

Chapter 10

Early Reading First as a Model for Improving Preschool Literacy Instruction and Outcomes

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Abstract The Early Reading First program (ERF) was sponsored by the U.S. Department of Education to develop model ‘preschool centers of excellence’ that enhance the early language and literacy skills of low-income preschool children. In this chapter we report on the outcomes of an ERF project conducted with Head Start classrooms in Hawai‘i. The intervention included intensive professional development on research-based curriculum and instruction, teacher-child interaction, family engagement, and child progress monitoring. Outcomes included large gains on intentional literacy instruction, classroom quality, and family engagement, and moderate to large gains on child emergent literacy skills. The intervention had little effect on oral language outcomes. Despite the academic focus, most teachers were highly satisfied with the experience, reporting increased child motivation and considerable professional growth.

Early Literacy Instruction: Background and Issues

Early Literacy

Emergent or early literacy is a multidimensional construct that encompasses the set of knowledge, skills, and attitudes that are the precursors of conventional reading and writing. Components of early literacy include:

- *Oral language* skills such as receptive and expressive vocabulary, syntax, morphology, and pragmatics.

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- *Phonological and phonemic awareness* or the ability to detect and manipulate sound units within spoken words. This includes sensitivity to word boundaries, syllables, rhyme, and individual phonemes.
- *Concepts of print* such as awareness of letters as a special group of symbols, knowing that print contains a message that can be understood by others, and familiarity with conventions like print directionality.
- *Alphabet knowledge* including awareness of letter symbols, names, and sounds.
- *Emergent writing* which includes the progression of written forms of increasing conventionality (e.g., scribble to letter-like shapes to recognizable letters) and initial attempts at phonetic spelling.
- *Interest and motivation* relating to text-based activities (International Reading Association and the National Association for the Education of Young Children, 1998; National Early Literacy Panel, 2008; Whitehurst & Longian, 2001).

Early Literacy Curricula

A number of preschool curricula, both commercially available and unpublished have been developed with the aim of enhancing early literacy outcomes. Some of these are stand-alone, comprehensive curricula that include a strong emphasis on literacy. Others focus more narrowly on literacy content and are intended to be used as a supplement to a broadly-based developmental curriculum. While it seems logical that using a literacy-focused curriculum would promote such outcomes for children, there is surprisingly little evidence to support this expectation.

The Preschool Curriculum Evaluation Research initiative (PCER) was a multi-site, randomized control trial conducted in the U.S. (Preschool Curriculum Evaluation Research Consortium, 2008). This project involved 14 curricula, 315 classrooms, and over 2900 children. Both comprehensive and literacy-specific curricula were included. Results suggested that using a literacy-focused curriculum was usually associated with corresponding changes in instructional content. For six of the nine literacy curricula, the frequency and quality of observed literacy instruction was superior to the control condition; the same pattern was found for only two of the five trials using comprehensive curricula. However, only one literacy-focused curriculum (and no comprehensive curriculum) showed significant benefits for children's literacy growth. The PCER evaluation suggests that simply providing teachers with a documented curriculum and a modest amount of workshop-based training on implementation is not sufficient to change child outcomes, at least in within the span of a single school year.

An exception to this trend is the work of Laura Justice and colleagues. Justice found that 2 days of workshop training on the scripted Read it Again! protocol led to successful implementation by teachers and positive effects on child literacy outcomes (Justice et al., 2010; Justice, Kaderavek, Fan, Sofka, & Hunt, 2009). Unlike the curricula included in the PCER evaluation, Read It Again! is tightly focused, consisting of 60 short lessons done twice per week during large group book-reading

time. Teachers are given specific books along with target vocabulary words, questions to ask, and teaching materials such as vocabulary picture cards.

The Justice curriculum is unusually narrow in terms of focus and unusually prescriptive in terms of teacher interaction and decision-making. Taken as a whole, the existing research suggests that a literacy-focused curriculum may be a necessary but insufficient step towards the goal of providing literacy-rich instruction that has a demonstrable effect on children's literacy development. The consensus is that attention should focus on ensuring that teachers have a solid knowledge base in early literacy development, a strong instructional skill set, and ongoing support with curriculum implementation (Pianta, Barnett, Burchinal, & Thronburg, 2009). Such supports are addressed in the next section of this chapter.

In-Service Professional Development in Early Literacy

The literature on adult learning and in-service education suggests that teacher professional growth is a complex process. This process unfolds over time and involves the interaction between teachers' pre-existing beliefs, skills and knowledge; the content and format of the training provided; and opportunities for practice, application, and self-reflection (Birman, Desimone, Portyer, & Garet, 2000; Clarke & Hollingsworth, 2002; Joyce & Showers, 1995). Research evidence suggests that professional development (PD) is most effective when (a) training addresses the standards and techniques on which teachers' performance will be evaluated, (b) duration and intensity are commensurate with the complexity of the changes to be implemented, (c) the focus is on classroom application, (d) follow-up support and mentoring is given to teachers as they use the new practices, and (e) efforts are made to create a community of learners with a shared purpose and commitment to organizational change (Fukkink & Lount, 2007; Landry, Anthony, Swank, & Monseque-Bailey, 2009; U. S. Department of Education, Office of Planning, Evaluation and Policy Development, Policy and Program Studies Service, 2010; Walpole & Meyer, 2008).

