

IS TEACHING MATHEMATICS HARD? IS IT HARDER TO TEACH INCLUSIVE MATHEMATICS, COMPUTATIONAL THINKING, AND ENGINEERING?

Michele Stites¹, Susan Sonnenschein¹, Jonathan Singer¹, Hsiu-wen Yang², Chih-Ing Lim², Megan Vinh², Hatice Gursoy¹, Freya Kaur¹, Besjanë Krasniqi¹

¹University of Maryland Baltimore County; ²University of North Carolina Chapel Hill

INTRODUCTION

- Children with disabilities are often denied opportunities to engage in STEM activities including mathematics, computational thinking, and engineering (Clements et al., 2021).
- It is widely accepted that literacy opportunities in preschool are more frequent than mathematics ones (Stites et al., 2019).
- Little is known about the frequency with which computational thinking and engineering occur in preschool.
- This presentation compares 10 Maryland Head Start teachers' ability to implement inclusive mathematics with their skills for implementing inclusive computational thinking, and engineering activities strategies following a four-day professional development focused on inclusive STEM and follow-up Networked Improvement Community (NIC) meetings.

RESEARCH QUESTION

- Do Head Start teachers increase the number of inclusive mathematics, computational thinking, and engineering opportunities following targeted professional development (PD) and on-going support using Networked Improvement Community (NIC) meetings?

METHOD

Participants:

- 10 Head Start teachers from Maryland, with teaching experience ranging from five to 31 years.

Table 1

Outline of the study methodology.

Time point	Description	Measure
Baseline Data collection	Collected Data on teacher beliefs, practices, and efficacy for inclusion and STEM teaching	<ul style="list-style-type: none">• ICP• STEM Instances tracking Form• Teacher Self-Efficacy Scale
During Summer PD	Assessed changes and progress in teacher beliefs, practices, and efficacy during PD	<ul style="list-style-type: none">• Inclusion Beliefs Survey
Following Academic year	Evaluated the long-term impact of PD on teacher beliefs, practices and efficacy.	

Note. The measures listed were applied across all time points.

RESULTS

- **Prior to the professional development**
 - Participating teachers indicated needing support and lacking the confidence to engage students in activities addressing mathematics, computational thinking, and engineering.
- **Following four days of intensive professional development**
 - Teachers reported higher confidence levels in teaching mathematics but not computational thinking or engineering.
- Teachers were observed implementing **mathematics activities** more frequently than computational thinking or engineering.
- Teachers indicated they would benefit from **additional support** in computational thinking and engineering.

CONCLUSIONS

- Teachers reported higher confidence in teaching mathematics after professional development.
- Confidence in teaching computational thinking and engineering did not increase significantly.
- Mathematics activities were implemented more frequently than computational thinking or engineering.
- These results suggest that increasing preschool teachers' STEM involvement, especially with children with developmental disabilities, will require significant additional effort.



MCLS, Washington DC, June 2024