



## PATHWAYS TO EARLY SCHOOL SUCCESS

ISSUE BRIEF NO. 2

# Effective Preschool Curricula and Teaching Strategies

Lisa Klein ■ Jane Knitzer | September 2006

**The National Center for Children in Poverty (NCCP) is the nation's leading public policy center dedicated to promoting the economic security, health, and well-being of America's low-income families and children. Founded in 1989 as a division of the Mailman School of Public Health at Columbia University, NCCP is a nonpartisan, public interest research organization.**

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Effective Preschool Curricula and Teaching Strategies

by Lisa Klein and Jane Knitzer

This issue brief explores lessons from research and practice about the role of intentional curriculum and professional development and supports for teachers in closing the achievement gap in early literacy and math for low-income preschool-age children. The aim is to help policymakers and administrators integrate this emerging knowledge more rapidly into their decisions to support teachers. It is part of a series of reports from the National Center for Children in Poverty (NCCP) that address the question “What will it take to ensure that young low-income children succeed in the early school years?” In other issue briefs, NCCP has focused on the importance of strategies to promote the social and emotional competencies of infants, toddlers, and preschoolers known to be foundational for effective learning (see *Pathways to Early School Success: Helping the Most Vulnerable Infants, Toddlers, and Their Families*, and *Resources to Promote Social and Emotional Health and School Readiness in Young Children and Families—A Community Guide*, as well as other publications in the series: Promoting the Emotional Well-Being of Children and Families at [www.nccp.org](http://www.nccp.org)).

AUTHORS

Lisa Klein is Principle of Hestia Advising and was formerly the Vice-President of Early Education at the Kauffman Foundation.

Jane Knitzer, Ed.D., is Director at NCCP and Clinical Professor of Population and Family Health at Columbia University's Mailman School of Public Health. She has contributed many important studies on how public policies can promote the healthy development of low-income children and better support families, particularly those who are most vulnerable.

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## EXECUTIVE SUMMARY

*“High quality early learning is like a ‘life jacket’ for low-income kids. They need the life-preserver; whereas middle and upper-income kids already know how to swim and are not dependent on this to get ahead.”*

Jean Layzer, ABT Associates and NCCP Meeting Participant

This issue brief, based on a meeting of a group of distinguished researchers, educators, and policymakers convened by the National Center for Children in Poverty (NCCP) explores lessons from research and practice about the role of an intentional curriculum and professional development and supports for teachers in closing the achievement gap for low-income preschool age children. The aim is to take stock of emerging knowledge about how to increase low-income children’s achievement in early literacy and early math and to explore the implications for how administrators and policymakers can best integrate this knowledge into their decision-making.

A special focus on curriculum and teaching strategies in preschool programs is important for two reasons. First, many low-income children in early learning settings fall behind early and remain very much behind their peers in reading and math. Second, we are learning that closing the achievement gap depends greatly on providing teachers with the professional development and supports that can help them more effectively promote early literacy and early math in the context of nurturing and emotionally supportive classrooms.

### Take-Home Messages

The research in this issue brief shows that low-income children make gains in early literacy and early math when high-quality preschool programs include an intentional curriculum and provide effective teacher professional development and supports. The most important take-home messages from the issue brief include the following:

- The gap in achievement between low-income children and their middle-class peers is real and significant.
- An intentional curriculum is research-based, emphasizes teachers actively engaged with children, includes attention to social and regulatory skills, is responsive to cultural diversity and English language learners, is not teacher-proof, and requires new ways to measure classroom quality, teacher effectiveness, and student progress.
- Using an intentional curriculum is an important strategy to reduce the achievement gap, and since no curriculum is teacher-proof, strategies to help teachers effectively use the curriculum are equally important.
- Defining and assessing quality early learning has shifted to a focus on teacher-child interactions, child-focused teaching style, and content-driven classroom instruction in addition to issues such as child-staff ratios and group size.

- On average, the association between teacher education and child outcomes is small and there is still no final determination about how much education and training is needed and what is the best way for to offer this so teachers are more effective in the classroom.
- Overall, children achieve more when they have teachers with more education and training closely tied to knowledge about early childhood and child development.
- New and existing teachers who do not have advanced degrees or training can be effective in classrooms with high concentrations of low-income children if they have ongoing consultation, mentoring, and feedback that is directly tied to their classroom practice.
- Some research on state pre-k programs shows positive results, other research suggests there are significant program quality problems and implementation challenges, and more rigorous research designs and methods would help determine how effective these programs are for increasing achievement, particularly with low-income children.
- There are examples of school districts using an intentional curriculum and teacher supports that have achieved powerful results with ethnically diverse and low-income children.

## Implications and Recommendations

The research in this brief has implications for state and local policymakers, early learning administrators, teachers, families, community leaders, and researchers. Recommendations for each of these key stakeholders groups follow.

### For State and Local Policymakers

- Ensure that requirements for obtaining more education are linked to requirements for training in early childhood development or a related field.
- Allocate resources for state and local training in instruction to ensure the translation of new knowledge about teaching, curriculum, and related practices actually reach teachers on the ground.
- Invest in training strategies that provide direct feedback on classroom practice through ongoing consultation, mentoring, or coaching.
- Ensure that state incentives for quality early childhood programs include teacher-child interactions, child-focused teaching, and content-driven classroom instruction.
- Invest in experimental research to determine the specific content, modules, and sequencing of curriculum that best predict increased achievement for low-income young children, including the most at risk, across all settings.
- For the most challenged families, build in supports that address family and community-based barriers to learning, such as child and family health and mental health.

### For Early Learning Administrators

- Implement and sustain over time a whole school/center model of professional development involving principals, directors, supervisors, teachers, child care providers, and families.

- Provide release time, substitute teachers, and subsidies so teachers can take advantage of professional development that helps them understand how young children learn and develop, and to help them implement curricula used by the district.
- Align early learning curriculum and teaching strategies with kindergarten through grade 3 standards to sustain increased achievement.

### For Teachers

- Participate in education and training that increases knowledge of the subject matter being taught and understanding of how to teach young children.
- Participate in education and training that focuses on how young children grow and learn.
- Participate in training that focuses on the cultural traditions and practices and language diversity of the growing number of immigrant and limited English proficient children.

### For Families and Community Leaders

- Join together to determine how effective preschools are in teaching early literacy and early math to low-income preschoolers.
- Develop advocacy efforts to ensure that parents and community leaders have a voice in improving early learning outcomes and implementing an intentional curriculum and effective teaching strategies across all preschool settings.

### For Researchers

- Conduct experimental studies to determine the specific content, modules, and sequencing of preschool curriculum that best predict increased achievement for low-income and the most at-risk preschoolers.
- Conduct experimental studies across all early learning settings to test what content and delivery methods of training best help teachers improve their classroom practice.
- Promote the development of new tools to measure classroom quality and predictors of increased achievement.
- Translate research findings so that parents, teachers, and community leaders can understand whether the differences identified are meaningful and make a difference in children's achievement.

## Conclusion

Closing the achievement gap is a large task requiring strategic planning and action at the classroom, local, state, and federal levels. For children in the highest-risk families and poorest communities, even the best early care and early learning opportunities will not be enough to help them perform on a level consistent with their more advantaged peers. However, a strong evidence base is showing that there are pathways to increase the early literacy and early math achievement for low-income preschool-age children. The challenge is to use this knowledge so that it gets into the hands of those working directly with the millions of low-income preschool-aged children across this country.

# INTRODUCTION

This issue brief explores lessons from research and practice about the role of an intentional curriculum and professional development and supports for teachers in closing the achievement gap for low-income preschool-age children. The aim is to take stock of emerging knowledge about how to increase low-income children's achievement in early literacy and early math and to explore how administrators and policymakers can use this knowledge in decisions about improving prekindergarten.

It is based on a meeting of a group of distinguished researchers, educators, and policymakers (see Appendix A) that NCCP convened to help explore the issues and challenges raised by emerging research on intentional curriculum and professional development support strategies.

In this paper, an “intentional curriculum” refers to planned, organized, sequenced activities and lessons focusing on academic readiness delivered through direct instruction that is age-appropriate and fun for young children.

Professional development refers to the education, training, and supports that teachers need to be effective in early learning classrooms. The focus on professional development and supports acknowledges the critical role teachers play in increasing the achievement of low-income children.

This brief is part of a series of reports from the National Center for Children in Poverty (NCCP) that address the question “What will it take to ensure that young low-income children succeed in the early school years? This question assumes a new urgency in light of the movement to expand preschool (pre-k) access and the complementary effort to align pre-k instruction with kindergarten through grade 3 curriculum. In other issue briefs, NCCP has focused on the importance of strategies to promote the social and emotional competencies of infants, toddlers, and preschoolers known to be foundational for effective learning.

