are different than those influencing K–12 teachers (Whitebook 2014). Specifically, PD must account for ECE workforce demographics, lower levels of compensation and benefits, higher turnover rates, lower levels of education and training, less time and support for planning and PD, and the need to target the entire teaching team.

The ECE workforce is more diverse than the K–12 workforce in terms of race, ethnicity, and language(s) spoken (Whitebook 2014). For example, between one-third and one-half of ECE teachers are from racial and ethnic minorities, whereas 84 percent of K–12 teachers are white. Given the importance of the teacher-child bond in ECE, this diversity may help ECE teachers better meet the needs of the increasingly diverse children and families served. For example, a

teacher who speaks the child's home language may be better able to foster the child's school readiness and to engage with his or her family than a teacher who is unable to communicate with the child or family in their dominant language. The changing demographics of families served also require changes in PD, however, to ensure all ECE teachers can meet the needs of children from a variety of backgrounds.

Early childhood educators receive lower compensation than primary and secondary school teachers (Whitebook 2014). The highest paid teachers in school-sponsored prekindergarten settings earn 25 percent less than kindergarten teachers, on average. Teachers with bachelor's degrees in Head Start and community-based public prekindergarten programs earn just over half the average income of similarly educated women and just over one-third that of similarly educated men. Many ECE teachers earn wages that place them near the poverty level and must supplement them with public income support, such as Supplemental Nutrition Assistance Program (SNAP) benefits, Medicaid, and housing subsidies. In addition to lower pay, ECE teachers often lack benefits afforded to K–12 teachers (such as vacation, holidays, sick leave, planning time, and PD). These benefits vary widely by ECE setting and funding stream. These inequalities have, in turn, contributed to higher rates of teacher-level turnover in ECE than in K–12; the historic teacher-level turnover rate in ECE is about 30 percent annually, compared to 15 percent in K–12.

Systemic challenges like low wages and high turnover rates are especially problematic in infant/toddler settings (Moreno et al. 2015), making long-term change from PD efforts challenging to sustain. Recent findings from the NSECE (2013) indicate that caregivers serving children age three through five years earned wages that were 28 percent higher than those serving infants and toddlers. The inequality in wages was attributable in part to differences in education level and center funding or sponsorship; however, when those differences were taken into account, caregivers serving infants and toddlers still received lower pay (NSECE Project Team 2013). Although we lack national estimates of caregiver turnover rates disaggregated by child age, a negative correlation has been shown between turnover and wages (Moreno et al. 2015). Given the sensitive attachment period during the infant/toddler years and the associated best practice of providing a continuity of care, these challenges may pose barriers to effective PD (Moreno et al. 2015). Ultimately, these inequalities discourage academically advanced students from entering the ECE workforce, leading to education disparities between the ECE and K–12 workforces (U.S. Department of Education 2010).

In addition, although low literacy is not a universal issue within the ECE workforce, the 1992 National Adult Literacy Survey found about half of child care workers perform at the lowest levels of proficiency on standardized literacy assessments (Kaestle et al. 2001). More recent studies of child care providers in California found almost one-third of the providers in Alameda County had "limited proficiency" in English, based on their scores on the Test of Applied Literacy Skills (TALS) (Phillips et al. 2003). The disparities in teacher education levels are also influenced by differences in standards. Across states and types of school (private, public, and charter), the consensus is that a teacher of school-age children should have at least a bachelor's degree. No such consensus exists on an educational floor for caregivers in ECE, and the education levels of the K–12 and ECE workforces reflect these disparities. All K–12 teachers have bachelor's degrees, with nearly half holding advanced degrees; by contrast, just 45 percent of center-based ECE teachers have earned bachelor's degrees or higher (Whitebook 2014).

Within the ECE workforce, disparities in caregiver education and experience exist between preschool and infant/toddler settings as well as between center- and home-based settings. NSECE (2013) findings indicate that although 45 percent of caregivers serving preschoolers have at least a college degree, only 19 percent of those serving infants and toddlers do. Looking at the lower end of the educational spectrum, 13 percent of caregivers serving preschoolers have a high school diploma or less, compared to 28 percent of caregivers serving infants and toddlers. With regard to the disparity between center- and home-based settings, center-based caregivers typically have fewer years of experience (10 years for center-based caregivers versus 14 for home-based caregivers) and work fewer hours weekly (39 versus 54 hours). Each of these differences may have implications for PD efforts, particularly for caregivers in infant/toddler and in home-based settings.

In addition to having lower educational requirements, the ECE workforce are not consistently required to meet the same sort of "teacher preparation," pre-service training standards as K–12 teachers, and, unlike in the K–12 system, no widely accepted standard exists for the components of a high-quality ECE program of study (Whitebook 2014). Similarly, the ECE field does not have common requirements for the education and experience of its administrators, mentors, coaches, or teacher educators. Zwahr and colleagues (2007) note that many states do not have specific pre-service licensing requirements for infant/toddler caregivers, and the majority do not require any ongoing training or PD.

Environmental factors also shape the PD needs of the ECE workforce. The ECE field does not afford teachers and caregivers as much time and support for PD. Within the ECE workforce, those working with infants and toddlers often have less access to and fewer opportunities for sustained and systematic PD (Snyder et al. 2012; Ochshorn 2011). The ECE field also lacks common standards for PD, with PD requirements varying by funding stream and program type (Whitebook 2014). In a related matter, the sheer number of settings, variety of professional roles in these settings, and landscape of services and funding streams make it challenging to ensure consistent quality of PD activities across settings (IOM and NRC 2015). PD and learning efforts also can occur in a variety of settings (for example, in higher education institutions, community organizations that provide training, and workplace training and support), and support can occur through different systems—with some focused on individual caregivers and others happening more at the program level (IOM and NRC 2015). In terms of classroom structure, ECE requires a collective effort, with at least two teachers (or a teacher and an assistant) in each classroom. Thus, PD in ECE may need to target more than just the lead classroom teacher (Whitebook 2014), and evidence suggests it is more effective (that is, change is more sustainable) when teams of teachers participate (U.S. Department of Education 2010). PD efforts also vary in their focus, duration, and intensity. Each of these factors can affect the ways in which PD efforts are implemented, their efficacy, and, ultimately, the implications we can draw from them.

Infant/toddler settings also face other systematic barriers that may inhibit the feasibility or effectiveness of PD interventions. For example, the child-adult ratios in infant/toddler settings fall short of best practice recommendations in most states (Lally 2013). Although failing to meet recommended child-adult ratios would be problematic in any ECE setting, it is especially problematic in infant/toddler settings for two reasons. First, infancy and toddlerhood are arguably the developmental periods in which individual attention is most urgent (Moreno et al. 2015). Second, the developmentally normative ranges for all learning domains can vary widely

across children and change quickly for each individual child, so better child-adult ratios better enable caregivers to meet the needs of each individual child (Lally 2013; Moreno et al. 2015). Without strong child-adult ratios, teachers may struggle to provide the individualized care that is critical to high-quality caregiving during this developmental period. Thus, although PD may equip caregivers with the skills and knowledge they need to deliver high quality care, caregivers may struggle to put those skills and knowledge to use in a real-world setting. This mismatch between the realities of those care settings and the needs of infants and toddlers may pose particular barriers to PD efforts (Moreno et al. 2015).

Moreno and colleagues (2015) posit that PD efforts in infant/toddler settings may face unique challenges in that the skills needed to improve professional practice in infant/toddler settings may be more difficult to adopt than those in preschool settings. For example, PD goals in preschool settings focus on at least some specific academic skills. These academic skills may be easier for a teacher to adopt than PD goals in infant/toddler settings that focus more broadly on ways of being or interacting that foster children's social-emotional development. Furthermore, within the domain of social-emotional connectedness, the global ways of being targeted in infant/toddler settings may be more difficult to achieve than some of the more distal expressions targeted in preschool settings, such as smiling or offering supportive words from a distance (Gasbarro et al. 2009; Moreno et al. 2015).

Thus, there is a particularly strong need for attention to certain caregiving skills in infant/toddler settings, with implications for the focus of PD efforts in these settings. For example, Moreno and colleagues (2015) note that, in recent studies, caregiver-child interactions in infant/toddler settings have demonstrated a lack of joint attention, limited opportunities for language stimulation, and inappropriate contingent responses (such as no response at all or abrupt termination of interactions). These patterns suggest the importance of PD efforts targeted at supporting caregiver-child interactions, above and beyond those traditionally focused on supporting standards of safety and quality. As compared to preschool settings, the nature of caregiver-child interactions in infant/toddler settings may also be more closely tied to caregivers' own attachment style or stance toward intimacy (Biringen et al. 2012; Moreno et al. 2015). For example, Vallotton and colleagues (2016) found that the attachment style of caregivers' enrolled in pre-service ECE coursework was related to their knowledge about infant/toddler development, attitudes about adult support for child development, and developmentally supportive interaction skills. As Moreno and colleagues (2015) note, the scarce research on the effectiveness of PD targeting caregivers' interactions with infants and toddlers have reported small or null intervention effects. Such factors, therefore, may pose additional barriers to change and PD efficacy in these settings.

Finally, PD efforts in infant/toddlers settings must navigate two challenges: low levels of quality in some settings and a lack of rigorous research about how to improve quality in those settings. In the 1990s, substandard quality of care for infants and toddlers was identified as a "quiet crisis" in early childhood (Weinstock et al. 2012; Carnegie Corporation 1994). More recent studies indicate a continued need for quality improvement. For example, Baby FACES, a descriptive study of Early Head Start programs, found mid-range quality ratings for Early Head Start classroom quality using the Classroom Assessment Scoring System-Toddler (CLASS-T; LaParo et al. 2012; Aikens et al. 2015). Since the 1990s, PD initiatives have aimed at increasing the quality of care for infants and toddlers, such as the National Infant and Toddler Child Care

Initiative and state child care quality initiatives. However, the field lacks a substantial body of rigorous research on the effectiveness of approaches to PD for infant/toddler caregivers (Weinstock et al. 2012).

C. Gaps in the PD literature

The literature points to gaps in three primary areas: what is known about the efficacy of PD strategies; what is known about the availability of PD, recipients of PD, and the settings in which they work; and shortcomings in the research and its rigor. Next, we describe some of the gaps in each of these areas.