Two literacy-focused PD packages that have been tested on a large scale are eCircle and My Teaching Partner (MTP). eCircle consists of a video course delivered in a small group facilitated format twice per month for 2 h. In one study, 262 teachers were randomized to one of five conditions: control and eCircle with or without coaching and with or without the use of PDA technology (Landry et al., 2009). The coaching conditions included 2 h of coaching twice per month. The PDA system was used to track each child's progress and select the next appropriate lessons based on individual assessment data. Collectively, the intervention conditions resulted in more frequent and higher quality literacy instruction, with effect sizes in the range of $d = .41$ – 1.11 . The most intensive intervention condition (eCircle video course plus coaching plus PDA) resulted in the largest changes in classroom practices; this group also showed the most consistent advantages for child gains on oral language, phonological awareness, and print and alphabet knowledge. Based

on these results, a second, scale up study was conducted with 213 Head Start and public preschool teachers (Landry, Swank, Anthony, & Assel, 2011). In this case, all intervention teachers received the intensive PD combination of eCircle, biweekly coaching, and use of the PDA device. After 4 months, intervention sites showed stronger instructional practices than control sites on nine out of ten measures ($d=.40-1.03$), but no difference on child outcomes.

MTP is an on-line program that includes (a) classroom language and literacy activities, (b) descriptions and justifications of ten dimensions of high quality teaching, and (c) a video library to illustrate the target teaching practices. Public preschool teachers ($n=113$) were randomly assigned to receive either MTP on line resources only or MTP plus biweekly, on-line coaching that included analysis and discussion of videotapes of the teachers' classrooms. After 1 year of intervention, classrooms in the coaching condition showed better instructional quality and children in these classrooms made larger gains on expressive language (Mashburn, Downer, Hamre, Justice, & Pianta, 2010; Pianta, Mashburn, Downer, Hamre, & Justice, 2008). On-line coaching was especially helpful in classrooms that served a high proportion of low-income children. There was also a dose-dependent relationship for teachers in the coaching condition, where greater engagement in the consultation process was associated with better child outcomes. An extension of this work involved 440 teachers assigned to either a control condition or an on-line course using MTP with no coaching component (Hamre et al., 2012). After 14 weeks, teachers who took the course had stronger knowledge of and beliefs about effective literacy instruction; these teachers also evidenced higher quality classroom interactions. Effect sizes ranged from $d=.41-.77$.

As a whole, these studies provide strong evidence that intensive PD can change teachers' knowledge, beliefs, and classroom literacy practices. In addition, intensive PD usually results in better child outcomes. However, little is known about the active ingredients of these often complex interventions, whether there are minimum thresholds for required PD supports or ceilings beyond which additional supports provide no additional benefits, or how PD effectiveness interacts with teacher characteristics. Furthermore, none of these studies provided data on maintenance of improvements once PD supports are withdrawn.

Family Engagement in Early Literacy

Family engagement is an important component of developmentally appropriate early education practices (Coppole & Bredekamp, 2009; U.S. Department of Health and Human Services, Families, & Office of Head Start, 2011). Elements of family engagement include home-school communication, classroom participation, and parent involvement in school leadership (Epstein, 1995; Fantuzzo, McWayne, Perry, & Childs, 2004). In the early childhood period, the forms of family involvement most strongly associated with children's early academic skills are those involving

direct parental teaching, stimulation, and modeling in the home (Fantuzzo et al., 2004; McWayne, Hampton, Fantuzzo, Cohen, & Sekino, 2004).

Parents' provision of learning materials, rich stimulation, and informal instruction in the context of everyday home life has a widespread influence on children's language, cognitive, and early academic skills (Bus, Van IJzendoorn, & Pellegrini, 1995; Hart & Risley, 1995; Sénéchal & LeFevre, 2002). Home instruction is more effective when parents receive training and practice with specific teaching strategies and learning materials (Starkey & Klein, 2000; Whitehurst et al., 1988). These training studies demonstrate that parents can have a strong effect on children's readiness skills. In fact, parents have sometimes been found to be more effective change agents than teachers (Lonigan & Whitehurst, 1998; Sénéchal & Young, 2008). This suggests that family engagement is an important component of early literacy interventions.

Early Reading First

Since the implementation of the controversial *No Child Left Behind Act of 2001* (NCLB), the focus of federal education policy in the United States has been to increase overall levels of student achievement (early reading achievement in particular) and reduce longstanding patterns of educational inequities found as a function of socio-economic status (SES), ethnicity, native language, and disability status. The Early Reading First program (ERF), sponsored by the U.S. Department of Education included preschool as part of the wider efforts of NCLB. The overall purpose of ERF was to develop model "preschool centers of excellence" that enhance the early literacy skills of low-income preschool children. The intent was to imbue research-based practices into early childhood programs at multiple levels including teacher professional development, curriculum and instruction, classroom environment and materials, and child assessment.

From 2002 through 2009, the U.S. government awarded approximately 30 ERF grants per year, serving about 31,000 children annually. With a total investment of almost \$US800 million, the cost per child was over \$US3,800 (U.S. Department of Education, n.d.a). Most ERF grantees were local public school systems (49%), non-profit organizations (24%), or universities (20%). Compared to the U.S. national average, children in ERF were more likely to live below the poverty line, be of Hispanic heritage, live in single parent households, and have foreign-born parents (U.S. Department of Education, n.d.b). ERF grantees were given much latitude in program design but were required to collect and report data on a core set of five performance measures (U.S. Department of Education, n.d.c).

ERF represents a large-scale experiment regarding the potential of intensive professional development to improve preschool practices and child outcomes. Because ERF was intended to promote school readiness, defined as emergent literacy, an analysis of the program can also inform the debate concerning the extent to which preschool education should have an academic focus. The purpose of this chapter is

to present the results of an ERF project conducted in the state of Hawai'i. We will discuss our results in the context of existing research on early literacy and what is known about the ERF program as a whole.

The goal of our study was to evaluate the results of an early literacy intervention package. This package integrated a literacy-focused curriculum with intensive professional development and family home engagement component. We expected that the intervention would result in positive changes in:

- teacher knowledge, skills, and attitudes about early literacy,
- literacy instruction practices and classroom quality,
- family support for early literacy learning in the home and
- child literacy outcomes.

