

Appendix C:
A Synthesis of Federally-Funded Studies on School Readiness:
What Are We Learning About Professional Development?

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Introduction

Effective teachers have long been considered essential to a high-quality early childhood education that prepares children to succeed in school. Recent expansions of publicly-funded preschool programs have increased the need for effective early childhood teachers who have the skills necessary to interact with children in ways that promote their social-emotional development, learning, and overall readiness to succeed in school. But, what are the best ways to improve the effectiveness of existing early care and education teachers and staff? This paper draws lessons from recent federally-sponsored research to explore that question.

The Scope of Professional Development and the Focus of This Paper

In the early childhood field, “professional development” (PD) is often the encompassing term used to refer to pre-service and in-service training and education, whether offered through institutions of higher education or through community-based training programs. Individuals entering the early childhood workforce undertake PD to gain an initial credential (e.g., Child Development Associate credential) or degree (typically either AA or BA). Existing members of the workforce undertake PD to achieve degrees and/or to increase their teaching skills, knowledge of a particular subject area, or to learn to implement a particular curriculum. It is that latter type of professional development (in-service training to help existing staff improve their teaching skills or to implement a new curriculum) that is the focus of most of the studies reviewed for this paper.

A recent, extensive review of the early childhood PD literature revealed many gaps in the research, with few studies systematically varying PD to explore its effects on teacher practices or children’s learning outcomes, or to investigate necessary threshold dosage levels, optimal content, or the possible mediating effects of teacher or program characteristics (Zaslow and Martinez-Beck, 2006). Ramey & Ramey (2008) summarize the state of the field: “Content, amount, and format of professional development varies but has not been linked to specific classroom instructional practices that have proven effective in promoting children’s developmental outcomes (p. 45).”

Instead of focusing on these types of issues, much of the early research in the field focused on the relationship between a teacher’s educational background, especially whether or not the teacher had a B.A. degree, and early child care and education (ECE) quality or child outcomes. Some studies of center- and home-based ECE programs found that the quality of care and instruction (as measured by scales such as ECERS, FDCRS, and ITERS) was likely to be better when teachers possessed BA degrees than when they did not (e.g., Burchinal, Cryer, Clifford, & Howes, 2002). Teachers with more education and training in child development specifically were likely to have more sensitive and less harsh interactions with children (Howes, 1997). And, children in both centers and family child care homes were more likely to show better outcomes when their teachers had higher levels of education (Clarke-Stewart, Vandell, Burchinal, O’Brien, & McCartney, 2002; Howes, Whitebook, & Phillips, 1992; Weaver, 2002).

Based on these and similar studies, many reviewers concluded that the best quality ECE programs were those in which teachers possessed BA degrees, especially in child development or similar fields (Barnett, 2004; Bowman, Donovan, & Burns, 2001; Whitebook, 2003). Indeed, the National Academy of Sciences’ Committee on Early Childhood Pedagogy recommended that “Each group of

children in an early childhood education and care program should be assigned a teacher who has a bachelor's degree with specialized education related to early childhood..." (Bowman, Donovan, & Burns, 2001, p. 13). The research findings and these and other similar recommendations helped spur changes in policy and practice such that many publicly-funded state preschool and Head Start programs now require lead teachers to have BA degrees.

But, recent studies have led some to re-examine the emphasis on teacher education levels. Studies from the Family and Child Experiences Survey (FACES) in Head Start showed statistically significant but small-in-magnitude associations between teacher qualifications and classroom quality (ACYF, 2001) and between teacher credentials and children's early writing skills (ACF, 2003). The National Center for Early Learning and Development's (NCEDL) Multi-State Study of Pre-Kindergarten suggested that students of teachers who had a BA degree or higher demonstrated greater learning gains in math skills but not in other academic areas than those whose teachers had less than a BA (Early, Bryant, Pianta, Clifford, Burchinal, Ritchie et al, 2006). Subsequent analyses of seven major studies of the relationship between classroom quality and children's educational outcomes and the educational attainment and majors of their teachers yielded null or contradictory findings (Early, Maxwell, Burchinal, Alva, Bender, Ebanks, et al, 2007).

Based on these new findings, research is beginning to explore more nuanced questions about PD such as the threshold and the amount of education that make a difference for quality and outcomes, the characteristics of teachers' undergraduate programs (because not all B.A. programs are of the same quality or have the same course content), outcomes other than children's academic achievement such as social interactions and behavioral management, the impact of teacher and program characteristics on classroom quality and child outcomes, and the supports that can help teachers gain the most from their PD experiences (Bryant, Barbarin, Clifford, Early, & Pianta, 2004; Hyson, Tomlinson, & Morris, 2008).

These are precisely the types of studies that are needed to fill the gaps in the research identified by Zaslow and Martinez-Beck (2006). They build on findings that suggest that training is related to improved quality of ECE programs (Burchinal, Howes, & Kontos, 2002; Burchinal, Cryer, Clifford, & Howes, 2002) and more sensitive interactions with children (Clarke-Stewart et al, 2002). But, what training strategies are most likely to be effective? While there is limited research in the early childhood field to answer this question, Tout, Zaslow, and Berry (2006) suggest that more intensive and longer duration training is likely to be better than brief training, and a recent review of in-service training for K-12 teachers concluded that "one-day programs, in most cases, are not worthwhile" (Loeb, Rouse, & Shorris, 2007, p. 8).

Other research suggests that ECE quality and teacher practices can be influenced by characteristics of the workplace or the teachers involved. For example, workplace characteristics such as the levels of education and training of teachers within an ECE program can affect individual teacher performance (Whitebook et al, 2001). Workplace characteristics such as teacher compensation and teacher turnover levels, program type (e.g., location in a school), teacher-child ratios, full- or part-day, and levels of poverty of children in the classroom have all been associated with classroom or program quality (Bryant et al, 2004; Kontos, Howes, Shinn, & Galinsky, 1994; Whitebook et al, 1990, Whitebook et al, 1993).

Similarly, teacher characteristics such as teachers' views about teaching have been associated with their classroom teaching behavior and ability to incorporate new instructional practices (Bowman et

al, 2001). Teacher attitudes and knowledge were also identified as mediators of the effect of teacher qualifications on classroom quality in a study of FACES, such that teacher qualifications were associated with significant positive changes only when teacher attitudes and knowledge were also taken into account (ACF, 2003). Teachers' knowledge of children's cultural and family backgrounds, and teachers who serve as role models have been linked to improved teacher-child relationship (Saft & Pianta, 2001).

Emerging Federal Research as a Source for New Evidence Concerning PD

In the early 2000s, several federal agencies funded research aimed at promoting children's school readiness. The four sets of projects (*Preschool Curriculum Evaluation Research Grants* program (PCER), the *Interagency School Readiness Consortium* (ISRC), *Evaluation of Child Care Subsidy Strategies*, and the *Quality Intervention for Early Care and Education Program* (QUINCE)) have different aims and approaches, but all share a commitment to rigorous research. The findings from these projects are still emerging, but they provide some of the most recent direct and indirect evidence concerning PD and its relationship to quality of early childhood services and outcomes for children. This paper reviews studies from three of the four sets of projects to distill lessons learned concerning PD.¹

An Underlying Logic Model

The federally-funded projects have been designed to test curricula, improve the quality of instruction, and promote one or more aspects of school readiness (e.g., early language/literacy, mathematics, or science skills, social-emotional development, general school readiness, and parent involvement; see Appendix C.2). But, most of these studies share a common assumption: PD (in the form of in-service teacher training) affects teacher practices in the classroom, and those practices in turn result in benefits for children.

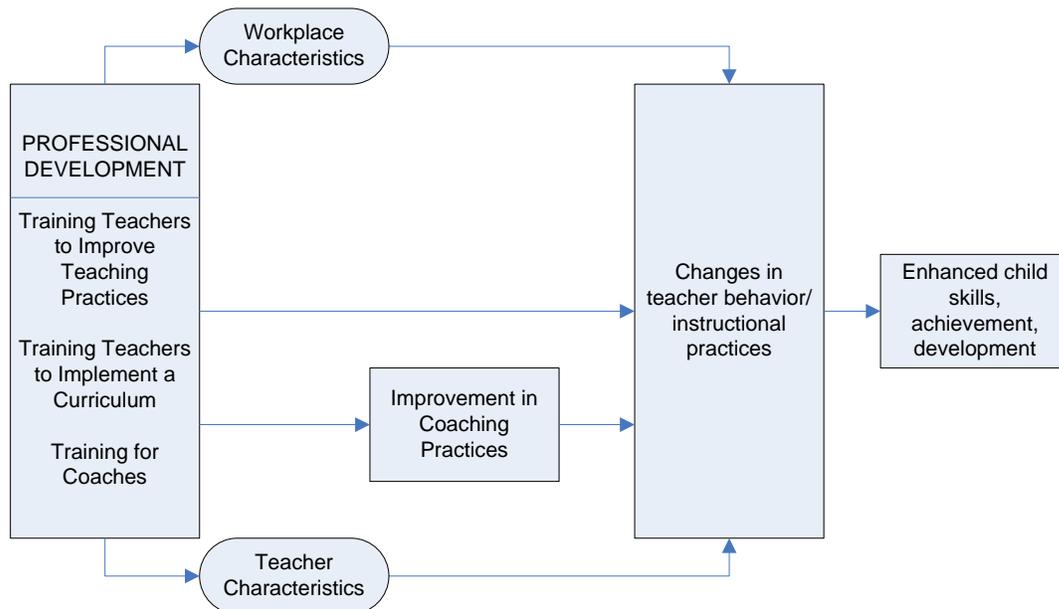
The logic model below (Figure 1) represents the common assumptions underlying these projects and illustrates that workplace and teacher characteristics can affect the results. We use this logic model as a framework for this paper. Our review focuses more on changes in teacher behavior and practices and less on changes in children because other papers will address child outcomes, but we do highlight those studies that connect changes in instructional practices or specific PD strategies with changes in children.

As illustrated in Figure 1, most of the projects reviewed in this paper included training of teachers (an exception was LA EXCeLS) to help the teachers improve their teaching practices and the overall quality of their classrooms and/or to help teachers implement a specific curriculum. Programs typically employed trainers to work with the teachers initially, and, sometimes those or other individuals also served as ongoing coaches or mentors to help the teachers implement the skills they had been taught. In some projects, the training for the coaches/trainers was described. Presumably, such training would improve the coaching delivered to teachers. Changes in teacher

¹ At the time publications and reports on these four initiatives were requested from the principal investigators, analyses had not yet been completed for all projects. QUINCE sent no papers to review, and several other projects indicated that additional studies would be forthcoming.

behavior/instructional practices, therefore, were either a direct result of the training that the teachers received or resulted from the better training of the teachers delivered by the coaches. The effects of training could be moderated by workplace or teacher characteristics. Changes in instructional practices are hypothesized to result in better outcomes for children.

Figure 1. Logic Model



This paper begins by describing the projects included in the review and what insights they have to offer about PD. Many of the projects were not developed as tests of PD strategies, to draw lessons about PD, so there are limits to the conclusions we can draw based on this body of work. Next, project results are summarized in two ways: (1) with a focus on the sub-set of the projects that directly tested different PD approaches; and then (2) across all projects, with findings reported in relation to the logic model. We conclude by offering suggestions for future research.

