

SCIENTIFIC RESEARCH

QUASI-EXPERIMENTAL

High Implementers of Accelerated Math Show Significant Gains Over Low- or Non-Implementers

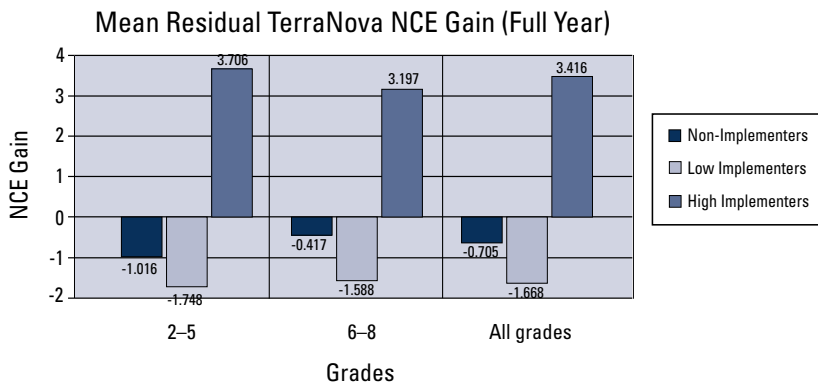
Summarized from: Ysseldyke, J., & Bolt, D. (2005). *Effectiveness of continuous progress monitoring in math as a function of implementation integrity*. Manuscript submitted for publication, University of Minnesota.

Independent research conducted in 2003–2004.

Introduction

An independent study conducted by Dr. James Ysseldyke, University of Minnesota, and Dr. Daniel Bolt at the University of Wisconsin–Madison shows that when implementing Accelerated Math, intervention integrity had a significant effect on gain in math scores.

Graph 1:



Graph 2:

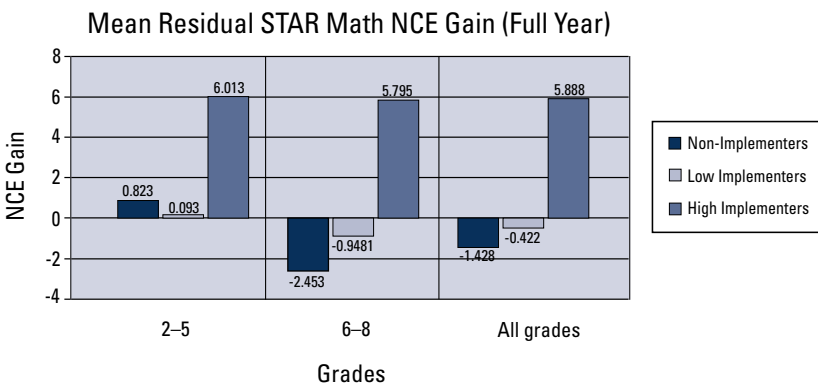


Table 1:

Effect Sizes (Cohen’s *d*) for High versus Low and No Implementation

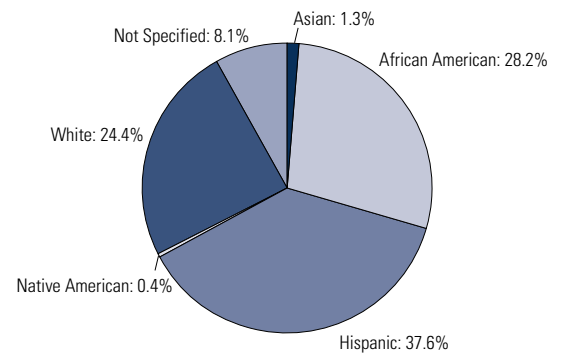
	TerraNova	STAR Math
High Implementation vs. Low Implementation	0.396	0.424
High Implementation vs. No Implementation	0.321	0.492

(more information on back)

Main Findings

- Students whose teachers use Accelerated Math—a continuous progress-monitoring and instructional management system—outperform students whose teachers rely solely on the math curricula being used in their district.
- When teachers implement Accelerated Math as intended, and students participate in the program activities and instruction, students gain significantly more than those for whom implementation is limited or nil.

