Symposium Justification

Symposium Title: Development, Implementation and Evaluation of Preschool Mathematics and Science Intervention Models

These papers highlight recent research on the development, implementation and evaluation of mathematics and science curricula, and teacher professional development supports in prekindergarten settings. Ensuring that young children begin formal schooling with the necessary academic and social skills continues to be a priority for researchers, practitioners, and policy makers. The differences in children’s school readiness skills are evident at kindergarten entry and persist over time (Rathbun & West, 2004; West, Denton & Reaney, 2000). This early achievement gap, which is related to socioeconomic indicators of risk, tends to widen over the early school years and have a lasting impact on children’s academic achievement.

In the area of mathematics education, findings from the Early Childhood Longitudinal Study (ECLS) show that by fifth grade, 57 percent of students from low-income backgrounds scored in the lowest third of the distribution of mathematics achievement scores, compared to 26 percent of students in households at or above the poverty threshold (Princiotta, Flanagan, & Germino-Hausken, 2006). In science, 67 percent of children from low-income families, as defined by free/reduced lunch status, scored below the basic level of proficiency on the 2005 fourth grade National Assessment of Education Progress (Grigg, Lauko, & Brockway, 2006). It is important to understand how we can intervene during the prekindergarten years to prepare children, especially at-risk children, for later success in mathematics and science education.

Mathematics and science instruction are two neglected areas in the field of early childhood education. Much of the attention in recent years has focused on promoting preschoolers’ understanding and acquisition of important early language and literacy skills (Report of the National Early Literacy Panel, 2008). In contrast, there has been a somewhat limited focus on mathematics and science education in prekindergarten programs. There is a need to encourage and support young children’s understanding of basic mathematics and science concepts because of the early and lasting achievement gaps in these academic domains.

The recent report on Mathematics Learning in Early Childhood (National Research Council, 2009), outlined several key recommendations for supporting mathematics instruction and learning experiences during the preschool years. The report called for “opportunities for children to experience high-quality mathematics instruction.” Although the report focused on the need for more mathematics instruction in prekindergarten classrooms, the recommendations can be applied to science education in early childhood settings. These five papers address the development, implementation and evaluation of mathematics and science intervention models that are designed to improve young children’s knowledge and understanding of mathematics and science concepts. The presenters will describe the content and components of each intervention model, the use of developmentally appropriate instructional practices, professional development support for early childhood educators, and teacher-level and child-level outcomes. Implications for future research and early childhood practice will be discussed.
References