Approach to This Review

Principal investigators submitted papers, presentations, and posters representing 15 projects. Twelve projects (all but LA ExCELS, and the articles by Fantuzzo, Bulotsky-Shearer, McDermott, McWayne, & Perlman (2007) and Powell, Burchinal, File, & Kontos (2008)) were reports of the effects of specific training interventions that also included details concerning professional development activities. While we draw lessons from all the projects, we focus most on these 12 projects. Further, four projects submitted studies in which PD strategies (e.g., mentoring versus non-mentoring; mentoring of different intensity) were tested explicitly. Table 1 lists the 15 projects reviewed, the 12 with relevant data regarding PD, and the 4 that explicitly compared PD strategies (Let's Begin with the Letter People/Doors to Discovery; Literacy Express; MyTeachingPartner; and Building Language for Literacy). This review highlights findings from these four projects, although results from all the studies were examined for patterns related to PD or workplace and teacher characteristics associated with the effects of PD on teacher practices, program quality, or child outcomes.

Table 1. Projects Included in Review

Project (Principal Investigator)	Did Submitted Studies Include Details and Results of PD?	Did Submitted Studies Explicitly Compare PD Strategies?
Project Upgrade (<i>Abt Associates</i>)	Yes	No
Head Start REDI (<i>Bierman</i>)	Yes	No
EPIC (<i>Fantuzzo</i>)	No	No
Early Literacy and Learning Model (<i>Fountain</i>)	Yes	No
Project ExCELS (<i>Howes</i>)	No	No
Language-Focused Curriculum (<i>Justice</i>)	Yes	No
Let's Begin with the Letter People/Doors to Discovery (<i>Landry</i>)	Yes	Yes
Literacy Express (<i>Lonigan</i>)	Yes	Yes
Children's School Success (<i>Odom</i>)	Yes	No
MyTeachingPartner (<i>Pianta</i>)	Yes	Yes
Project Approach (<i>Powell</i>)	No	No
Building Language for Literacy (<i>Ramey & Ramey</i>)	Yes	Yes
Chicago School Readiness Project (<i>Raver</i>)	Yes	No
Getting Ready (<i>Sheridan</i>)	Yes	No
Pre-K Mathematics (<i>Starkey</i>)	Yes	No

Appendices 1-12 provide detailed information regarding the projects and submitted studies, including methods, measures, the PD strategies employed, and results. Briefly, the highlights of these appendices and the main implications for this review are as follows:

- **Study design** (see Appendix C.1): While 11 of 12 projects employed randomized trial designs, only the four mentioned above were designed to hold curriculum constant, making it possible in those four studies to assess the effects of PD strategies without confounding them with the effects of the curriculum.
- **Sample sizes** (see Appendix C.1) ranged from 6 to 55 per group for analyses at the classroom level, and from 6 to 89 at the teacher level, with much larger groups for analyses at the child level. For some of the teacher/classroom-level analyses, therefore, small sample sizes may limit finding significant effects or the generalizability of results.
- **PD as a package of strategies:** Most projects typically employed one or more of several PD strategies as their in-service training approach (see Table 2). For most projects, therefore, it is not possible to determine which of the specific strategies in their PD package might be exerting more, less, or any effect on teacher practices or child outcomes. The most commonly employed strategies were workshops and coaches/mentors who worked with teachers to help them implement what they learned via workshops.

Table 2. Strategies for Professional Development

Project Name	Initial Workshop	Refresher Workshop	Ongoing Access to Web-Based Materials	Coaches/Mentors	Reflection with Coaches	Reflection with Peers/Group Discussion
Project Upgrade	X	X		X		
Head Start REDI	X	X		X	X	
Early Literacy and Learning Model	X			X	X	X
Language-Focused Curriculum	X	X				
Let's Begin with the Letter	X	X		X		
People/Doors to Discovery						
Literacy Express	X			X (in one study)		
Children's School Success	X	X		X		
MyTeachingPartner	X		X	X (on-line)	X	
Building Language for Literacy	X			X		X
Chicago School Readiness Project	X (5 Saturdays)			X		
Getting Ready	X	X		X	X	X
Pre-K Mathematics	X	X (new content)		X		

- Important factors not described.** Since most of these studies were not designed as tests of PD approaches, they did not describe factors that might influence the effectiveness of the PD. For example, the studies did not always describe the qualifications of coaches/mentors/trainers, the PD they received, whether teachers and assistant teachers were both trained as part of the projects (see Appendix C.6), or the PD provided to control groups (see Appendix C.1). This makes it difficult to draw definitive conclusions about these factors.
- Mapping results onto the logic model, and measuring changes in implementation and teacher behavior.** The logic model in Figure 1 suggests that training can be delivered for three purposes (to improve teacher practices, to help teachers implement a curriculum, and to train coaches). Most of the projects report results both for implementation of a curriculum and for improving teacher practices (see Appendix C.9). In some studies, the measures used to assess the implementation of the curriculum are conceptually similar to measures used to assess changes in classroom practices (e.g., a measure of the implementation of a curriculum designed to promote early language might be the extent to which teachers used open-ended questions to promote conversation and vocabulary, but that might also be considered a measure of change in teacher behavior). In this review, we report the effects of PD on implementation and teacher behavior separately, but we note that there is some conceptual overlap.
- Workplace characteristics.** All 12 projects took place primarily (though not solely) in settings that serve low-income children, including Head Start, publicly-funded preschool, and/or community child care programs (see Appendix C.4). However, it is not clear if

projects used terms consistently (e.g., a setting might be described as a Title I program in one study but a school-based preschool program in another), which limits the conclusions that can be drawn regarding the effects of auspices. Other workplace characteristics such as incentives to encourage participation in training (see Appendix C.5) and teacher turnover were described less frequently.

- **Teacher characteristics.** Projects differed in the extent to which they described the characteristics of participating teachers (see Appendix C.7). Most of the teachers described were either Caucasian or African-American and English-speaking. In the half of the projects that reported on teachers' educational level or experience, most teachers had BA's or degrees higher than BA's, which may limit the extent to which these results generalize to the broader early childhood workforce, especially those in non-school-based settings.
- **Emerging research.** The studies submitted for this review represent only some of the federally-funded research that is relevant. More studies are forthcoming, both for the projects included in the review and for others (e.g., QUINCE), and many more details regarding PD and its effects will undoubtedly become available.

Results: What We Know

In this section, we report, first, from the four projects that explicitly tested different approaches to professional development and therefore provide the most direct evidence about PD (see Appendices 1-12 for additional details). Then, second, we report findings across all projects, organized according to the logic model presented in Figure 1.

Projects that Tested Effectiveness of Specific PD Strategies

Four projects conducted randomized trials that held constant the effects of curriculum, isolating the effects of particular PD strategies. These four examined the use of mentors/coaches and the effects of differing levels of coaching intensity.

Let's Begin with the Letter People/Doors to Discovery

Assel, Landry, Swank, & Gunnewig (2006) report on the first-year results of a randomized trial designed to test two curricula (Let's Begin with the Letter People and Doors to Discovery) and two PD strategies (mentoring and non-mentoring). The authors hypothesized that (1) mentoring would help teachers implement a curriculum; (2) children would show greater academic gains when their teachers have been mentored than when they have not; and (3) the impact of mentoring would be greatest in classrooms with teachers who have lower levels of education.

School sites that had Head Start, Title I pre-K, and universal pre-K programs were randomly assigned to, first, a curriculum condition (Let's Begin with the Letter People or Doors to Discovery) and then to a PD condition (mentoring or non-mentoring), resulting in assignment to one of five conditions: (1) Let's Begin with the Letter People, mentored; (2) Let's Begin with the Letter People, non-mentored; (3) Doors to Discovery, mentored; (4) Doors to Discovery, non-mentored; and (5) control group. Seventy-six classrooms, 76 teachers, and 603 children participated in the study.

Teachers in experimental groups were trained in their curriculum in a four-day summer workshop that was teacher-centered, employed small groups, and focused on curricula-specific content for promoting language, literacy, and social-emotional skills. During the year, curriculum mentors supported teachers as they implemented their assigned curriculum. Mentors worked with teachers twice per month in classroom coaching sessions that focused on lesson planning, room arrangement, schedules, behavioral issues, curriculum fidelity, and demonstration of curriculum components.

Mentors completed fidelity checklists designed for each curriculum three times during the year, for both mentoring and non-mentoring classrooms. Fidelity of implementation improved over time for both curricula: Just 29.8% of Let's Begin teachers scored at high levels at the first evaluation, but that figure had increased to 71.5% by mid-year (comparable figures for Doors to Discovery were 28.6% and 59.6%, respectively). The authors speculate that implementation of Let's Begin might have been better because it has a single user-friendly teacher guide, as compared with the multiple guides teachers had to consult for Doors to Discovery.

Study findings revealed few main effects for mentoring across all settings or curricula or for all outcome measures. For example, on phonological awareness, children in Title I and universal pre-K classrooms with mentoring had significantly greater gains than children in non-mentored classrooms regardless of curricula, but children in Head Start classrooms did better in non-mentored classrooms. Children in Title I classrooms using Doors to Discovery showed greater growth in vocabulary whether or not there was mentoring, while children in the Let's Begin classrooms did better when their teachers had been mentored. The authors summarize these and other findings by saying, "When mentoring showed a positive impact, it was only in the Title I or universal pre-K classrooms," and, further, that benefits were more likely to be within the public school system utilizing Let's Begin and within the literacy rather than the language domain.

The authors suggest that, had more intense mentoring been offered, the results for mentoring might have been stronger. They also note that all teachers received feedback about implementation of curricula, which may have lessened the impact of the mentoring overall, as that feedback could have served as a kind of intervention.

MyTeachingPartner (MTP)

Two studies of MTP, a web-based PD model designed to improve teachers' instructional practice and interactions with children to promote language/literacy and social skills, were submitted for this review (Pianta, Mashburn, Downer, Hamre, & Justice, in press; Whitaker, Kinzie, Kraft-Sayre, Mashburn, & Pianta, 2007).

Whitaker et al (2007; also described in Kinzie, Whitaker, Neesen, Kelley, Matera, & Pianta, 2006) explored the relationship between levels of teacher support and teacher participation in MTP training activities. A total of 235 teachers were assigned to one of three levels of service support: (1) a "Web-Only" group that received a laptop computer and access to the MTP website; (2) a "Materials" group that received the same plus printed versions of MTP curricula and their corresponding materials; and (3) a "Consultancy" group that received all of the above plus a video camera to tape their classroom practice for bi-weekly on-line discussions with a teacher consultant who reviewed the video clips and provided feedback and recommendations.

Teachers in the Consultancy group logged on to the website more often than teachers in the Web-Only and Materials groups, but the Materials group spent more time on-line than did members of the

other groups. The Consultancy and Web-Only groups agreed in their views of MTP's usefulness, but the Materials group responded significantly less positively than the other two groups. The authors conclude that teachers will voluntarily participate in PD if they find it useful and if they receive the level of supports they feel they need.

