STEMIE
INNOVATION FOR INCLUSION IN EARLY EDUCATION

UNC | FRANK PORTER GRAHAM CHILD DEVELOPMENT INSTITUTE

A Systematic Review of Practices that Support STEM Identity in Young Children

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Supporting positive STEM identity in young children requires creating inclusive, engaging, and socially relevant learning environments that incorporate play-based learning, leverage group dynamics, gender alignment, and integrate inquiry-based activities to foster motivation, self-efficacy, and academic achievement in STEM fields.

Defining STEM identity

STEM identity refers to how individuals see themselves in STEM fields. It encompasses their self-perception, confidence, and sense of belonging in these areas or the belief that one can succeed in STEM fields.

Search Terms

['STEM' OR 'Science' OR 'Technology' OR 'Computational Thinking' OR 'Engineering' OR 'Math'] AND ['Identity' OR 'Self-concept' OR 'Interest' OR 'Attitude' OR 'Self-efficacy' OR 'Motivation' OR 'Belief'] AND ['Young children' OR 'Early childhood' OR 'Infant' OR 'Toddler' OR 'Preschool' OR 'Kindergarten']

Databases

PsycINFO, ERIC, Academic Search Premier, ProQuest, SCOPUS, Google Scholar, and EndNote (n =1225)

Title/Abstract Screening (n = 1219; 94% IR)

Full Text Review Inclusion Criteria (n = 65; 59% IR)

- Available full text in English
- Include empirical evidence on practices that support STEM identity in young children (birth to kindergarten)

Included (n = 7)

OBJECTIVE

What practices and educational strategies are documented in the literature that can be used to support the development of STEM identity in young children (birth-kindergarten)?

METHODS

Developed systematic review protocol with assistance of UNC Libraries
Conducted systematic review with 2 reviewers using Covidence (Import references, Title/Abstract screening, Full text review, and Extraction) following PRISMA guidelines (Identification, Screening, and Included) and meeting to resolve conflicts.

KEY FINDINGS

		N = 7
STEM	Science	5
	Computational Thinking	3
	Engineering	3
	Math	3
Age	Preschoolers	4
	Kindergarteners	5
Practice	Group membership	1
	Hands-on play-based learning	1
	Positive Technological Development	1
	Same-gendered character	1
	Science inquiry (CER) & Literacy	2
	Teacher scaffolding	1

We excluded several studies because they did not explicitly mention identity. When considered within the developmental learning and theory framework, they could contribute to developing STEM identity (e.g., STEM talk, family values).

FUTURE DIRECTIONS

Investigate practices that support STEM identity in diverse children and those with disabilities and develop tools to assess program effectiveness in affirming all children's STEM identity.

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