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FRANK PORTER GRAHAM

CHILD DEVELOPMENT INSTITUTE

A Systematic Review of Technology as a Tool for STEM Learning

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OBJECTIVE

How is technology being used as a tool for STEM learning for young children (birthkindergarten), as documented in the literature?

METHODS



nent of Education. and you should not assume endorsement by the Federal Government

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 = 179 |
|----------------------|---------------------------------|---------|
| STEM | Science | 24 |
| | Computational Thinking | 28 |
| | Engineering | 2 |
| | Math | 125 |
| Technology as a Tool | Toddlers | 1 |
| | Preschoolers | 81 |
| | Kindergarteners | 96 |
| | Games/Apps | 77 |
| | Robots/Programming toys | 42 |
| | Digitally delivered instruction | 25 |
| | Interactive whiteboard | 8 |
| | eBooks | 4 |
| | Other | 23 |

FUTURE DIRECTIONS

- Investigate the features and extent of effectiveness of the technology on children's learning.
- Explore strategies to support adults in using technology to promote children's STEM learning

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Digital games, apps, and programmable robots can engage young children in STEM learning opportunities effectively. Using technology is most beneficial when adults provide guidance and scaffolding while working alongside children.

Defining Technology as a STEM Learning Tool

Using technology means using equipment or digital media (like video, tv, games, or apps) with a STEM activity to help children learn and develop. We are not considering digital literacy or beliefs about using technology with children ages birth to kindergarten.

Search Terms

['STEM' OR 'Science' OR 'Technology' OR 'Computational Thinking' OR 'Engineering' OR 'Math'] AND ['Technology Uses in Education''' OR 'Educational Games' OR 'Programming' OR 'iPad or tablet or mobile device' OR 'Robot' OR 'Augmented Reality'] AND ['Young children' OR 'Early childhood' OR 'Infant' OR 'Toddler' OR 'Preschool' OR 'Kindergarten']

Databases

PsycINFO, ERIC, Academic Search Premier, ProQuest, SCOPUS, and Google Scholar (n =4269)

Title/Abstract Screening (n = 4269; 52% IR)

Full Text Review Inclusion Criteria (n = 521; 63% IR)

Available full text in English

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 Included technology in some form being used to support STEM learning (and not as an assessment) in young children (birth to kindergarten)

Included (n = 179)

This research was conducted under a Cooperative Agre