## How This Issue Brief is Organized

Section I, **Setting the Context**, highlights key principles and challenges that impact all efforts to ensure that all children succeed as they enter kindergarten, as well as the rationale for the specific focus on intentional curriculum and professional development. Section II, **Stretching the Early Education Paradigm**, highlights two emerging, research-informed strategies responsive to the key principles and challenges: the use of an intentional curriculum and effective teaching support strategies. Section III, **Expanding the Knowledge Base**, highlights additional emerging research evaluating early learning strategies and state-funded preschool programs. Section IV, **The Role of Local-Level Leadership**, provides an example of a district-wide early learning reform effort that encompasses a number of the emerging strategies and has documented impressive results. The final section summarizes the **Take-Home Messages, Implications, and Recommendations** for policymakers and administrators, teachers, families and community leaders, and researchers.

## SECTION I

### Setting the Context

*“High quality early learning is like a ‘life jacket’ for low-income kids. They need the life-preserver; whereas middle and upper-income kids already know how to swim and are not dependent on this to get ahead.”*

Jean Layzer, ABT Associates and NCCP Meeting Participant

#### Key Principles About Effective Early Learning Strategies

To set the context for our findings, first we highlight four key research-informed principles about early learning that should frame all efforts to improve outcomes for young low-income children.

##### **Principle #1: High quality, continuous early care and education helps low-income children do better in school.**

Getting young children started on the right track is essential to getting them where they need to go. Reviews of empirical research show that children are born eager to learn and that learning occurs faster in the first five years of life than at any other time.<sup>1</sup> Economist James Heckman’s research applies an economic principle to early learning and shows that “early success begets later success,”<sup>2</sup> implying that children who do not have good early learning experiences are more likely to fail.

In fact, there is strong experimental evidence, primarily from early childhood demonstration programs, that high-quality interventions beginning in the earliest years help children learn and achieve.<sup>3</sup> In addition, three large-scale descriptive studies looking at the relationship between high-quality programs and child outcomes report positive gains for low-income children,<sup>4</sup> but others have found that middle-class children benefit from center-based, high-quality early learning programs as well.<sup>5</sup> However, most research shows that these programs are most effective for low-income children.<sup>6</sup> The most practical issue may be to consider the magnitude of the gain that is seen, with low-income and minority children generally making more progress than their middle-income peers.<sup>7</sup>

There is a sizable amount of evidence that shows length of time in programs has a positive effect on children’s achievement. Low-income children make the most gains in prereading and premath when they are in high-quality early learning programs for either more than 30 hours per week, full-day programs, or programs for more than one year.<sup>8</sup> New results from the two-year follow-up to the Early Head Start (EHS) impact study show that the most positive results for children were found when they went into formal preschool care after participating in high-quality EHS programs.<sup>9</sup>



## **Principle #2: Social-emotional development is the foundation for, and intertwined with, early cognitive development.**

During the past decade, an explosion of knowledge in both brain science and child development research underscores the importance of early relationships as the foundation for developing social and emotional competencies. Young children learn and perform well in school as a result of stable and supportive social relationships that form the base for self-confidence, self-management, and the ability to get along well with peers and adults.<sup>10</sup> Two years after participating in EHS, parents reported that their children still had fewer behavior problems and more positive approaches to learning when they were 5 years old.<sup>11</sup>

There is also evidence that links social-emotional development to early literacy and early math. An age-appropriate ability to manage emotions, relate to others, and understand the emotional cues of others can facilitate the development of early literacy and math skills. The reverse is also true, so that helping children to succeed in early literacy and math can reduce some behavioral and emotional problems.<sup>12</sup>

At the same time, research also tell us that young children who start preschool with anti-social or aggressive behavior are more likely to do poorly on academic tasks, be held back in the early years, and be at greater risk for dropping out in the later school years.<sup>13</sup> And there is now evidence that preschoolers are being expelled from their classes for behavior problems three times more than students in kindergarten-12 schools.<sup>14</sup> Therefore, systematic attention to social and emotional issues in the context of early learning is important to successful academic outcomes.

## **Principle #3: Formal early learning occurs in a variety of settings, including school-based, center-based, and home-based programs, so it is important to pay attention to all settings when considering strategies to improve achievement and close the gap.**

Currently, much of the focus in early learning is on state funded pre-k, which is largely housed in public schools. However, preschool settings also include community-based child care programs (public, private, faith-based, and Head Start) and home-based child care (family, relative, kith and kin care). In fact, 62 percent of young children are in one or more arrangement. State funded pre-k programs, Head Start, and preschool special education programs collectively served 35 percent of the nation's 4-year-olds during the 2003-2004 school year<sup>15</sup> and only 17 percent were in state-funded pre-k programs.

There is limited research on the impact that different settings have on children's achievement in early literacy and early math. Some new evidence is however showing that increased letter-word recognition and decreased aggression in children who participated in EHS were maintained regardless of whether they transitioned into community center-based child care, Head Start, or public pre-k programs.<sup>16</sup>

**Principle #4: Closing or reducing the achievement gap is not simple and requires a comprehensive approach that goes beyond only efforts to improve what children know and can do and must consider how families, schools, and communities can support early learning and the transition to school.**

This principle is perhaps the least explored; it reflects experiential knowledge that piecemeal efforts (a new curriculum here, a new workshop there) are not likely to pay off. Instead, sustained strategic reform efforts that include comprehensive services and supports are required. From this perspective, the challenge is not just choosing a curriculum, providing some professional development, or creating a program, but building a comprehensive early childhood system where families and communities help support the social, emotional, and cognitive growth children need to be successful as they enter and continue through school.

## Four Challenges

At the same time, those seeking to improve early learning for low-income children also must be responsive to four core challenges that make the task especially difficult.

### **Challenge #1: The Achievement Gap or Readiness Gap Related to Income Status is Real and Significant**

The achievement gap has been defined as “the disparity in academic performance between different groups of students.”<sup>17</sup> The focus is often on kindergarten-12 students, but some researchers are quantifying differences in knowledge in the preschool years. The study, *Inequality at the Starting Gate*, shows that before entering kindergarten, the average cognitive scores of preschool-age children in the highest socioeconomic group are 60 percent above the average scores of children in the lowest socioeconomic group.<sup>18</sup> Another study found more than a year’s gap between low-income and middle-class children on an array of cognitive and academic achievement tests, with middle-class preschool children scoring significantly higher, on average, than the economically disadvantaged kindergarten children.<sup>19</sup>

A review of national data sets on preschool and child care shows that at age 4 years, children who live below the poverty line are 18 months below the developmental norm for their age group. By age 10, that gap is still present. For children living in the poorest families, the gap is even larger, and neither time nor the first years of elementary school have closed the gap.<sup>20</sup>

One of the most dramatic gaps has to do with the use of language, which is highly predictive of school success. Many studies have recorded and analyzed the verbal interactions of children from different socioeconomic levels from the time they were 10 months old until they were age 3 years (see Table 1). A child growing up in a family on welfare could have heard 32 million fewer words than a classmate growing up in a professional family by the time of kindergarten entry.<sup>21</sup>

Other research confirms these findings. By the time children from middle-income families with well-educated parents are in the third grade, they know about 12,000 words. At the same time, children from low-income families with undereducated parents who don’t talk

**Table 1: Verbal Interactions of Children 10 Months to Age 3 Years, By Socioeconomic Status**

	Number of words heard per hour	Vocabulary words by age 3
Professional	2,153	1,100
Working Class	1,251	750
Welfare	616	500

Source: Hart, B. & Risley, T. R. (2003). *Meaningful differences in the everyday experience of young children*. Paul H. Brookes Publishing.

to them very much have vocabularies around 4,000 words, one-third as many words as their middle-income peers.<sup>22</sup>

The achievement gap is so large that a study of over 14,000 preschool-age children concluded: “the magnitude of gains for poor children is simply insufficient to catch-up.”<sup>23</sup>

### **Challenge #2: The Population of Young Children At Risk of Poor Early School Achievement by Virtue of Poverty and Low-income Status is Large**

Forty percent of all young children (9.6 million children) live in low-income families, 20 percent (4.6 million) of them in families with income less than the poverty level (\$20,000 for a family of four in 2006).<sup>24</sup> Moreover, poverty and low-income status disproportionately impact children of color. Over 3 million young children of Hispanic descent (65 percent) and 2 million young African-American children (64 percent) live in low-income families, double the percentage for white children.<sup>25</sup>