1. What is known about the efficacy of PD strategies

The literature highlights factors considered important for PD efforts;[5] however, those characteristics are not always well defined for translation into the design and delivery of PD (Artman-Meeker et al. 2015; Schachter 2015; U.S. Department of Education 2010). For example, the literature recognizes the importance of targeting caregiver skills, knowledge, and beliefs and in providing "ongoing" or "hands on" support, but those terms are not always well defined in the literature (Schachter 2015). As a result, PD developers must attempt to operationalize these terms, and they may do so inconsistently. The lack of specificity in the literature leads to variability in the design and implementation of PD efforts. In ECE settings in particular, the targets of PD efforts may be guided by theory, with little evidence for how those efforts will ultimately effect change for children (Schachter 2015) or how they should be implemented to achieve change (Artman-Meeker et al. 2015). In addition, more needs to be known about the efficacy of the full range of PD approaches (Schachter 2015), especially those most effective for caregivers working with infants and toddlers (U.S. Department of Education 2010). Gaps in the literature also remain regarding PD efforts that target caregivers' cultural and linguistic competence in an increasingly diverse early childhood population (U.S. Department of Education 2010), published studies do not always include details about how researchers design and deliver PD and measure change associated with those efforts (Schachter 2015). Questions also remain around PD efforts targeting pedagogical content areas beyond language and literacy (Schachter 2015) as well as how to integrate content across early learning domains (Powell et al. 2013; U.S. Department of Education 2010).

2. Availability and recipients of PD

A review of the research on PD in early childhood found that the literature is largely focused on caregivers working (1) in center-based settings, such as prekindergarten programs and Head Start, which constitute less than one-quarter of the workforce, and (2) with preschool-age children (U.S. Department of Education 2010). Recent national surveys provide some descriptive information about receipt of PD among caregivers in licensed and unregulated home-based settings (NSECE Project Team 2015), but the quality and intensity of these efforts is unknown. More research is also needed about PD within settings serving infants and toddlers (IOM and NRC 2015). In addition, the U.S. Department of Education (2010) review identified a need for

[5] For example, the literature emphasizes the use of approaches that pair one-time PD events with ongoing efforts such as coaching and the use of strategies such as trusting relationships, goal setting, frequent feedback, the use of video vignettes and video-recorded observations, modeling, and active learning.

research on when to deliver PD (that is, pre-service or in-service) and how best to tailor PD strategies by setting (community-based prekindergarten, public prekindergarten, center-based child care, Head Start, and home-based child care).

3. Shortcomings in the research

The PD review by the U.S. Department of Education (2010) also indicated a need for increased rigor in studies of professionals in early childhood in terms of the methods and analytical strategies used—including the design of experimental studies, the reporting of effect sizes, and accounting for "nesting" of children within classrooms and programs—and called for studies that report on all three outcomes identified as important in the literature: caregiver's knowledge, caregiver's practice, and child outcomes.

III. KEY FINDINGS FROM THE LITERATURE

This chapter summarizes information across the relevant studies and identify themes. When reporting findings, we organize the discussion around the questions that guided the literature review. Finally, we identify implications for the development of the Q-CCIIT PD Tools conceptual model and PD materials. We focus on information extracted from studies focused on caregivers serving infants and toddlers (n=31) and derived from studies with caregivers in home-based settings (n=26). However, given the small number of applicable studies, in some areas we also refer to studies focused on preschool children or the broader ECE literature. We distinguish between findings from descriptive and implementation studies and those from experimental and quasi-experimental studies. We summarize key findings from the literature to address the study research questions (noted in Chapter I). In the first three sections, we highlight key messages from the broader ECE literature, the prevalence of specific tools and strategies in the infant/toddler and home-based literature, and findings primarily from infant/toddler and home-based studies that have implications for the development of the Q-CCIIT PD Tools.

In our discussion, we make a distinction between PD "tools/approaches" and "strategies." By "tools and approaches," we mean the vehicle by which PD is delivered or *how* it is delivered (for example, coaching, online course, or workshop). "Strategies" refer to the elements used in PD efforts or *what* is a part of those approaches (for example, frequent performance feedback, building of trusting relationships). In other words, each tool or approach may include a range of strategies when implemented. As we discuss in subsequent sections, most tools/approaches and strategies have not been studied in isolation and instead are typically bundled together. As a result, we cannot identify their independent influence on caregiver practice or child outcomes. Table B.1 in the appendix provides a glossary of key terms used throughout our discussion.

A. What PD tools/approaches are used in settings serving infants/toddlers? In home-based settings?

In this section, we highlight the PD tools and approaches discussed in the literature, prevalence of those tools and approaches in infant/toddler and home-based settings, and key findings from the literature. Box III.1 highlights key messages from the literature in this area.

Box III.1. Key messages from the literature: PD tools and approaches

- A limited number of studies focus on caregivers in infant/toddler or home-based settings, but the broader literature discusses tools and approaches useful for these two groups.
- Although there is positive evidence for isolated PD approaches like workshops, growing consensus suggests that such efforts may not be as effective at sustaining caregiver or child outcomes as ongoing PD efforts.
- Coaching is the most commonly cited approach to PD in the literature, including in infant/toddler and home-based studies.
- Coaching is most effective when it is sustained, actively engages caregivers, and emphasizes positive and respectful coach-caregiver relationships.
- More intensive delivery, such as multi-day workshops coupled with coaching, are most supportive of caregiver practice.

1. Key PD tools and approaches in the broader ECE literature

Although a limited number of studies targeted caregivers in infant/toddler or home-based settings, the literature discussed a variety of PD tools and approaches helpful to early childhood practitioners more broadly that may also be useful for those two subgroups. The most common approaches include coaching, mentoring/supervision, reflective supervision, curricula, online and in-person courses, workshops, and intensive workshops, with

coaching and workshops (Snyder et al. 2012; Artman-Meeker et al. 2015; Aikens and Akers 2011; U.S. Department of Education 2010; IOM and NRC 2015;; Hernandez et al. 2015; Schachter 2015). As depicted in Tables I.3 and I.4, coaching is by far the most commonly cited approach to PD, both across studies as well as within each subset of studies by age (infant/toddler and preschool) and setting (center based and home based).

The available literature on PD tools and approaches indicates that traditional approaches to PD such as workshops can increase early childhood caregivers' knowledge about intervention practices, but there is a growing consensus that isolated training workshops may not be as effective at improving caregivers' instructional practices or children's outcomes (Schachter 2015). Instead, intensive workshops or ongoing PD efforts such as one-on-one coaching may best sustain caregivers' use of those practices and foster fidelity of implementation (Artman-Meeker et al. 2015; IOM and NRC 2015; Mattera et al. 2013; U.S. Department of Education 2010). A sustained, intensive approach to PD that layers interconnected workshops, coaching, and peer networks or learning communities may enhance caregivers' understanding and implementation of evidence-based instructional practice, thereby enhancing child learning outcomes (IOM and NRC 2015). In fact, there is an increasing trend towards using workshops in conjunction with other PD methods (Schachter 2015). Across methods of delivery, more intensive delivery such as multiday institutes accompanied by follow-up coaching appears to be the most effective (Artman-Meeker et al. 2015; Dunst et al. 2015). Evidence from a recent state prekindergarten PD evaluation, however, suggests that coaching may not always be more effective than other PD efforts (Early et al. 2014). In that study, intensive workshops—coupled with online resources, a community of learners, and active learning activities—led to better caregiver-child interactions than an online coaching approach.

Given indications that coaching may be a key approach to ECE PD, the coaching literature is of particular interest. The literature suggests that coaching can have positive effects on curriculum implementation, classroom environmental indicators, classroom instruction, teacher-child interaction, and child outcomes. However, the research does not consistently isolate the effects of coaching from other PD approaches, and the most critical aspects of coaching remain unclear (Aikens and Akers 2011). Coaching can be delivered in a variety of ways (in the classroom or via the web, immediately following an observation or later), but it may be most effective when it is sustained, systematic, directly linked to the intervention practices, and characterized by positive and respectful coach-caregiver relationships that actively engage caregivers (Aikens and Akers 2011; Artman-Meeker et al. 2015).

2. Prevalence of key PD tools/approaches in infant/toddler and home-based studies

As mentioned above, we identified a number of studies in infant/toddler and home-based settings in our review that used the following PD approaches: coaching, mentoring/supervision, reflective supervision, curricula, online and in-person courses, workshops, and intensive workshops. Tables I.3 and I.4 present the number of studies focused in each of these areas by age and ECE setting. In infant/toddler settings, whether center-based or home-based, the most commonly cited approach was coaching, followed by mentoring/supervision, workshops, and reflective supervision. In home-based studies, coaching was again the most commonly cited approach, followed by mentoring/supervision and intensive workshops. In addition to literature reviews and meta-analyses, the studies used a variety of designs, including experimental and

quasi-experimental, single subject designs, and pre-post studies. Below, we present findings related to PD approaches from a selection of these studies.

3. Key findings in the literature with implications for Q-CCIIT PD tools

Coaching paired with workshops or coursework can have positive effects on the quality of care for infants and toddlers, such as enhanced caregiver-child interactions and improved teacher knowledge and practice in infant/toddler settings (Moreno et al. 2015; Cain et al. 2007). For example, one study indicated that providing infant/toddler caregivers with both coursework and coaching can have a greater impact on quality of care than coursework alone (Moreno et al. 2015). Caregivers receiving both coursework and coaching showed more favorable results in terms of their job-related self-efficacy, knowledge of best practices, and quality of interactions with children. The most favorable results were in quality of interactions with children; within that, the quality was best for interactions supporting language and learning. This is significant because language and learning is the area found to be in greatest need of improvement for infant/toddler caregivers, both in this study and in prior research (Moreno et al. 2015).

The literature also points to approaches other than coaching that hold promise for caregivers working with infants and toddlers. For example, one study of infant caregivers employed a PD approach that provided opportunities for dialogic conversations between infant caregivers with both their peers and researchers who presented themselves as "co-learners" rather than experts (Goouch and Powell 2013). The study indicated that dialogic encounters can positively influence caregiver-child interaction as well as caregivers' beliefs and reflective practice in infant/toddler settings. Early on, the dialogic encounters revealed that "practitioners were not routinely, incidentally or intuitively talking to the babies in their care, nor were they aware of the importance of doing so" (Goouch and Powell 2013, p. 78). In their final evaluations of the PD, caregivers indicated that they had started to talk more to the infants in their care and had gained a greater sense of their own importance in fostering the infants' development ("It's made me realize how important our role is in babies' lives," p. 88) and begun to reflect on their own practice ("I now sometimes question what I do, and who it actually benefits," p. 88).

