



Fidelity of Implementation in a Preschool Math Intervention

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Guided Play and Preschool Math

Preschool math is crucial for later academic development, but preschool classrooms need more curricular math supports: Guided play may be the answer!



What is Guided Play?

The adult initiates the learning process, constrains the learning goals, and helps maintain the focus on those goals as the child directs their own play (1).

Teachers will be assigned to a **high guidance** (more teacher directed), **low guidance** (more child directed), or a control condition.

Research Question

How do we operationalize and create rigorous measurement of guided play?

Fidelity of Implementation

Fidelity of Implementation has traditionally been defined as the extent to which the implementors actions aligns with an ideal, in this intervention the ideal of each guided play condition (2).

- The term is well-defined within public health research but ill-defined for educational interventions.
- Fidelity of implementation is typically measured using an implementor questionnaire or a classroom observation.

Some theorists believe that implementation is as important as the intervention itself (2,3).

- Fidelity of implementation measures allow researchers to attribute success or failure to the intervention materials and not the methods for implementation (3).

Structural vs Procedural Fidelity

Fidelity of implementation is a multidimensional concept.

Structural Fidelity: the presence or absence of key intervention components (3).

Procedural Fidelity: the quality of the implementation or of the student-teacher interactions (3).

Mathematics knowledge is better predicted by measures of structural fidelity or multidimensional measures (4).

Our battery of measurements has multiple tools to measure all the facets of fidelity.

Questionnaire

- How often are the games played per week
- How long do children play with the games
- How and when are teachers introducing each game

Classroom Observations

- How much are teachers interacting with the children during play
- Levels of directive language
- Physical interactions with the games

Room for Adaptation

Allowing for adaptations can help increase fidelity as every classroom has their own individual needs.

- Too much adaptation can decrease fidelity as teachers are not implementing the intervention as intended (3).
- Best practice includes building in room for adaptations and clearly articulating the key components that cannot be adapted to teachers before the intervention.
- Adaptations can also align the intervention to teachers' own opinions of the intervention and their pedagogical philosophies, which can predict fidelity of implementation (5).
- *Pre-Training Questionnaire:* designed to assess teachers' natural guidance style to help us guide teacher's adaptations.

Differentiating Experimental Conditions

If our operationalization and measure of guided play are both correct, we should be able to measure differences among the conditions.

Our measurements will be able to answer:

- What does it look like when teachers engage in different forms of guided play?
- How does the guided play condition affect children's play and math talk?

Hypotheses by Condition

High Guidance

- Medium play durations
- More conversational turns
- Teacher initiates the math talk
- The teacher is more directive in their talk
- Teachers interact with the game materials more frequently
- Positive teacher and child affect
- Low levels of peer-to-peer instructions
- Minimal periods of quiet

Low Guidance

- Long play durations
- Less conversational turns
- Higher levels of child talk
- Child initiates the math talk
- Teachers interact less frequently with the game materials
- Fewer teacher-student interactions
- Positive teacher and child affect
- High levels of peer-to-peer instructions
- Increased periods of quiet

Control

- Short episode durations
- Low rates of guided play interactions
- Low rates of math talk
- Less positive teacher and child affect
- Minimal peer-to-peer instructions

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