

## Registry of Efficacy and Effectiveness Studies

### Study Title:

Efficacy Study of a Pre-Algebra Supplemental Program in Rural Mississippi Schools

**Registry ID:** #11.1v1

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### Version History

**The first version of this entry was published on June 27, 2018 8:23 AM ET.**

Currently viewing this version.

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### Section I: General Study Information

**PI name:** Tedra Clark

**PI affiliation:** Mid-continent Research for Education and Learning (McREL)

**Primary funding source:**

Institute of Education Sciences

**Award number(s):** R305A120045

**IRB name:**

**IRB approval date:**

**IRB approval number:**

**Other registration name:**

**Other registration date:**

**Other registration number:**

**Study start date:** 2012-03-21

**Study end date:** 2015-02-28

**Intervention start date:**

**Timing of entry:**

### Brief abstract:

In some states, rural students continue to lag significantly behind their non-rural peers in mathematics achievement. A strong correlate of the mathematics achievement gap between rural and non-rural students is the availability for opportunities to learn. Providing supplemental learning activities can help improve the mathematics achievement of rural students by providing students with additional opportunities to learn the content. This study will evaluate the efficacy of a supplemental mathematics curriculum, Every Day Counts Algebra Readiness (EDC Algebra Readiness), in Mississippi, a state with a sizable number of rural schools and the largest gap in achievement on the eighth-grade algebra scale of the National Assessment of Educational Progress.

**Keywords:** Math achievement, rural schools, cluster randomized trial

**Comments:**

## **Section II: Description of Study**

**Type of intervention:**

Curriculum/Product, Professional Development

**Topic area of intervention:**

Mathematics and Science Education

**Number of intervention arms:**

1

**Target school level of intervention:**

6, 7, 8

**Target school type:**

Rural

**Location of implementation:**

*United States: South*

**Further description of location:**

Rural Mississippi

**Brief description of intervention arm:**

The EDC Algebra Readiness program is a widely used supplemental mathematics program that has not yet been rigorously evaluated. The program consists of an interactive bulletin board containing several visual models around which teachers conduct whole-class activities for 10-15 minutes per day. Teachers use the visual models to lead students in consistent, incremental daily practice designed to help them express conceptual thinking about mathematics and to understand critical algebra readiness concepts and skills. EDC Algebra Readiness focuses on the following topics: fractions, decimals, and percents; integers; number patterns; algebraic representation with variables, expressions, equations, and graphing; geometry; measurement; and data and probability with problem solving and discussion.

**Brief description of comparison condition:**

Schools in the control condition will continue to implement their business-as-usual mathematics curriculum and instructional practices.

**Comparison condition:** Business-as-usual

**Comments:**

*Section III starts on the next page.*

### **Section III: Research Questions**

#### **Confirmatory research questions:**

*Question 1*

1. What is the effect of EDC Algebra Readiness on 7th grade student math achievement compared to business-as-usual?

*Question 2*

2. What is question 2?

#### **Exploratory research questions:**

*Question 1*

1. Does participation in EDC Algebra Readiness for 7th grade rural Mississippi students predict: a) more pre-algebra instruction, b) more consistent instruction, and c) a different trajectory of instruction across the year?

*Question 2*

2. Is there a significant relationship between algebra readiness of 7th grade rural Mississippi students and: 1) more pre-algebra instruction, b) more consistent pre-algebra instruction, and c) the trajectory of instructions across the year?

#### **Comments:**

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### **Section IV-A: Study Design (Selection)**

#### **Study Design:**

Randomized Trial (RT)

#### **Comments:**

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### **Section IV-B: Study Design (Input)**

#### **Unit of random assignment of intervention:**

School

#### **Assignment within blocks or selected strata:**

No

#### **Probability of assignment to treatment the same across all units:**

Yes

#### **Probability of assignment to treatment:**

0.50

#### **Unit outcome data measured:**

Student

#### **Intermediate clusters between unit of random assignment and unit of measurement:**

No

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**Design Classification:**

RT: 2-level Cluster Randomized Trial

**Comments**

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**Section V: Sample Characteristics**

**Approximate number of students per school:** 50

**Number of schools in the comparison condition:** 20

**Number of schools in the intervention condition:** 20

**Certain students that were targeted for the study:**

Yes - 7th grade students

**Certain students that were excluded from the study:**

No

**Certain schools that were targeted for the study:**

Yes - Public schools that (1) are in Mississippi, (2) are rural as defined by the National Center for Education Statistics (National Center for Education Statistics Common Core of Data [NCES CCD], n.d.-a), (3) offer seventh grade mathematics, and (4) are not currently using EDC Algebra Readiness.

**Certain schools that were excluded from the study:**

No

**Comments**

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**Section VI-A: Outcomes (Selection)**

**Confirmatory question 1 - number of outcome measures:** 1

**Confirmatory question 2 - number of outcome measures:** 1

**Comments:**

*Section VI-B starts on the next page.*

**Confirmatory Question 1, Outcome Measure 1**

**Outcome domain:** Student Achievement - Mathematics

**Minimum detectable effect size:**

**Outcome measure:** algebra readiness assessment

**Scale of outcome measure:** Continuous

**Normed or state test:** Yes

**Same outcome measure in treatment and comparison groups:** Yes

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**Confirmatory Question 2, Outcome Measure 1**

**Outcome domain:** Student Achievement - Mathematics

**Minimum detectable effect size:**

**Outcome measure:** IOWA Algebra Aptitude Test (IAAT), 5th Edition

**Scale of outcome measure:** Continuous

**Normed or state test:** No

**Test-retest reliability:**

**Internal consistency:**

**Inter-rater reliability:**

**Same outcome measure in treatment and comparison groups:** Yes

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**Comments:**

*Section VII starts on the next page.*

## Section VII: Analysis Plan

**Baseline data collected prior to start of intervention:** Yes

**Description of baseline data:**

Pre-tests

**Covariates to include at the student level in the model:**

Student Pretest

**Covariates to include at the school level in the model:**

Cluster-level Mean Pretest scores

**Analytic model:**

$$Y_{ij} = \gamma_{00} + \gamma_{01}T_j + u_{0j} + e_{ij}$$

**Plan to handle cases with missing outcome data:**

Impute missing outcome data

**Process description:**

Multiple imputation assuming data is missing at random

**Comments:**

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## Section VIII: Additional Materials

**Links**

*No links have been added yet.*

**Files**

*No files have been added yet.*

**Comments**