With regard to home-based caregivers (including home visitors, FCCs, and kith and kin childcare providers, as noted previously), studies suggest that coaching and other one-on-one forms of PD can be effective. In one study, center-based and FCC caregivers working with preschool-aged children were randomly assigned to a control group or one of two treatment groups: Group 1 members took a three-credit early language and literacy course, whereas Group 2 members took the course and also received ongoing coaching (Neuman and Cunningham 2009). Both the course and coaching were intensive, with 45 hours of coursework over 15 weeks (plus outside assignments) and 64 hours of coaching over 32 weeks. The coursework was especially intensive when compared to other training studies that average five or six sessions and range from one to six hours (Fukkink and Lont 2007; Neuman and Cunningham 2009). Both center-based and FCC providers in Group 2 had statistically significant improvements in language and literacy practices with substantial effects compared to either the control group or Group 1. Group 1 members saw negligible effects in their language and literacy practices. The authors conclude, "Home providers who received coaching, in fact, demonstrated changes in practice so dramatic as to be essentially on par with quality practices in center-based care. These results also suggest that PD and coaching can be facilitative in multiple contexts" (Neuman and

Cunningham 2009, p. 557). Given the intensity of the coursework, the authors also note the surprisingly modest growth in teacher knowledge and improvement in language and literacy practice for Group 1.

Another study showed promising results for a PD intervention for FCC providers delivered one-on-one by a home visitor (Collins et al. 2010). A total of 153 FCC providers were randomly assigned to either a control group or a treatment group that received two home visits per month over the course of two years to train them in the delivery of LearningGames, an early childhood education program consisting of one-on-one game-like interactions with children to stimulate language, cognitive, and social-emotional development. For the FCC providers who received up to two years of home visits, LearningGames demonstrated positive impacts on their engagement in high-quality small group and individualized interactions with children.

In a study of a statewide mentoring program, FCC providers received weekly or bi-weekly home visits averaging 2 to 2.5 hours (Abell et al. 2014). Mentoring visits involved coaching and modeling around mutually agreed-upon quality improvement goals. The program also provided periodic group training sessions, linkages and referrals to other sources of PD, and professional networking opportunities. The study found that, compared to baseline scores measured at enrollment, program participants demonstrated significantly higher scores on the Family Day Care Rating Scale (FDCRS) after an average of 21 months (Harms and Clifford 1989). The authors also studied the association between increases in observed quality and self-reports of FCC providers' professional engagement (membership in professional associations and number of professional contacts) for a subsample of providers who had participated in the program for an average of 41 months. The study found that an increase in observed quality was significantly associated with an increase in professional engagement.

B. What PD strategies are used in settings serving infants/toddlers? In home-based settings? What are caregivers' perspectives on these strategies?

Next, we highlight the PD strategies discussed in the literature, the prevalence of these strategies in infant/toddler and home-based settings, and key findings from the literature, including caregiver perspectives on these strategies where feasible. We note when any of the reviewed studies include preschool settings. Box III.2 highlights key messages from the literature in this area.

Box III.2. Key messages from the literature: PD strategies

- Active-learner strategies—particularly practicing, evaluating strengths/weaknesses and experiences, reflecting on performance, and self-assessment—are strongly associated with caregiver outcomes.
- The development of positive provider-caregiver relationships is critical to PD efforts.
- Performance feedback is also a key means for supporting caregiver outcomes, particularly feedback that is positive, constructive, specific, and immediate.
- Using a combination of PD strategies may foster better caregiver outcomes.

1. Key PD strategies in the broader ECE literature

Although our review identified a small number of studies focused on caregivers serving infants and toddlers and those in home-based settings, the available PD research points to strategies helpful to ECE caregivers more broadly that may also benefit infant/toddler caregivers. Such strategies include the formation of trusting

relationships, goal setting, the opportunity for practice, frequent feedback, the use of video vignettes, modeling (video or live), active learning, self-reflection and coaching based on video-recorded practice, and quality observations (Fukkink and Lont 2007; Guss et al. 2013; IOM and NRC 2015; Trivette et al. 2012; Weinstock et al. 2012; U.S. Department of Education 2010). Other studies also report strategies such as follow-up performance feedback based on direct observations as means for supporting caregiver change (Krick Oborn and Johnson 2015). Also critical is the approach selected for delivery of PD activities (Dunst and Trivette 2009; Guss et al. 2013; Pianta et al. 2008, 2014a, 2014b; Hamre et al. 2012; Lee et al. 2012; Vick Whittaker et al. 2015). For example, findings from a large-scale meta-analysis study indicated that adult-learning approaches that include active-learner participation had the largest effect sizes on study outcomes (Dunst and Trivette 2009; Trivette et al. 2012). These included practicing (real-life application, role playing, problem solving), evaluation (assessing strengths/weaknesses, reviewing experiences and making changes), reflection on performance, and self-assessment. The study examined the efficacy of adult-learning strategies in terms of how new information is presented to learners, how learners are engaged in the application of information, and how learners' deep understanding is promoted. Strategies that focused more on how the instructor or coach presents new material (for example, introduction of materials and illustrating/demonstrating skills) produced medium effect sizes, and there was an upward trend in effect sizes when a combination of strategies (whether active learner and/or instructor driven) was used.

2. Prevalence of key PD strategies in infant/toddler and home-based studies

We identified a number of studies in infant/toddler and home-based settings using the following PD strategies: goal setting, opportunity for practice, frequent performance feedback, modeling, active learning, self-reflection, coaching based on video-recorded practice, and quality observations. Tables I.3 and I.4 note the number of studies focused in each of these areas, by age and ECE setting. Quality observations, frequent feedback, and opportunity for practice were the most common strategies employed in the infant/toddler studies we reviewed. Similarly, frequent performance feedback, opportunity for practice, and modeling were most commonly cited in home-based studies. Examples of performance feedback in the literature included face-to-face feedback (Rudd et al. 2008), email feedback (Krick Oborn and Johnson 2015), check-list based feedback (Biringen et al. 2012), audio-recorded feedback of teachers' performance in real time (Ottley and Hanline 2014), and annotated videos of caregiver performance (Brown et al. 2009; Early et al. 2014). In many instances, although frequent feedback is cited as a PD strategy, the nature of that feedback is not specified. Quality observations overwhelmingly included global quality measures of the environment (for example, the Infant/Toddler Environment Rating Scale-Revised or the Family Child Care Environment Rating Scale-Revised) and other well-known measures of teacher-child interactions (for example, the Classroom Assessment Scoring System [CLASS] or the Arnett). In addition to literature reviews and meta-analyses, the studies used a variety of designs, including experimental and quasi-experimental, single subject designs, and pre-post studies.

3. Key findings in the literature with implications for Q-CCIIT PD tools

Evidence from the reviewed studies highlights the importance of the relationship between the PD provider and the center- or home-based caregiver (henceforth referred to as the provider-caregiver relationship). For instance, Early Head Start and Head Start caregivers participating in

a parent engagement intervention considered supportive relationships with their coach to be critical to the intervention's success (Brown et al. 2009). In fact, when the coaching relationship was felt to be lacking, caregiver commitment to the intervention and willingness to be involved diminished. Similarly, preschool caregivers in the Midwest valued the skills and knowledge of their coach (Knoche et al. 2013), with caregivers reporting value in their relationships with their coaches and both personal and professional growth through partnerships with their coaches. The training of the coaches involved in this study included substantial content on promoting effective dyadic relationships with families, child care providers, and preschool teachers. The authors stress the importance of developing and engaging quality provider-caregiver relationships in PD efforts.

Several studies highlighted the important role of performance feedback, particularly positive and constructive feedback. For example, in a qualitative study focused on early childhood practitioners' perspectives on PD efforts (Brown and Inglis 2013), coaches acted as models for giving feedback and praise, and caregivers of toddlers felt these experiences helped them better respond when interacting with families in their caseload. Work by Ottley and Hanline (2014) focused on the provision of ongoing, performance-based feedback to infant/toddler caregivers via bug-in-ear technologies (i.e., small, wireless, one-way communication instruments that allow the coach to communicate privately with a caregiver during observation). The authors found that such an approach to performance feedback was associated with improved implementation of targeted communication strategies. The author highlights the importance of feedback that is positive, corrective, specific, and immediate. Krick Oborn and Johnson (2015) described findings from a PD study that included two brief workshops and six weeks of coaching and performance feedback delivered via email. In this study, all infant/toddler home visitors showed an increase in the use of strategies targeted by the PD following the six weeks of performance feedback. Feedback began with positive statements, followed by corrective feedback, planned actions, and closing encouragement. The feedback ended with a final question or reflective prompt. The authors argue that the use of technology for performance feedback may be especially useful in remote contexts. In addition, in a qualitative study focused on the benefits and challenges of ECE coaching relationships (Knoche et al. 2013), preschool teachers reported viewing performance feedback as a pathway to improved practice. Feedback was positive in nature and was offered as suggestions for change. Teachers reported that feedback (along with other elements of coaching) was helpful for ensuring the application of targeted practices. In a study of a statewide mentoring program (Abell et al. 2014), mentoring of FCC providers used a range of active learning methods, including demonstration, modeling, reflective feedback, discussion, one-on-one teaching, and joint review of print materials or audio/visual resources. As noted earlier, program participants had significantly better FDCRS scores at the end of the program.

Finally, Artman-Meeker and colleagues (2015) recently conducted a review of PD strategies in ECE settings. They identified eight studies in ECE settings focused on online coaching. Although not focused exclusively on infant/toddler or home-based settings, the review highlights the range of strategies employed in ECE PD studies with an online component. Almost all (seven out of eight) studies provided feedback to participants, with one study providing the feedback in email rather than direct communication. The online platforms in these studies incorporated manuals for teachers about the practices (n = 5), ongoing practice plans (n = 4), self-reflection by teachers (n = 3), video models (n = 3); progress monitoring (n = 2); action plans (n = 2); and one

provided help with instructional materials needed to implement the practices. Although 30 percent of coaches received training on content, less than 30 percent of the studies reported offering support for how to coach. When training was reported for coaches in these studies, coaches received guidance on topics such as relationship building, setting measurable and attainable goals, how to collaboratively create action plans, how or when to model, conducting structured observations with clear goals, guiding self-reflection, and provision of effective performance feedback

C. How is technology used in PD efforts in settings serving infants/toddlers? In home-based settings? What are caregivers' perspectives on the use of technology?

Turning to use of technology, we highlight how technology has been in the PD literature, their prevalence in infant/toddler and home-based settings, and key findings from the literature, including caregiver perspectives on these strategies. Box III.3 highlights key messages from the literature in this area.