In a second study reporting on a randomized controlled trial of MTP, Pianta et al (in press) compared the effects of Consultancy versus Web-Only supports on the quality of observed teacher-child interaction in pre-K classrooms. Teachers in the Web-Only condition received materials and access to the MTP web-site, which included video clips of high-quality teaching exemplars. Teachers in the Consultancy group videotaped their own classroom teaching and sent the videotapes to a consultant (mentor) who provided feedback to teachers in on-line video chats twice each month over the course of the school year.

In the first year of the two-year study, teachers in the Consultancy group had more sensitive interactions with students, were better at engaging students in instruction, and improved their ability to stimulate children's language more than teachers in the Web-Only group. The effects of Consultancy on teacher behaviors were moderated by the level of poverty of children in the classroom. Specifically, when 50% of the children in classrooms were classified as poor, there were no differences in the rates of change between teachers in the Consultation and Web-Only conditions. But, when 100% of the children in the classrooms were poor, then the teachers in the Consultation group had greater increases in the quality of teacher-child interactions than teachers in the Web-Only condition. This latter finding suggests that PD interventions in classrooms with a high density of children from low-income households may need to look different with respect to intensity and/or supportiveness for teachers than PD interventions in other classrooms.

All classrooms were in publicly-funded pre-K programs, and the teachers in these studies were highly experienced (averaging 15 years teaching; one-third with advanced degrees), so it is unclear if these findings would apply to other settings or to teachers with other backgrounds.

Literacy Express

Literacy Express is a comprehensive preschool curriculum for three- to five-year-olds with units on oral language, emergent literacy, basic math, science, general knowledge, and social-emotional development. The study submitted for this project included a brief description of a randomized trial that compared three groups: (1) training via workshops; (2) training via workshops plus mentoring; and (3) a "business as usual" control group. As described in greater detail in Lonigan, Farver, Clancy-Menchetti, & Phillips (2005),² a total of 48 preschools (mostly Head Start centers) in Florida and California were randomly assigned to one of three PD conditions: Literacy Express workshops only (15 schools), Literacy Express workshops plus mentoring (15 schools), or a "business as usual" comparison group (18 schools).

In the workshop group, teachers and aides participated in a 2-day Literacy Express initial workshop plus three ½-day workshops during the school year. Teachers and aides in the mentoring group participated in the same workshops and received classroom visits by a trained project mentor. Preschools in the business-as-usual comparison group used the preschools' standard curricula (most

² Study not in the set submitted but used to supplement information.

often *High/Scope* or *Creative Curriculum*) (Lonigan et al, 2005; Preschool Curriculum Research Consortium, 2008).

Results revealed statistically significant increases in print knowledge for children in the workshop-plus-mentoring group, but no differences were found between children in the two groups in phonological processing, oral language, or math.

Building Language for Literacy

The purposes of this randomized trial (Ramey, Ramey, Kleinman, Lee, Farnett, Timraz, et al, no date) were to understand the factors and instructional practices that promote children's language and literacy in the context of Scholastic's Building Language for Literacy (BLL) curriculum and two levels of coaching (monthly versus weekly). The project emerged from a ten-year partnership between the Montgomery County Public Schools (MCPS) in Maryland and Georgetown University's Center on Health and Education. Three hypotheses addressed PD: (1) BLL coaching will lead to significant benefits in classroom instructional environment; (2) children with teachers who have BLL coaches will have significantly higher literacy levels; and (3) weekly coaching will lead to greater benefits than monthly coaching.

All classrooms used the BLL language and literacy curriculum. Twenty-four classrooms were randomized into the intervention (coaching) or control conditions, and the classrooms in the intervention condition were further randomized to either weekly (30 sessions) or monthly (8 sessions) coaching.

In the two intervention conditions, PD consisted of a three-day summer institute to introduce the curriculum (2 days for paraeducators), coaching, plus optional monthly evening group sessions with coaches and peers for more discussions. The teachers' time for the evening sessions was covered by district stipends, and teachers could earn up to 16 units of PD credits. Coaches had Master's degrees in reading with additional training on the BLL curriculum, and they received ongoing supervision during the course of the study.

PD in the comparison condition consisted of the PD offered to all MCPS pre-K/Head Start classrooms. Certified teachers could participate in a voluntary summer training institute; aides could participate in a half-day of instruction. Teachers also had access to additional PD days and supervisors who were content specialists throughout the year. Teachers in all classrooms were certified teachers with a specialty in early childhood education.

Results indicated that BLL coaching classrooms had significantly higher levels of curriculum implementation than comparison classrooms. Contrary to the hypothesis on intensity, teachers who received monthly coaching had better implementation scores than teachers who received weekly coaching.

Classrooms in both coaching conditions had higher scores on the Early Language and Literacy Classroom Observation (ELLCO) than control group classrooms, but there were no differences in ELLCO scores between the weekly and monthly coaching groups. Although no statistical tests were conducted, the authors report that teachers in the coaching condition may have displayed better performance on the Rameys' Observation of Learning Essentials (an observational measure of teacher behavior).

Three measures of child outcomes, all focused on children’s early language and literacy skills (Test of Early Reading Ability (TERA); Get It, Got It, Go!; and a school district pre-K reading measure) were used to assess differences in the gains children made from fall to spring during the study year. Children in coaching conditions showed greater gains than children in the control group in TERA scores (total scores, and two of three subscales), but there were no significant differences in gains between children in weekly and monthly coaching conditions. Children who were English Speakers of Other Languages achieved greater fall-to-spring gains in TERA scores if they were enrolled in coaching rather than non-coaching conditions. There were no differences among any groups on the other two measures of child outcomes.

In summary, BLL coaching resulted in higher levels of literacy-rich classroom environments and instructional practices and higher early literacy skills on one standardized measure of children’s reading ability compared to typical classrooms. There was no benefit of the more intense coaching. This may perhaps be due to the small sample size, as there were only six classrooms in each of the coaching conditions. The small sample sizes, school-based settings, and high educational levels of teaching staff may also limit generalizability.

Examining the Results Across All Projects

The results of the studies above are direct tests of approaches to PD. This section examines those findings as well as those of the studies submitted by other projects, reporting all of them according to the logic model in Figure 1.

Effects of PD on Implementation of Curricula

Eleven of the 12 projects employed teacher training to help teachers implement a particular curriculum (see Appendix C.1). Ten of 12 reported on changes in teacher behavior as evidence of implementation of the curriculum or of the intervention on which teachers were trained. Projects employed implementation checks at frequencies ranging from three times per year to ongoing, primarily using curriculum-specific checklists or measures of implementation (see Appendices 9-10). Study not in the set submitted but used to supplement information.

Four projects (Children’s School Success, Project Upgrade, Language-Focused Curriculum, Let’s Begin with the Letter People/Doors to Discovery) suggest that teachers gradually achieved better implementation and stronger fidelity over time, presumably as they had more practice. But, more frequent visits by a coach were not always associated with better implementation (e.g., Building Language for Literacy).

It makes intuitive sense that dosage of PD (or curriculum) is associated with both implementation and outcomes. The Children’s School Success project proposed a useful definition of dosage that combines fidelity, implementation, and child attendance. The authors conclude that, for an intervention to benefit children, teachers must deliver the curriculum as intended, the whole curriculum must be delivered, and children must attend class to receive the intervention. Their results suggest that fidelity measures were significantly associated with children’s post-test performance, but those associations were sometimes moderated by children’s attendance (and their pre-test performance). Similarly, the Language-Focused Curriculum project found that children in intervention classrooms who had better attendance benefited more than children with weaker

attendance. These two projects suggest that future studies of PD should monitor fidelity, implementation, as well as child attendance.

Effects of PD on Changes in Teacher Practices

Appendix C.12 describes changes in teacher practices observed in the 12 studies. In addition to the MTP study that directly assessed and reported positive changes in teacher practices as a result of mentoring/coaching, four other projects that employed coaching/mentoring reported positive changes in teaching behaviors. For example, the Chicago School Readiness Project found the emotional climate of the classroom improved in intervention (5-6 Saturday workshops plus mental health consultants/coaches) classrooms, and teachers were more enthusiastic and responsive in their interactions with students and displayed fewer emotionally negative practices. In Project Upgrade, teachers in the intervention (workshop/coaching/curricula) groups out-performed members of a control group on behaviors related to promoting literacy (e.g., support for oral language, print knowledge, print motivation, support for phonological awareness, literacy resources, and literacy activities). Although these studies were not designed to isolate the effects of mentoring from the effects of other PD strategies employed in the projects or from the curriculum the PD was designed to help teachers implement, they may provide some support for the value of mentors/coaches in changing teacher practices.

Some teacher behaviors appear harder to change than others. For example, in the Language-Focused Curriculum project, researchers recorded the extent to which teachers made changes in classroom activity contexts (e.g., setting up a dramatic play corner for the week) and in instructional processes (e.g., asking open-ended questions to promote early literacy skills). Activity contexts were more likely to be implemented soon after training, while changes in instructional processes took longer to achieve. In Project Approach, an observational study of children's engagement in public preschool classrooms, the researchers report that teachers were reluctant to work with students in small rather than large groups, even after training. These results suggest that future PD research might seek to establish the types of teacher behaviors that are harder to change and the specific PD strategies that might be more effective with such hard-to-change behaviors.

Effects of PD for Coaches/ Mentors/Consultants

Eleven projects employed individuals described as coaches, mentors, or mental health consultants. Their responsibilities included training teaching staff on the curriculum, visiting classrooms to observe the teaching staff in action and to model appropriate implementation of the curriculum, providing feedback to the staff, facilitating group meetings with teachers to reflect on practices, barriers, and successes, and, in the Chicago School Readiness project, providing stress reduction services to teachers and direct one-to-one mental health services to a few children in each classroom. But, despite the central role played by the coaches, most studies contained limited information about them, the training or supervision they received, or the effects of that training on their coaching skills or performance (see Appendix C.8). Future PD research specifically designed to identify the best approaches to PD for coaches would be useful.

The Effects of PD on Children

As described above, two of the four studies that tested specific PD approaches (BLL and MTP) suggest that coaching/mentoring produced better outcomes for children compared to PD that did not

include mentoring, but the four studies also suggest that outcomes for children can vary depending on curricula, auspices, and outcome being assessed (see Appendix C.12).

Other projects that included coaching/mentoring also produced benefits in child outcomes (e.g., Project Upgrade, Head Start REDI, Pre-K Mathematics), but it is not possible to say what elements of the PD/curriculum interventions in those projects were associated with the benefits. However, across all 12 projects, the lone effort that produced no significant effects on either classroom/instructional quality or child outcomes was also the only project that did not include a coaching component along with its workshops (Language-Focused Curriculum).

Workplace Characteristics and Outcomes

The submitted studies described workplace characteristics such as program auspices/settings, incentives provided to PD recipients, poverty of children enrolled in the participating programs, and teacher turnover.

