

Executive Summary

Synthesis of IES Research on Early Intervention and Early Childhood Education

The purpose of this synthesis is to describe what we have learned from research grants on early intervention and childhood education funded by the Institute of Education Sciences (IES) National Center for Education Research and National Center for Special Education Research and published in peer-reviewed outlets through June 2010. This synthesis is not intended to be the typical research review, which provides a broad overview of research in a field. Rather, it looks across the projects that IES funded to determine what has been learned and to suggest to the field avenues for further research to support improvements in early childhood education in our country.

It is important to contextualize this report. Soon after it was founded, IES launched a broad range of research programs to better understand the links between early childhood education, early intervention, and children's learning and development; develop more powerful interventions for improving child outcomes; rigorously test the impact of programs, practices, and policies on child outcomes; and develop and validate assessment measures for use with young children. Among these research programs are those that focus on improving developmental outcomes and school readiness for young children with or at risk for disabilities. In the synthesis report accompanying this Summary, we give special attention to summarizing what has been learned about early childhood classrooms as contexts for development and learning, the kinds of instructional practices and curricula that appear to be efficacious for enhancing children's development and learning, and approaches for improving teachers' and other practitioners' (e.g., speech, occupational, or physical therapists) instruction, given hypothesized linkages between instructional quality, instructional effectiveness and children's learning.

To support the development of this report, IES identified its research grants relevant to the topic and gathered the peer-reviewed journal articles and chapters produced under these grants. IES staff consulted with its grantees to confirm that all peer-reviewed articles emerging from these projects and published or in-press by June 2010 were identified. The articles and chapters were then provided to a panel that included four nationally-recognized experts in early childhood education. Through several conference calls, panel members decided on the focus and organizing themes for the synthesis. The written report reflects their expert judgment as to the contributions of the reviewed articles and chapters toward advancing knowledge and practice in early childhood education.

The panel identified a number of notable contributions of IES-funded research projects to understanding early childhood education and interventions intended to improve early education. These contributions reflect four areas of inquiry by IES-supported researchers: research related to early childhood classroom environments and general instructional practices; research related to educational practices designed to impact children's academic and social outcomes; research

related to measuring young children's skills and learning; and research related to professional development for early educators.

Below, we provide a summary of contributions to the knowledge base in early childhood education and intervention produced by IES-funded research across these four focal areas.

Research related to early childhood classroom environments and general instructional practices

A considerable volume of work supported by IES research investments has focused on improving understanding of teaching and learning as it occurs in early childhood programs; such work is important for helping us to identify those features of classrooms that are reliably associated with children's achievements. IES-supported research has furthered our understanding of early childhood classroom environments and general instructional practices by making the following seven contributions to the literature.

First, IES-supported research shows that there are critical associations between features of pre-kindergarten classrooms, such as the quality of teacher-child interactions and the nature of teachers' feedback to children, and positive children's outcomes. For instance, the extent to which teachers are observed providing emotional support to children in their classroom is positively associated with children's growth in social competence. Second, research findings show that parents' and teachers' support for children's learning contributes to young children's outcomes. As an example, one study showed that the extent to which parents were involved in their children's schooling and their perceptions about their children's teacher were related to their children's academic and social competence. Third, research findings show that participation in higher-quality classroom environments is associated with improved learning outcomes for young children. IES-supported research found that children within classrooms characterized by relatively high levels of emotional support and instructional support show greater growth over an academic year on measures of academic and social development. Fourth, IES-supported research indicates that children enrolled in early education settings exhibit great variability in their skills and risk factors. Such work may be important for considering how early instruction can be differentiated to meet the diverse needs of children with early education settings. Fifth, IES-supported work demonstrates that there is a need to improve characteristics of the classroom language environment. This work suggests that children in preschool classrooms may be exposed to few exemplars of advanced linguistic content, such as challenging questions, which may inhibit language-development opportunities. Sixth, and relatedly, studies show that the content of early childhood education may be relatively constrained with respect to provision of math- and science-oriented instruction; in turn, children's potential for increasing their knowledge of math and science concepts within the preschool classroom may be limited. Seventh, IES-supported work shows that the composition of preschool classrooms may influence children's learning. Optimal classrooms may be those in which children have the opportunity to learn from peers with advanced skills, as suggested in one study.

Research related to educational practices designed to impact children's academic and social outcomes

In the field of early childhood education, teaching professionals are pressed to use research-based practices, particularly in the areas of language, literacy, mathematics, cognition, and social skills. For this to occur, there must be a body of work identifying those practices that are likely to have positive impacts on children's development if applied in the classroom. This work might be directed towards developing and testing new, innovative practices targeting certain areas of learning (e.g., math, science), or it might be directed towards documenting the effects of commonly used practices or curricula. A substantial volume of IES-supported work contributes to developing and testing new or accepted practices, resulting in 13 separate contributions to the literature noted in this report. These contributions fall into three focal areas.