Race/Ethnicity



Educator Background

Jim Ysseldyke, Ph.D. is Birkmaier Professor of Educational Psychology and Co-Director of the Center for Reading Research at the University of Minnesota. He is author of five major textbooks, numerous book chapters, and many articles in professional journals. Dr. Ysseldyke has received awards for his research from the School Psychology Division of the American Psychological Association, the American Educational Research Association, and the Council for Exceptional Children.

Daniel Bolt, Ph.D. is an associate professor of educational psychology at the University of Wisconsin-Madison, where he specializes in quantitative methods. Dr. Bolt earned his Ph.D. in psychology (quantitative) from the University of Illinois at Urbana-Champaign in 1999. In 2003, he received the Jason Millman Promising Scholar Award from the National Council on Measurement in Education.

Study Description

This study investigated the effect of teacher use of Accelerated Math to monitor student progress and to manage daily instruction. More specifically, the researchers were interested in determining the extent to which there are differences in teacher implementation of the computerized, continuous monitoring and instructional management system (Accelerated Math) in elementary and middle school classes, as well as whether students whose teachers are high, moderate, and low implementers of Accelerated Math differ in gains on standardized math tests.

The study included 3,309 grade 2–8 students from 133 classrooms and 9 schools. Eight school districts and states were represented in the ethnically diverse sample. (See Race/Ethnicity chart.) The study employed random assignment of teachers or classes, depending on grade level. At the elementary schools, three teachers per grade were randomly assigned to one of three conditions: A) Start using Accelerated Math October 2003, B) Start using Accelerated Math in January 2004, and C) Refrain from using Accelerated Math at all during 2003–2004 school year. In the middle schools, where teachers teach one subject to numerous sections of students, as opposed to one teacher teaching all subjects to one class, sections of students were randomly assigned to one of two conditions: A) Use Accelerated Math in 2003–2004 school year, and B) Refrain from using Accelerated Math in 2003–2004 school year. Participating teachers in middle schools taught at least one A group and one B group.

Teachers in the experimental condition used Accelerated Math as an enhancement to their regular math curriculum, while the others simply used their regular math curriculum. All students in the 133 classrooms were pretested with STAR Math, a computer-adaptive test of general mathematics achievement, and with the mathematics subtest of the TerraNova¹.

Students in the experimental group were assigned by their teachers to specific instructional libraries (levels) using data from

the STAR Math pretest to inform placement. Accelerated Math was used to track their performance, assign work, and inform both the student and teacher of the accuracy of the work.

Surprisingly, teachers did not implement Accelerated Math at all for 1,046 of the 2645 (39.5%) students in the experimental group. As a result, the researchers investigated whether teachers chose not to implement it with specific kinds of students, but through an analysis of the data, no systematic method for exclusion of students was identified. It was also discovered that six teachers in the experimental group did not implement Accelerated Math with any of their students, and there was nothing “special” about these teachers.

Due to large variation in how thoroughly teachers actually implemented Accelerated Math, an index of intervention integrity was formulated. Students were divided into three groups based on the number of Accelerated Math objectives the students mastered: no implementation, low implementation, and high implementation.

Results

A significant difference ($p < .001$) in the amount of gain in NCEs was evidenced by students in the no-, low-, and high-implementing groups on both the STAR Math Test and the TerraNova Achievement Test. Results indicated that high implementers had significantly greater gains in math scores. (See Graphs 1 and 2.) Effect sizes (Cohen’s d) ranged from 0.321 to 0.492. (See Table 1.)

Conclusion

The results of the study demonstrate that Accelerated Math is a highly successful continuous progress-monitoring and instructional management system. Students who used Accelerated Math in the high-implementing group significantly outperformed those who were low implementers or those who used solely their district math curricula.

¹TerraNova (CTB McGraw-Hill, 2001) is a national norm-referenced achievement test that measures student academic performance in reading, language, and mathematics.



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