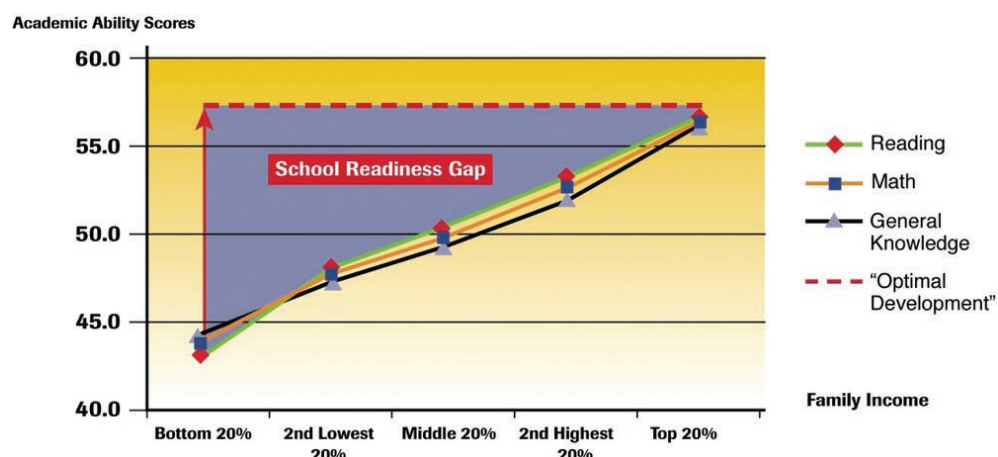
Why do these numbers matter? Because virtually all research points in the same direction: poverty and the hardships that come with poverty pose the greatest risk factors for poor academic and other outcomes.<sup>26</sup> In general, there is a linear relationship between academic success and income (see Figure 1).<sup>27</sup> In the aggregate, although there are many exceptions, children from low-income families score well below the national average on reading tests compared to children from higher-income families, who score well-above.<sup>28</sup>

For poor children living in neighborhoods with concentrated poverty, the risks are even greater. An analysis of the 2000 U.S. Census categorizes the country’s 65,000 census tracts into a child-raising vulnerability index using 10 indicators reflecting social, educational, economic, and wealth factors.<sup>29</sup> Neighborhoods with the greatest number of “vulnerability” factors also have proportionately higher rates of young children. According to Charlie Bruner, an NCCP meeting participant, who carried out the analysis, “Poor neighborhoods are rich in young children.”<sup>30</sup> This underscores the importance of also taking a community perspective and paying attention to where young children live when considering how to change the trajectory for educational success.

### **Challenge #3: Young Immigrant Children and Children with Limited English Proficiency Face Additional Challenges Before They Begin and as They Continue in School**

The infusion of children of immigrants in this country raises new challenges about how to

**Figure 1: Academic Abilities of Entering Kindergarteners by Family Income**



Source: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Kindergarten Class of 1998-99, Fall 1998. In Barnett, W. S.; Hustedt, J. T.; Robin, K. B.; & Schulman, K. L. (2004). *The state of preschool: 2004 state preschool yearbook*. Washington, DC: National Education Association <[nieer.org/yearbook2004/pdf/yearbook.pdf](http://nieer.org/yearbook2004/pdf/yearbook.pdf)>.

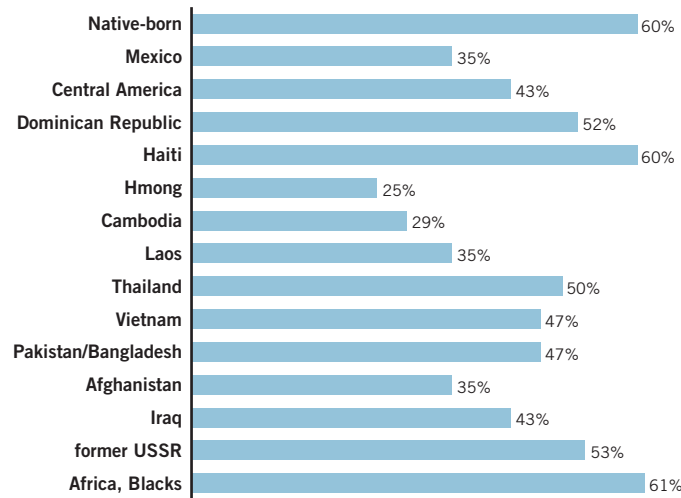
promote language and literacy in young children, especially if their families are non-English speaking. The Latino/Hispanic population is the largest and fastest-growing ethnic minority group in the United States,<sup>31</sup> but there are increasing numbers of immigrant children below age 5 representing multiple countries and speaking multiple languages. It has been noted that preschool participation for these children varies greatly.

Some believe the disparity is caused largely by financial and linguistic barriers, while others note differences in how families feel about formal preschool learning. Whatever the roots, achievement levels of limited English proficient children remain markedly below those of their white, English-speaking peers, although research is showing that they can be successful if they are supported in developing their home language while using their new language in school.<sup>32</sup>

#### **Challenge #4: The Quality of Child Care and Preschool Programs is Often Poor; and Poor Children Tend to be in the Lowest Quality Settings**

A large-scale study of child care found the overall quality so poor that 11 percent of all centers could actually harm children and another 64 percent had quality lower than the recommended level that the early childhood profession recognizes as necessary to promote achievement.<sup>33</sup> Furthermore, poor and low-income children are more likely to be enrolled in settings with lower quality than their more affluent peers. A recent study found that early learning classrooms comprised of at least 60 percent of children from low-income homes were rated significantly lower in quality indicators of teaching, teacher-child interaction, and provisions for learning.<sup>34</sup> And as they go on, typically the most disadvantaged children enter elementary school with the fewest resources and the least-qualified teachers.<sup>35</sup>

**Figure 2: U.S. Four-Year-Olds in Immigrant Families Enrolled in Pre-K/Nursery School, by Parents' Country of Origin, 2000**



Source: Calculated by Donald J. Hernandez based on U.S. Bureau of the Census, Census 2000 data, 5 pct Public Use Microdata (PUMS) files.

Despite these conditions, new evidence shows low-income children in higher-quality settings can begin to catch up to their peers. A study of high-quality Georgia pre-k found the lowest income children made the most gains.<sup>36</sup> In Oklahoma, while all children in high-quality preschool benefited, low-income black and Hispanic children made the most gains.<sup>37</sup>

## Why a Special Focus on Curriculum and Teaching Strategies to Improve Early Learning Outcomes for Low-Income Children?

A special focus on curriculum and teaching strategies in preschool programs is important for two reasons. First, although all young children are born ready to learn, many low-income children fall behind early and remain very much behind their peers in reading and math. Success in narrowing this achievement gap depends on providing young children with specific knowledge in preschool curricula before they start kindergarten.

Second, over the past decade there has been an exponential increase in our understanding of how young children learn and how early experiences promote achievement. As a result of this new research, there has been a fundamental shift in the way curriculum and professional development are understood during the preschool years. We are learning that closing the achievement gap depends greatly on providing teachers with the professional development and supports that can help them more effectively promote early literacy and early math in the context of nurturing and emotionally supportive classrooms. Designing and allocating resources for these infrastructure supports poses new challenges and opportunities for policy-makers and administrators that need to be part of the public dialogue about improving access to and the quality of preschool learning.

## SECTION II

# Stretching the Early Education Paradigm

*“What’s happening in the field is the emergence of more specificity, which is to say it’s not enough to say you need more hours of training, or more years of education. You have to talk about the content and how to best deliver professional development and then relate it to specific child outcomes.”*

Marty Zaslow, Child Trends and NCCP Meeting Participant

This section explores the research and leading expert opinion on two key strategies: the use of an intentional curriculum and improving teachers’ capacity to be effective through professional development and supports.

### Strategy 1: Intentional Curriculum

The National Association for the Education of Young Children (NAEYC), a leading national organization dedicated to improving the quality of education and care provided to children birth through age 8, developed a position statement on curriculum in conjunction with the National Association of Early Childhood Specialists in State Departments of Education (NAECS/SDE). The goal, according to this position paper, is not to identify the single best curriculum, but to identify what features of a curriculum are most effective for what outcomes and under what conditions.<sup>38</sup>

Recognizing the importance of curriculum to increase the achievement of low-income children, below we highlight the NAEYC and NAECS/SDE joint position statement for a high-quality intentional preschool curriculum. (See Box 1.)

#### Box 1: Joint Position Statement on Curriculum

Policymakers, the early childhood profession, and other stakeholders in young children’s lives have a shared responsibility to implement a curriculum that is:

- Thoughtfully planned
- Challenging
- Engaging
- Developmentally appropriate
- Culturally and linguistically responsive
- Comprehensive across all developmental domains
- Likely to promote positive outcomes for all young children

Source: National Association for the Education of Young Children (NAEYC) and National Association of Early Childhood Specialists in State Departments of Education (NAECS/SDE) (2003). *Early childhood curriculum, assessment, and program evaluation: Building an effective, accountable system in programs for children birth through age 8*. Washington, DC: NAEYC < [www.naeyc.org/about/positions/pdf/CAPEexpand.pdf](http://www.naeyc.org/about/positions/pdf/CAPEexpand.pdf)>.

### Box 2: Characteristics of a High-Quality Intentional Curriculum

- Is research-based
- Emphasizes teachers actively engaging with children
- Includes attention to social and regulatory skills
- Is responsive to cultural diversity and English language learners
- Is not teacher-proof
- Requires new ways to measure classroom quality, teacher effectiveness, and student progress

NCCP meeting participants discussed what they believe is essential for an intentional early learning curriculum. (See Box 2.) What emerged is consistent with the NAEYC and NAECS/SDE position but emphasizes a few other points.

