

SCIENTIFIC RESEARCH

QUASI-EXPERIMENTAL

Accelerated Math® Leads to Statistically Significant Growth on the Northwest Achievement Levels Test

Students at All Skill Levels Achieve More

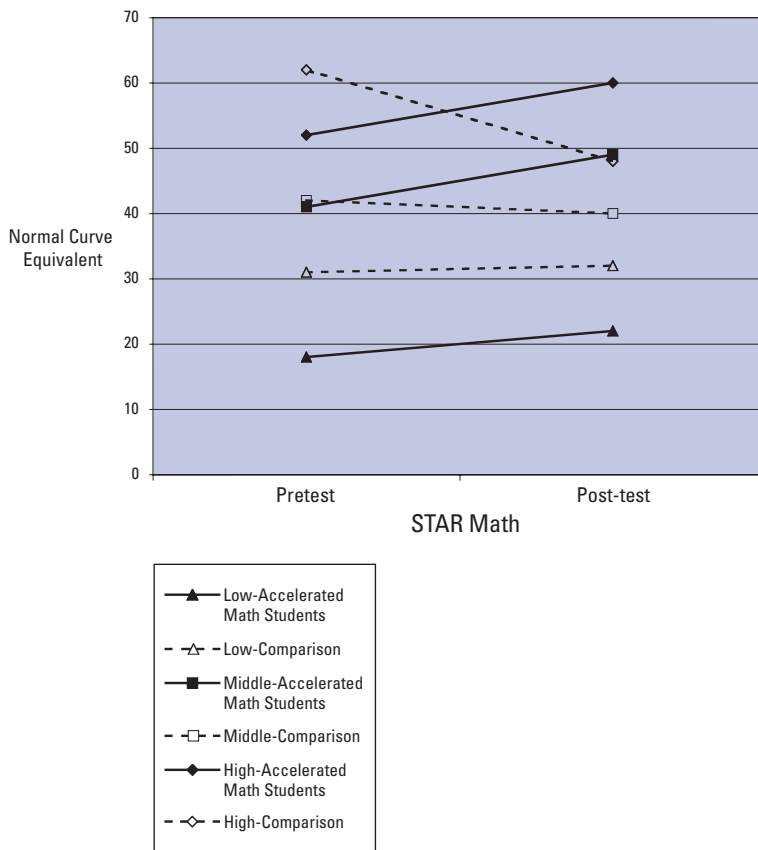
Summarized from: Spicuzza, R., J. Ysseldyke, A. Lemkuil, S. McGill, C. Boys, & E. Teelucksingh. "Effects of Curriculum-Based Monitoring on Classroom Instruction and Math Achievement." *Journal of School Psychology* 39, no. 6 (2001).

Research conducted during the 1998–1999 school year.

Introduction

The implementation of Accelerated Math math management software into a district's ongoing math curriculum led to greater math achievement and positive changes in student's instructional environments.

Students at all Skill Levels Achieve More with Accelerated Math



Main Findings

- Accelerated Math students achieved more on assessments than students not using the program.
- Accelerated Math students at all levels of achievement demonstrated growth while middle- and high-skill students not using Accelerated Math experienced losses.

Study Profile

District identity is confidential, so limited information is available.

Accelerated Math Classes:

137 students, Grades 4 and 5

Demographics: Urban

English Language Learners: 30%
Free or reduced lunch: 80%

Race/Ethnicity:

Minority: 79% • Non-minority: 21%

Same-School Comparison Group:

61 students, Grades 4 and 5

Demographics: Urban

English Language Learners: 23%
Free or reduced lunch: 89%

Race/Ethnicity:

Minority: 69% • Non-minority: 31%

District Comparison Group:

297 students, Grades 4 and 5

Demographics: Urban

English Language Learners: 33%
Free or reduced lunch: 81%

Race/Ethnicity:

Minority: 74%
Non-minority: 26%

(more information on back)

PEER-REVIEWED

Study Description

This quasi-experimental study examined the extent to which the addition of a curriculum-based monitoring system to an ongoing math program improved students' math achievement and instructional environment. The study compared the achievement of students who used Accelerated Math with students who did not; monitored changes in the presence of components of effective instruction after implementation of Accelerated Math; and compared differences in achievement gains and instructional environment conditions by student achievement level.

Four elementary schools in a large, urban, midwestern school district participated in this study from February through June 1999. Four fourth-grade and four fifth-grade teachers implemented Accelerated Math in their classrooms in addition to their district math curriculum (Everyday Mathematics). Achievement data was collected on all 137 Accelerated Math students. Instructional environment data was collected on a subsample of 24 students: one low-, one middle-, and one high-achieving student from each Accelerated Math classroom.

Math achievement gains of the students using Accelerated Math were compared to the gains of two groups of students not using Accelerated Math: 1) 61 fourth- and fifth-grade students who were enrolled at the same schools as the Accelerated Math students; and 2) 297 fourth- and fifth-grade students from three demographically similar schools in the same district.

Two measures of math achievement were used: 1) STAR Math[®], computer-adaptive norm-referenced standardized test of math skills which was administered to Accelerated Math students and the non-Accelerated Math students from the same schools in December 1998 and May/June 1999; and 2) Northwest Achievement Levels Test (NALT),¹ the district-mandated standardized test which is administered every year. The researchers also used The Instructional Environment System-II (TIES-II)² to gather data about the instructional environment of the subsample of 24 students before their teachers implemented Accelerated Math and again after their teachers implemented Accelerated Math.

Results

The researchers examined differences in STAR Math and NALT gains between Accelerated Math students and non-Accelerated Math students using analysis of covariance. Accelerated Math students demonstrated more growth than the non-Accelerated Math students at the same schools on both STAR Math and NALT (statistically significant, $p < .000$, $p < .01$ respectively) and more growth than the district non-Accelerated Math group on NALT (statistically significant, $p < .01$).

The researchers also found differences in achievement growth by initial math skill level. The researchers grouped students into low-, middle-, and high-math skill categories using their 1998 NALT results. Accelerated Math students at all initial skill levels demonstrated STAR Math test score growth while the middle- and high-skill non-Accelerated Math students experienced losses (see graph on front).

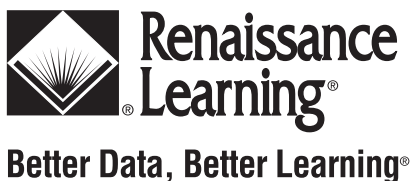
Finally, the researchers analyzed changes in students' instructional environment to determine what instructional mechanisms might have contributed to the greater achievement growth of Accelerated Math students. They found a statistically significant change in 2 of 10 instructional components: cognitive emphasis (thinking skills and learning strategies are communicated explicitly to students) and progress evaluation (direct and frequent measurement of student progress toward completion of instructional objectives).

Conclusion

Although they advocate for more research, the researchers conclude that adding curriculum-based monitoring systems such as Accelerated Math to a comprehensive math curriculum can be beneficial to student math achievement. While acknowledging the complexities of developing solutions to educational problems, they conclude that technological advances like Accelerated Math can help teachers provide effective instruction to all students.

¹Northwest Evaluation Association. *Achievement Level Tests Technical Description*. Portland, OR: Northwest Evaluation Association, 1996.

²Ysseldyke, J. & S. Christenson. *The Instructional Environment System-II: A System to Identify a Student's Instructional Needs*. Longmont, CO: Sopris West, 1993.



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