Auspices/Setting. All projects took place in at least some Head Start, publicly-funded preschool, and/or community-based child care programs (see Appendix C.4). As described above, in the Let's Begin with the Letter People/Doors to Discovery project, the authors concluded that, when mentoring made a difference in child outcomes, it was mostly in Title I/ UPK classrooms, rather than in Head Start. In contrast, the Pre-K Mathematics project found no differences in effects on children across the participating Head Start and state preschool programs. Because of the mixed findings and the fact that few studies examined this issue directly; no firm conclusions about auspices can be drawn, except that future PD research should consider the effects of different preschool settings.

Children's Poverty Level. Most projects operated in settings with a high percentage of low-income children. The MTP project, which reported the effects of PD by children's poverty level, showed effects of consultancy when 100% of children were in poverty but no effects when 50% of children were in poverty. Because these subgroup analyses were not based on original randomization of the study, it is possible that the results are due to selection bias or some other factor. Nevertheless, the findings suggest that the impact of high levels of poverty should be assessed in future PD research.

Incentives. Half of the 12 projects mentioned that teachers or programs were provided with incentives to encourage participation (see Appendix C.5). The incentives primarily included financial compensation for the time of the teachers and free sets of curricular materials. Only one project (Building Language for Literacy) allowed teachers to earn PD units for participation, which is a strategy that many ECE programs nationally are using. There were no direct tests of the effectiveness of these incentives in any project. Nevertheless, because of their policy importance, incentives may be an area for future PD research to explore.

Teacher Turnover. In Project Upgrade, turnover ranged from 28% to 44% in intervention classrooms to 49% in control group classrooms over the two-year period of the project. The coaches/mentors in the project identified high turnover as a barrier to effective implementation. Turnover was either not reported or was lower in most other submitted studies.

Teacher Characteristics and Outcomes

Studies described teacher characteristics such as years of education, educational degrees, demographics, and teacher motivation (see Appendix C.7). Results suggest some teacher behavior or

child outcomes can be affected by particular teacher characteristics, but, in other cases, training/PD/curricula interventions exert their effects without moderation by teacher characteristics.

Teacher Education Levels and Years of Experience

In the Children’s School Success and Pre-K Mathematics projects, teachers without BA’s or with fewer years of experience implemented the curriculum or changed their classroom (Pre-K Mathematics) practices about as much as did teachers with BA’s or with many years of experience. In the Early Literacy and Learning Model, changes in child outcomes were not affected by teachers’ educational level, leading the authors to conclude, “This suggests that ELLM is successful in addressing the preparation deficiencies of early childhood and child care educators, though the issue merits further study (Cosgrove et al, 2006, p. 25).”

But, in the LA ExCELS observational study, better classroom emotional climate was observed in settings taught by educators with BA degrees in a child development major, across all settings.

Teacher Language. Project Upgrade found PD interventions benefited teachers differently depending on their initial education levels, their dominant languages, and the outcomes being observed. While the curricular/PD intervention had strong effects on teacher behavior overall, the impacts were stronger for teachers whose primary language was Spanish than for their English-speaking peers. Further, for the two curricula that produced benefits for children, the benefits were larger for children in classrooms with Spanish-speaking teachers.

Teacher Attitudes and Motivation. In the Chicago School Readiness project, teachers who demonstrated a high level of dedication to their own PD (63% attended three or more of the Saturday trainings) were more likely to implement the curriculum as fully intended. In Project Upgrade, mentors reported that the best implementers of the curricula had, among other things, a positive attitude toward instructional change, while resistance to instructional change was a barrier to implementation.

In sum, teacher education, language, and motivation may influence the impact of a PD intervention and further research is warranted.

What We Don’t Know and Recommendations for Future Research

These projects do much to illuminate the process and importance of professional development. Overall, findings suggest that teacher training and ongoing supports can help improve the implementation of curricula, and that such training and support is often associated with improvements in teacher behavior and instructional practice, and enhanced child outcomes. However, benefits are influenced by characteristics of the workplace and teachers, the type of professional development activities, and the intensity of supports. Because most of the studies were not designed to specifically test PD approaches, these findings are suggestive, not conclusive. Nevertheless, the projects provide clues about areas where future research and exploration would be helpful.

How Can Research Provide a More Complete Picture of Professional Development and Its Effects?

Most of these studies were not designed and did not attempt to trace all the links across the full logic model.

Recommendation for Future Research: Support analyses in existing and any new studies that trace the links from different types of PD to both shorter-term changes in teacher or instructional practice and longer-term changes in children’s academic achievement or social-emotional skills, while also examining how those effects are heightened or moderated by workplace and teacher characteristics.

What are the Threshold Levels of Implementation, Fidelity, and Dosage, and How Can They Be Measured?

These and previous studies of PD suggest that implementation, fidelity, and dosage are multi-dimensional concepts important for achieving good outcomes, but there is no definitive information about how best to measure these constructs, and how much of any given professional development activity is needed to achieve desired results.

Recommendation for Future Research: Support the development of measures of implementation that identify the most critical elements of effective program delivery. Include regular reporting on child attendance as part of discussions of dosage and implementation. Conduct additional research to compare the effects of different types and amounts of professional development on these constructs.

How Does Coaching/Mentoring Produce its Effects, and How Should Coaches/Mentors Be Prepared for Their Roles?

Most projects were not designed to study the effectiveness of coaches/mentors, so descriptions of their backgrounds or of the PD they received were limited. While coaching/mentoring appears to be effective, it is not possible to draw conclusions from these studies about how it is producing its effects, or what pre-service or in-service training, professional development, or work experiences an effective coach should possess.

Recommendation for Future Research: Directly assess coaching and mentoring by conducting studies to: (1) determine what specific activities occur during coaching/mentoring that result in the most positive changes in teaching and instructional practice; (2) explore how much coaching and mentoring are needed to produce desired results for different types of teachers (e.g., new, or less educated or experienced teachers); or (3) test the effectiveness of coaches/mentors with varying backgrounds or experiences.

What Professional Development Strategy or Combination of Strategies Produces the Greatest Impact?

Most of the projects delivered multiple professional development strategies (e.g., workshops, coaching, individual/group reflections, etc.) as integral parts of a single training package, making it impossible to isolate the effects of a specific PD strategy.

Recommendation for Future Research: Compare the effects of individual training strategies to determine the impact each has on teacher behavior/instructional practices and child outcomes.

How Do Teacher and Workplace Characteristics Influence Professional Development and Outcomes?

Generally, these projects produced improvements in teaching practices and outcomes for children, though sometimes those main effects were moderated or heightened by teacher and workplace

characteristics (language teachers speak, teacher motivation, poverty status in the classroom, and program auspice).

Recommendation for Future Research: Conduct studies that explore how teacher and workplace characteristics influence the effects of PD. Develop and test new professional development approaches to better meet the needs of teachers and programs for whom existing approaches may not work as well.

What are the Best Ways to Support All Educators, Not Just Lead Teachers?

A few of the reviewed projects urged future professional development activities be delivered to the whole teaching staff (not just the lead teacher) and involve program administrators. It is not clear from the results of the reviewed projects if these approaches yield greater benefits.

Recommendation for Future Research: Assess professional development approaches that target not only lead teachers, but assistant teachers and aides as a team, as well as program administrators or school principals who provide supports and set the tone for what educators do in the classroom.

What Professional Development Strategies Will Best Benefit New Teachers and Teachers with Less Education and Experience?

The projects included in this review focus mostly on PD for existing staff, rather than on preparing new entrants for work in the early childhood field. Many participating teachers had BAs and more years of experience than may be reflective of the general ECE workforce. The projects therefore did not address questions related to PD for new entrants into the field, for existing staff with limited experience or degrees, or existing staff who undertake PD to achieve higher levels of education.

Recommendation for Future Research: Explore the use and test the effectiveness of various PD practices with different populations: (1) new entrants into the ECE field; (2) existing staff with limited professional experience, and (3) existing staff striving for higher levels of education.

What is the Best Way to Alter Hard-to-Change Practices?

In several studies, it appears that some teaching practices are harder to change than others (e.g., working in small rather than large groups; changing instructional processes rather than classroom activity contexts), but there is not much information on how PD can be delivered or targeted to change those practices.

Recommendation for Future Research: Support analyses of existing data to determine which practices are hardest to change. Conduct new research to test PD approaches that can help teachers alter those practices.

Conclusions

In sum, these projects demonstrate that PD can produce benefits in teacher behavior and instructional practices and in child outcomes ranging from academic achievement to social-emotional development. Generally, teachers trained on a curriculum demonstrated improvements in their classroom instructional practices, and children showed benefits in outcomes. This set of projects provides four rigorous assessments of PD, particularly as it relates to coaching and mentoring. When

it comes to the benefits of particular PD strategies, the conclusions from this set of emerging findings are more limited. There is also new information about the relationship of PD and implementation of curricula with fidelity. However, results vary across curricula and outcomes, and are affected by workplace and teacher characteristics – variations that have not yet been consistently considered or reproduced across projects. Exploring these factors in future research can help provide even more information about PD so that effective teaching supports can be put in place that ensure children are prepared to enter school ready to succeed.

References

Curriculum/Intervention	Source(s)
Project: Preschool Curriculum Evaluation Research (PCER)	
Doors to Discovery, Let's Begin with the Letter People	Assel, M.A., Landry, S.H., Swank, P.R., & Gunnewig, S. (2007). An evaluation of curriculum, setting, and mentoring on the performance of children enrolled in pre-kindergarten. <i>Reading and Writing, 20</i> , 463-494.
Early Literacy and Learning Model	Cosgrove, M., Fountain, C., Wehry, S., Wood, J., & Kasten, Katherine. (2006, April). <i>Randomized Field Trial of an Early Literacy Curriculum and Instructional Support System</i> . Paper presented at the annual meeting of the American Educational Research Association, San Francisco, California.
	Wehry, S., Cosgrove, M., & Fountain, C. (2006) <i>Preschool-to-Kindergarten: A Longitudinal Study of the Effectiveness of the Early Literacy and Learning Model (ELLM)</i> . Poster.
Language-Focused Curriculum	Pence, K.L., Beckman, A.R., Justice, L.M., & Bowles, R.P. (in press). Preschoolers' Exposure to Language Stimulation in Classrooms Serving At-Risk Children: The Contribution of Group Size and Activity Context. <i>Early Education and Development</i> .
	Justice, L.M., Pence, K., Bowles, R.B., & Wiggins, Alice. (2006). An investigation of four hypotheses concerning the order by which 4-year-old children learn the alphabet letters. <i>Early Childhood Research Quarterly, 21</i> , 374-389.
	Massey, S.L., Pence, K.L., & Justice, L.M. (2008). Educators' Use of Cognitively Challenging Questions in Economically Disadvantaged Preschool Classroom Contexts. <i>Early Education and Development, 19</i> (2), 340-360.
	Justice, L.M., Mashburn, A., Pence, K.L. & Wiggins, Alice. (2008). Experimental Evaluation of a Preschool Language Curriculum: Influence on Children's Expressive Language Skills. <i>Journal of Speech, Language, and Hearing Research, Vol.51</i> , 983-1001 .
	Pence, K.L., Justice, L.M., & Wiggins, A. K. (in press). Preschool Teachers' Fidelity in Implementing a Comprehensive Language-Rich Curriculum. <i>Language, Speech, and Hearing Services in Schools</i> .
	Justice, L. M., Cottone, E. A., Mashburn, A., & Rimm-Kaufman, S. E. (2008). <i>Relationships Between Teachers and Preschoolers Who Are At Risk: Contribution of Children's Language Skills, Temperamentally-based Attributes, and Gender</i> . University of Virginia. Unpublished manuscript.
	Rudasill, K.M., Rimm-Kaufman, S.E., Justice, L.M., & Pence, K. (2006). Temperament and language skills as predictors of teacher-child relationship quality in preschool. <i>Early Education and Development, 17</i> (2), 271-291.
Literacy Express	Lonigan, C.J. (2006, July). Impact of Preschool Literacy Curricula: Results of a Randomized Evaluation in a Public Prekindergarten Program. Paper presented at the 13th annual meeting of the Society for the Scientific Study of Reading, Vancouver, British Columbia, Canada.