Intervention Model

Research-Based Curriculum

Curriculum Content *Learning Connections* (LC) is an enrichment curriculum (DeBaryshe & Gorecki, 2005, 2007; DeBaryshe, Gorecki, & Mishima-Young, 2009; DeBaryshe, Kim, Davidson, & Gorecki, 2013; Sophian, 2004) developed for use as a supplement to a more holistic or comprehensive preschool curriculum. Learning goals were based on a review of the research literature and standards and recommendations of key educational organizations and review panels (e.g., Copple & Bredekamp, 2009; International Reading Association and the National Association for the Education of Young Children, 1998; National Association for the Education of Young Children and the National Council of Teachers of Mathematics, 2002; National Early Literacy Panel, 2008). Results of two quasi-experimental field trials indicated that children exposed to LC for one school year show greater gains than children in closely matched control classrooms on measures of emergent reading, phonemic awareness, letter-sound correspondence, emergent writing, and emergent math, with effect sizes ranging from $d = .21$ – $.81$ (DeBaryshe & Gorecki, 2005, 2007; Sophian, 2004).

The full LC curriculum addresses emergent literacy and emergent mathematics. However, the intervention described in this chapter included only the literacy components. LC literacy domains and child learning goals are shown in Table 10.1. LC was designed for use in mixed-age preschool classrooms (i.e., those serving both 3- and 4-year-old children), so lessons needed to cover a fairly wide range of skills. A teacher's manual includes over 140 developmentally sequenced classroom and home activities. Examples of lessons from each domain are given below.

A key oral language activity was small-group dialogic reading. Dialogic reading is an interactive read-aloud technique shown to promote oral language skills, especially vocabulary growth (Hargrave & Sénéchal, 2000; Wasik, Bond, & Hindman, 2006; Whitehurst et al., 1988). In dialogic reading, the adult scaffolds the

Table 10.1 LC curriculum domains and learning goals

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| Oral language |
| To follow two-step and multi-step directions |
| To communicate needs, questions, emotions, and thoughts with increasing sophistication |
| To use increasingly diverse and sophisticated vocabulary |
| To engage in conversations of increased length and complexity |
| To increase English language competence while maintaining heritage language growth |
| Phonological and Phonemic awareness |
| To recognize and discriminate environmental sounds |
| To segment and blend compound words and syllables |
| To recognize and generate rhyming words |
| To segment and blend onsets and rimes |
| To recognize and generate words with the same initial and final sounds |
| To segment and blend phonemes in consonant-vowel-consonant words |
| Alphabet knowledge and Print awareness |
| To show independent interest in and use of books and print materials |
| To recognize and identify letter symbols and letter names |
| To identify letter-sound correspondences |
| To track print from left to right and top to bottom |
| To be aware of the functions of print |
| To make use of environmental print |
| To use print to convey meaning |
| To read consonant-vowel-consonant words |
| Emergent writing |
| To use writing to convey meaning |
| To strengthen fine motor skills and use tools in preparation for writing |
| To use increasingly higher levels of emergent writing |
| To use a left-to-right and top-to-bottom orientation when writing |
| To begin to spell simple words using letter-sound correspondence |
| Approaches to learning |
| To increase attention and persistence when doing LC activities |
| To incorporate newly learned skills in free play |
| To use prediction, comparison/contrast, definitions, and taxonomic knowledge in the context of discussing LC activities |

book-related discussion by asking challenging questions, explaining new concepts, having children make connections between the book and their own experiences, and responding to children's interests. Other examples of LC language activities included having children retell stories from their favorite classroom books, and teachers using target vocabulary words, dialogic conversation strategies, and selected props as they interacted with children in the dramatic play center.

Phonological and phonemic awareness was addressed through short games that teach children to attend to the units of sound within spoken words. Examples include clapping out the number of syllables in classmates' names, using rubber stamps and ink to make prints with pairs of rhyming words, and a classroom or neighborhood

scavenger hunt to find objects that start with a particular sound. Phonemic awareness games were sequenced in order from larger to smaller sound units: e.g., compound words, syllables, onsets and rimes, individual phonemes and from easier to harder sound analysis skills, e.g., detect, match, generate, blend, or segment sound units.

Activities often combined skills from two or more literacy domains. For example, in the mystery box activity, children reached into a shielded box full of small toys and guessed which object they were holding. If the objects were selected to start with the sounds /m/, /t/, and /a/, children would then sort the objects into groups based on first sound, placing toys next to letter cards m, t, and a.

Print concepts were addressed through activities such as a neighborhood sign walk to identify environmental print and having children take turns physically tracking print on chart paper as the teacher and child re-read a class-created morning circle time message. An example of an *alphabet* activity is a Montessori technique called the three period lesson. In this game, children are shown three large sandpaper letters. In the first period the teacher shows one letter at a time, reviews the name or sound, and asks children to trace the letters with their fingers while saying the name or sound. The second period is short, fast-paced game that provides repeated opportunities to pair the letter symbol with the name or sound. For example, “Kiana, give /m/ to Sarah. Sarah, put /m/ in my lap. Kianna, take /s/ from Zach and put /s/ on your head. Zach, swap /s/ for /a/.” In the third period, the teacher reviews these associations by showing one letter at a time and having children say the letter name or sound.

Emergent writing activities supported children’s attempts at meaningful written communication. Scaffolded journaling was a key writing activity. Working one-on-one or in small groups, teachers and children responded to a daily writing prompt. The teacher would support the child in first deciding what message he or she wanted to convey. The teacher would then have the child write as much of a message as he or she could with modest support, aiming over time to move to higher levels of emergent writing. Children just starting to differentiate writing from drawing might be asked to explain which part of the page represented their picture versus their signature. Children who could form some printed letters might be prompted to label their drawing with a letter representing the first sound of one of the objects included in their message. Children with stronger phonological awareness and alphabet skills might be encouraged to say the words slowly and write down as many sounds as they heard.