1. Key uses of technology in the broader ECE literature

Recent reviews have identified a number of ways that technology has been used as a mode for PD delivery in ECE settings (Artman-Meeker et al. 2015; Hernandez et al. 2015). These include (1) use of video, (2) online coaching or coursework, (3) social media, and (4) other technologies like audio recordings, personal digital assistants (PDAs), or mobile devices. Online or distance learning in particular is an emerging vehicle for providing PD to caregivers in a convenient, flexible, and accessible fashion (Chen et al. 2009). For caregivers working in more remote locations, online tools can be a both cost-effective and effective approach to providing PD (Krick Oborn and Johnson 2015). Online efforts may employ other uses of technology, including video.

Box III.3. Key messages from the literature: Technology use

- The most common use of technology in the literature is use of video. Video is a particularly supportive tool for coaching and the provision of performance feedback.
- Online tools can be a cost-effective and effective approach to providing PD, particularly for caregivers in more isolated settings. Caregivers in the research literature highlight the value of connecting with other learners.
- In research studies, caregivers using online tools for PD appreciate supplementing online content and activities with in-person contact, including contact with others in their local program.
- Technical support, including initial orientation to technology and ongoing logistical support, is an important consideration for any online approach.

2. Prevalence of technology use in infant/toddler and home-based studies

Of the 28 studies focused on infant/toddler settings that we reviewed, few employed technology as a mode for PD delivery (see Table I.3). Studies focused on home-based settings reported the use of technology more commonly than infant and toddler studies (see Table I.4). In addition to literature reviews and meta-analyses, the studies used a variety of designs including experimental or quasi-experimental, single-subject designs, and pre-post studies. In both infant/toddler and home-based settings, many studies did not employ specific aspects of technology in isolation and instead used some combination of technologies. No studies focused

on evaluating the impact or influence of technology alone on program, caregiver, or child outcomes.

3. Key findings in the literature with implications for Q-CCIIT PD tools

Use of video. Across the reviewed studies, the most common technology employed was use of video, for both learning and communication. In fact, video was used in 7 infant/toddler studies and 12 home-based studies. The studies used video modeling (for example, Kyzar et al. 2014; Rudd et al. 2008), coaching or feedback based on video-recorded practice (for example, Biringen et al. 2012; Goouch and Powell 2013; Krick Oborn and Johnson 2015), and video conferencing (for example, Chen et al. 2009). Video-based technology was typically employed in conjunction with online approaches.

The reviewed studies highlight the supportive role of video in PD efforts, particularly for coaching and the provision of performance feedback. For example, in a study conducted by Biringen and colleagues (2012), infant/toddler caregivers watched videos jointly with their coach and discussed what they saw and how to improve interactions. Caregivers receiving the intervention showed improvements on measures of emotional availability. Krick Oborn and Johnson (2015) also found that infant/toddler home visitors who received two brief workshops (workshop phase of the PD) and six weeks of coaching and performance feedback based on video-recorded practice (performance feedback phase of the PD) showed an increase in the use of targeted coaching strategies with parents during the performance feedback phase of the PD.

Online coaching or coursework. Three studies in infant/toddler settings and eight in home-based settings focused on the use of online coaching or coursework. These studies report the inclusion of digital copies of articles, content, or materials (for example, Chen et al. 2009; Early et al. 2014; Kyzar et al. 2014), online interactions and discussions (for example, Chen et al. 2009), and online or email feedback (for example, Early et al. 2014; Krick Oborn and Johnson 2015). Like video, online technologies were used in studies for both imparting information and communicating.

Two studies employing online coursework suggest the importance of supplementing online content and activities with in-person contact. Following a 16-week online PD course, caregivers of infants with multiple disabilities perceived themselves as more knowledgeable on key strategies, and they emphasized the importance of online discussions with peers coupled with face-to-face sessions (Chen et al. 2009). The online course included electronic modules on specific topics (presented via text and graphics), course vignettes, description of key terms and strategies, video exemplars of strategies, online discussion questions (with peers and instructors), online quizzes and assignments, a mid-point video conference session, and initial and final face-to-face meetings. Similarly, an online PD course for caregivers in home-based settings (Kyzar et al. 2014) employed online content modules, video exemplars, downloadable documents, and multimedia learning tools (video, audio, graphics). Weekly mentor coaching sessions, focused on the online content and on development and feedback on caregiver action plans, were also included. Caregivers in this study were particularly satisfied with the availability of multimedia tools and downloadable resources in the online course. They also found coaching sessions to be useful but indicated the importance of having face-to-face contact with support staff locally.

Chen and colleagues (2009) suggest that technical support, including initial orientation to technology, are important considerations for any online approach. Some caregivers reported technology-related issues that made logistics for videoconferences, accessing video clips, use of the CD-ROM, participating in online discussions on the course web site, and taking quizzes online as somewhat difficult. In addition, the online course was the first online instructional experience for the majority of participating caregivers in the study. Other studies in our review also cited technological challenges (Hollingsworth and Lim 2015). The ability to access online coursework at home (versus at the office) was also challenging for some home-based caregivers (Kyzar et al. 2014).

Findings from Chen and colleagues (2009) also highlight the importance of caregiver connection with other learners, including those in their local program. Participants in the online course preferred enrolling with colleagues from their own early intervention agency and having opportunities for face-to-face interaction with them. This allowed for ongoing discussions on the job. For caregivers whose practice took place largely in isolation, such as those in rural areas, online discussions provided collegial support that was not present in their work environments. Regardless of whether caregivers worked in more isolated settings, their feedback suggested an appreciation for being able to interact with professionals with varied knowledge and background. Prior research indicates that involvement of multiple staff members (for example, assistant and lead teachers or the administrator and others on the team) can support successful implementation and sustainability (Mattera et al. 2013; U.S. Department of Education 2010).

Social media. As noted by Hernandez and colleagues (2015), social media may also be used for PD delivery. Such approaches employ the use of social media networking sites, blogs, and online forums in order to provide information and connect professionals. Only one infant/toddler study explicitly mentioned the use of social media (Goouch and Powell 2013),[6] but the discussion boards incorporated in online courses may serve a similar purpose. For example, the online forums described by Chen and colleagues (2009) allowed caregivers of infants to post questions, strategies, and resources beyond the specific discussion topics in the course.

Other technologies. Two infant/toddler studies and six home-based studies in our review employed the use of other technologies. In the infant/toddler study, bug-in-ear technology was used,[7] whereas efforts-to-outcomes (ETO) software (for tracking goal progress), DVDs, multimedia tools (audio and video), and mobile devices were used in the home-based studies. In the infant/toddler setting (Ottley and Hanline 2014), bug-in-ear technology improved caregivers' strategy implementation for providing wait time, offering choices, and modeling and reinforcing language. Caregivers felt that the technology supported their learning of targeted strategies, their understanding of how to implement the strategies within play routines, and their self-efficacy.

[6] This study did not describe the use of social media and only noted that a social networking site was incorporated as part of the study's PD effort.

[7] As noted previously, bug-in-ear technology consists of small, wireless, one-way communication instruments that allow the coach to communicate privately with a caregiver during observation.

D. What do we know about effective PD strategies for supporting interactions between caregivers and children, particularly for infants and toddlers?

Given the importance of responsive interactions and support for social-emotional development of infants and toddlers (Halle et al. 2011) and its centrality in the Q-CCIIT (Atkins-Burnett et al. 2015), we examined studies that focused on changing caregiver interactions or practices supporting social-emotional development, including curricula designed to support social and emotional development. Our literature review revealed some studies that addressed different areas of support for caregiver-child interactions and children's social-emotional development.[8] These studies included a focus on caregivers' emotional availability (Biringen et al. 2012), caregivers' positive behavior support (Muscott et al. 2009), caregiver-child joint attention (Rudd et al. 2008), as well as social-emotional curriculum (for example, Domitrovich et al. 2009; Morris et al. 2014; Weinstock et al. 2012) and multiple evidence-based practices in supporting social and emotional development (Artman-Meeker et al. 2015; Hemmeter et al. 2013; Snyder et al. 2015). The studies used a variety of designs, including cluster randomized controlled trials, quasi-experimental, single subject designs, and pre-post studies. We found one meta-analysis in this area. Only three of the reviewed studies focused solely on infant/toddlers. Our discussion in this section, therefore, focuses on findings across all of the reviewed studies. Box III.4 highlights key messages from the literature in this area.

Box III.4. Key messages from the literature: Findings on caregiver-child interactions

- The literature points to positive associations between PD and caregiver-child interactions. There are also typically positive links between PD and children's social-emotional outcomes, although some findings have been mixed or null.
- PD can successfully influence caregiver practice even within a short timeframe, particularly when focused on discrete practices.
- Caregivers need more support for developing skills to implement more complex curricula and approaches.
- Most, although not all, of the PD approaches in the reviewed studies include some type of coaching or observation and feedback. Opportunities for practice and the use of video are also common.

Overall, the results were very encouraging regarding the effectiveness of PD in improving caregiver-child interactions and social-emotional practices including those associated with social-emotional curriculum. All but two of the studies that looked at PD in these domains took place only in centers, and the majority were with preschool children. The studies used a variety of PD strategies, with many including coaching or mentoring and opportunities for practice. Almost all of the studies had at least one positive finding in relation to caregiver practices. In this literature, change in caregiver practices is an intermediate finding and the ultimate outcome would be improvements in child outcomes. Studies that reported child outcomes typically also had positive results. Five studies had mixed results either in teacher practices and/or child outcomes (Gilliam 2014; Gloeckler et al. 2014; Jensen et al. 2015; Lambert et al. 2015; Morris et al. 2014). One study that attempted to change infant/toddler caregiver interactions and practice across many different areas had no favorable experimental results, but did find that intervention classrooms that implemented with more

[8] Given ongoing questions around PD efforts targeting pedagogical content areas beyond language and literacy (Schachter 2015), we focus our discussion on studies targeting social-emotional practices and development.

fidelity had more positive child outcomes compared with those that did not (Weinstock et al. 2012).

The Head Start CARES demonstration (Morris et al. 2014) resulted in changes in targeted teacher practices (as assessed by the CLASS, among other measures) for all three of the curricula that were tested. The demonstration employed a combination of trainings, coaching and reflective supervision and found some positive impacts for the Incredible Years teachers in the areas of classroom management and social-emotional instruction, as well as reduction in problem behaviors for children at highest risk. However, the study did not find other positive child outcomes for Incredible Years. Similarly, Preschool PATHS' teachers had stronger social-emotional instruction than the comparison teachers, and small to moderate impacts were noted for children's emotion knowledge, social behavior, and social problem solving skills, but there was no change in children's learning behaviors, executive functions, or problem behaviors. In Tools of the Mind classrooms, teachers scaffolded children's pretend play and peer interactions more than teachers in the comparison group, and they provided stronger literacy instruction, but did not differ from the comparison group on any of the CLASS domains. Children in the Tools of the Mind classrooms only demonstrated improvement in knowledge of emotions compared to their peers.