### An Intentional Curriculum is Research-Based

A longitudinal study to identify important preschool predictors of elementary school reading success found that specific prereading skills such as knowledge of print (for example, letter names), phonological awareness (for example, being able to rhyme), and writing (for example, being able to print one's name) were strong predictors of reading success well into elementary school).<sup>39</sup> Half of the differences in reading ability in children at the end of kindergarten could be predicted from these same abilities measured at the end of their pre-k year when they were 4-year-olds in Head Start. The authors concluded that children who had begun to learn content that included print, sounds, and writing during the preschool period were more likely to be ready to read at the end of kindergarten, and more likely to be reading successfully in elementary school. An intentional curriculum incorporates explicit strategies that build these skills.

An intentional curriculum can be effective in mathematics as well as in literacy. In fact, there is evidence that the two content areas overlap. Herb Ginsburg, an NCCP meeting participant, has described early childhood mathematics education (ECME) as the broad and deep study of mathematics, which includes a connection to language and literacy.<sup>40</sup> His research shows that many preschool-age children have an “everyday mathematics”—informal ideas about mathematics and methods for solving problems. However, they are often unable to express the ideas clearly or are unable to describe the methods in words.<sup>41</sup> The language difficulty may be one important reason why low-income children generally perform lower on tests of mathematical abilities than middle-class children. The need to focus on mathematical language is articulated by both NAEYC and the National Conference of Teachers of Mathematics, whose joint position statement proposes that mathematics education emphasize both language (vocabulary) and communication.<sup>42</sup>



## An Intentional Curriculum Emphasizes Teachers Actively Engaging with Young Children

Successful early learning occurs when both teachers and children are actively engaged. The challenge for teachers is to help children to think, explore, talk about concepts, and practice new skills. This pedagogical approach requires far more than simply transmitting facts to the children and emphasizes opportunities that foster higher-order skills. Optimally, early literacy teaching strategies allow teachers to explicitly and systematically help children develop a conceptual knowledge base that underlies the meaning of words rather than only focusing on letters and sounds.<sup>43</sup>

One example of an intentional early literacy curriculum is Partners for Literacy (PfL). PfL is a comprehensive, sequenced, and structured curriculum that emphasizes language development and literacy skills. The curriculum includes LiteracyGames, Interactive Book Reading strategies, and scaffolding to promote early literacy skills and social/emotional competence. The curriculum is appropriate for children from all income groups and for those with limited English proficiency. PfL combines explicit intentional instruction and high levels of engagement of children with both teachers and their peers.<sup>44</sup>

The PfL curriculum uses scaffolding (see definition in box below) to promote oral language, phonological awareness, print awareness, and alphabet knowledge in both formal (lessons using opportunities to intentionally build on and expand language skills) and informal (adult-child conversations) ways throughout the entire day in large groups, small groups, and individual instruction.<sup>45</sup>

PfL is one of two curriculum currently being tested in 44 locations as part of a randomized study of Even Start sites in the Classroom Literacy Interventions and Outcomes (CLIO) study sponsored by the U.S. Department of Education and conducted by Westat Research Corporation. The project is in its second year of implementation and results on achievement for low-income children are expected in 2007.

### Curriculum Concepts and Guidelines for Partners for Literacy

- Positive adult-child relationships are the foundation for learning language and literacy.
- Games rely on sequenced, integrated curriculum.
- All domains of child development are addressed.
- Adults provide Scaffolding\* to promote early language and literacy.
- All staff must use culturally responsive practices and the curricula must be appropriate for English language learners.
- Parents and teachers engage in instructional conversation with children when reading to them.
- Parents and teachers use everyday care-giving routines as opportunities to foster language and literacy as well as social development.
- Teachers help children problem-solve and learn social skills.
- Teachers practice the 3 N's: notice, nudge, and narrate in order to help children learn to attend and follow directions.

\* Scaffolding is a teaching strategy that provides supports for children to build on existing knowledge so as to promote the development of new skills and concepts.



## **An Intentional Curriculum Includes Attention to Social and Regulatory Skills**

Research on early brain development and the impact of a child's earliest relationships and experiences makes it clear that children who have strong social, emotional, and behavioral skills are more successful in the classroom. An intentional curriculum addresses both social and regulatory skills in addition to academic skills. It also focuses on promoting a warm and nurturing classroom climate and encouraging interactions between teachers and children (as well as among peers). Helping children interact positively with teachers and classmates, be excited about learning, be willing to engage in new challenges, manage their impulses, and take turns are key components of school success<sup>46</sup> and important components of intentional curriculum. One example of an intentional curriculum that pays special attention to social and emotional skill development in the context of early literacy is Tools of the Mind.<sup>47</sup>

## **An Intentional Curriculum is Responsive to Cultural Diversity and English Language Learners**

There is a growing presence of young English language learners, children whose families speak little or no English, in preschool settings. An intentional curriculum should be responsive to cultural diversity and children with limited English proficiency.<sup>48</sup> Although it is clear how important this is, our research did not surface any specific curriculum that exemplify these principles.

## **An Intentional Curriculum is Not Teacher-Proof**

While the dichotomy between child-centered and direct instruction has been a part of the discussion about early learning in the past, the future conversation is more likely to be around the kind and quality of instructional interactions that teachers should have with children. According to new evidence, focused, direct, intentional interactions that are characterized by feedback loops about student performance have the greatest value for increasing student achievement.<sup>49</sup> This is not to be confused with what have been called “drill and kill” approaches that have not been found to be effective for engaging children actively in the learning process.

At the same time, it is also important to recognize that a curriculum itself, however rich in activities and conceptual understanding of how young children learn, is simply a tool in the hands of a teacher. Even the best curriculum can be implemented poorly, while a talented teacher can make up for a poor curriculum.

## **An Intentional Curriculum Requires New Ways to Define and Measure Classroom Quality, Teacher Effectiveness, and Student Progress**

One of the consequences of the recognition of the importance of an intentional curriculum is a parallel recognition of the importance of measuring how well teachers *teach* an intentional curriculum. In turn, this is stretching the definition of quality that has long guided the early childhood field. To date, much of the emphasis on quality in research has been on structural issues, such as the ratio of adults to children, or the overall group size, and on creating rich

environments.<sup>50</sup> Structural variables are usually defined and monitored in part by state licensing regulations and national accreditation systems and are typically used as proxies for quality. Much of the early research on child care quality looked at structural variables. In summary, two factors are consistently related to better child outcomes for low-income children: lower adult-child ratios and more time spent in programs.<sup>51</sup>

Now, the focus on measurements of quality early learning has expanded to include what are called “process variables” of teaching. These include things like the actual experiences of teachers and children in classrooms, teacher and child interactions in social, emotional, and instructional areas, and how well teachers are teaching the content-linked aspects of the curriculum. The importance of process quality has been recognized for some time but hasn’t been measured very well until recently. (See Box 3.)

New research is looking more at process quality and assessing how this impacts children’s achievement. Measures of process quality are now being used to examine the actual interactions of teachers and children in classrooms and focus on the teaching of curriculum content.

When both measures of quality are included, additional findings emerge. The National Center for Early Learning and Development (NCEDL), in its 2004 large-scale study of state-funded pre-k, used the revised edition of the Early Childhood Environmental Rating Scale (ECERS-R), a widely used measure of mostly structural quality, as well as a new measure, the Classroom Assessment Scoring System (CLASS), which looks at process quality, including the emotional climate, classroom management, and instructional supports for learning. (See Box 4.)

### Box 3: Structural Quality versus Process Quality Research

<i>Structural Quality</i>	<i>Process Quality</i>
Education Level of the Teacher	What Teachers Do (Practices) in classrooms
Teacher-Child Ratio	
Class Size	What Children Do (Activities) in classrooms
Teacher Compensation	

### Box 4: Classroom Assessment Scoring System (CLASS) Constructs & Scales

<i>Socioemotional Climate and Quality of Teacher-Child Interactions</i>	<i>Instructional Support</i>
<ul style="list-style-type: none"> <li>• Positive climate</li> <li>• Negative climate</li> <li>• Sensitivity</li> </ul>	<ul style="list-style-type: none"> <li>• Concept development</li> <li>• Instructional learning formats</li> <li>• Quality of feedback</li> </ul>
<i>Classroom Management</i>	<i>Academic Content</i>
<ul style="list-style-type: none"> <li>• Lack of over-control</li> <li>• Effective behavior management</li> <li>• Productivity</li> </ul>	<ul style="list-style-type: none"> <li>• Literacy</li> <li>• Mathematics</li> <li>• Social Studies</li> </ul>

The pre-k programs in the study met the criteria for high structural quality set by NAEYC, however, measures of teaching quality were lower than expected. Assessors rated the majority of classrooms in the lowest range for instructional climate, found instructional quality was poor, and noted that learning interactions between children and teachers occurred infrequently.<sup>52</sup>

Other researchers have studied structural quality in prekindergarten programs and, unlike studies of child care, found no relationship between program quality and things like staff-child ratio or length of program day. This finding suggests that structural standards alone are insufficient for ensuring program quality or improved child outcomes.<sup>53</sup>

In England, a longitudinal study of new preschool curriculum that emphasizes literacy, numeracy, and scientific skills is looking at the effects of both structural and process quality, with an emphasis on the latter. The ECERS-E, created by the research team as an extension of the ECERS-R, adds subscales to reflect the more academic components of the curriculum. Results on quality from over 3,000 children in 141 preschool centers showed that the new measure was a better assessment of children's cognitive progress, while the traditional version was more sensitive to children's social and behavioral development.<sup>54</sup>

Findings from these studies demonstrate the importance of defining and assessing quality early learning along multiple dimensions in order to determine what ultimately leads to improved achievement for preschool-age children.