Other emergent writing activities involved shared writing. Children made group-authored classroom and family books. Morning message was a common large group activity. Children and teachers would discuss a topic and several children would dictate a message for the teacher to write on chart paper. These messages were then read aloud by the group.

Literacy skills were taught within the context of monthly units of study, for example, nutrition, plants, wild animals, domestic animals, marine life. Target vocabulary words were selected to represent the ‘big ideas’ of the current unit. Additionally, target vocabulary were what Beck, McKeown, and Kucan (2002) call tier 2 (sophisticated) and tier 3 (technical) words. Books, songs, poems, and dra-

matic play materials were selected to complement the unit of study. Skill-oriented lessons were also adapted to complement the unit. For example, during ocean month, syllable clapping was done using words such as algae and octopus.

Lesson Plans Teachers were provided with weekly LC lesson plans. Each day included one or two LC large group activities, two or three LC small group activities, and suggestions for transition and extension activities, unit-related songs, books, and dramatic play props. Lesson plans were presented in two levels with one set of LC small group activities for children who were younger or had less advanced literacy skills and another set of small group activities for older or more advanced children. Alphabet letters were introduced in sets of three (usually two consonants and one vowel) to allow more advanced children to start to form consonant-vowel-consonant (CVC) words. Both new letters and review letters were indicated on the lesson plan. Over time, teachers were given increased responsibility for designing lesson plans with their classroom coach.

Individualized Instruction Individualization occurred primarily in the context of small group instruction. At the start of the year, and at least monthly thereafter, teachers collected curriculum-based assessment (CBA) data to monitor children's progress. This assessment involved rating the child's progress on LC learning goals and specific curriculum activities. The rating sheet was organized by content area and developmental complexity; by looking at the sheet, teachers could determine what a child has mastered and which skills and activities they should work on next. CBA results were used to identify small groups of two to five children with homogeneous skills. Teachers (lead and assistant) were responsible for particular small groups; this was intended to support the establishment of close teacher-child relations and allow the teacher to develop in-depth knowledge of each child's skills and needs. Group membership could change in response to CBA results, but most groups remained stable over the school year.

Individualization occurred in three ways. First, as mentioned above, parallel lesson plans were written at two levels; the small group activities in each level addressed similar content areas (e.g., phonological awareness) but different degrees of skill complexity. Teachers would follow the more advanced or less advanced activity on the lesson plan, depending on the skill level of the small group. Second, each assigned activity could also be done with a number of modifications to make it easier or harder, depending on the particular children within the small group. Finally, we included a response to intervention (RTI) protocol (Buisse & Peisner-Feinberg, 2013) for children not making adequate progress. Children in the bottom 20% on CBA measures of oral language and/or alphabet knowledge for their age group were provided with additional one-on-one instruction using alphabet games or dialogic reading (known as Tier 2 instruction). Alphabet instruction was not provided for younger children during the first half of the school year, as most 3-year-olds started the year with minimal alphabet skills. Sessions lasted for 20–30 min and were conducted two to three times per week by a graduate student. Children with identified special needs (Tier 3 instruction) received instruction as specified in their Individualized Education Plan.

Professional Development and Coaching

Professional development (PD) was intensive and each component was integrated to form a coherent whole. The ERF training team (University faculty and a master's-level project coordinator) provided quarterly in-service workshops for a total of 56 h per school year. To help create a team-wide learning community, coaches, RTI staff, and Head Start supervisors facilitated the workshop sessions. Content included the research basis for the LC curricula, developmental sequences and mechanisms, and hands-on practice of interaction strategies, curriculum activities, and use of assessment tools. Applications for dual language learners and children with special needs were integrated in each topic. To enhance teachers' understanding of the classroom quality measures on which they were evaluated (see below), teachers received full or abbreviated versions of the observer training protocols. Additional topics included classroom environmental design, collaboration with families, and kindergarten transitions.

In-service workshops provided only the foundation for actual classroom practice. In-class coaching was the mechanism through which teachers were supported in the actual implementation and honing of the ERF intervention. Coaches were experienced classroom teachers with at least a master's degree (one coach had a doctoral degree) in early childhood education. Coaches worked with each classroom team to implement and reflect on their use of the LC curriculum, target instructional and individualization strategies; revise grouping and scheduling practices; improve environmental design; increase family engagement; and use assessment data for continuous improvement.

Each coaching visit lasted for 5–6 h. In the morning, coaches would demonstrate, observe, collect assessment data, and consult as needed with individual teachers. Technical assistance meetings were held with the classroom team during naptime (for full-day sites) or after the children were gone for the day (for part-day sites). The coaching model was primarily skill-focused, with aspects of cognitive coaching, such as self-directed learning (Walpole & Meyer, 2008). The coaching agenda followed a planned content sequence but also allowed for flexibility in meeting unique classroom priorities. Approximately half of the coaching meetings focused on curriculum planning, modeling and practicing new lessons, and discussing children's progress and individualization needs. The remaining meetings were devoted to quality improvement. This included discussion of teaching fidelity and classroom quality data, reflecting on videos of classroom practices, reviewing reading assignments, and creating or reviewing written classroom action plans.

Teachers were also offered three tuition-free college courses open only to ERF teachers, coaches, and Head Start supervisors. Course instructors worked closely with the ERF training team to integrate course content and assignments with ERF project goals. All participants met as a group, with different assignments and expectations for those enrolled at the associate (2-year degree) versus bachelor (4-year degree) level.