The Head Start CARES social-emotional curricula differed in the level of specificity or support provided to teachers in terms of scripted lessons and opportunities for teachers to practice more complex strategies such as scaffolding. The Head Start CARES implementation study (Mattera et al. 2013) noted that "it was easier for teachers to implement an enhancement that was scripted and that involved activities or skills with which they were familiar" (p. 53). However, across programs, the implementation study found improvement in teacher practices in the intervention classrooms compared with the business as usual classrooms. On average, all of the curricula in Head Start CARES were implemented at or above the defined "satisfactory" level of implementation. The teacher's age and motivation to implement the practices were associated with fidelity of implementation. Based on qualitative data, the implementation study attributed stronger fidelity of implementation to the comprehensiveness of the PD with ongoing training and coaching, ongoing technical assistance with monitoring of implementation and technical assistance for coaches and classrooms, capacity and support from the organization; alignment with organization's philosophy and curriculum, and strong articulation of how to implement key practices (Mattera et al. 2013).

In a very small quasi-experimental study, Gloeckler and colleagues (2014) examined the influence of 3-1/2 hour-training sessions on teacher social-emotional practices, classroom behavior problems, and classroom quality. The study noted positive differences in classroom quality for the intervention versus control sites on the Toddler CLASS, particularly in areas related to social-emotional support (for example, positive climate, negative climate, and behavioral guidance). The researchers calculated change scores comparing phases 1 (initial PD training) and 2 (booster PD training) and phases 1 and 3 (final PD training) for each CLASS dimension. Nine CLASS dimension comparisons favored the intervention classrooms (that is, there was greater change for intervention classrooms), four comparisons favored the control group, and no difference was found between groups in five of the comparisons. In addition, the number of caregiver practices implemented to address children's social problems (for example, crying, pulling/pushing, and fighting over a toy) increased across phases in one of the two

intervention sites for redirection and in the other intervention site for problem-solving, suggesting that caregivers used more strategies over time. However, one of the control sites also demonstrated an increase in frequency of the positive practices of problem solving and limit setting.

Lambert and colleagues (2015) also used a quasi-experimental design to examine whether and how much the quality of a peer-mentoring program for teachers was related to observed engagement. The study found positive child outcomes for the group that had higher intensity mentoring and stronger teacher engagement in the intervention on the Intensity of Intervention Scale (Abbott-Shim and Lambert 2000). The mentors worked with the caregivers on improving classroom practices based on observations of the classroom and on individualizing children's learning experiences. The mentors were supported by a mentor coordinator. However, the study had multiple confounds, including self-selection into the high intensity or moderate intensity group. The caregivers rated the children on the Preschool Learning Behaviors Scale (PLBS; McDermott et al. 2000) and thus the reports represent the teachers' perceptions of the children rather than independently gathered child outcomes.

A meta-analysis of 19 randomized controlled (RCT) studies[9] that examined the effectiveness of programs designed to improve child care quality, caregiver interaction, and child social-emotional development (Werner et al. 2015) found that interventions were moderately effective in improving overall caregiver-child interactions and quality at the classroom and caregiver level, and positive child behavior. Most of the classrooms in the studies served children from low socioeconomic family backgrounds. The studies in the meta-analysis were published between 2003 and 2012 and used different combinations of group training, individual coaching, and video. Almost all of the interventions included at least some group training and the use of video (13 for modeling and/or video feedback). Only 5 of the studies involved the use of a classroom curriculum. Group training ranged from 0 to 56 hours and individual coaching hours ranged from 0 to 160. The time span between pre-test and post-test ranged from less than a month to 13 months, with most 8 to 9 months in duration. The meta-analysis investigated but did not find moderator effects on changes in caregiver behavior for program intensity, program duration, use of a classroom curriculum, focus of the intervention, or use of video. The inclusion of an individual training (coaching or mentoring) component led to stronger effect sizes on caregiver change.

PD could be successful even within a short timeframe, particularly when looking at discrete practices, such as increasing caregiver-child joint attention (Cain et al. 2007; Rudd et al. 2008) or caregiver use of specific praise (Hemmeter et al. 2011). For example, in a cluster randomized controlled trial of an intervention to improve frequency and quality of joint attention (Focus, Follow, Talk®; Rudd et al. 2008), caregivers in the treatment group attended a four-hour workshop followed by three coaching visits across a three-month period. Even with this limited intervention, caregivers who received the PD participated in longer and more frequent periods of joint attention with toddlers. The duration and frequency of joint attention episodes were strongly

[9] The 19 studies were published between 2003 and 2012 in peer reviewed articles and did not include the Morris et al. (2014) or the Weinstock et al. (2012) study cited above. Four of the studies summarized in the previous paragraphs having positive findings were included in this meta-analysis. The meta-analysis also included other RCT studies from Canada, the Netherlands, Jamaica, and the United States published in earlier years.

correlated, and children in classrooms with greater joint attention had higher scores in language development as measured by a parent-reported measure of communication (MacArthur Communicative Development Inventory).

Caregivers need more support for developing skills to implement more complex curricula and approaches. For example, in the Head Start CARES project, implementation was more successful when practices were more familiar and/or scripted and the organization also supported implementation (Mattera et al. 2013). Length of implementation seemed to be supportive of integrating more complex practices. A cluster randomized controlled trial (Hemmeter et al. 2013) of an intervention to train teachers to use the practices in the teaching pyramid model for social-emotional and behavior development included a three-day intensive training followed by 14 weeks of weekly coaching (onsite), debriefing meetings and email feedback. Independent observations indicated that the intervention teachers implemented the teaching pyramid practices more often than control classrooms and the teacher reported improvements in children's social skills and behavior. Conversely, in an earlier study with a more discrete outcome (use of descriptive praise), Hemmeter and colleagues (2011) had positive results after a two-week intervention that provided video models and practice plans along with seven coaching sessions with emailed performance feedback.

Most, although not all, of the PD approaches in the reviewed studies included some type of coaching or observation and feedback. A cluster-randomized study of Head Start classrooms found differences in classroom quality between teachers who received only a one-day training and teachers who received the same one-day training plus distance coaching using video and emailed feedback (Artman-Meeker et al. 2015). Follow-up non-experimental analyses of the group that received the distance coaching found that teachers who viewed the training videos and read their email feedback more frequently implemented the targeted practices more often than teachers who accessed the online materials less frequently.

E. What are challenges and barriers to PD implementation in infant/toddler and home-based settings?

In the available literature discussing challenges and barriers to PD implementation, few studies focus on infant/toddler and home-based settings. However, the research does provide a sense of the challenges and barriers faced by preschool educators and ECE caregivers more broadly that may also apply to infant/toddler and home-based settings. In this section, we discuss these challenges. Box III.5 highlights key messages from the literature in this area.

1. Time and finances

With regard to time, challenges on the caregiver side included balancing their caregiving responsibilities with PD activities without being afforded additional time by their agency to do so (Diamond and Powell 2011; Powell and Diamond 2013). On the PD provider side, a review of coaching PD interventions in ECE found that coaching efforts faced challenges when coaches lacked adequate time for the work and when the coaching role involved too many responsibilities (Aikens and Akers 2011). PD programs must also allot adequate time for support and supervision of PD providers; findings from the Head Start CARES implementation study indicated that coaches needed ongoing support and supervision to ensure high-quality implementation (Mattera et al. 2013). In terms of finances, some studies indicated that the success of the PD intervention in question may have been attributable in part to program funding or financial incentives for caregivers that may not be replicable in other settings (Cain et al. 2007; Fabiano et al. 2013; Mohler et al. 2009).

2. Caregiver attitudes and beliefs

Caregiver attitudes and beliefs posed a barrier to PD implementation in some cases, including both an attitude of resistance when assigned to participate rather than volunteering to do so (such as insisting that none of the PD content was beneficial; Nasser et al. 2015), low motivation to implement new curriculum (Mattera et al. 2013), declining to implement strategies presented in the PD due to a difference in personal beliefs or values (such as refusing to use "time-out;" Morris et al. 2013) and beliefs that PD content was not relevant to their work (Neuman and Wright 2010). Some studies also cited caregiver knowledge as a barrier to implementation, such as caregivers being unable to meet the literacy demands of PD coursework (Neuman and Wright 2010) and caregivers not understanding the content that they are supposed to teach children (such as how to isolate phonemes; Mohler et al. 2009).

Box III.5. Key messages from the literature: Challenges and barriers to PD

- Commonly identified challenges and barriers include caregiver and PD provider time, lack of program funding or incentives, caregiver attitudes and beliefs, caregiver knowledge, and technology-related issues.
- Caregivers and PD providers often have challenges balancing their ongoing work with PD activities. This is true for caregivers when their agency does not afford additional time for PD activities, and for PD providers when their coaching role involves too many responsibilities.
- Caregiver attitudes and beliefs—such as believing that PD content is not relevant to the work or resistance to strategies perceived as inconsistent with personal beliefs—may also pose a barrier to PD implementation.
- Technology-related issues also pose challenges to PD implementation. These may include caregivers' lack of technological literacy and insufficient access to technological resources.
- Home-based caregivers face unique barriers to participation in PD, including longer work hours, social and professional isolation, financial limitations, travel distance, scheduling conflicts, and caregivers' perception of the content's utility and relevance for their unique caregiving setting.
- For infant/toddler caregivers, unique challenges to PD include high turnover rates in infant/toddler care, the heightened role of caregiver-child interactions (given the connection to caregivers' own attachment style), and lower levels of education than preschool caregivers.

3. Technology

Finally, technology-related issues posed challenges to PD implementation in some studies, both on a resource level (such as Head Start centers lacking sufficient internet connection to transmit coaching videos; Powell et al. 2010) as well as on a personal level (such as caregivers' resistance to online mentoring "partly due to lack of proficiency in communicating using a

variety of technologies and partly because of a preference for face-to-face interactions;" Nasser et al. 2015, p. 354). Interviews with 16 experts who have evaluated, built, or used such technologies revealed three commonly cited challenges to the effective use of technology for PD: caregivers' lack of technological literacy, insufficient access to technological resources, and a lack of support from program administrators (Hernandez et al. 2015). The experts' commonly recommended solutions to these challenges included providing caregivers with technological resources that are both functional and contemporary, PD around the use of technology, and explaining the direct benefit of the technology to caregiver practice. The experts felt that early childhood administrators were uniquely situated to encourage caregivers' use of technology through the provision of sufficient funding, infrastructure, training, support, and encouragement.