## Strategy 2: Professional Development and Effective Teacher Supports

*“Teacher education is one of the active ingredients of preschool quality.”*

Ron Haskins, Brookings Institution and NCCP Meeting Participant

Early lessons from research on the effects of an intentional curriculum point repeatedly to the importance of teachers and effective teaching strategies. Teachers are the critical mediators through which learning, including content-linked learning, occurs in preschool settings, whether they are in a school setting or a child care setting. Meeting participants all agreed that curriculum does not stand apart from teachers, whose knowledge, theories, and belief systems influence their instructional plans, decisions, and actions.

Meeting participants also acknowledged some fundamental challenges with the early childhood workforce. Despite the important role that teachers play, research has documented that early childhood teachers are undervalued and underpaid. A study by the Economic Policy Institute aptly entitled *Losing Ground in Early Childhood Education* found that wages and benefits have remained constant for the last 15 years, contributing to an industry with fewer new entrants, lower qualifications overall, and high turnover rates.<sup>55</sup>

Although not the focus of this issue brief, clearly this reality contributes greatly to the challenge of improving the early childhood workforce. That said, it is still important to consider what research tells us about other kinds of supports that can help teachers of young children

be more effective even in the context of low wages and benefits. Therefore, this section explores two core questions to which research provides some, albeit not definitive, insight:

- How important is teacher education and training for impacting classroom quality and child outcomes?
- What is the best way to support teachers in the classroom so they can effectively teach children when there is no strong curriculum in place?

### Professional Development: What We are Learning About Formal Degrees and Training

*“While our study does not provide comprehensive evidence supporting a bachelor’s degree as a teacher requirement, it and previous studies suggest children benefit from effective teachers. We found that children made academic gains in classrooms where the teacher engaged them in interactions that encouraged communication and reasoning, was sensitive and responsive in her/his interactions with children, and constructed an atmosphere of respect, encouragement, and enthusiasm for learning”*

Carollee Howes, Donna Bryant, Margaret Burchinal, Dick Clifford, Diane Early, Bob Pianta, Oscar Barbarin, and Sharon Ritchie. NCEDL Issued Statement. 2006.

One of the current policy strategies in early learning requires all lead teachers to have at least a bachelor’s degree (B.A.). New studies raise questions about what best predicts children’s achievement: the advanced degree (B.A.), an increased understanding of child growth and development, or a combination of the two? There are also questions about how teachers can best acquire this new knowledge, through education-based course work or through training outside an academic classroom. In early childhood professional development there is a distinction between education and training. Education refers to activities that occur in the formal academic system and lead to a degree, while training refers to activities outside the formal education system.<sup>56</sup>

Reviews of early childhood research have looked at the relationship between teacher education and quality child care that shows that the presence of a B.A.-level teacher with specialized training in early childhood education leads to better outcomes for young children.<sup>57</sup> For example, findings from the Cost, Quality, and Outcomes study suggest that teachers with a B.A. or A.A. (associate’s) degree in early childhood education or a related field have higher structural quality classrooms.<sup>58</sup>

Marcy Whitebook conducted a review of the literature on center-based preschool for 3- and 4-year-olds. Eight studies of child care and Head Start specifically explored the contributions of a bachelor’s degree and specialized training in early childhood to teacher behavior and program quality. Results strongly suggest that the best results are found when teachers have a bachelor’s degree and specialized early childhood training at the college level.<sup>59</sup>

In addition to studies of child care, several new, large-scale studies involving about 2,500 preschool and early elementary classrooms are looking at how indicators like teacher education and training relate to changes in achievement. Findings show that on average, there is only a small association between child outcomes and teacher training/experience and teacher’s

education.<sup>60</sup> The NCEDL pre-k study showed teacher education effects in particular are small and are attributable to training closely tied to knowledge about child development.<sup>61</sup> Another study found similar results: teacher education paired with specialized training in early childhood is the key to increasing quality and achievement. Teachers with a four-year college degree and a teaching certificate in early childhood were rated as creating a more positive emotional climate and providing more learning activities than teachers with no formal training in early childhood.<sup>62</sup>

A follow-up to the six-state NCEDL prekindergarten study looked at teacher education in three ways: years of education, highest degree, and bachelor's versus no bachelor's degree. Researchers also examined the data for the effects of state teaching certification and the Child Development Associate (CDA) credential. Data were analyzed to determine the predictors of classroom quality and academic achievement, as well as to minimize the chance that results could be due to classroom characteristics rather than teacher education. Findings show that teacher education, training, and state certification are not consistently related to improved classroom quality or academic gains in children. Children in classrooms with teachers who had bachelor's degrees compared to teachers with associate's degrees or less did better in math achievement. The only other predictor of achievement was the CDA credential, which is related to increases in basic skills, such as naming letters, numbers, and colors but not with increases in higher order skills, such as receptive or expressive language or math. The researchers conclude that having a bachelor's degree may be necessary for attaining high-quality early learning but not sufficient for increasing children's academic achievement.<sup>63</sup>

Other studies of pre-k have examined the relationship between teacher education and child outcomes. In a study of Georgia's state-funded pre-k program, there was no difference in child outcomes based on whether they had teachers with B.A.'s, A.A.'s, or other technical degrees.<sup>64</sup> A recent study used data from the Early Childhood Longitudinal Study Kindergarten Class of 1998-99 (ECLS-K) to estimate the degree to which teachers' reports of their qualifications are related to student achievement and found no evidence of a direct relationship between the two. Although the degree did not appear to make a difference, teachers who reported emphasizing reading, math, and didactic instruction had positive associations with student gains in reading and teachers who reported using more computation, numbers, and operations were associated with more student gains in math.<sup>65</sup> These findings suggest that the degree is less important than the way the teachers practice in the classroom.

Findings from all these studies suggest that even if the entire early learning workforce had a four-year degree, it would still not be enough to insure classroom quality and positive child outcomes unless they also have some specialized training in early childhood development and how young children learn.

In the early childhood field, the CDA certificate provides on-site training and mentoring to teachers to meet the national credential requirements. The requirements for this certification are not as intensive as an A.A. degree, but it does represent demonstrated competency in interacting with young children. In the debate about what type of education and training lead to the best results for children, the idea of reconsidering the CDA and how it can be part of an effective professional development system has been raised.<sup>66</sup>

Overall, there is still inconclusive evidence and more research needed about what type and amount of education or training lead to better achievement for young children, but the importance of having teachers knowledgeable about early childhood development does seem clear.

## Teacher Supports: What We are Learning About the Best Way to Help Teachers Deliver Intentional Curriculum and Effective Practice in the Classroom

The reality is that most teachers who are working with low-income children do not have the combination of a high educational level and knowledge of child development that is necessary to bring high-quality practice into the early childhood classroom. What do these teachers need in order to be effective in the classroom?

A new book, *Critical Issues in Early Childhood Professional Development*, identifies problems and gaps in what we know about early childhood professional development and outlines new approaches and strategies for both research and practice.<sup>67</sup> These include teaming researchers and teachers, making training courses credit-bearing, and using technology in the form of PDA's (personal digital assistants like the Palm Pilot) and web-based feedback and instructional supports. Some of these new approaches are being evaluated to determine how effective they are for teachers and ultimately, for young children.

**Teacher Support Strategies Related to Early Reading Literacy.** For example, Robert Pianta and colleagues have developed a new set of resources, My Teaching Partner (MTP), an interactive web-based tool combined with consultation. MTP links individual teachers' practices and standards for classroom quality to improved learning, especially in early literacy.<sup>68</sup>

In a statewide study currently being conducted in Virginia, Pianta has preliminary findings showing positive outcomes for teachers who get consultation, while there are some negative findings in terms of lower positive classroom environments for teachers who only have web access to training. Future results will show if these results are robust and which of the combinations of support are most effective.