Curriculum/Intervention	Source(s)
	Lonigan, C.J., Farver, J.M., Clancy-Menchetti, J. & Phillips, B.M. (2005, June). Promoting the Development of Preschool Children's Emergent Literacy Skills: A Randomized Evaluation of a Literacy-Focused Curriculum and Two Professional Development Models. Paper presented at the 12th annual meeting of the Society for the Scientific Study of Reading, Toronto, Ontario, Canada.
Building Language for Literacy	Ramey, C.T., Ramey, S.L., and Stokes, B.R. (2008). Effective Pre-K Programs: Research Evidence About Program Dosage and Student Achievement. Unpublished manuscript. Georgetown University.
	Ramey, S.L. & Ramey, C.T. (2008). Establishing a science of professional development for early education programs: The knowledge application information systems theory of professional development. In L.M. Justice and C. Vukelich (Eds.). <i>Achieving excellence in preschool literacy instruction</i> . New York, NY: Guilford Press.
Project Approach	Ramey, S.L., Ramey, C.T., Kleinman, B.E., Lee L.M., Farnetti, C.C., Timraz, N.M. et al (2008). The Effects of Curriculum and Coaching Supports on Classrooms and Literacy Skills of Prekindergarten/ Head Start students in Montgomery County Public Schools. Unpublished manuscript. Georgetown.
Pre-K Mathematics	Powell, D.R., Burchinal, M.R., File, N., & Kontos, S. (2008). An eco-behavioral analysis of children's engagement in urban public school preschool classrooms. <u><i>Early Childhood Research Quarterly</i>, 23</u> , 108-123.
	Starkey, P., Klein, A., Clements, D., Sarama, J., Iyer, R. Effects of a pre-kindergarten mathematics intervention: A randomized experiment. <u><i>Journal for Research on Educational Effectiveness</i>, in press.</u>
Interagency School Readiness Consortium (ISRC)	Source(s)
Head Start REDI	Bierman, K.L., Domitrovich, C.E., Nix, R.L., Gest, S.D., Welsh, J.A., Greenberg, M.T., Blair, C., Nelson, K.E. & Gill, D. (in press). Promoting academic and social-emotional school readiness: The Head Start REDI program. <i>Child Development</i> .
	Bierman, K.L., Nix, R.L., Greenberg, M.T., Blair, C. & Domitrovich, C.E. (2007). Executive functions and school readiness intervention: Impact, moderation, and mediation in the Head Start REDI Program. <i>Development and Psychopathology</i> , 20, 821-843.
	Bierman, K., Nix, R. & Domitrovich, C. <i>Beyond "What Works": Using RCTs to Illuminate Mechanisms of Change as well as to Assess Outcomes</i> . Penn State University. Power point slides.
Chicago School Readiness	Raver, C.C., Jones, S.M., LiGrining, C.P., & Metzger, M. (2008). Improving Preschool Classroom Processes: Preliminary Findings From a Randomized Trial Implemented in Head Start Settings. <i>Early Childhood Research Quarterly</i> .
	Raver, C.C., Jones, S.M., Metzger, M., Li-Grining, C., Smallwood, K., Jones, D., Smith-Donald, R., Sardin-Adjei, L., & Solomon, B. <i>Early Lessons Learned: Preliminary findings from CSRP</i> . Powerpoint. No date provided.
	Li-Grining, C.P., Madison-Boyd, S., Jones, D., Smallwood, K.M., Sardin, L., Metzger, M.W., Jones, S.M., & Raver, C.C. <i>Implementing a Classroom-Based Intervention in the "Real World": The Role of Teachers' Psychosocial Stressors</i> . Powerpoint. No date provided.

Curriculum/Intervention	Source(s)
Children's School Success	Odom, S.L., Butera, E.H., Schneider, R., Lieber, J., Sarpatwari, S., Horn, E., Palmer, S., Goodman-Jensen, G., Diamond, K., Czaja, C., Hanson, M., & Ceja, M. (2007, April). <i>Children's School Success: Child outcomes from three years of research</i> . Paper presented at CEC. Louisville, KY.
	Lieber, J., Goodman-Jansen, G., Horn, E., Palmer, S., Manson, M., Czaja, C., Butera, G., Daniels, J., & Odom, S. (2007, April). <i>Factors that Influence the Implementation of a New Curriculum: Results from Two Years of Implementation</i> . Poster presented at the Biennial Meeting of the Society for Research in Child Development, Boston, MA.
	Odom, S.L., Diamond, K., Hanson, M., Lieber, J., Butera, G., Horn, E., et al (2007). <i>Children's School Success: Treatment dosage and child outcomes</i> . Poster presented at the Biennial Meeting of the Society for Research in Child Development, Boston, MA.
Getting Ready	Sheridan, S.M., Marvin, C.A., & Knoche, L.L., & Edwards, C.P. (in press). Getting Ready: Promoting School Readiness through a Relationship-based Partnership Model. <i>Early Childhood Services</i> .
	Knoche, L.L., Woods, K.E., & Sheridan, S.M. Adolescent Parents' Participation in Learning: Factors Contributing to their Children's Development. Manuscript submitted for publication.
	Sheridan, S.M., Knoche, L.L., & Marvin, C.A. (2008). Competent families, competent children: Family-based interventions to promote social competence in young children. In W.H. Brown, S.L. Odom, & S.R. McConnell (Eds.), <i>Social competence of young children: Risk, disability, and intervention</i> (2 nd ed., pp.301-320). Baltimore: Paul H. Brookes.
	Woods, K.E., Knoche, L.L., Rasmussen, K., & Sheridan, S.M. (2007). Adolescent Parents' Participation in Learning: Participation in Learning: Factors Contributing to Factors Contributing to Children's Development. Paper presented at the National Association of School Psychologists. Annual Conference.
	Sheridan, S.M., Edwards, C.P., Knoche, L.L., Cline, K.D., & Bovaird, J.A. (2007 March). "Getting Ready:" The Effects of Parent Engagement on School Readiness of Low-Income Children. Poster. Presented at the Biennial Meeting of the Society for Research on Child Development. Boston, MA.
	Knoche, L.L., Givens, J.E., & Sheridan, S.M. (2007). Risk and Protective Factors for Children of Adolescents: Maternal Depression and Parental Sense of Competence. <i>Journal of Child and Family Studies</i> .
	Sheridan, S.M., Clarke, B.L., Knoche, L.L., & Edwards, C.P. (2006). The effects of conjoint behavioral consultation in early childhood settings. <i>Early Education and Development</i> , 17_(4), 593-617.
	Knoche, L.L., Sheridan, S.M., Cline, K., Givens, J.A. & Fleissner, S. (2006, June). <i>Moderating the Effects of Risk on Children's School Readiness: What Are the Roles of Family Literacy and Parent Sense of Competence?</i> Poster session presented at the annual National Research Conference of Head Start, Washington, DC.

Curriculum/Intervention	Source(s)
	Sheridan, S.M., Burt, J.D., Clarke, B.L., Taylor, A.M., & Knoche, L.L. <i>Conjoint Behavioral Consultation: The Effects of a Family-School Partnership for Enhancing Positive Development in Early Childhood</i> . Poster. No date given.
	Sheridan, S.M., Edwards, C.P., & Knoche, L.L. <i>Lessons Learned About Professional Development: Parent Engagement and Child Learning Birth to Five</i> . Powerpoint slides. No date given.
LA: ExCELS (Los Angeles: Exploring Children's Early Learning Settings)	Fuligni, A. S. (2008, May). <i>School Readiness of English-Speaking and English-Learning Children: Links with Experiences in Early Learning Settings</i> . Power point slides.
	Howes, C. (2008 April). <i>Diverse Pathways in Early Childhood Professional Development: An Exploration of Early Educators in Public Schools, Private Preschools, and Family Child Care Homes</i> . Manuscript.
	Fuligni, A.S. (2007 May). <i>Learning Experiences in Preschool Programs for Low-Income Children: How Do Instructional Activities Promote School Readiness?</i> Powerpoint Slides.
	Fuligni, A.S. <i>Children's Experiences in Early Childhood Programs for Low-Income Children: Influence of Program Type and Curriculum Use</i> . Manuscript submitted for publication.
MyTeachingPartner (MTP)	Whitaker, S., Kinzie, M., Kraft-Sayre, Mashburn, A., & Pianta, R.C. (2007). Use and evaluation of web-based professional development services across participant levels of support. <i>Early Childhood Educational Journal</i> , 34 (6), 379-386.
	Kinzie, M.B., Whitaker, S.D., Neesen, K., Kelley, M., Matera, M., & Pianta, R.C. (2006). Innovative web-based professional development for teachers of at-risk preschool children. <i>Educational Technology & Society</i> , 9 (4), 194-204.
	Pianta, R.C., Mashburn, A.J., Downer, J.T., Hamre, B.K., & Justice, L. (in press). Effects of Web-Mediated Professional Development Resources on Teacher-Child Interactions in Pre-Kindergarten Classrooms. <i>Early Childhood Research Quarterly</i> .
	Pianta, R.C., Mashburn, A.J., Hamre, B.K., A.J., Downer, J.T., & Justice, L. Using Web-based Feedback to Improve Teacher-child Interactions in Prekindergarten Classrooms. Powerpoint. No date provided.
	LoCasale-Crouch, J. & Pianta, R.C. Pre-K Professional Development through Standardized, Systematic Observation and Consultation. Powerpoint. No date provided.
EPIC	Fantuzzo, J., Bulotsky-Shearer, R., McDermott, P.A., McWayne, C., Frye, D., and Perlman, S. (2007). Investigation of dimensions of social-emotional classroom behavior and school readiness for low-income urban preschool children. <i>School Psychology Review</i> , 36(1), 44-62.
Evaluation of Child Care Subsidy Strategies	Source(s)
Project Upgrade	Layzer, J.I., Layzer, C.J., Goodson, B.D., & Price, C. (2007). Subsidy Strategies: Findings from Project Upgrade in Miami-Dade County. Washington, DC. Prepared for U.S. Department of Health and Human Services, Administration for Children and Families, OPRE and CCB. Washington, DC.