4. Challenges cited in infant/toddler studies

Of the studies in this review that included infants and toddlers, very few discuss challenges and barriers to PD implementation. As mentioned in the background section of this report, prior research indicates a number of challenges to PD in infant/toddler settings, such as sustaining long-term change given the high turnover rates in infant/toddler care (especially given the sensitive attachment period during the infant/toddler years and the associated best practice of providing a continuity of care; Moreno et al. 2015); enabling infant/toddler caregivers to meet the vast range—and dynamic nature—of child needs in the face of subpar adult-child ratios (Moreno et al. 2015, Lally 2013); equipping caregivers with the challenging skills needed to foster social-emotional development for a period when children have particularly sensitive social-emotional needs (Moreno et al. 2015); changing the nature of caregiver-child interactions given the influence of caregivers' own attachment style (Biringen et al. 2012; Moreno et al. 2015); tailoring PD for caregivers with lower levels of education than preschool caregivers (Biringen et al. 2012; Moreno et al. 2015; NSECE Project Team 2013); and developing PD programs for caregivers in infant/toddler settings that may have substandard levels of care, without the benefit of a large pool of rigorous research on the effectiveness of PD approaches for that population that could guide PD development (Weinstock et al. 2012).

5. Challenges cited in home-based studies

Of the 27 studies in this review that include home-based care, few discussed challenges and barriers to PD implementation that differed from those cited in the overall ECE literature. Home-based caregivers are less likely to participate in PD than center-based infant/toddler and preschool caregivers (Rusby et al. 2013; Weber-Mayrer 2015), including workshops and coursework, although recent national estimates indicate they may be more likely than center-based caregivers to participate in coaching (NSECE Project Team 2015). The literature provides little guidance on factors that influence home-based caregivers' participation in PD (Rusby et al. 2013), but they are less likely than center-based caregivers to receive financial support for PD participation (NSECE Project Team 2015). Prior research suggests that other barriers to participation in PD for home-based caregivers include longer work hours (NSECE Project Team 2013), social and professional isolation, financial limitations, travel distance, scheduling conflicts, and caregivers' perception of the content's utility and relevance for their unique caregiving setting (Rusby et al. 2013). PD for home-based caregivers may need to be designed specifically around their unique needs.

In one study, a PD program focused on preschoolers' social development was developed specifically for home-based child care providers and included "the opportunity for informal support via the group format, PD credit, holding the workshops at a time when home-based care providers are generally available, and offering home study opportunities for caregivers who had to miss a workshop so that they did not feel left behind" (Rusby et al. 2013, p. 450). The study found that efforts such as home study opportunities may have prevented caregivers from dropping out after they missed a session, indicating that scheduling could be a barrier to home-based caregivers' participation in PD when home study opportunities are not offered. The study also found that caregivers responsible for fewer preschool-age children were less likely to participate in all phases of the PD; given that the PD was focused on preschoolers, this implies that home-based caregivers may be less likely to participate in PD that they do not find relevant to the children in their care.

The Enhanced Home Visiting Pilot Project provided quality supports to kith and kin caregivers enrolled in home-based Early Head Start programs including home visits, training workshops, support groups, and access to materials and equipment (Paulsell et al. 2006). The project report highlights challenges in providing PD to kith and kin caregivers. First, the project faced difficulties completing home visits, with most PD home visitors only able to conduct about half of the intended visits each month. These difficulties were sometimes caused by scheduling, such as when caregivers only provided care during nonstandard work hours or when caregivers cancelled visits because they were not caring for the child that day or had another appointment or work commitment. In addition, most pilot sites experienced low caregiver turnout for group events such as training workshops, support groups, and socialization events. Transportation was the most commonly cited cause of the low turnout; other causes included caregivers' conflicting work schedules, health problems, or reluctance to participate. Finally, some PD home visitors found caregivers resistant to changing their caregiving practices, and struggled both to motivate caregivers to make changes and to offer suggestions without offending them.

F. What do we know about approaches that might be particularly helpful for supporting FCC settings, with limited education, and in isolated settings?

Several of the reviewed studies offer insight relevant to supporting caregivers in FCC settings, with limited education or literacy, and in isolated settings. In this section, we describe the implications from these studies. Box III.6 highlights key messages from the literature in this area.

1. Implications for FCC providers

Turning first to FCC providers, Paulsell and colleagues (2010) describe strategies for engaging FCC providers in PD efforts. The authors emphasize the importance of addressing the challenges that FCC providers in particular face. For example, FCC providers may have more difficulty than those in center-based settings in finding or compensating substitutes while they attend classes. Helping caregivers to access and pay substitutes is one way that PD efforts can address this obstacle. Given their isolation, FCC providers may also lack the mentoring or encouragement provided to center-based teachers from directors or supervisors. To address this gap, PD efforts can connect caregivers with mentors or other supports in the community (for example, at educational institutions). Other potential strategies include offering transportation, encouraging support among participating caregivers, and offering courses at convenient times and locations or through distance learning opportunities.

Box III.6. Key messages from the literature: Implications for caregivers in FCC settings, with limited education, and in isolated settings

- PD efforts must recognize the unique barriers to engaging FCC providers, including difficulty finding and compensating substitutes, accessing mentors locally, and traveling and finding time for PD activities. They also commonly work long work hours and with children of varying age ranges.
- Approaches to addressing barriers for FCC providers may include finding or compensating substitutes while caregivers attend classes, connecting caregivers with mentors and ongoing support in the community, providing transportation to PD activities, offering courses online or at convenient times and locations, and tailoring PD efforts and materials to their specific needs and interests.
- When the literacy demands for PD materials are high and concepts are abstract, providing a clear translation to classroom practice is critical. This may be particularly helpful for caregivers with limited education or literacy levels.
- Online tools can be effective for caregivers in rural areas or in home-based settings, because they are accessible and less expensive.
- Online technologies also offer an opportunity to provide collegial support for caregivers who are geographically or socially isolated.

Rusby and colleagues (2013) identify similar barriers for engaging FCC providers in PD efforts. When citing prior research, these authors note that these caregivers often work in isolation and face related challenges that may affect their participation in PD efforts, including heightened stress levels and higher child–caregiver ratios. Recent national estimates (NSECE Project Team 2013) show that most FCC providers serve children of varying age ranges (both infants/toddlers and preschoolers) when providing care. The majority also work full time, and virtually all exceed 40 hours per week of work, working a median of 54 hours (NSECE Project Team 2013). FCC providers are also less educated (Dowsett et al. 2009; NSECE Project Team 2013), have less pre-service training in early childhood, and hold more traditional caregiving beliefs (Dowsett et al. 2009) than center-based providers—each of which may have implications for PD efforts. Distance to training and inconvenient scheduling may also limit FCC providers' ability to engage in PD (Rusby et al. 2013; Weber-Mayrer 2015). In addition, caregivers' perceptions of the

relevance and usefulness of PD efforts are important factors to consider. Paulsell and colleagues (2010) also note that PD strategies and content that may be appropriate for caregivers in center-based settings may not be appropriate for those in FCC settings. This suggests the importance of tailoring PD efforts and materials to the specific needs of FCC providers. In addition, given diversity in FCC providers' education levels, experience, regulation status, and motivations for caregiving, PD efforts may need to target specific subsets of the population (Paulsell et al. 2010). This recommendation applies to all ECE caregivers, however, not just those in home-based settings. It may also be easier for FCC providers to access and sustain engagement with online PD activities. Establishing supportive, trusting relationships with a mentor, coach, or peers may also be particularly important for those in FCC settings.

2. Implications for providers with limited education

A study conducted by Neuman and Wright (2010) provides insight into the needs of PD efforts that include caregivers with limited education or literacy. In this study—a randomized, controlled trial examining different forms of PD in early childhood and their impact on quality language and literacy practices (Neuman and Wright 2010) —many of the teachers were either returning to college after many years or new to college instruction. Results indicated that coaching was a more effective PD form than coursework for improving the structural characteristics in classrooms. Responses from interviews suggested that teachers found the pacing of the course, the reading requirements, and the information demanding. Some found the textbook difficult to read and had trouble keeping up with the assignments. In addition, some teachers did not see the relevance of the readings to their practice. They believed that much of the course's material focused more on the *why* of doing certain literacy practices rather than the *what and how* of doing them. The authors note that when the literacy demands for PD are high and concepts are abstract, a clear translation to classroom practice is critical. This was the only study identified in our review with insight on the specific needs of caregivers who may have low literacy skills or who may be inexperienced with college-level course work, but other studies emphasize the importance of having concrete and well-articulated PD materials and lessons (Mattera et al. 2013). As suggested in the review by the U.S. Department of Education (2010), more information is needed to identify the frequently occurring challenges to PD initiatives for caregivers with less formal education.

3. Implications for caregivers in isolated settings

Although focused on preschool settings, two studies note the unique challenges to service delivery in rural areas and potential approaches to addressing them. For example, Steed and colleagues (2013) note that rural programs face challenges such as geographically large service areas, lack of well-qualified or sufficient numbers of PD providers, higher turnover rates, a lack of technological equipment or financial resources, and increased costs of service delivery. To address these issues, the consultants in this study communicated with participating personnel in between site visits via email and online video calls. In addition, given limited resources, the consultants provided necessary materials and resources for each program when possible. Morrison and colleagues (2007) suggest that satellite-based or distance learning courses can be effective for caregivers in rural areas because they are accessible and less expensive.

Finally, prior evidence suggests that home-based caregivers and those working in infant/toddler settings may feel isolated. In fact, Goouch and Powell (2013) found that caregivers

working with infants frequently felt isolated and neglected in relation to support for caregiving practices. There is some evidence that home-based caregivers, like others working in isolated settings, are particularly drawn to PD for opportunities for informal support and supportive social relationships (Rusby et al. 2013). As suggested previously, findings on PD efforts incorporating online technology or distance learning highlight the importance of caregiver connection with other learners, especially for those working in isolated settings (Chen et al. 2009). The implications are that online technologies offer an opportunity to provide collegial support for caregivers who are geographically or socially isolated.

G. Are there available conceptual frameworks that can inform our work and/or specific materials or approaches that provide insight into development of the Q-CCIIT PD tools?

