Developing Early Interest and Skill in STEM: Hands-On Activities and Parent-Child Conversations

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THE PROBLEM

The U.S. needs more children prepared and motivated for future STEM education and career opportunities. Our research examines ways to address the STEM pipeline problem by learning how young children develop early interest and skill in STEM through hands-on activities and conversations with their parents.

WHY THIS MATTERS

- U.S. children have many *informal* learning experiences, visiting museums, zoos, and aquaria, even before school age.
- Informal learning experiences are critically important for early STEM learning.

CURRENT RESEARCH

- The research takes place at the Chicago Children's Museum in an exhibit designed for STEM learning. Families build skyscrapers in a hands-on activity that may promote understanding of engineering and general principles of science, technology, and math.
- Thus far, we have observed more than 150 children ages 4 – 8 building skyscrapers with their families.
- Some families viewed a demonstration of a simple engineering principle before engaging in the hands-on building activity, while others did not.

Demonstration

- We examine how and when parents' conversations and children's hands-on activities lead to STEM learning.

WHAT HAVE WE LEARNED?

Compared with families who did not view the demonstration:

- Parents who viewed the demonstration talked more with their children about engineering and the scientific method while engaged in hands-on activities in the museum.
- When asked to fix a wobbly building, children who viewed the demonstration showed more understanding of engineering principles.
- Later, at home, children who viewed the demonstration showed greater recall and use of what they learned in the museum.

IMPLICATIONS

Findings from this study specify conditions that promote conversations and support children's STEM learning and interest across informal learning contexts.