- Administration for Children, Youth, and Families (ACYF). (2001). Head Start FACES: Longitudinal findings on program performance. Third progress report. Washington, D.C.: U.S. Department of Health and Human Services.
- Administration for Children and Families (ACF). (2003). Head Start FACES: A whole-child perspective on program performance. Fourth progress report. Washington, D.C.: U.S. Department of Health and Human Services.
- Barnett, W. S. (2004). Better teachers, better preschools: Student achievement linked to teacher qualifications. *Preschool Policy Matters*, 2. New Brunswick, NJ: NIEER.
- Bryant, D., Barbarin, O., Clifford, R.M., Early, D., & Pianta, R. (June 2004). *The National Center for Early Childhood Development and Learning: Multi-state study of pre-kindergarten* Presentation at the National Association of the Education of Young Children's 13th National Institute for Early Childhood Professional Development, Baltimore, MD.
- Bowman, B.T., Donovan, M.S., & Burns, M.S. (Eds.). (2001). *Eager to learn: Educating our preschoolers*. Washington, DC.: National Academy Press.
- Burchinal, M. R., Howes, C., & Kontos, S. (2002). Structural predictors of child care quality in child care homes. *Early Childhood Research Quarterly*, 17, 87-105.
- Burchinal, M. R., Cryer, D., Clifford, R. M., & Howes, C. (2002). Caregiver training and classroom quality in child care centers. *Applied Developmental Science*, 6(1), 2-11.
- Clarke-Stewart, K. A., Vandell, D. L., Burchinal, M. R., O'Brien, M., & McCartney, K. (2002). Do features of child care homes affect children's development? *Early Childhood Research Quarterly*, 17, 52-86.
- Early, D., Barbarin, O., Bryant, D., Burchinal, M., Chang, F., Clifford, R., Crawford, G., Weaver, W., Howes, C., Ritchie, S., Kraft-Sayre, M., Pianta, R., & Barnett, W.S. (2005). Pre-Kindergarten in Eleven States: NCEDE's Multi-State Study of Pre-Kindergarten & Study of State-Wide Early Education Programs (SWEEP). Preliminary Descriptive Report. University of North Carolina-Chapel Hill.
- Early, D., Bryant, D., Pianta, R., Clifford, R., Burchinal, M., Ritchie, S., et al. (2006). Are teachers' education, major, and credentials related to classroom quality and children's academic gains in pre-kindergarten? *Early Childhood Research Quality*, 21, 174-195.
- Early, D., Maxwell, K., Burchinal, M., Alva, S., Bender, R., et al. (2007). Teachers' education, classroom quality, and young children's academic skills: Results from seven studies of preschool programs. *Child Development*, 78(2), 558-580.
- Howes, C. (1997). Children's experiences in center-based child care as a function of teacher background and adult-child ratio. *Merrill-Palmer Quarterly*, 43(3), 404-425.

- Howes, C., Whitebook, M., & Phillips, D. (1992). Teacher characteristics and effective teaching in child care: Findings from the National Child Care Staffing Study. *Child & Youth Care Forum*, 21(6), 399-414.
- Hyson, M., Tomlinson, H.B., & Morris, C. (2008). *Quality improvement in early childhood teacher education: Faculty perspectives and recommendations for the future*. Manuscript under review.
- Kontos, S., Howes, C., Shinn, M., & Galinsky, E. (1994). *Quality in family child care and relative care*. NY: Teachers College Press.
- Loeb, S., Rouse, C., & Shorris, A. (2007). Introducing the issue. Excellence in the classroom. *The Future of Children*, 17(1), 3-14.
- Lonigan, C. J., Farver, J. M., Clancy-Menchetti, J., & Phillips, B. M. (2005, April). *Promoting the development of preschool children's emergent literacy skills: A randomized evaluation of a literacy-focused curriculum and two professional development models*. Paper presented at the biennial meeting of the Society for Research in Child Development, Atlanta, GA.
- Preschool Curriculum Evaluation Consortium (2008). *Effects of preschool curriculum programs on school readiness*. (NCER 2008-2009). Washington, D.C.: National Center for Education Research, Institute of Education Sciences, U.S. Department of Education, Washington, D.C.: U.S. Government Printing Office.
- Ramey, S.L. & Ramey, C.T. (2008). *The effects of curriculum and coaching supports on classrooms and literacy skills of prekindergarten/Head Start students in Montgomery County Public Schools*. Unpublished Manuscript. Georgetown University Center on Health and Education. Washington, DC.
- Saft, E.W. & Pianta, R.C. (2001). Teachers' perceptions of their relationships with students: Effects of child age, gender, and ethnicity of teachers and children. *School Psychology Quarterly*, 16, 125-141.
- Tout, K., Zaslow, M., & Berry, D. (2006). Quality and qualifications: Links between professional development and quality in early care and education settings. In (M. Zaslow & I. Martinez-Beck, Eds.), *Critical issues in early childhood professional development*. Baltimore: Brookes Publishing.
- Weaver, R.H. (2002). Predictors of quality and commitment in family child care: Provider education, personal resources, and support. *Early Education and Development*, 13(3), 265-282.
- Whitebook, M., Howes, C., & Phillips, D. (1990). *Who cares? Child care teachers and the quality of care in America*. Oakland, CA: Child Care Employee Project.
- Whitebook, M., Phillips, D., & Howes, C. (1993). *National Child Care Staffing Study revisited: Four years in the life of center-based child care*. Oakland, CA: Child Care Employee Project.
- Whitebook, M., Sakai, L., Gerber, E., & Howes, C. (2001). *Then and now: Changes in child care staffing 1994-2000, Technical report*. Washington, DC: Center for the Childcare Workforce.

Whitebook, M. (2003). *Early education quality: Higher teacher qualifications for better learning environments-A review of the literature*. Berkeley, CA: Institute of Industrial Relations, University of California, Berkeley.

Zaslow, M. & Martinez-Beck, I. (2006). *Critical issues in early childhood professional development*. Baltimore: Brookes Publishing.

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Appendix C.1: Research Design and Experimental and Control/Comparison Groups

Project Name	Research Design/ Details of Randomization	Experimental and Control/Comparison Groups					
		Curricula	Professional Development	# of Centers/ Programs	# of Classrooms	# of Teachers	# of Children
Project Upgrade	Randomized.	E1: Ready, Set, Leap! (plus literacy materials) E2: Building Early Language and Literacy (plus literacy materials) E3: Breakthrough to Literacy (plus literacy materials) C: Existing curricula; package of literacy materials and materials for infant-toddler center OR outdoor play materials	E1-E3: Initial and refresher workshop, coaches	N=164: E1: n=38 E2: n=36 E3: n=36 C: n=55	E1-E3: n=36 or 37 C: n=55	E1-E3: n=36 or 37 C: n=55	E1: n=320 E2: n=340 E3: n=354 C: n=509
Head Start REDI	Randomized. Stratified on county location, length of program (full-day, half-day, year- round), student demographics (minority and Spanish-speaking children), and center size. Classrooms in same center randomized to same experimental condition. Recruited over 2 yrs.	E: New curriculum integrated into existing curricula. New = Preschool PATHS and language/emergency literacy skills enhancement (interactive reading, sound games, print center). Among programs, 45% were using Creative Curriculum; 55% High/Scope C: 45% Creative Curriculum; 55% High/Scope	E: 4-6 days per year of workshops or presentations plus 3-day summer workshop; monthly visits by supervisor/mentor to provide feedback and monitor teacher adherence to program requirements and individualize goals/action plans plus weekly mentoring, videotaped models to introduce concepts, reflection and problem-solving discussions C: 4-6 days per year of workshops or presentations; monthly visits by supervisor/mentor to provide feedback and monitor teacher adherence to program requirements and individualize goals/action plans		E: n=22 C: n=22	E: n=22 teachers, n=21 assistant teachers C: n=22 teachers, n=22 assistant teachers	N=356

Project Name	Research Design/ Details of Randomization	Experimental and Control/Comparison Groups					
		Curricula	Professional Development	# of Centers/ Programs	# of Classrooms	# of Teachers	# of Children
Early Literacy and Learning Model	Randomized to E and wait-list C	E: Early Language and Literacy Model C: "Locally-accepted curriculum." Creative Curriculum, Beyond Centers and Circle Time, High Reach, or High/Scope*	E: initial summer workshop, coaches, team meetings		N=48 classrooms		N=466: E: n=222 C: n=244
Language-Focused Curriculum	Randomized.	E: Language-Focused Curriculum C: "Existing curriculum": High/Scope*	E: Summer 3-day institute on language development and the LFC curriculum C: Summer 3-day institute on topics such as creative music and movement, behavior management techniques	N=5	E: n=7 C: n=7	E: n=7 C: n=7	E: n=97 C: n=98
Let's Begin with the Letter People/Doors to Discovery	Randomized. Randomization by school site. Schools first randomized into curriculum condition, then into mentoring/no mentoring condition.	E1: Let's Begin with the Letter People + mentoring E2: Let's Begin with the Letter People + non-mentoring E3: Doors to Discovery + mentoring E4: Doors to Discovery + non-mentoring C: Variety of classroom curricula and materials	E1-E4: initial 4-day summer workshop E1 and E3: mentoring 2x month to help with lesson planning, demonstration of curricula, fidelity issues, classroom schedules, behavioral issues, side-by-side coaching on implementation of curricula E2 and E4: Feedback 3x/year on implementation of curricula		76 classrooms: E1: n=12 E2: n=12 E3: n=12 E4: n=13 C: n=27	76 teachers	N=603
Literacy Express	Randomized trial	E1: Literacy Express E2: Literacy Express C: High/Scope*	E1: workshops E2: workshops plus mentoring C: "business as usual"		N=30		N=486
Children's School Success	Randomized cluster design. Randomized by classroom.	E: ScienceStart!, 123 Mathematics, ABC Literacy, the Incredible Years, Building Blocks Curriculum Model	E1: 3-day initial workshop, plus weekly consultation/support		E: n=10 C: n=10	N=30 (15 in Year 1 and 15 in Year 2)	N=809

Project Name	Research Design/ Details of Randomization	Experimental and Control/Comparison Groups					
		Curricula	Professional Development	# of Centers/ Programs	# of Classrooms	# of Teachers	# of Children
MyTeachingPartner Whitaker et al (2007); Kinzie et al (2006)	Randomized trial. Also, focus groups of some participating teachers	E1: MTP Curriculum for Language and Literacy Development, Banking Time, and PATHS curriculum E2: same E3: same	E1: "Materials"—computer and access to MTP website E2: "Web" – same as E1, plus printed versions o MTP and PATHS, more resources on web E3: "Consultancy" – same as E2, plus biweekly on-line chats with consultant and reflection on videotapes of their own teaching practices			For randomized groups: N=235: E1: n=66 E2: n=89 E3: n=80 For focus groups: E1: n=14 E2: n=55 E3: n=42	N=1659 being followed as of Kinzie et al (2006) article
MyTeachingPartner Pianta et al (article and powerpoint)	Randomized at district level, stratified by district size (small, medium, and large, defined by the number of classrooms in the preK program)	E1: MTP Curriculum for Language and Literacy Development, Banking Time, and PATHS curriculum E2: same	E1: Web Access teachers: activity descriptions, materials, access to MTP website E2: Consultancy teachers: same as E1, plus biweekly discussions with teaching consultant			E1: n=52 E2: n=61 C: n=66	