Family Engagement

Quarterly parent workshops were provided in the classroom, led by ERF staff and teachers. The first workshop covered the domains of the LC curriculum, during which parents rotated through learning stations and participated in sample classroom activities. Subsequent workshops focused on a content area such as reading aloud or emergent writing. Each meeting included a discussion of developmental sequences followed by modeling and practice of strategies and activities to support children's learning.

In addition to workshops, families were provided with weekly home activities that extended LC curriculum content introduced in the classroom. Each activity was quick to do and some were designed to be done in the context of family routines such as mealtime or commuting. Families were provided with short written instructions and any needed materials. Written translations were available in two common home languages (Chinese and Chuukese). Examples of home activities include reading and acting out one of the child's favorite storybooks, identifying first sounds in the names of food items eaten at dinner, clapping syllables in the names of objects collected on a home scavenger hunt, and writing and illustrating a family book to share at school. Teachers and coaches provided short demonstrations of the new activities as they were distributed and consulted with families in small groups or individually. The purpose was to clarify parents' understanding of the goals of an activity, provide ideas for individualization and promote ongoing dialog about the child's learning. In the last 2 years of the project, a bilingual graduate student worked with the teachers and coaches to provide support for Chinese speaking families. Each month, families were given new books to add to their child's home library. Selections represented a mix of fiction, non-fiction, and instructional (e.g., alphabet, rhyme, alliteration) texts related to the unit of study.

Methods

Participants

Classrooms from the same Head Start program participated as intervention sites. Head Start is a federally-funded preschool program offered free of charge to low-income children. Head Start provides comprehensive services including developmental, health, and dental screening; educational programming; and family support. The classroom intervention started in January 2010, half way through the school year, and continued for three additional school years. The original intention was to serve ten classrooms for two and one-half school years. One site closed after the second project year. Per the funder's requirement, a replacement classroom was added, yielding a total of 11 classrooms for the project overall. The final project year was funded by a no-cost extension. Eight classrooms volunteered to remain for the fourth optional year.

The typical Head Start classroom operates on a part-day schedule and follows a 10-month school year. Most project classrooms followed the traditional Head Start calendar; however, three classrooms offered extended-day, year-round services. Three other classrooms were inclusion sites, operated under a collaborative arrangement with the state Department of Education. Inclusion sites reserved up to six slots for children with a diagnosed special need and were staffed by a Department of Education certified special education teacher and an educational aide in addition to the regular Head Start lead and assistant teacher. Depending on the classroom type, the teacher-child ratio ranged from 1:10–1:5.

Fifty-four teachers participated in the project. Lead teacher positions were highly stable (i.e., all remained employed for the duration of the project) but there was considerable attrition among the assistant teachers. At the start of the project, the average years of teaching experience was 15.8 years for lead teachers and 5.8 years for assistant teachers and aides. Twenty percent of lead teachers had a postgraduate degree, 40 % had a 4-year bachelor's degree, and 40 % had a 2-year associate's degree. Among assistant teachers and aides, the figures were: bachelor's degree, 13.5 %; associate's degree, 24 %; a six-course Child Development Associate certificate (CDA), 13.5 %; and high school diploma, 49 %. Eight teachers earned a new credential during the project; most of the changes involved assistant teachers completing a CDA.

A total of 560 children participated in the intervention. This represents the unduplicated headcount of children who were enrolled for at least one full school year. Children were predominantly of Native Hawaiian (35 %), Asian (28 %), and other Pacific Islander (15 %) heritage. Twenty-one percent of the children were dual language learners and 9 % had special needs. Head Start serves mixed-age groups of 3- and 4-year-old children; most children (70 %) were in the older age group. About 13 % of children enrolled for two consecutive years.

Measures

Classroom Quality Data were collected three times per year (twice in year 1) on the Early Language and Literacy Classroom Observation (ELLCO) (Smith, Brady, & Anastasopoulos, 2008), and the Classroom Assessment Scoring System PreK (CLASS) (Pianta, La Paro, & Hamré, 2008). Observations were conducted by reliable evaluators. The ELLCO has two scales, General Classroom Environment (e.g., scheduling, classroom management) and Language and Literacy (e.g., materials and interactions to support oral language, book use, emergent writing, phonological awareness). The CLASS scales are Emotional Support (e.g., affective climate), Classroom Organization (e.g., time use, classroom management), and Instructional Support (e.g., interactions that support language, cognition, and critical thinking). Both are widely-used instruments and the CLASS in particular has strong evidence for external validity.

Family Engagement A comment sheet/rating scale was included with each weekly home activity. The percentage of home activity comment sheets returned was used as a proxy measure of completion of the home activities.

Child Outcomes Children were assessed twice yearly by trained evaluators on the *Peabody Picture Vocabulary Test (4th. Ed.)* (PPVT) (Dunn & Dunn, 2007) and the *Test of Early Reading Abilities (3rd. Ed.)* (TERA) (Reid, Hresko, & Hammill, 2001). The PPVT is a widely-used measure of receptive vocabulary. The TERA includes alphabet knowledge, print concepts, and use of environmental print. Results for both tests are expressed in quotient scores. Alphabet knowledge data were collected by both teachers and the assessors. This included upper and lower case letter names and lower case letter sounds (e.g., naming or giving the sound of a letter shown on a card).