### MTP Comprehensive Professional Development Resources

- Curriculum and classroom practices
  - Language and literacy curriculum
  - Banking time for relationship supports
- Professional development support for high-quality teaching and implementation
  - One-to-one consultation via the internet
  - Quality teaching web site
  - CLASS observational assessment system

**Teacher Support Strategies Related to Early Math.** In early math, to promote effective implementation of the Big Math Little Kids curriculum, Herb Ginsburg and his colleagues are conducting and evaluating a series of in-service workshops for preschool and kindergarten teachers. Part of the evaluation includes in-depth observations of classroom teachers who had attended the workshops. Although the evaluation is currently underway, findings have been described as “unsettling.” Some teachers overestimated the ability of young children to learn the math concepts in the curriculum and spent little time or effort in implementing the program. Other teachers underestimated children’s ability to learn the material and failed to challenge them. Some teachers had difficulty understanding the mathematical content themselves, while still others had trouble developing a pedagogy effective for teaching mathematics to young children. At the same time, there is good news. The analysis suggests that carefully sequenced and on-going workshops can be an effective tool in helping the teachers develop confidence and skills to teach early math and overcome their own fear and lack of deep understanding about the subject matter. Some child care providers and poorly trained preschool educators can become effective teachers of mathematics.<sup>69</sup>

There are also research-based efforts to improve the quality of training or preservice education. For example, Video Interactions for Teaching and Learning (VITAL) is a web-based course that addresses the need for new methods to train prospective teachers more effectively in early childhood mathematics education. Developed by the Columbia University, Center for New Media Teaching and Learning, and Herb Ginsburg from Teachers College at Columbia University, VITAL is drawn from cognitive research on adult learning and principles of instructional technology. VITAL uses interactive media to help college students achieve a deep understanding of children’s mathematical development and of the pedagogies to foster it. The course provides students with the opportunity and means to analyze an extensive collection of videotapes of real children and teachers engaged in mathematics learning activities. College students are instructed to apply the knowledge being constructed through the course to actual early childhood educational settings.

Early indications show that VITAL improves comprehension, retention, and transfer skills.<sup>70</sup> In 2006 and beyond, a series of evaluations will be conducted to learn even more about VITAL’s potential to enhance preservice education.

#### **The VITAL Application**

- Digital Library of video clip examples of children performing different mathematical tasks that are linked to specific topics in the course syllabus
- Workspace that contains only video clips that students have selected and annotated and space to create a multi-media essay
- Video Lessons to help students develop observation and interviewing skills



## SECTION III

### Expanding the Knowledge Base

This is an exciting time in early childhood research on how to improve early learning outcomes, especially for low-income children. Below we highlight several types of research. First, there are studies evaluating programmatic efforts in early literacy and early math in both school- and community-based settings. Second, there are three new federally funded studies that focus on promoting school readiness through a variety of curriculum and professional development supports. Finally, there are studies of state-funded pre-k programs. Each of these research efforts, although meeting different levels of scientific rigor, has important messages for those seeking to improve the quality of early learning in actual classrooms and the achievement of young, and especially, low-income children. A future NCCP brief will provide an update on some of this research that is currently in progress, with results and implications as findings are available.

#### Evaluating Early Education Learning Strategies:

##### Examples of Research in Early Literacy

The three studies described below illustrate efforts to increase the early literacy of low-income preschoolers.

- **Training Child Care Providers to Implement Early Literacy Curriculum.** In Miami, Dade County, Florida, Abt Associates, Inc., is studying the effects of three curriculum: B.E.L.L. Program, Breakthrough to Literacy, and Ready, Set, Leap, on classroom environment, teacher behavior and interactions with children, and teacher understanding of children's development, as well as the effects of the curriculum on children's language and emergent literacy skills, school readiness, and on subsequent school performance. Additional information is available at: <[www.abtassociates.com](http://www.abtassociates.com)>.
- **Comparing Materials and Coaching to Support Early Literacy.** In Pennsylvania, Linda Katz of the Children's Literacy Initiative (CLI) is testing the impact of an early literacy curriculum, Blueprint for Early Literacy. The curriculum has a classroom and workshop coaching component to provide teachers with the supports they need to effectively use books to increase children's language and literacy levels. Additional information is available at: <[www.CLIontheweb.org](http://www.CLIontheweb.org)>.
- **Assessing the Impact of a Statewide Multipronged Teacher Support Strategy to Improve Early Literacy.** In Texas, a major effort is underway in response to a call by the Texas legislature to improve the school readiness of 3- and 4-year-olds statewide, particularly those from low-income families. The overall project calls for integrating three key instructional components developed by The Center for Improving the Readiness of Children for Learning and Reading (CIRCLE): (1) a state-approved research-based curriculum, (2) interactive training in small groups with coaching, PDA's to conduct child assessments and to inform



instruction and mentoring in a multi-unit web-based professional development course, and (3) progress monitoring to evaluate the impact. Additional information is available at: <[www.uth.tmc.edu/circle/projects.htm](http://www.uth.tmc.edu/circle/projects.htm)>.

### Examples of Research in Early Math

The two studies described below are examples of research on efforts to improve early mathematics skills of low-income preschoolers.

- **Using a Personal Digital Assistant to Guide Early Math Teaching.** The National Institute of Health has funded a project to develop an Early Mathematics Assessment System (EMAS), which uses a PDA to guide teachers as they administer the EMAS and gain insight into student proficiency. The EMAS has three major functions: to evaluate the effectiveness of the curriculum, to provide immediate and specific cognitive process information for guiding instruction, and to be a screening tool for identifying children at risk for mathematical difficulties and those that require comprehensive assessment and intervention. Additional information is available at: <[hpg4@columbia.edu](mailto:hpg4@columbia.edu)>.
- **Evaluating Multiple Aspects of an Early Math Curriculum.** The Longitudinal Study of the Effects of a Prekindergarten Mathematics Curriculum on Low-Income Children's Mathematical Knowledge is evaluating the short-term and long-term effects of the Building Blocks curriculum on the mathematical knowledge of 320 low-income children in Head Start and state-funded preschool programs in 40 classrooms in California and New York. Both the national evaluation study and a local, complementary research study use random assignment to an intervention or control group. The national study will follow children into kindergarten and first grade. The local study will highlight the differences between one and two years of teacher training. Additional information is available at: <[pstarkey@uclink4.berkeley.edu](mailto:pstarkey@uclink4.berkeley.edu)>.

### Examples of Federally Sponsored Research in Progress

In addition to these efforts, there is a significant research agenda in early childhood at the federal level, much of which grew out of Good Start/Grow Smart (GS/GS), the early childhood companion to President Bush's No Child Left Behind Act. Following are three examples meant to improve early learning programs, prepare children to succeed in school, and close the achievement gap.

- **The Quality Intervention for Early Care and Education Project (QUINCE).** The federal Child Care Bureau, together with support from the Office of the Assistant Secretary for Planning and Evaluation (ASPE) in the U.S. Department of Health and Human Services, is examining the effectiveness of alternative approaches to training child care providers with limited experience and education. This project is a multisite, random assignment evaluation of two consultation models: Partnerships for Inclusion (PFI) and Immersion Training for Excellence. The studies began in September 2004 and are due to continue through September 2007. Additional information about QUINCE is available at: <[www.fpg.unc.edu/~quince](http://www.fpg.unc.edu/~quince)>.
- **Preschool Curriculum Evaluation Research Grants Program (PCER).** The Institute for Education Science (IES) awarded grants to seven researchers to test the impact of several widely used preschool curriculum. In 2003, IES funded an additional five researchers,

with Mathematica Policy Research (MPR), Inc. serving as their national evaluation coordinator. Grantees are implementing one or more preschool curriculum and conducting complementary research activities that supplement the cross-site evaluation. The final sample includes Head Start, Title 1, state pre-k, and private preschool programs serving over 2,000 children in 20 geographic locations implementing 13 different experimental preschool curricula. The overall program goal is to improve the quality of the nation's preschool programs in part, by providing evidence so early learning educators and parents can make more informed choices of classroom curriculum. The initial preschool and kindergarten outcome report is due to be released by the end of 2006. For more information about the PCER grantees see: 2002 grantees: <pcer.rti.org> and 2003 grantees: <www.pcer-mpr.info>.

- **Early Learning and School Readiness Program.** A collaboration between the National Institute of Child Health and Development, the Office of the Assistant Secretary for Planning and Evaluation, and the Administration for Children, Youth, and Families in the U.S. Department of Health and Human Services and the Office of Special Education and Rehabilitative Services and the Institute for Education Sciences in the U.S. Department of Education has led to the creation of the Interagency School Readiness Consortium. Eight effectiveness studies are looking at a range of interventions implemented in real-world, public settings, including Head Start, child care, and prekindergarten programs. For example, one study focuses on the role of emotions, another on early learning in Los Angeles County. These are five-year grants, with the first cohort data collection in spring 2003 and cohort two in fall 2004. When completed, this project will result in the development and dissemination of new, scientifically-based curriculum with established professional development components. Unlike the PCERS project, there will not be a formal cross-site research or evaluation study. Instead, the eight federal grant partners meet during the year to talk about what they are finding and what, if any, similarities there are among the projects. Initial outcome data is due in summer 2006 for those projects that collected data in the first year. Other results will be released as the program continues. Additional information is available at: <berchd@mail.nih.gov>.