Project Name	Research Design/ Details of Randomization	Experimental and Control/Comparison Groups					
		Curricula	Professional Development	# of Centers/ Programs	# of Classrooms	# of Teachers	# of Children
Building Language for Literacy	Randomized, to assure an equal proportion of Head Start classrooms in E1, E2, and C	E1: Building Language for Literacy E2: Building Language for Literacy E3: Building Language for Literacy and other curricula	E1: 3-day summer institute, weekly coaching (30 sessions), opportunity to attend evening group meetings for more PD E2: Same as E1, plus monthly coaching (8 sessions) C: Existing Montgomery County Public Schools PD: voluntary summer institute for certified teachers, voluntary ½-day summer training for paraeducators, additional professional days during year. Supervisors and content specialists visit classrooms during year and observe and provide PD.		E1: n=6 E2: n=6 C: n=12		E1: n=65 E2: n=68 C: n=130
Chicago School Readiness Project	Randomized at the preschool site level, with pairwise matching procedure used on 14 variables. Intent-to-treat analyses	E: Modification of The Incredible Years; teacher training plus mental health consultants C: Teacher's aide assigned to classrooms	E: Saturday workshops plus weekly visits by mental health consultants C: Teacher's aide assigned to classroom	E: n=9 C: n=9	E: n=18 C: n=17	E: n=48 C: n=42	N=602 C: n=206
Getting Ready	Single-subject designs (e.g., A/B with follow-up design; reversal or multiple baseline design) (Based on Sheridan et al, 2006)	Intervention to help ECE staff and parents work together to improve children's social-emotional development	Initial workshop plus individual and group coaching			N=44	N=50

Project Name	Research Design/ Details of Randomization	Experimental and Control/Comparison Groups					
		Curricula	Professional Development	# of Centers/ Programs	# of Classrooms	# of Teachers	# of Children
Pre-K Mathematics	Randomized trial. Block randomization: 40 preschool classrooms, with 10 Head Start and 10 state-funded preschools in each of two states)	E: PreK Mathematics with DLM Early Childhood Express Math software C: Various (Creative Curriculum, High/Scope, Montessori, and locally developed curricula)	E: initial workshop and second work shop, and on-site training	6 programs (4 in CA and 2 in NY)	N=40: E: n=20 C: n=20	N=40	N=316: E: n=159 C: n=157

***SOURCES:** All information from submitted articles except items marked with an asterisk. Those items are drawn from 2008 report on PCERS studies, available at: <http://ies.ed.gov/ncsr/pubs/20082009/pdf/20082009.pdf>

Appendix C.2: Content Focus of the Interventions, as Reported in Submitted Studies

Project Name	Language/ Literacy	Mathematics	Science	Social- Emotional	School Readiness/ Child Development	Parent Involve- ment
Project Upgrade	X					
Head Start REDI	X			X		
Early Literacy and Learning Model	X					
Language-Focused Curriculum	X					
Let's Begin with the Letter People/ Doors to Discovery	X					
Literacy Express	X					
Children's School Success	X	X	X	X		
MyTeachingPartner	X			X		
Building Language for Literacy	X					
Chicago School Readiness Project				X		
Getting Ready					X	X
Pre-K Mathematics		X				

Appendix C.3: Training Activities Provided in the Interventions, as Reported in Submitted Studies

Project Name	Initial workshop	Refresher workshop	Ongoing Access to Web-Based Materials	Coaches/Mentors	Reflection/Group Discussion
Project Upgrade	Yes (length unspecified)	2 (length unspecified)		Every 2 weeks	
Head Start REDI	3 days (summer)	1 day (midway through year)		Weekly. Avg 3 hr/week visits to classroom, plus 1 hour/week meeting with teachers and assistant teachers	Yes – with mentor
Early Literacy and Learning Model	2 days (summer)			Weekly support from literacy coach	Monthly site-based literacy team meetings; quarterly regional teacher meetings
Language-Focused Curriculum	3 days (month before school); approximately 15 hrs total	2.5 hours (January)			
Let's Begin with the Letter People/ Doors to Discovery	4 days (summer)			1.5 hrs (2 times per month)	
Literacy Express	X			X (in one condition)	
Children's School Success	3 days	1 day (1 month later)		Weekly meetings with teachers and teaching assistants); fidelity of treatment measure 7 times/yr	
MyTeachingPartner	Depends on specific study: 1.5 day (summer) or "training and introductory workshop (fall)		X	Depends on condition, but on-line video-chat feedback and consultation in 2-week cycles, repeated during the year	

Project Name	Initial workshop	Refresher workshop	Ongoing Access to Web-Based Materials	Coaches/ Mentors	Reflection/ Group Discussion
Building Language for Literacy	3 days for teachers, 2 days for "paraeducators" (summer)			Monthly or weekly (depending on condition): all-day visits by coaches with private feedback/discussion	Monthly 2-hour evening meetings for additional professional development and to exchange ideas
Chicago School Readiness Project	Invited to participate in 5 trainings on Saturdays, each lasting 6 hours	Booster training for new staff (mid-winter)		1 morning/ week in classroom	
Getting Ready	Depends on study: 1-3 days	Annual booster session		1 hour/ month individual coaching sessions	Group coaching: 1.5 – 2 hrs/month
Pre-K Mathematics	4-day training on units 1-3	4-day training on units 4-7 (winter)		On-site training 2x/month; implementation rating and feedback 1-2x/month	

Appendix C.4: Workplace Characteristics: Auspices/Settings, as Reported in Submitted Studies

Project Name	Head Start	State Pre-school	School District Preschool	Private/Community-based Preschool or Child Care	Title I	UPK	High School Student Parent Programs	Early Head Start (home visits)
Project Upgrade				?				
Head Start REDI	X							
Early Literacy and Learning Model								
Language-Focused Curriculum	X	X			X			
Let's Begin with the Letter People/ Doors to Discovery	X				X	X		
Literacy Express	X	X						
Children's School Success	X	X		X				
MyTeachingPartner		X						
Building Language for Literacy	X		X					
Chicago School Readiness Project	X							
Getting Ready	X						X	X
Pre-K Mathematics	X	X						

Note: Programs participating in Project Upgrade were described as child care centers that had to “serve primarily low-income children..., including some whose care was subsidized; and have at least one four-year-old classroom with at least five children.” (p. 8) No additional descriptions of the programs were provided.

Appendix C.5: Workplace Characteristics: Incentives, as Reported in Submitted Studies

Project Name	Curricula Materials	Training	Financial	Course Credits	Other
Project Upgrade	X		\$500 annual payment for teachers who remained at same center for entire study year		
Head Start REDI			\$20 for each observation		
Early Literacy and Learning Model					
Language-Focused Curriculum	X		Allowance to use for PD opportunities; small account for educational supplies during year		
Let's Begin with the Letter People/ Doors to Discovery	X	X			Summary report of language and literacy skills of enrolled children
Literacy Express					
Children's School Success					
MyTeachingPartner					
Building Language for Literacy			Compensated for attending evening sessions	Up to 16 hrs of professional development credit	
Chicago School Readiness Project			\$15/hr for participation		
Getting Ready					
Pre-K Mathematics					

Note: This table reports incentives, as they were described by project authors.

Appendix C.6: Recipients of Professional Development Activities, as Reported in Submitted Studies

Project Name	Teachers	Assistant Teachers/Aides	Coaches
Project Upgrade	X	X	
Head Start REDI	X	X	
Early Literacy and Learning Model	X		X
Language-Focused Curriculum	X		
Let's Begin with the Letter People/ Doors to Discovery	X		
Literacy Express	X		
Children's School Success	X		
MyTeachingPartner	X		
Building Language for Literacy	X	X (paraeducators)	
Chicago School Readiness Project	X	X	
Getting Ready (and home visitors)	X		X
Pre-K Mathematics	X		

Appendix C.7: Teacher Characteristics, as Reported in Submitted Studies

Project Name	Race/Ethnicity	Language	Educational Experience	Tenure in Field
Project Upgrade		>1/2 Spanish as primary language; >1/4 spoke English at home; 11% spoke both Spanish and English. Most spoke English only (42%) or mix of English and Spanish (26%) in classroom.	28% no education beyond high school. 14% some college. 58% AA or BA degree. Of post-secondary degrees, >75% from institutions outside US.	
Head Start REDI	Lead teachers (E group): 85% white, 2% black, 1% multi-racial. Assistant teachers (E group): 91% white, 9% Hispanic	E lead and assistant teachers: 95% English-speaking	Lead teachers: 55% in E group had 4-year degree+; 35% had CDA credential; 40% had teaching certificate. Assistant teachers: 68% in E had high-school or some post-HS education	Lead teachers in E: 75% had 6+ yrs experience; Assistant teachers in E group: 64% had 6+ years experience
Early Literacy and Learning Model	63% African American		40% E teachers – at least 2-yr AA degree	Avg: 14 yrs experience working with young children; most with <3.5 yrs in current position.
Language-Focused Curriculum	100% white, non-Hispanic		78% - BA or graduate degree	Avg: 11.4 years in the classroom
Let's Begin with the Letter People/Doors to Discovery	Head Start: 71% African American, 13% Hispanic, 6% Caucasian; 10% other; Title I: 100% white; UPK: 84% white, 11% Hispanic, 5% other		Head Start: 6% high school, 39% CDA, 10% 2-year, 39% 4-year, 6% graduate; Title I: 81% 4-year, 19% graduate; UPK: 79% 4-year, 16% graduate. Head Start: teaching certificate 13%, SPED 3%, ESL 3%, none 58%; Title I: teaching certificate 92%, SPED 15%, ESL 88%, none 0%; UPK: teaching certificate 84%, SPED 10%, ESL 19%, none 0%	
Literacy Express				

Project Name	Race/Ethnicity	Language	Educational Experience	Tenure in Field
Children's School Success				
MyTeachingPartner	72% white, 24% African American, 4% multi-racial		100%, at least BA. 35% with advanced degree. Educational majors: 34% early childhood; 31% elementary; 5% SPED, ESL, CD	Avg = 15.9 years
Building Language for Literacy			Lead teachers: Master's degree with specialty in ECE	
Chicago School Readiness Project	70% African-American, 20% Latina, 10% white.		Most with AA or higher, ¼ with high school degree or some college; near 50% with AA degree, nearly ¼ with BA or higher	
Getting Ready	100% white		9% AA degree; 61% BA; 28% MA; 2% doctorate	
Pre-K Mathematics	38% white; 33% African-American, 13% Hispanic, 10% Asian American, 5% interracial/other.		73% BA or higher	Avg = 12.4 years experience teaching preschool, with state-funded preschool teachers having more experience (16 yrs) than Head Start teachers (10 years).

