Investigating Preschoolers' Computational Thinking: Challenges in Assessment September 19, 2019





Integrating Computational Thinking into Mathematics Instruction in Rural and Urban Preschools

- 3-year collaboration between WGBH, EDC, and Kentucky Educational Television.
- Goal: Create CT learning opportunities that integrate with current preschool math instruction for all children, with an emphasis on underserved children and their educators in rural and urban preschool settings.



Research Question & Process

What does the CT learning process look like in young children when they engage with CT learning tasks that support hands-on problem solving?

- 1. Created a learning blueprint to map out learning goals for each of the target CT Core Ideas.
- Identified a playful hands-on approach for assessment for each target CT Core Idea
- 3. Developed problem solving/goal-oriented tasks
- 4. Conducted three rounds of iterative development



Example: Debugging Task

Children are asked to help the assessor make two identical bracelets and fix errors along the way.

The task includes the following parts:

- Initial verbal description
- Laying out the straw beads
- Comparing straw bead sequences
- Fixing straw bead sequences
- Comparing straw bead sequences

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Example: Sequencing Task

- Children are given several different trials of various card sets and are asked to place the cards in a logical order to illustrate the steps needed to accomplish a goal (building block tower, sliding down a slide, pouring glass of juice, eating cereal).
- Children asked to order cards and either verbally describe or behaviorally demonstrate the sequence.

Challenges in Pre-K CT Assessment

- 1) Measuring CT, a construct closely related to meta-cognition, with children that are still developing language
- 2) Determining indicators that clearly identify the use of CT skills
- 3) Avoiding the development of simple problem solving activities that do not require the use CT skills
- 4) Taking a skill versus construct focus creates a lengthy assessment

Questions?

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