## Evaluating State Preschool Programs

*“States have multiple systems that serve early childhood and are increasingly responsible for the continuum of pre-k through elementary school so it is in our best interest not to encourage more preschool as a separate silo, but to better connect preschool to elementary school (grade 3) standards and practices.”*

Harriet Dichter, Deputy Secretary, Office of Early Childhood, Pennsylvania State Department of Education and NCCP Meeting Participant

Public policy interest in closing the gap for low-income young children has resulted in the expansion of preschool for 4- and sometimes 3-year-olds. Currently, 38 states have some type of state-funded preschool program. Over 800,000 children were enrolled in state-funded pre-k programs during the 2004-2005 school year and investments are growing, with \$2.8 billion spent on state pre-k during that same year. With this growth, more evaluations of state-funded

### Box 5: Evaluations of Selected Prekindergarten Programs

Program	States conducted in
NCEDL Multi-State Study of Prekindergarten and Study of State-Wide Early Education Programs	CA, GA, IL, KY, MASS, NJ, NY, OH, TX, WA, WI
Universal Preschool in Oklahoma	Tulsa Public Schools
Universal Preschool in Georgia	GA
NIEER Five-State Study	MI, NJ, OK, SC, W.VA

pre-k programs (see Box 5) are being conducted.<sup>71</sup> Overall, the research also calls attention to the significant implementation challenges that states face in ensuring that the quality of preschool programs is sufficiently robust to turn around early learning trajectories for low-income children. The findings also underscore the importance of systematically implementing the kinds of strategies highlighted in this issue brief.

Some early results are promising. A study of the Georgia pre-k program found that by the end of kindergarten children who had attended the pre-k program had equaled or surpassed norms for their age group on all but one (expressive language) of nine standardized measures.<sup>72</sup> The first evaluation of Oklahoma's state-funded pre-k program found the largest effects in language skills and other measures of cognitive development, although some gains were also made in social-emotional development.<sup>73</sup> A follow-up to the Oklahoma study of the effects on kindergarten children who had just completed pre-k showed that the results lasted over time. Children made significant and meaningful progress in prereading, reading, prewriting, spelling, math reasoning, and problem-solving skills, with gains falling somewhere between other state-funded pre-k programs and the small demonstration early intervention programs like Abecedarian and Perry Preschool.<sup>74</sup>

In a new study looking at 20 evaluations of pre-k in the states listed above plus Maryland and Texas, the majority (13 of 18) showed children made gains in “overall developmental competence” at the end of pre-k, on measures of language, literacy, numeracy, social skills, self-help, and motor development.<sup>75</sup> Only one study found effects lasting beyond first grade. The authors are, however, cautious about the extent to which state-funded preschool programs are effective. Two problems are identified: most of the research designs are too weak (none use random assignment to a control group) to determine if outcomes are the result of the program, and the research question (Does pre-k work?) is too simplistic and general to provide information about what specifically leads to improvement in the achievement of low-income children.

Findings from a literature review and interviews in eight states by the Rand Corporation show how widely curriculum and professional development practices vary. In four of the states, curriculum in local sites were put in place without regard to standards and assessments mandated by the state. Professional development strategies were inconsistent with the lessons from research highlighted earlier. States had to rely on passive activities for professional development like toolkits and information packets as opposed to more active, intense, and

sustained activities, primarily because of budget constraints. States also reported it difficult to balance and blend federal and state funding streams so there was not enough money to effectively implement programs on a large scale.<sup>76</sup>

The researchers connected with NCEdL who have conducted the most studies on pre-k to date have issued a statement saying: “We call on researchers, advocates, and policymakers to examine the data on preschool programs objectively and carefully. Preschool is not a cure-all for widespread systemic shortcomings in our educational system, but as our research and that of others shows, it appears to provide substantial benefits for a broad range of children, both poor and not poor. But these benefits are realized only if careful attention is given to establishing a sound set of standards for programs and ensuring that the programs are in fact implemented with teaching practices that have been shown to result in improvements in child well-being.”<sup>77</sup>

## SECTION IV

### The Role of Local-Level Leadership

*“Building a successful model requires consistency, persistence, and a systematic approach.”*

Jerry Weast, Superintendent, Montgomery County,  
Maryland School District and NCCP Meeting Participant

In addition to research, there is much to be learned from practice. Below, we briefly describe the experience of how one school district, under the leadership of Jerry Weast, Superintendent of Montgomery County Public Schools, is narrowing the achievement gap between low-income and more affluent children across race and ethnicity, drawing on some of the strategies highlighted in this issue brief.

#### Background Description

Montgomery County, Maryland, has over a million residents and is the 17th largest school district in the United States. It has some of the highest performing schools in the wealthiest neighborhoods, along with a growing immigrant population and high concentrations of poverty. The district is ethnically diverse; 123 different languages are spoken in the public schools, 27 percent of the children are Hispanic, 22 percent are African American. Mobility rates are high in some schools. The district operates 100 Head Start classrooms, 100 preschool classrooms, and 125 elementary schools. Before reforms were put in place, the achievement gap between advantaged and disadvantaged children had been widening.

#### Plan of Action

Planning began in 1999 to implement systemwide reforms to counter what Weast called a “sense of desperation in the highest poverty schools.” To guide the effort, Weast asked teachers a series of four questions: What do you want children to know and do? How will you know if they know it? What do you do if they don’t? What do you do if they do? One year later the Early Success Performance Plan was launched with the goal of establishing conditions to ensure that children would be ready for college after graduating high school.

#### Financing the Plan

Montgomery County is in the fortunate position of having a stable and supportive government and community when it comes to advocating for the schools and young children. Teachers, principals, and support staff and their unions all supported the plan. Weast’s longevity and trust in the community—he has been superintendent for seven years in a job with

an average length of stay of 2.5 years—allowed him to braid together funding from multiple sources to support the plan. In addition to state education dollars, and federal Title I and Head Start funds, Montgomery County raised \$60 million in tax revenue for the schools. The program, costing approximately \$12,000 per child, benefited from the additional funds and the local control over part of the budget.

## Targeting the Most At-Risk Students and Schools

To decrease the achievement gap, the bold decision was made to focus on the schools with the greatest number of students living in poverty. Different interventions were tailored for 56 targeted schools, including increasing the number of full-day kindergarten classes and decreasing class size to 15:1 in full-day kindergarten. According to Weast, “we spent 60-70 percent more on classrooms with higher concentrations of poverty than we did on classrooms with higher percentages of upper-income children and got full support when we told everyone what we were doing and why we were doing it.”

## Professional Development

Weast took into account both the time and funding limits the schools were facing. Most of the professional development activities were embedded into the schools and involved peer-to-peer learning and support and curriculum content consultations. Between \$3-4 million has been spent on permanent substitutes assigned to each school for teacher release time to do classroom observations, plan together, and reflect on what they are learning.

Professional development activities are aimed at both teachers and principals. In the first two years, about 500 teachers went through over 100 hours of training on the revised reading, math, and language arts curriculum. In the next year, more teachers were added, and they also received four days of training over the summer and 45 additional hours of training during the school year. Teacher coaches, which are new permanent positions, are assigned to each school to be available for additional on site assistance.

## Curriculum

Before the reforms, schools were doing their best but looking for a magic bullet to help solve the problems. In one year there were seven different changes and additions to the reading curriculum being used, and principals and teachers in a school and across school buildings implemented the curriculum in different ways.

As part of the new program, kindergarten teachers were given a curriculum blueprint and instructional guidelines with explicit instructions for reading and math. Curriculum and standards are now aligned from prekindergarten through grade 5 and seen as key to the reform program.

## Additional Services for Families

Parents were an integral part of The Early Success Performance Plan. They had identified early childhood as a priority for the district and were involved in adopting the guiding principles for the kindergarten program. Frequent meetings in parents' home languages help keep them updated about what is happening in the schools and solicit their feedback about the program. In addition, families have access to school-based health clinics and home visitation. Extended-day and year-round programs complete with breakfast, lunch, and transportation, are now offered to families at no cost so children have access to before- and after-school activities, as well as four hours a day of school over four weeks in the summer.

## What Has Changed

The efforts have paid off. In 2001, fewer than 30 percent of children could read at the benchmark level set for kindergarten and now 81 percent are reading at that level. Two groups of children who had gone through kindergarten during the reform have taken the grade 2 national test of basic skills. In 2004, the children who made up the most ethnically diverse group in the district's history "set new records" in scoring above national norms on standardized tests of reading, language, and math. Low-income students scored above the national average in two content areas and surpassed the 70th percentile in math computation. African-American students scored above the national average in every subject for the first time.<sup>78</sup>

## Lessons Learned

According to Weast, and based on evaluation of the program to date, three key lessons have come out of the reform effort so far.