Appendix C.8: Characteristics of Coaches/Mentors, as Reported in Submitted Studies

Project Name	Demographics	Education	Experience	Supervision
Project Upgrade				On-site coordinators
Head Start REDI			Experienced master teachers	2 project-based senior educational trainers
Early Literacy and Learning Model				ELLM consultants provide TA and support
Language-Focused Curriculum				
Let's Begin with the Letter People/ Doors to Discovery			Senior-level trainers, intimately familiar with curriculum	
Literacy Express				
Children's School Success				
MyTeachingPartner				
Building Language for Literacy		MA in reading	>20 years experience in providing professional development; extensive experience working in school district	
Chicago School Readiness Project	Matched to sites on basis of racial/ethnic and cultural similarity, Spanish proficiency, and judgment of supervisory staff	LCSW trainer; MSW mental health consultants	"Trained using a manualized approach"	MA-level intervention coordinator
Getting Ready	83% female, 92% white; 8% Hispanic	Grad students in school psychology	Demonstrated mastery of program model in a training program	
Pre-K Mathematics				

Appendix C.9: Constructs Measured in Submitted Studies

Project Name	Implementation	Classroom/ Instruction	Child Outcomes	Parent Outcomes
Project Upgrade	X	X	X	
Head Start REDI	X	X	X	
Early Literacy and Learning Model			X	
Language-Focused Curriculum	X	X	X	
Let's Begin with the Letter People/ Doors to Discovery	X		X	
Literacy Express			X	
Children's School Success	X	X	X	
MyTeachingPartner	X	X		
Building Language for Literacy	X	X	X	
Chicago School Readiness Project	X	X	X	
Getting Ready	X		X	X
Pre-K Mathematics	X	X	X	

Appendix C.10: Implementation Measures and Frequency of Implementation Checks

Project Name	Frequency of Implementation Checks	Measures of Implementation
Project Upgrade	Every 2 weeks (coach visits)	Curriculum-specific checklist
Head Start REDI	At least monthly	Curriculum-specific
Early Literacy and Learning Model	Weekly	
Language-Focused Curriculum	Observed classrooms 3x yr; teachers sent in lesson plans weekly	Curriculum-specific checklist; 50-minute video sample of instruction; assessment of activity contexts and instructional processes
Let's Begin with the Letter People/ Doors to Discovery	3x/year	Curriculum-specific checklist
Literacy Express		
Children's School Success	7x/year	% of curriculum completed; quality of implementation
MyTeachingPartner	Ongoing	Minutes/month n website, working with on-line consultant; % of teacher-submitted videotapes that included language/literacy or social development activities
Building Language for Literacy	Weekly/monthly, depending on experimental condition	Curriculum-specific checklist
Chicago School Readiness Project		
Getting Ready	Yes – frequency unclear	Audiotapes of individual/group sessions, coach notes, teacher/provider reports of completion of plan components, fidelity ratings of home visit videos
Pre-K Mathematics	1-2x/month	Adherence to schedule of activities; preparation of materials; delivery of small-group math activities; provision of developmental adjustments to individual children; written assessments of individual children; parents' self-report on use of home activities; teachers' use of DLM Express math software

Appendix C.11: Measures Used to Assess Changes in Teacher Behavior or Instructional Practices

Project Name	Measures
Project Upgrade	OMLIT, Arnett Caregiver Rating Scale
Head Start REDI	CLASS, Teacher Style Rating Scale, Classroom Language and Literacy Environment Observation
Early Literacy and Learning Model Language-Focused Curriculum	Use of language stimulation techniques (LSTs)
Let's Begin with the Letter People/ Doors to Discovery	CIRCLE- Teacher Behavior Rating Scale
Literacy Express	
Children's School Success	CLASS (1 hr of videotaped observations), ELLCO
MyTeachingPartner	CLASS
Building Language for Literacy	ELLCO; Ramey & Ramey Observation of Learning Essentials (ROLE)
Chicago School Readiness Project	ECERS-R (baseline only), CLASS
Getting Ready	
Pre-K Mathematics	Early Mathematics Classroom Observation (EMCO)

Appendix C.12 Professional Development, Implementation, and Changes in Classrooms/ Instructional Practices and Children

Project (PI)	Initial Workshop	Refresher Workshop	Coaching/ Mentoring	Reflection/ Group Discussion	Frequency of Implementation Checks	Implementation Fidelity	Classroom/ Instructional Quality	Child Outcomes	Interactions
Project Upgrade (Abt Associates)	X	2	Every 2 weeks		Every 2 weeks	By end of Yr 1: 11-22% of classrooms not implementing at satisfactory level. By end of Yr 2, 3-4 centers per group not implementing at satisfactory level.	At end of study: E>C on six constructs related to promoting literacy (support for oral language; print knowledge; print motivation; support for phonological awareness; literacy resources; literacy activities).	For 2/3 curricula: E>C on definitional vocabulary, phonological awareness, print knowledge, and early literacy index.	Effects on classrooms/instructional practices as strong or stronger for Spanish-dominant than English-dominant teachers. Effects on child outcomes stronger for children in classes with Spanish-dominant teachers, and, to a lesser extent, for children whose home language was Spanish or Haitian Creole (combined group). Small effect for BA degree for some classroom instructional measures, driven by Spanish-speaking teachers.
Head Start REDI (Bierman)	3 days	1 day	Weekly	yes	At least monthly	Average ratings of "adequate" to "strong" for implementation of PATHS, dialogic reading, alphabet activities, Sound Game activities, and overall REDI program.	TSRS: E>C positive emotional climate, classroom management; E=C positive discipline CLASS: trend, but ns emotional climate, instructional support E>C for more statements, asking more questions, more decontextualized utterances, richer and more sensitive talk with children.	E>C oral language, social-emotional competence E>C on two measures of executive function (cognitive performance task and behavioral performance task) E=C backward word span, peg tapping, Walk-a-Line slowly Teacher practice correlated with child outcomes, and accounts for 30-77% of intervention effect (depending on child outcome)	REDI intervention effects were as large for assistant teachers as for more highly educated lead teachers.

Project (PI)	Initial Workshop	Refresher Workshop	Coaching/Mentoring	Reflection/Group Discussion	Frequency of Implementation Checks	Implementation Fidelity	Classroom/ Instructional Quality	Child Outcomes	Interactions
Early Literacy and Learning Model (Fountain)	2 days		Weekly	Monthly, quarterly	Weekly			E>C emergent literacy skills	Teacher education (BA) predicted student achievement on conventions of print measure, but, more generally, children's Fall to Spring gains were about equal in magnitude between BA and non-BA ELLM teachers.
Language-Focused Curriculum (Justice)	3 days	2.5 hours			Weekly check-ins (non-observation) ; observations 3x/yr	Teachers submitted average of 39/40 weekly lesson plans (high fidelity), but average use of LSTs by teachers very low, though increased after refresher. On average, more implementation of activity contexts than of instructional processes (e.g., LSTs).	E=C on use of language stimulation techniques (LSTs).	E=C expressive language skills	Children who attended preschool more regularly did better, so child attendance and implementation are both important to figuring out dosage and effects on children.
Let's Begin with the Letter People/ Doors to Discovery (Landry)	4 days		1.5 hrs (2x/mo)		3x/yr	High levels of implementation, with growth over time. Better fidelity on Let's Begin than Doors to Discovery		Generally E>C, but interactions. Examples: Language comprehension: Mentored, Title I/D to D classes and non-mentored Title I/Let's Begin classes showed slower growth than C.	Greater gains in Head Start classrooms, whether mentored or not, but for other classroom types, curriculum and mentoring mattered.
Literacy Express (Lonigan)	X		X (in one condition)					Mentoring + workshops > workshops only on print knowledge, but not oral language, phonological processing, or cognition	

Project (PI)	Initial Workshop	Refresher Workshop	Coaching/Mentoring	Reflection/Group Discussion	Frequency of Implementation Checks	Implementation Fidelity	Classroom/ Instructional Quality	Child Outcomes	Interactions
Children's School Success (Odom)	3 days	1 day	Weekly		7x/yr	Better fidelity in Year 2 than Year 1. Coaching associated with better implementation.		Relationship of fidelity with child outcomes varies across variables. Low performers (at baseline) benefit more from high implementation and less for low implementation, with exception of math – where there was a strong main effect for quality of implementation.	Little relationship between years of teaching and/or degree status and curriculum implementation. Teachers' motivation to change is powerful factor in curriculum implementation.
MyTeachingPartner (Pianta)	1.5 days (some articles)		2-week cycles, repeated during the year	Ongoing (online)	Ongoing (online)	<i>In one study:</i> over 6 months: average website use of 18 minutes/month for activities, videos, and quality teaching; 43 min/mo for consultancy section. Teachers reported avg of 720 minutes per month for preparing/implementing lessons; 57 min/mo for responding to prompts. Avg of 10 cycles completed/yr.	Teachers grew more sensitive in interactions with students, became more adept at engaging students in instruction, improved the quality of their language stimulation techniques.		Consultancy had greater effect on teacher practices in high-poverty classrooms. Even videos (without consultancy) are helpful though. Teachers in high-poverty classrooms accessed more consultancy support.
Building Language for Literacy (Ramey Ramey)	3 days for teachers; 2 days for para-educators		Weekly (30 sessions) or monthly (8 sessions) depending on condition)	Monthly	Weekly or monthly	Monthly coaching > weekly coaching conditions for fidelity. Authors note importance of MIS and monitoring for program quality and improvement.	Monthly = weekly coaching on ELLCO	E (coaching) conditions > C, on multiple measures, but weekly coaching not always better than monthly	

Project (PI)	Initial Workshop	Refresher Workshop	Coaching/Mentoring	Reflection/Group Discussion	Frequency of Implementation Checks	Implementation Fidelity	Classroom/ Instructional Quality	Child Outcomes	Interactions
Chicago School Readiness Project (Raver)	5 train-ings x 6 Saturdays (avg 18/30 possible hrs per tchr)	Yes	Weekly			Average teacher received 18 of 30 possible hrs of initial training; classrooms received avg of 132 hrs of teacher training and mental health consultation.	E>C for classrooms' positive climate (CLASS); E better than C for negative climate; marginal benefits on teacher sensitivity, trends toward benefits on teachers' management of children's disruptive behavior. No effect of teachers' psychosocial stressors on classroom emotional climate.	Executive function (C group, preliminary results only)	Lower quality social interaction and behavior management in classrooms with less experienced teachers.
Getting Ready (Sheridan)	1-3 days	1/yr	1 hr/mo	1.5-2hrs/mo	Yes			Average effect size for all behavioral outcomes in the home was 1.01, and in the school, 1.15.	
Pre-K Mathematics (Starkey)	4 days	4 days	2x/mo		1-2x/mo	Overall fidelity scores unrelated to teachers' education level and years of preschool teaching experience.	E>C for total number of minutes of math support per child per day, for focal math support. E=C for # minutes of embedded math support. No differences due to either teacher education level or amt of preschool teaching experience.	E>C for gains in math; E=C for gains in reading skills, language composite, and social skills. Fidelity didn't predict change in child outcomes, but amt of focal math provided did predict child outcome scores.	No differences due to program type (Head Start/state preschool; half-day/full-day classes), or teacher education/experience.