Teacher Outcomes Data were collected on the fidelity of teachers' implementation of LC activities, knowledge, beliefs, self-reported changes, and consumer satisfaction. Starting in year 2, coaches observed each teacher conducting an LC large or small group activity every 6–8 weeks and collected *LC fidelity* data. Each lesson was rated for (a) accuracy of implementation, (b) quality of instruction, (c) individualization, and (d) success in engaging children using a five-point scale where 1 = "poor," 3 = "acceptable," and 5 = "mastery." At program entry and exit, teachers were administered a 30-item multiple choice *LC Knowledge Test* developed by the lead author. This test covered declarative knowledge about early literacy development and instruction consistent with the principles covered in the professional development package. At the start and end of each year, teachers were also administered an eight-item survey of *literacy beliefs* ($\alpha = .80$) developed for the project. Items were scored on a five-point Likert scale. Sample items include "Preschoolers can use print or writing attempts to communicate with other children" and "Rhyming is too hard for most preschoolers" (reverse coded). The end of the year survey also included sets of items about *perceived changes* in classroom practices and *satisfaction* with the ERF intervention. Open-ended comments were solicited on the year-end surveys and annual focus groups were conducted by an outside evaluator. Focus group notes and open-ended comments were subjected to a content analysis.

Results

Classroom Quality

Scores on the ELLCO and CLASS dimensions are shown in Fig. 10.1. There was some evidence for seasonal effects, with lower scores at the start of a school year, especially for the CLASS. The main finding was the steady and dramatic

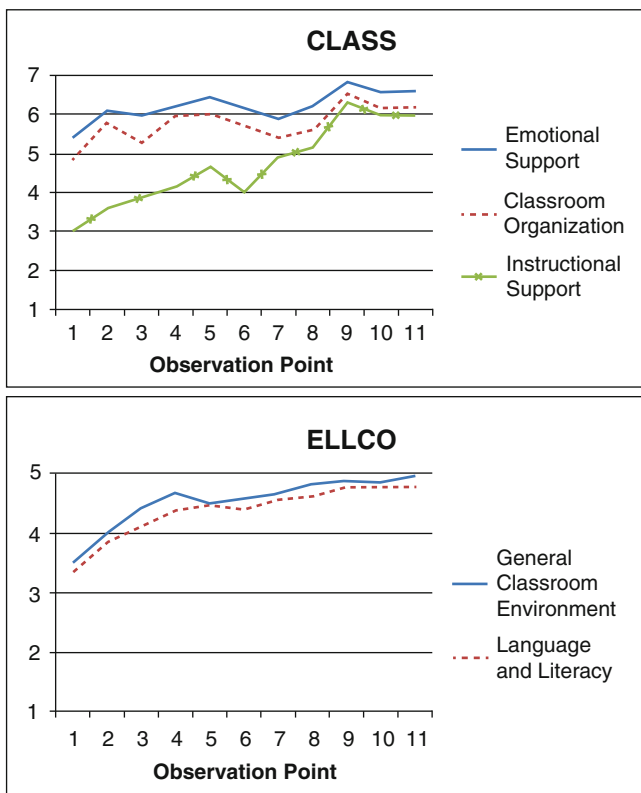


Fig. 10.1 Classroom quality over time (*Note.* Times 1 and 2 occurred in January and May of project year 1. After that, observations occurred in August, January, and May)

improvement in both quality assessments over time. Pre-to-post differences were statistically significant and unusually large in magnitude (Lipsey & Wilson, 2001). Effect sizes were smallest for Classroom Organization ($d=1.35$), intermediate for Emotional Support and Language and Literacy ($d=2.08$ and 2.33 , respectively) and largest for Instructional Support and General Classroom Environment ($d=2.92$ and 3.34 , respectively). By the end of the third project year, scores were at or approaching ceiling level, indicating that very high levels of quality were achieved.

Family Engagement

The main measure of family engagement was the return rate for the weekly home activity comment sheets. The mean return rate was 89, 72, 68, and 86% for project years one through four, respectively. Most families did almost all the home activities and returned the comment sheets. A smaller group, about 10% of families showed a consistent pattern of not engaging with the home activities. One classroom with

low teacher buy-in had notably lower return rates and attendance at the family workshops.

No direct observation was conducted of the quality of teaching or interaction around the home activities. However, in data presented elsewhere (DeBaryshe et al., 2013), parents reported high levels of satisfaction with the home activities. Parents and children enjoyed doing the activities together, which were valued both as learning experiences and as a chance to share quality parent–child time. Parents felt they became more aware of their child’s interests and capacity to learn, more child-focused in their instructional interactions, and more skilled at supporting their child’s school readiness.

Child Outcomes

Results for the child assessment items are shown in Table 10.2. With only one exception (vocabulary scores in project year 1), children showed significant pre-post gains on each assessment. As would be expected, effect sizes were large for alphabet knowledge ($d=1.15$ averaged across all project years) which was measured in raw score units and more modest for the two age-normed standardized tests (mean $d=.23$ for the PPVT and $.44$ for the TERA). Effect sizes were smallest during the abbreviated first project year. Effect sizes for alphabet knowledge were much higher in years 3 and 4. This suggests that teachers became more successful in

Table 10.2 Descriptive statistics, t-tests, and effect sizes for child outcomes

| Year | Variable | Pre Test | | Post Test | | <i>t</i> | <i>d</i> | <i>n</i> |
|------|-----------------------|----------|-----------|-----------|-----------|-------------------|----------|----------|
| | | <i>M</i> | <i>SD</i> | <i>M</i> | <i>SD</i> | | | |
| 1 | PPVT | 92.91 | 13.37 | 94.01 | 13.49 | 1.71 ⁺ | 0.08 | 169 |
| | TERA | 90.48 | 13.08 | 93.31 | 14.32 | 3.66** | 0.20 | 155 |
| | Alphabet ^a | 7.66 | 7.02 | 12.13 | 8.11 | 17.56** | 0.56 | 175 |
| 2 | PPVT | 92.24 | 15.29 | 96.16 | 14.68 | 4.56** | 0.26 | 159 |
| | TERA | 88.50 | 11.59 | 94.75 | 15.39 | 5.84** | 0.44 | 120 |
| | Alphabet ^b | 5.93 | 7.48 | 13.79 | 8.28 | 16.00** | 0.99 | 163 |
| 3 | PPVT | 90.67 | 16.28 | 95.91 | 14.07 | 5.75** | 0.34 | 168 |
| | TERA | 88.73 | 13.45 | 98.96 | 17.00 | 9.95** | 0.64 | 135 |
| | Alphabet ^b | 5.49 | 6.95 | 16.94 | 8.00 | 21.62** | 1.52 | 175 |
| 4 | PPVT | 91.74 | 14.94 | 95.32 | 12.96 | 3.71** | 0.25 | 141 |
| | TERA | 87.76 | 13.14 | 94.32 | 12.97 | 5.38** | 0.50 | 105 |
| | Alphabet ^b | 5.98 | 7.21 | 17.66 | 7.91 | 20.55** | 1.54 | 145 |