Conceptual frameworks in the literature highlight researchers' theories about the key elements of PD efforts and the context surrounding them. We describe the relevant frameworks identified in our review of the literature. Box III.7 highlights key messages from the literature in this area.

Across the different PD approaches, researchers used different models to represent their approach. These models were sometimes simple, such as the practice-based coaching framework (PBC; Snyder et al. 2015) that represents key activities of coaching; first, effective teaching practices are identified through shared goals and action planning, followed by focused observation, then reflection and feedback and repetition of this cycle within collaborative partnerships. Other models are more complex and represent the network of influences on both proximal and distal outcomes, including implementation and sustained change in teacher practice (Sarama et al. 2012). Some include characteristics of the caregivers and children in their framework in addition to other contextual influences.

Some researchers (Buysse et al. 2009; Cox et al. 2015) have adopted the National Professional Development Center on Inclusion (NPDCI) Framework for Professional Development. This framework includes key contextual variables such as resources, policies, organizational structures, access and outreach, and evaluation. The core of the framework is three overlapping circles that meet in a common space representing highly effective teaching and intervention. The circles represent (1) the "who," that is, the learners and contexts; (2) the "What," that is, the PD content; and (3) the "how," that is, the approaches used in PD, such as a series of intensive workshops, video coaching, or mentoring.

Box III.7. Key messages from the literature: Conceptual frameworks

- Most conceptual models are relatively simple and, at minimum, identify the content and activities, and method of delivery of the PD effort.
- Performance feedback, supportive relationships, goal setting, shared vision, and action planning are common strategies included in conceptual models in the literature.
- Details about PD content and information on dosage, duration, or frequency of activities are not typically represented in models. However, such information may be particularly important to articulate when known.
- Contextual variables are also commonly included and provide insight about the factors expected to influence PD implementation, participants, and providers.
- Information on the providers of PD and the factors shaping their behavior are rarely noted in models in the literature.

Dunst and colleagues (Dunst and Trivette 2009; Trivette et al. 2012) proposed a Participatory Adult Learning Strategy (PALS) model that involves the introduction/illustration of new content (including processes and practices) that is then applied, practiced and evaluated. This application of the content should lead to informed understanding with reflection and mastery. The learner then repeats the process identifying next steps. Each part of the process is facilitated by active learner involvement. As discussed previously, these researchers conducted meta-analyses to identify the most effective adult learning practices (real-life applications, role playing, assessing strengths and weaknesses, standards-based self-assessment, and performance improvement review/reflection).

Some researchers incorporate responsive evaluations such as the Closing the Loop evaluation model (Manswell Butty et al. 2015) and Developmental Evaluation (Guss et al. 2013) into their conceptual frameworks of PD. These evaluations emphasize the role of establishing trusting relationships.

Feedback is an important part of most of the models, usually referring primarily to performance feedback to caregivers, whether delivered by self-reflection on their own video-recorded practice, peer feedback, mentor or expert coach feedback. However, even when models included the same components, some differences were evident. For example, multiple types of feedback were discussed in the literature, including supportive and constructive feedback, graphic feedback, shared reflection, and email feedback. The feedback could be immediate and/or delayed. Similarly, multiple approaches to observation were included in these studies. Other components found in researchers' frameworks include relationships, goal setting, shared vision, and action planning.

Dose, duration and frequency of the PD activities, particularly coaching, have been discussed in relation to the success of PD, but are not represented in the models themselves. Similarly, most approaches include multiple activities, such as modeling, observing, environmental arrangements, gestural supports, providing resources, problem solving, reflective conversation, graphing, and role play,[10] but researchers usually do not specify these in the conceptual models (Snyder et al. 2015). Instead, models may refer to the method of delivery (for example, workshops, professional learning communities, coaching, mentoring, and observation).

Although characteristics of the caregiver are sometimes discussed (for example, Vallotton et al. 2016), the characteristics of the coach or PD provider receive less attention in most frameworks. Some models specify the level of expertise needed by the coach, some specify combined training of coaches and teachers (Morris et al. 2014), and some discuss the availability

[10] Coaches may use a variety of methods to support a caregiver in implementing a specific practice. Environmental arrangements would involve recommendations to rearrange the physical space or addition or placement of materials in order to facilitate more positive behavior. Gestural supports involve using a movement or gesture to cue the caregiver about what should be done next or how to do it. Graphing is a visual display of data. In this context, graphing may involve looking across time at the caregiver implementation (e.g., frequency of implementing different elements of a practice) or at the child's responses to the caregiver use of the practices. Reflective conversation is an interactive process whereby a coach prompts the caregiver to think about her actions in light of her intended objectives.

of coach training, supervision, and/or a coach handbook (Biringen et al. 2012; Fishman et al. 2014).

1. Summary

Looking across the conceptual models in the literature, the models highlight researchers' theories about the key elements of PD efforts and the context surrounding them. Regardless of their complexity, the reviewed models articulate the key elements of PD efforts. At a minimum, these include description of PD strategies, method of delivery, and participants, suggesting the importance of including such elements in our conceptual model. Specifics about PD content are not typically represented in models, neither is information on dosage, duration, or frequency of activities. However, as others have noted (Artman-Meeker et al. 2015; Schachter 2015; U.S. Department of Education 2010), PD characteristics are not always well defined for translation into the design and delivery of PD. This shortcoming suggests the importance of articulating PD content and intensity where known. Contextual variables also provide insight about the factors expected to influence PD implementation, participants and providers, and outcomes and should be identified. Information on the providers of PD and the factors shaping their behavior is rarely noted in models in the literature. Finally, our review suggests that some strategies may be particularly important to include in PD efforts and, in turn, the conceptual models guiding those efforts. In the next chapter, we offer a summary of findings from the literature and their implications for the development of PD tools.

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IV. SUMMARY AND IMPLICATIONS

We conclude the report by offering a summary of key findings and implications for the development of PD tools supporting the Q-CCIIT, an observation tool that measures the quality of caregiver-child interactions in child care settings serving infants and toddlers.[11] Before turning to such a discussion, we describe lingering gaps in the literature.

A. Remaining gaps in the literature

Our review begins to fill several gaps in the literature, although many remain. Focusing first on caregivers in infant/toddler and home-based settings, more research is needed about the different forms of PD for caregivers in these settings (IOM and NRC 2015) and evidence of their effectiveness (Paulsell et al. 2010). Our review identified only a small number of studies focused on these settings; as such, many of the findings and implications that we discuss are based on those in ECE settings more broadly or those serving older children.

In addition, although we know that home-based caregivers are less likely to participate in PD than center-based and preschool caregivers, more guidance on factors that influence home-based caregivers' participation in PD is still needed (Rusby et al. 2013). Of particular interest is how to design efforts that consider the context of home-based child care and provide support for the maintenance of key skills and practices (Paulsell et al. 2010).

In general, more information is needed on how best to tailor PD strategies to meet the needs of caregivers in different settings, as our review identified only a handful of studies providing such insight. Given the changing demographics of the early childhood population, major gaps in the literature also remain regarding PD efforts that target caregivers' cultural and linguistic competence. Our review identified only two studies with such a focus, and neither focused on caregivers in infant/toddler or home-based settings.

Finally, although our review offers insight on the efficacy of PD efforts focused on children's social-emotional development, more research is needed on efforts targeting this and other pedagogical content areas beyond language and literacy (Schachter 2015).

B. Implications for the Q-CCIIT PD tools

Although few of the reviewed studies focused on infant/toddler caregivers and home-based providers, findings from our review offer insight for the development of PD tools. In addition, most tools/approaches and strategies have not been studied in isolation and instead are typically bundled together. As a result, we cannot identify their independent influence on caregiver practice or child outcomes. Overall, however, the literature indicates that traditional approaches to PD such as workshops can lead to positive outcomes for caregivers, but ongoing PD efforts may best sustain caregivers' use of those practices and foster fidelity of implementation (Artman-Meeker et al. 2015; U.S. Department of Education 2010; IOM and NRC 2015). Across methods of delivery, more intensive delivery such as multiday institutes accompanied by follow-

[11] The Q-CCIIT measures caregiver support for infant/toddler social-emotional development, cognitive development, language and literacy development, as well as areas of concern (behaviors and factors that negatively affect the physical and emotional health of children).

up coaching have the strongest evidence of effectiveness (Artman-Meeker et al. 2015; Dunst et al. 2015).

The available literature also points to a range of commonly used and effective PD strategies. For example, relationship building is seen as important for engaging caregivers in PD efforts (Aikens and Akers 2011; Brown et al. 2009; Knoche et al. 2013) and for supporting their professional growth (Knoche et al. 2013). The active participation of caregivers is also a crucial aspect of PD efforts (U.S. Department of Education 2010). In fact, a recent meta-analysis found that studies that offered opportunities for caregivers to practice; evaluate experiences, strengths, and weaknesses; reflect on their performance; and engage in self-assessment had larger effect sizes than those that did not (Dunst and Trivette 2009; Trivette et al. 2012). Also important is the illustration of strategies by the PD provider (for example, demonstrating skills and role playing; (Trivette et al. 2012). There is also support for performance feedback as a means of supporting caregiver skills while also expanding them (Brown and Inglis 2013; Knoche et al. 2013; Krick Oborn and Johnson 2015; Ottley and Hanline 2014). Feedback may be immediate or delayed and provided face-to-face, in writing, or via email. With such efforts, positive feedback and praise should be provided along with any constructive feedback (Diamond and Powell 2011; Ottley and Hanline 2014).

Because evidence suggests that performance feedback can be delivered successfully via online tools (Krick Oborn and Johnson 2015), distance and online learning are also useful PD strategies. This is especially true for efforts with caregivers in more isolated settings (Chen et al. 2009; Kyzar et al. 2014). Online efforts also offer the benefit of developing and connecting a community of learners. Findings from the literature suggest that connecting with a community of learners is perceived favorably by caregivers, especially among home-based caregivers and those in more isolated settings (Chen et al. 2009; Goouch and Powell 2013). In fact, findings by Rusby and colleagues (2013) suggest the importance of an FCC community of learners because of their isolation; presence/sense of a professional community makes higher PD participation more likely. Notably, evidence indicates that caregivers perceive online approaches positively but appreciate having face-to-face interaction as well (Chen et al. 2009; Kyzar et al. 2014). As a result, such efforts should be supplemented with in-person activities. Online approaches offer flexibility and are generally accessible, but technical support with such efforts is also critical (Chen et al. 2009; Hollingsworth and Lim 2015; Kyzar et al. 2014). Some caregivers may have less experience using online platforms for such purposes or may encounter other logistical challenges.