- 1) **Teachers were both the key to success and one of the biggest challenges.** In preschool settings, teachers were strict about their ideas of what is developmentally appropriate. With the right set of supports, they have changed the way they think about what children should be learning in pre-k.
- 2) **Working with community-based child care centers is challenging for schools.** Despite offering free training, it was difficult to get the teachers to participate, so some children didn't attend the programs even when they were available.
- 3) **The success in the Montgomery County Public Schools would not have been achieved if the effort wasn't comprehensive and multifaceted.**

Further research will help determine what parts of the model will make the most sense for other districts to implement given their own circumstances.

## SECTION V

# Take-Home Messages, Implications, and Recommendations for the Field

This issue brief has highlighted the roles that an intentional curriculum and professional development supports for teachers play in improving the achievement of low-income preschoolers. Based on lessons from the existing and emerging research, as well as ideas from leading experts in early learning, we have identified implications and made recommendations about how to integrate this knowledge into practice and policy.

### Take-Home Messages

The research in this issue brief shows that low-income children make gains in early literacy and early math when high-quality preschool programs include an intentional curriculum and provide effective teacher professional development and supports. The most important take-home messages from the issue brief include the following:

- The gap in achievement between low-income children and their middle-class peers is real and significant.
- An intentional curriculum is research-based, emphasizes teachers actively engaged with children, includes attention to social and regulatory skills, is responsive to cultural diversity and English language learners, is not teacher-proof, and requires new ways to measure classroom quality, teacher effectiveness, and student progress.
- Using an intentional curriculum is an important strategy to reduce the achievement gap, and since no curriculum is teacher-proof, strategies to help teachers effectively use the curriculum are equally important.
- Defining and assessing quality early learning has shifted to a focus on teacher-child interactions, child-focused teaching style, and content-driven classroom instruction in addition to issues such as child-staff ratios and group size.
- On average, the association between teacher education and child outcomes is small and there is still no final determination about how much education and training is needed and what is the best way for to offer this so teachers are more effective in the classroom.
- Overall, children achieve more when they have teachers with more education and training closely tied to knowledge about early childhood and child development.
- New and existing teachers who do not have advanced degrees or training can be effective in classrooms with high concentrations of low-income children if they have ongoing consultation, mentoring, and feedback that is directly tied to their classroom practice.
- Some research on state pre-k programs shows positive results, other research suggests there are significant program quality problems and implementation challenges, and more rigorous research designs and methods would help determine how effective these programs are for increasing achievement, particularly with low-income children.
- There are examples of school districts using an intentional curriculum and teacher supports that have achieved powerful results with ethnically diverse and low-income children.



## Implications and Recommendations

The research in this brief has implications for state and local policymakers, early learning administrators, teachers, families, community leaders, and researchers. Recommendations for each of these key stakeholders groups follow.

### For State and Local Policymakers

- Ensure that requirements for obtaining more education are linked to requirements for training in early childhood development or a related field.
- Allocate resources for state and local training in instruction to ensure the translation of new knowledge about teaching, curriculum, and related practices actually reach teachers on the ground.
- Invest in training strategies that provide direct feedback on classroom practice through on-going consultation, mentoring, or coaching.
- Ensure that state incentives for quality early childhood programs include teacher-child interactions, child-focused teaching and content-driven classroom instruction.
- Invest in experimental research to determine the specific content, modules, and sequencing of curriculum that best predict increased achievement for low-income young children, including the most at risk, across all settings.
- For the most challenged families, build in supports that address family and community-based barriers to learning, such as child and family health and mental health.

### For Early Learning Administrators

- Implement and sustain over time a whole school/center model of professional development involving principals, directors, supervisors, teachers, child care providers, and families.
- Provide release time, substitute teachers, and subsidies so teachers can take advantage of professional development that helps them understand how young children learn and develop, and to help them implement curricula used by the district.
- Align early learning curriculum and teaching strategies with kindergarten through grade 3 standards to sustain increased achievement.

### For Teachers

- Participate in education and training that increases knowledge of the subject matter being taught and understanding of how to teach young children.
- Participate in education and training that focuses on how young children grow and learn.
- Participate in training that focuses on the cultural traditions and practices and language diversity of the growing number of immigrant and limited English proficient children.

### For Families and Community Leaders

- Join together to determine how effective preschools are in teaching early literacy and early math to low-income preschoolers.
- Develop advocacy efforts to ensure that parents and community leaders have a voice in improving early learning outcomes and implementing an intentional curriculum and effective teaching strategies across all preschool settings.

### For Researchers

- Conduct experimental studies to determine the specific content, modules, and sequencing of preschool curriculum that best predict increased achievement for low-income and the most at-risk preschoolers.
- Conduct experimental studies across all early learning settings to test what content and delivery methods of training best help teachers improve their classroom practice.
- Promote the development of new tools to measure classroom quality and predictors of increased achievement.
- Translate research findings so that parents, teachers, and community leaders can understand whether the differences identified are meaningful and make a difference in children's achievement.

## CONCLUSION

Closing the achievement gap is a large task requiring strategic planning and action at the classroom, local, state, and federal levels. For children in the highest-risk families and poorest communities, even the best early care and early learning opportunities will not be enough to help them perform on a level consistent with their more advantaged peers. However, a strong evidence base is showing that there are pathways to increase the early literacy and early math achievement for low-income preschool-age children. The challenge is to use this knowledge so that it gets into the hands of those working directly with the millions of low-income preschool-aged children across this country.

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## APPENDIX A: Meeting Participants

### **Oscar Barbarin, Ph.D.**

L. Richardson and Emily Preyer Bicentennial  
Distinguished Professor for Strengthening Families  
University of North Carolina School of Social Work  
Fellow, Frank Porter Graham Child Development Institute  
Chapel Hill, North Carolina

### **Charlie Bruner, Ph.D.**

Child and Family Policy Center  
Des Moines, Iowa

### **Jennifer Burrell**

School Readiness Program Manager  
Children and Families of Orange County, California

### **Donna Bryant Ph.D.**

Frank Porter Graham Child Development Institute  
National Center for Early Development and Learning  
Chapel Hill, North Carolina

### **Harriet Dichter**

Director of Early Childhood  
Department of Education  
Office of Policy  
Harrisburg, Pennsylvania

### **Linda Espinosa Ph.D.**

Professor of Early Childhood Education  
College of Education  
University of Missouri-Columbia  
Columbia, Missouri

### **Herb Ginsburg Ph.D.**

Jacob H. Schiff Foundation Professor of Psychology and Education  
Department of Human Development  
Teachers College Columbia University  
New York, New York

### **Ron Haskins, Ph.D.**

Senior Fellow  
The Brookings Institution  
Washington, D.C.

### **Marilou Hyson, Ph.D.**

Senior Advisor for Research and Professional Practice  
National Association for the Education of Young Children  
Washington, D.C.

### **Lisa Kane**

Program Associate  
Annie E. Casey Foundation  
Baltimore, Maryland

### **Jean Layzer Ph.D.**

Vice-President and Principal Associate  
Abt Associates, Inc.  
Cambridge, Massachusetts

### **Joan Lombardi**

Director  
The Children's Project  
Washington, D.C.

### **Jana Martella**

Director of Early Childhood and Family Education  
Council of Chief State School Officers  
Washington, D.C.

### **Ivelisse Martinez-Beck, Ph.D.**

Research Coordinator  
Child Care Bureau, Office of Family Assistance  
Administration for Children and Families  
U.S. Department of Health and Human Services  
Washington, D.C.

### **Martha Moorehouse, Ph.D.**

Director, Division of Child and Youth Policy  
U.S. Department of Health and Human Services  
Washington, D.C.

### **Bob Pianta, Ph.D.**

Novartis Professor of Education  
Curry School of Education  
University of Virginia  
Charlottesville, Virginia

### **Barbara Reisman**

Executive Director  
The Schumann Fund for New Jersey  
Montclair, New Jersey

### **Ann Segal**

Wellspring Advisors  
Washington, D.C.

### **Joe Sparling, Ph.D.**

Frank Porter Graham Child Development Institute  
Chapel Hill, North Carolina

### **Barbara Wasik, Ph.D.**

William R. Kenan, Jr. Professor  
University of North Carolina  
Chapel Hill, North Carolina

### **Jerry Weast, Ph.D.**

Superintendent  
Montgomery County Public Schools  
Rockville, Maryland

### **Marty Zaslow, Ph.D.**

Senior Scholar  
Child Trends  
Washington, D.C.

### HOSTS:

### **Jane Knitzer, Ph.D.**

Director  
National Center for Children in Poverty  
New York, New York

### **Lisa Klein, Ph.D.**

Principal  
Hestia Advising  
Leawood, Kansas