Note. Based on the federal fiscal year, the first project year was abbreviated, with the intervention starting in January

⁺ $p < .10$, ^{*} $p < .001$, ^{**} $p < .0005$

^aAlphabet composite for Year 1 is the mean of lower case letter names and lower case letter sounds

^bAlphabet composite for Years 2–4 is the mean of upper and lower case letter names and lower case letter sounds

promoting alphabet knowledge with increased experience in the program. A particularly striking change in alphabet knowledge was that by the end of the project, children showed similar levels of knowledge of upper and lower case letter names and letter case letter sounds. Early in the project, performance was higher on upper case names compared to lower case names, and much lower on letter sounds. This suggests that children's alphabet knowledge became more broadly based.

Teacher Outcomes

There was evidence that the intervention affected teachers' knowledge, beliefs, and curriculum-specific practices. Changes in declarative knowledge on the knowledge test were modest. ERF teachers had average knowledge scores of 63 % correct at pretest and 80 % at posttest. A group (lead vs. assistant role) by time (pre vs. post) ANCOVA with participant duration as a covariate indicated that this change was almost entirely due to increased knowledge among the ERF assistant teachers, $F_{(1, 21)}=4.17, p<.05, \eta^2=.69$. There was also a modest change in teacher's self-reported beliefs on the eight-item belief scale. Repeated-measures ANOVAs for teachers with a minimum of seven data points showed significant linear trends over time for literacy beliefs, $F_{(6,16)}=5.56, p<.0005, \eta^2=.26$.

Teachers delivered curriculum lessons with very good observed fidelity, averaging a score of 4.22 on a five-point scale. Fidelity increase significantly from a teacher's first project year to his/her final project year, $F_{(1, 26)}=10.58, p<.004, \eta^2=.30$. This indicates that with increased experience in ERF, teachers became more skillful in their instruction. Fidelity was not associated with classroom role or level of education. Fidelity was higher for teachers with stronger knowledge and beliefs consistent with research-based practice. When considering the scores averaged across all data collected on a particular teacher, fidelity was associated with teacher knowledge, $r=.47, p<.003$, and literacy beliefs, $r=.38, p<.01$.

At the end of each year, teachers were asked to rate their practices and expectations compared to what they were before they joined the intervention project. The majority of teachers felt that they devoted more time for focused literacy instruction and small group learning (85 and 81 %, respectively) compared to practices before starting ERF. A similar percentage (81 %) said they increased their expectations for what preschool children can learn. A very high proportion of teachers (91 %) reported that children in their classrooms made more progress on literacy skills than before the intervention. This did not appear to come at a cost in terms of child well-being, as 75 % of teachers felt that ERF children showed more motivation and enjoyment of learning.

Teachers provided positive ratings on consumer satisfaction items regarding the ERF curriculum and materials, PD, child progress, and their own ability to understand and implement new principles and practices. Only two areas received consistently lower satisfaction scores (i.e., 2.5–2.9 on a 4-point scale)—the amount of

preparation time required and the time per day devoted to intervention activities on the daily lesson plans.

Themes prevalent in teachers' focus group discussions and open-ended comments on the annual surveys included the following:

- The ERF intervention was demanding and required a considerable learning curve. The first year was especially stressful. Teachers had to learn new curriculum activities and the justification for the curriculum sequence. It took time for teachers to be comfortable with delivering the lessons and understanding how to "make them their own," i.e., to follow the principles flexibly but accurately rather than using the lessons plans as a script. Many expectations for teachers' performance changed simultaneously. In addition to learning a new curriculum, teachers were asked to adopt new interaction strategies, make scheduling and environmental changes, increase instructional responsibilities for assistant teachers, use more small group instruction and assessment-based planning, and give increased attention to family involvement. The new approach required more preparation time, planning, and individualization as well as sheer minutes of the classroom day. These concerns decreased over time. A less common concern was that the focus on language and literacy came at a cost to other developmental areas.
- Teachers bonded with their coaches and felt that coaching was invaluable to the success of the intervention. Also highly valued was the peer learning community that emerged from multiple years of intense group PD that allowed classroom teams to work together and provide mutual support.
- Most teachers who stayed in the intervention for multiple years saw it as a transformative experience. They valued all the PD components, and became "converts" to the main principles around which the intervention was designed. Teachers felt they became more accomplished professionals and wanted to share their experiences with colleagues in their own Head Start program and the local early childhood community. Several teachers assumed new leadership roles, taking new positions and/or making public presentations for the first time.
- There were concerns about maintenance once the ERF grant was over. Most teachers expected to continue the LC language and literacy instruction on a less intense basis. Teachers were especially sorry to lose access to the ERF coaches.