The literature suggests that use of video is another effective approach to providing PD. Video can be used effectively for coaching and the provision of performance feedback (Biringen et al. 2012; Krick Oborn and Johnson 2015). In fact, a recent review of research identified multiple studies that provide evidence of the effectiveness of using video analysis for PD and/or preservice teacher training (Nagro and Cornelius 2013). To facilitate the use of technology and overcome common barriers, efforts may need to provide caregivers with PD around the use of technology, and with an explanation of the direct benefit of the technology to caregiver practice (Hernandez et al. 2015).

Finally, prior research suggests that barriers to participation in PD for home-based caregivers include longer work hours, social and professional isolation, financial limitations,

travel distance, scheduling conflicts, and caregivers' perception of the content's utility and relevance for their unique caregiving setting (Rusby et al. 2013). PD for home-based caregivers may need to be designed specifically around their unique needs (Paulsell et al. 2010), with content and provision of materials tailored accordingly. Regardless of setting, written materials should be clear and adapted so as to be applicable to a range of audiences and literacy levels (Neuman and Wright 2010). Efforts should also be made to clearly translate materials for classroom practice.

C. Summary

Overall, the available literature provides implications for the development of the Q-CCIIT PD tools. For example, findings suggest that PD efforts should offer intensive or ongoing support to caregivers, include interactive materials with active learning exercises or components, and build on caregiver strengths and positive practices within the context of a trusting relationship. Video can be a particularly useful PD tool for self-reflection and the provision of performance feedback. Other technology, especially online approaches, should be considered for providing information, sharing feedback, and connecting caregivers with other learners, especially those in more isolated settings, with the availability of in-person support where feasible. Efforts must be made to ensure that PD materials are accessible, relevant, and clearly translated for practice.

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APPENDIX A:

STUDY REVIEW TEMPLATE

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Study information

RefWorks ID: *Enter text*

Citation: *Enter text*

Field of study: *Enter text*

Topics addressed*: Enter text*

Source:
- ☐ Library search
- ☐ Expert recommendation
- ☐ Website report

Document type:
- ☐ Empirical study
- ☐ Literature review/ meta-analysis

If empirical study, study design:
- ☐ Psychometric only
- ☐ Descriptive
- ☐ Correlational
- ☐ Experimental or quasi-experimental
- ☐ Implementation study
- ☐ Regression discontinuity
- ☐ Single case design

Methodological concerns: *Enter text*

Setting, target population, and sample characteristics

ECE setting:
- ☐ Center
- ☐ Home-based care
- ☐ FCC setting
- ☐ Other (describe): *Enter text*

Agency setting for caregiver:
- ☐ Child care
- ☐ Early Head Start
- ☐ Head Start
- ☐ Public prekindergarten program
- ☐ Other (describe): *Enter text*

Setting location:
- ☐ Rural
- ☐ Urban
- ☐ Suburban

Age of the target child population:
- ☐ Infant
- ☐ Toddler
- ☐ Preschool (ages 3–5)
- ☐ If FCC, age range: *Enter text*
- ☐ Other (describe): *Enter text*

Characteristics of target child sample:
- ☐ Dual-language learners
- ☐ Children with special needs
- ☐ Low-income families
- ☐ Other (describe): *Enter text*

Sample size (children, families, or providers):
- ☐ Overall**:** *Enter text*
- ☐ Treatment group (if applicable)**:** *Enter text*
- ☐ Comparison/control group (if applicable)**:** *Enter text*

Caregiver education:
- ☐ Less than high school
- ☐ High school diploma or GED
- ☐ Some college
- ☐ Associate's degree
- ☐ Bachelor's degree
- ☐ Graduate or professional degree
- ☐ Not provided

Caregiver field of study
- ☐ Child development or developmental psychology
- ☐ Early childhood education
- ☐ Elementary education
- ☐ Special education
- ☐ Other (describe): *Enter text*

Caregiver certification:
Mark all that apply
- ☐ CDA
- ☐ State-awarded certificate
- ☐ Teaching certificate or license
- ☐ Infant/toddler specific
- ☐ Other (describe): *Enter text*

Professional development (PD) approach and strategies

PD approach employed:
- ☐ Coaching
  - ☐ Expert
  - ☐ Peer
- ☐ Mentoring
  - ☐ Expert mentoring/supervision
  - ☐ Peer mentoring/supervision
- ☐ Reflective supervision
- ☐ Curricula
- ☐ Online courses
- ☐ In-person courses
- ☐ Intensive workshops
- ☐ Workshops
- ☐ Other: *Describe*

Context of PD implementation:

Contextual supports for PD:
- ☐ Baseline classroom coverage
- ☐ Evening sessions
- ☐ Funds for courses
- ☐ Incentives for participation
- ☐ Not specified
- ☐ Transportation
- ☐ Child care for teachers'/caregivers' children
- ☐ Manual available
- ☐ Other: *Enter text*

Dosage and intensity of PD:
- ☐ Total number of sessions: *Specify*
- ☐ Length of sessions: *Specify*
- ☐ Whether coaching interspersed with coursework: *Describe*

PD strategies employed:
- ☐ Trusting relationships
- ☐ Goal setting
- ☐ Opportunity for practice
- ☐ Frequent feedback
- ☐ Video vignettes
- ☐ Modeling (video or live)
- ☐ Active learning
- ☐ Self-reflection
- ☐ Coaching based on video-recorded practice
- ☐ Quality observations

Use of technology/mode:
- ☐ Video
- ☐ Video conferencing

Mark all that apply
- Assistant teacher in classroom included, if center-based
- Director included, if center-based
- All teachers in program included, if center-based
- PD required
- PD provider available on ongoing basis
- Other: *Describe*

- Other: *Describe*

- Written materials (e.g., guides or exercises)
- Computer-facilitated or web delivery
- Mobile device or PDA
- Other: *Describe*

Coach/mentor selection/training/supervision: *Enter text*

PD goals, if applicable, including focus of efforts (e.g., specific curriculum implementation or child assessment, QRIS ratings): *Enter text*

Provides detailed description of PD tools and materials

Study measurement and findings

Study purpose: *Enter text*

Data collection methods:
- Interview
- Site visit
- Administrative records
- Child assessment data
- Observation data
- Survey

Outcomes measured:
- Child outcomes
- Teacher/caregiver outcomes
- Classroom quality outcomes
- Other: *Enter text*

Outcomes tool used, if applicable:
- CLASS (Infant, Toddler, or Preschool)
- Environmental Rating Scale: ITERS. FCCERS, or ECERS
- Arnett
- Child assessment tool: *Specify*
- Other: *Specify*

Fidelity measurement: *Enter text*

Timing of data collection:
- Baseline
- During intervention: *Enter timing of data collection*
- Post-intervention: *Enter timing of follow-up*

Findings related to teachers/ caregivers:
- Classroom practice
- Caregiver knowledge
- Caregiver beliefs
- Financial
- Course enrollment
- Degree attainment
- Credentials
- Other: *Specify*

Findings related to program quality:
- Child-caregiver interactions
- Other: *Specify*

Findings related to child development, by domain:
- Cognitive
- Language
- Social-emotional
- Health/physical
- Other: *Specify*

Challenges or barriers to PD:
- Time
- Money
- Transportation
- Caregiver beliefs
- Caregiver knowledge
- In FCCs, caring for children of different ages
- Other: *Specify*

Findings related to subgroups:
- FCCs
- Teachers/caregivers with limited education
- Other: *Specify*

Key findings (*complete as applicable, noting whether positive change, negative change, or no change):*

- Findings related to teachers/caregivers: *Enter text*
- Findings related to program quality: *Enter text*
- Findings related to child development, by domain: *Enter text*
- Challenges or barriers to PD: *Enter text*
- Other findings: *Enter text*

Subgroup findings: *Enter text*

Whether study includes a conceptual model: *Enter text*

Description of conceptual model, if applicable: *Enter text*

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APPENDIX B:

GLOSSARY OF KEY TERMS

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Table B.1. Glossary of key professional development terms

Term	Definition used in the literature
Active learning	An opportunity for learners to be engaged in both application and understanding; when the learner is engaged in practice (e.g., role playing), evaluation (e.g., assessing strengths and weaknesses), reflection (e.g., group discussion about feedback), and mastery (e.g., standards-based assessment).
Coaching	Coaching is a relationship-based process led by an expert with specialized and adult learning knowledge and skills, who often serves in a different professional role than the recipient(s). Coaching is designed to build capacity for specific professional dispositions, skills, and behaviors and is focused on goal-setting and achievement for an individual or group.
Consultation	A collaborative, problem-solving process between an external consultant with specific expertise and adult learning knowledge and skills and an individual or group from one program or organization. Consultation facilitates the assessment and resolution of an issue-specific concern—a program-/organizational-, staff-, or child-/family-related issue—or addresses a specific topic. There are different types and approaches to consultation including expert consultation, collaborative consultation, process consultation, organizational, and mental health.
Distance education	A relationship-based education in which there is substantive and frequent interaction between students and between the student and the instructor. Distance education may use any of these technologies—the internet, satellite, cable, video cast, podcast, CD, and DVD—and may be conducted through exclusively distance methods or through blended or hybrid methods that combine distance and face-to-face coursework.
Mentoring	A relationship-based process between colleagues in similar professional roles, with a more-experienced individual with adult learning knowledge and skills, the mentor, providing guidance and example to the less-experienced protégé or mentee. Mentoring is intended to increase an individual's personal or professional capacity, resulting in greater professional effectiveness.
Performance feedback	A coaching strategy in which the coach provides feedback based on observation of teacher implementation. Can be provided verbally, in writing, or graphically. The feedback may be immediate or delayed but usually follows the observation within a brief time period.
Professional development	A continuum of learning and support activities designed to prepare individuals for work with and on behalf of young children and their families, as well as ongoing experiences to enhance this work.
Reflective supervision	A collaborative, mutually trusting relationship between a caregiver and PD provider for professional growth that improves caregiving quality and strengthens practice by building upon strengths and partnering in addressing vulnerabilities to generate growth. Reflective supervision encourages self-reflection by the caregiver.
Self-reflection or assessment	A coaching strategy in which the caregiver engages in discussions of and reflections on their learning practices, experiences or opportunities.

Note: Definitions for coaching, consultation, distance education, mentoring, and professional development are taken from the NAEYC PD glossaries (https://www.naeyc.org/ecp). Definitions for other terms in the table are drawn from elsewhere in the literature.

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