First, IES-supported work identified specific practices that teachers can use to improve children's language, literacy, mathematics, cognitive (i.e., abstract reasoning), and social skills. For instance, researchers identified specific ways that teachers can read books to children to improve literacy skills, and specific types of activities (e.g., board games) that teachers can use to improve mathematic skills. At the same time, researchers also identified some commonly used programs that appear to have little impact on children's skills. Second, some IES-supported work focused specifically on developing and testing practices that may be used with special populations of children, such as those at-risk for reading difficulty, those with problem behaviors, and those with sensory disabilities (e.g., hearing loss). This work is important for supporting the development of all children in the classroom and appropriately differentiating instructional approaches. Third, IES-supported work examined the use of tiered approaches to supporting instruction, commonly referred to as response-to-intervention (RtI). For instance, study findings show that RtI may be an appropriate approach for supporting children's early math development.

Research related to measuring young children's skills and learning

The development of valid and reliable measures of children's skills and learning, for use by educators or members of the research community, is an important scientific pursuit. For instance, research examining the association between specific features of classroom environments, such as the quality of instruction, and children's language development must validly and reliably represent the classroom environment and children's learning in some way. IES-supported researchers made three notable contributions related to the measurement of children's skills and learning.

First, research findings show that some measures commonly used in the early childhood community may not provide reliable information about children's skills. Such findings show the importance of conducting ongoing evaluations of measures commonly used, and also point to the need for new measures to be developed that provide reliable information. To this end, a second contribution of note is that IES-supported research generated new tools that can reliably and

validly describe children's growth and learning in key areas. These include screening tests that can reliably show which children may benefit from supplemental or specialized interventions in reading. Third, research has focused on the use of progress monitoring and data-based decision making tools that might improve teachers' instructional practice. This line of research considers how dynamic tools that monitor children's growth over time can be used by teachers to individualize instruction in key areas.

Research related to professional development for early educators

A growing volume of work, including work supported by IES, is systematically identifying how professional development may be used to improve instruction in early childhood settings. The need for improvement is warranted not only based on descriptive evaluations of the need for improved quality of instruction in many early education settings, but also to ensure that early childhood educators have access to the most up-to-date information about effective practices and programs. As IES-supported researchers continue to expand what is known about early childhood, this knowledge must be shared in effective ways with educators. This report identified three ways in which IES-supported research contributed to what is known about professional development for early educators.

First, study findings show that classroom instruction can be improved by providing professional development to teachers. Improvements in instruction may be seen in general measures of the instructional environment or in more focal ways, such as teachers' use of assessment data to design individual instruction. Second, and as importantly, study results show that professional development impacts are seen not only in what teachers do in their classrooms but also in what children are learning. As an example, children's literacy development benefits when teachers receive professional development coursework focused on improving their literacy instruction. Third, IES-supported work made important contributions to showing how technology can be used as a mechanism for the professional development of teachers. Technology provides a mechanism for helping teachers observe their own practices (via video analysis), for working distally with coaches, and for monitoring children's progress using hand-held digital technologies.

The research, practice, and policy communities have learned a lot about effective educational practices through IES-supported research. For instance, this body of work identified specific practices that teachers can use to improve children's learning in key areas, and has also identified effective ways to support teachers through professional development.

The authors of this report also assert that there is much more that needs to be learned to ensure that early education settings are as effective as they can be as the entry point for many children to arrive into formal schooling. For instance, there is a great need for improved understanding of the most effective ways to intervene with children who live in very challenging circumstances or who are learning multiple languages at once. Moreover, there is still a pressing need to learn more about the practices and curricula commonly employed in early education settings,

particularly the conditions under which these are most effective. Many of the practices studied in IES-supported work likely work in some settings, but not all, and for some children, but not all. In our view, important questions for early education research include:

What are the crucial features of high quality early childhood education? More evidence is needed about the relationship between specific features of classroom quality and children's development and learning in specific domains. We know little about minimum thresholds of classroom quality that are necessary to optimize learning. Research is needed that will help us identify when and what kinds of investments in quality improvement are likely to have the biggest impact on children's learning and development.

Which instruction is most effective for which children and under what circumstances? More evidence is needed about aspects of effective instruction for young children, including children with significant learning needs. What are the most effective and efficient approaches for improving children's attention and self-regulation, and promoting their language, literacy, mathematics, and science learning to establish the foundations for success in the elementary grades? What adaptations are needed so that instruction is effective for every child? Also, many important issues remain to be addressed about effective and efficient interventions with children who demonstrate learning difficulties. In addition to the continued development of effective, individualized interventions, further attention is needed to the development of assessment tools that can be used quickly and reliably to monitor preschool children's progress in academic and social learning domains, and which can sensitively and specifically identify future academic risks.

How do we effectively and efficiently support teachers in improving their instruction? While we have learned a lot about effective instructional practices, we know much less about effective strategies for helping teachers to improve the quality of their classrooms and the instruction that they provide. This remains an important target for future research.

Research in early education and early intervention, supported by IES, has made substantial and significant contributions to our understanding of effective practices for enhancing the learning and development of our youngest and most vulnerable citizens. Importantly, much of this work is ongoing and is not included in this report. In the next decade, due in part to these IES-supported efforts, our understanding of early childhood education will expand exponentially. In our opinion, it is important that periodic compilations of these accumulating findings, such as that presented here, are undertaken; this is important for cataloging advances in what we are learning as well as areas in which we must continue to improve our understanding. Rigorous research that addresses important questions about approaches for promoting children's development and learning can provide educators (and other public consumers of education) with important guidance regarding the scientific bases for practices and policies currently in place, or under consideration for adoption.