Teacher buy-in, philosophical fit, and resistance are important issues in school change (Landry et al., 2009; Toll, 2005). Although these issues did not emerge as consistent themes in our analysis, they are worth mentioning. Most teachers were moderately to highly eager to participate in ERF. Some took a wait and see attitude, withholding judgment until positive results were seen. These teachers tended to enjoy debating with their coaches and actively sought to integrate ERF principles with their existing notion of effective teaching. A small number of teachers remained philosophically opposed to ERF, seeing it as antithetical to their beliefs that classrooms should be child-centered and play-based. These teachers sometimes expressed discomfort to their coaches and saw ERF as a temporary burden that provided a wealth of material benefits rather than long-term professional enrichment.

Discussion

The issue of educational reform and improvement is at the forefront of K-12 education in the U.S., and has percolated down to the preschool level. Early Reading First was an initiative of the U.S. Department of Education intended to improve the quality of language and literacy instruction in preschools serving low-income children. The ERF project described in this chapter showed qualified success in achieving this aim. Classroom quality improved dramatically, including the more elusive aspects of teacher-child interaction that support language and cognitive development and higher-order thinking. ERF classrooms showed levels of instructional support that well surpassed the very low scores typically seen in publically funded preschools and Head Start centers, i.e., below 2.5 on a 7-point scale (Aikens et al., 2011; Pianta et al., 2008). Our project was highly successful in engaging families in supporting their children's learning at home via activities that complemented the classroom curriculum and created a strong home-school partnership towards meeting common goals. Results were more mixed for child outcomes. ERF children showed larger annual gains on alphabet skills than is typically seen in Head Start classrooms (Aikens et al., 2011) and similar gains on the PPVT. Results were quite positive for the TERA, but comparative data from the overall Head Start population are not available.

The larger question for the field is whether the ERF model was worthwhile. As an overall program, did ERF work? Despite the large number of ERF projects, there is little data to answer this question. Required annual posttest reporting data on over 13,000 ERF children indicate that children knew an average of 19 alphabet letters and three quarters had age-appropriate oral language skills. Data from a very small follow-up sample indicate that 81–91 % of ERF graduates showed age-appropriate language and code-related skills at the end of the kindergarten year (U.S. Department of Education, n.d.c). However, a national evaluation including 205 teachers and over 1,600 children conducted with the 2003 grantee cohort provided mixed results (Jackson et al., 2011). Compared to applicants that were not funded, ERF sites in their second project year had stronger professional development systems, including more PD hours and a greater use of coaching; higher overall classroom quality; stronger literacy practices such as interactive book-reading, support for emergent writing, and activities to support phonological awareness; and more use of child assessment. Despite these changes in classroom process, ERF children showed greater change than control children on only one of four outcomes: ERF was associated with better alphabet knowledge, but there were no effects for phonological awareness or expressive or receptive language. This evaluation has been criticized for looking at preliminary results only, overlooking the possibility that grantee performance became stronger with each successive year of implementation and/or that each grantee cohort showed better outcomes as the overall ERF program benefitted from earlier lessons learned.

Only a small number of peer-reviewed publications have resulted from ERF projects and these report positive results. Both Gettinger and Stoiber (2008) and

Gonzalez et al. (2011), found that ERF children made stronger gains than control children on all outcomes measured including oral language, alphabet knowledge, and phonological awareness. In an exceptionally well-designed study, Hindman and colleagues (Hindman, Erhart, & Wasik, 2012; Hindman & Wasik, 2012) found that ERF children made stronger gains on language and alphabet skills. Furthermore, the advantage accrued for language outcomes was strongest for children with low initial vocabularies in classrooms of higher interaction quality. Fewer studies have tracked children into elementary school. Bingham and Patton-Terry (2013) found that ERF graduates maintain language and early reading gains in kindergarten. Another study suggested that the code skills performance gap between ERF children and middle class peers is eliminated by Grade 1 (Martin, Emginfer, Snyder, & O'Neal, 2014). However, both of these follow-up studies were small in size.

The ERF model was extremely resource intensive, beyond the means of most early childhood programs. This raises the question of threshold and sufficiency effects: How much support is necessary, and at what point might it become excessive? Which aspects of the ERF package were most effective and for which outcomes? Since ERF was delivered as a package, little is known about the independent or additive outcomes of each component of the intervention. There is evidence to suggest that consecutive years of coaching and curriculum support results in cumulative benefits. Hindman and Wasik (2012) found continued improvement in classroom quality and child language outcomes when teachers had a second year of intervention. Landry et al. (2011) also found incrementally better performance for child language and literacy growth when teachers had a second year of coaching. In the second year, teachers were also more effective with higher-risk children. This is consistent with the findings from our own project indicating that classroom quality continues to improve for at least 3 years.

ERF is also relevant to debates concerning the wisdom or folly of having an academic focus in early childhood education. There are strong concerns in the field that the preschool and kindergarten years have become too narrowly focused on early reading and math achievement at the expense of other developmental domains, and too results-based, at the expense of developmentally appropriate practice (Bassok & Rorem, 2014; Neuman & Roskos, 2005). Our results suggest that a strong literacy focus does not have to be detrimental. Although our teachers expressed some concerns about giving less time to other curricular areas, they learned how to balance instructional demands and felt that children were more motivated, rather than less engaged, with an intentional curriculum. We also found benefits for the overall classroom emotional climate. Even though coaching efforts focused on instructional content, lesson plans, and time use, classroom emotional support scores increased, perhaps as a result of children becoming more productively engaged as teachers became more intentional in their use of classroom time.

In sum, lessons learned from our project and the ERF program as a whole suggest that intensive efforts to increase literacy instruction can be successful, even though the immediate outcomes for children may be more modest than initially expected. To change teacher practices and child outcomes takes time, on the order of two to three complete school years, and seems to require a considerable investment

in coaching and peer-to-peer support. However, we still know little about the specific processes that lead to significant and lasting change at the classroom level, and the extent to which this translates into long-term benefits for children's academic trajectories.

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